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WORLD CONFERENCE ON EXERCISE MEDICINE - 2023

AT HYDERABAD, FROM 2ND TO 4TH SEPTEMBER 2023

ACADEMIC SUPPORTERS

FROM THE ORGANISING CHAIR

Greetings to all and I must admit that I have been looking forward to writing this message.

Again, my utmost gratitude to all the scientific committee and those who have been directly or indirectly dedicated your time, effort and expertise on this mission to combat NCDs. We have hosted 5 programs in Malaysia and this coming session will be our 6th. I was indeed so happy to know that India has taken up this courageous effort to be the host and I believe one day in the very near future we will make an impact to change the mortality statistics soon.

We probably may not be aware that every two seconds, a person under the age of 70 dies of an NCD, and 86% of those deaths occur in low- and middle-income countries. This was announced on the sides of the 77th UN General Assembly as stated in the World Health Organization_new reportand _accompanying data.

In 2016, The World Health Organization (WHO) estimated that noncommunicable diseases (NCDs) were responsible for 41 million deaths, equivalent to 71% of global deaths. On the 16th Sept, 2022, The World Health Organisation published a similar figure that NCDs kill 41 million people each year, equivalent to 74% of all deaths globally. The figures remained unchanged.

The world is dying and we have to do more. As we focus on exercise medicine as an intervention, this year our speakers will deliver their paper on to the correct and safe types of exercise and the right dosage for each type of NCDs. From world renowned speakers of all fraternity and all over the world, we have assembled the best for your learning.

I am sure our relentless effort from so many countries will bring down the mortality figures soon and I look forward to meet you all in Hyderabad, Telangana State, India.

Dr. Jessy Lai,

WORLD CONFERENCE ON EXERCISE MEDICINE 2023

THREE DAYS OF EXERCISE FORMULATION

02 09

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ABSTRACTS

WORLD CONFERENCE ON EXERCISE MEDICINE 2023

Gender differences in sports injuries: A retrospective case study at our hospital

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ABSTRACT

Objective: The aim of the study was to investigate gender-specific differences in the types of injuries sustained in sports activities in males and females at our center. **Methods:** Injuries sustained in sports in professional athletes in cricket, football, volleyball, tennis, badminton, and track and field sports were analyzed. Data on age, sex, activity level, type of sports, and sports injury were collected. The proportions of common injuries caused by sports activities were investigated, and gender-specific differences in the types of common injuries caused by sports activities were clarified. The Fisher's exact test was used to determine the significance ($P < 0.01$) of the gender-specific differences in the types of sports injuries. **Results:** Ten-year data between the periods from June 2013 till June 2023 were collected. Total of 538 athletes were seen aged between 22 and 38 years of age. The most common injuries seen were in the knee joint, followed by ankle joint and lumbar spine. Among these injuries, a significantly higher proportion of females presented with an ACL injury, compared with their male counterparts ($P < 0.001$). **Conclusion:** The findings of this retrospective study suggest that there are gender-specific differences in ACL injuries sustained during sports.

Keywords: ACL injuries, Gender, Sports activities etc.

A study on motor fitness variables of varied sports players

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ABSTRACT

Fitness is the key to athletes' success, and it is the first factor that has an impact on performance. Motor fitness component are necessary for all athletes in each activity. The aim of the present study was to compare the motor fitness variables of various sports players. Sixty (60) male university-level athletes were chosen at random to take part in the study. Sports represented by the athletes included athletics (n = 10), basketball (n = 10), cricket (n = 10), football (n = 10), handball (n = 10), and volleyball (n = 10). The athletes were between the ages of 18 and 25, and they participated in the inter-university competition. Motor fitness components: Agility, speed, power, hand strength, abdominal strength, and cardiovascular endurance are measured with the appropriate methods and tools. The mean, standard deviation, standard error mean, minimum, and maximum value were computed for each group. A one-way analysis of variance (ANOVA) and *post hoc* (LSD) test was used to statistically analyze the given data for a significant difference. $P < 0.05$ was chosen as the level of significance. The F-value of the agility parameter between the groups was F (5.54) = 4.776, $P < 0.001$; speed parameter between the groups was F (5.54) = 5.602, $P < 0.000$; and cardiovascular endurance parameter between the groups was F (5.54) = 3.578, $P < 0.007$; there was a significant difference. Whereas for the parameters power, F (5.54) = 2.079, $P > 0.082$; hand strength, F (5.54) = 1.368, $P > 0.251$; and abdominal strength, F (5.54) = 1.947, $P > 0.102$, there was no significant difference between groups. According to the *post hoc* (LSD) test findings, each group's agility, speed, and cardiovascular endurance parameters were compared to each other to check the significance level. The study concluded that, to measure the motor fitness status of university-level athletes, there was a significant difference in agility, speed, and cardiovascular endurance parameters. On the contrary, the variables power, hand strength, and abdominal strength showed no significant difference between groups

Keywords: Agility, Athletes, Endurance, Motor fitness, Power, Speed, Strength

Role of managerial skills of a coach in talent development in the case of ethiopian athletics clubs

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ABSTRACT

The purpose of this study was to investigate the role of managerial skills of a coach in talent development in Ethiopian Athletics clubs. Taking this purpose as the general objective of the study, a descriptive survey research method was employed to investigate the problem. The target population for the study was selected from 405 male and female athlete runners attending five public academies. Out of the total 405 athletes, the researcher used simple random sampling techniques and selected 195 to be included in the study. Data were collected using a questionnaire, a tool designed to obtain information from participants by asking a series of questions. Specifically, the study utilized the Talent Development Environment Questionnaire, developed by (Martindale *et al*., 2010). Descriptive and inferential statistical analysis techniques were employed to analyze the data. Based on the results of this research, which aimed to identify managerial skills for athletes' development and explain coaching styles, it was found that the Talent Development Environmental Questionnaire (TDEQ) yielded mean and standard deviation results for the following variables: Long-Term Development Focus (M = 3.95, SD = 1.071), Quality Preparation (M = 3.28, SD = 0.071), Communication (M = 3.97, SD = 1.11), Understanding and Supportive Network for Athletes (M = 3.312, SD = 1.344), Supportive Network (M = 3.638, SD = 1.211), Challenge and Supportive Environment (M = 3.235, SD = 1.358), and Long-Term Development Fundamental Understanding (M = 3.805, SD = 1.096). It can be concluded that LTDF, QP, CS, USNA, SN, CSE, and LTDFU are all essential factors for the overall development of athletes in track and field athletics. Understanding the general problems addressed in this study can help managers to be more careful in selecting their coaching styles and choosing the best management model for developing athletes' skills, which has the most effective role.

Keywords: Athlete, Sport academy/club, Talent development, Talent

Healthy life style

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ABSTRACT

A healthy lifestyle is a way of living that lowers the risk of being seriously ill or dying early. Scientific studies have identified certain behaviors and lifestyles that contribute to the development of non-communicable diseases, leading to early death. Thus, health is not just avoiding disease or illness in life. It is also about physical, mental, emotional, and social well-being. The COVID-19 has highlighted the importance of maintaining good health to fight diseases and illness. Sedentary lifestyle and work pressure have made individuals more susceptible to poor lifestyle diseases and illness, such as diabetes, hypertension, and obesity. Regular health check-up scan help identify these deteriorating conditions at an early stage, allowing timely interventions by the medical experts. In today's highly competitive and professional world, people are in the midst of rising expectations and every individual and nation are fired with an ambition of projecting their ever best performance in every walk of life to lead the world from the front. For this purpose, adoption of a healthy lifestyle with dietary changes and active participation in activities-games and sports is of paramount importance and it currently holds a high profile in the global agenda of the World Health Organization (WHO). As a result, a fine combination of dietary changes and participation in physical activities in one's lifestyle, followed by its effective execution will help in reducing health-care costs and increasing the productivity of people, leading to improved per capita income of a nation, to a greater extent. The emerging paradigm shift of scientific research in public health has carved a niche, which individuals, nations/societies can ignore at their own peril. The contribution of a healthy lifestyle by active participation of people in games and sports for achieving sustainable economic growth and prospects of a nation is indispensable. The public expenditure on health care in India is found to be extremely low at 1.1% of GDP as compared to China that is 2.4% of their GDP. Malnutrition and poor sanitation are found to be major causes for diseases and illness among the children and old people. The global commission of leading economists found a strong connection between public health and national wealth. A prominent economist, Dean Spears has highlighted that malnutrition is the cause of almost half of those children who survive, leading to cognitive impairments that prevent them from ever reaching their potential in life. Therefore, the future of a nation depends on the health investment and active involvement of the public in effective execution of policy on health care at all levels. Now, it is a need of the hour to encourage sporting icons to project a healthy lifestyle (Dietary Changes and Exercise Changes) as role models for other people in the family and society to change their behavior to live healthier and longer lives. Further, health education can be of great help in motivating the people of ages to adopt active, healthy, and productive lifestyles, to develop positive attitude, dynamic behavior and quality of life. There are many reasons for poor public health, such as genetics, metabolism, eating disorders, lack of activity, energy imbalance, prolonged dieting, malnutrition, and psychological factors. A. Dietary Changes include –balanced diet, plenty of water, limited caffeine, and alcohol. B. Active participation includes-moderate intensity exercise, getting enough sleep, stress management, meditation, and deep breathing. On a regular basis, for executives with hectic schedules in the corporate sector.

Keywords: Genetics, Healthy life style, Metabolism etc.

Cardiovascular risk biomarkers and grip frailty among newly diagnosed diabetes in inactive people

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ABSTRACT

Cardiovascular diseases (CVDs) continue to be a significant global health concern, necessitating an understanding of their nature and assessment methods. This abstract explores the fundamentals of CVDs, including their definition, risk factors, and assessment techniques. It also delves into the concept of cardiovascular endurance, its importance, and strategies for enhancing endurance and efficacy. Cardiovascular diseases encompass a range of conditions affecting the heart and blood vessels, such as coronary artery disease, hypertension, and heart failure. Assessing these diseases involves various diagnostic tools, including medical history evaluation, physical examinations, imaging techniques, and laboratory tests. Early identification and accurate assessment are crucial for prompt intervention and management. Cardiovascular endurance refers to the ability of the cardiovascular system to sustain prolonged physical activity. It is a key component of overall fitness and plays a vital role in preventing CVDs. Improving cardiovascular endurance involves regular aerobic exercise, such as brisk walking, jogging, or cycling, combined with appropriate intensity and duration. Adopting a well-balanced diet, managing stress, and getting sufficient rest are also beneficial. Individuals with cardiovascular issues face an increased risk of developing diabetes, necessitating a closer examination of this relationship. Factors contributing to this vulnerability include insulin resistance, obesity, inflammation, and genetic predisposition. Understanding these links can aid in developing preventive strategies and interventions to mitigate the risk of diabetes in cardiovascular patients. Diagnosing a newly diabetic patient involves various methods, including blood glucose testing, oral glucose tolerance tests, and glycated hemoglobin (HbA1c) measurement. Accurate diagnosis enables health-care professionals to initiate appropriate treatment and lifestyle modifications promptly. Effective measures to improve the overall health and well-being of diabetic patients include implementing a well-balanced diet, regular physical activity, medication adherence, blood sugar monitoring, and continuous education on diabetes self-management. In conclusion, this abstract sheds light on the intricacies of cardiovascular diseases, emphasizing the importance of assessing them accurately. It also highlights the significance of cardiovascular endurance and provides insights into enhancing endurance and efficacy. Moreover, it explores the link between cardiovascular diseases and diabetes, underscoring the need for preventive measures. By diagnosing and supporting newly diabetic patients through comprehensive lifestyle interventions, their health and quality of life can be positively impacted.

Keywords: Cardio-vascular, Diabetes, Exercise, Healthy life

Wellness lifestyle management – for fitness, health, and fulfilling life

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ABSTRACT

Contemporary society is affected by several non-communicable diseases mainly due to increasing inactivity. Hypokinetic diseases such as diabetes, hypertension, and other cardiovascular diseases are causing severe strain on the nations. Inactivity not only increases obesity but is also a direct impactor for non-communicable diseases. Although exercise seems an effective therapeutic factor that could heavily influence the health status of individuals, physical wellness alone cannot achieve the desired health status for an individual. Other aspects such as nutrition and emotional stress also play a key role in terms of securing proper health fitness and functional health among individuals. Even optimizing and securing financial, and social wellness may also play a significant role in the health status of an individual. Hence, individuals should regularly exercise, adapt proper nutritional programs that would suit the daily physical routines of the individuals including exercise, and also secure proper social wellness and emotional wellness for experiencing excellent functional health and making their lives so fulfilling. Hence, a wellness lifestyle is a correct and apt requisite for individuals to maintain proper health and energy. Wellness lifestyle management is a complex and simultaneous process through which individuals try to achieve perfect balance among all the possible human domains such as physical, nutritional, emotional, social, spiritual, environmental, financial, etc. through conscious and scientific efforts.

Keywords: Cardiovascular disease, Exercise, Functional health, Non-communicable diseases, Wellness lifestyle

Effect of yogic practices and aerobic exercises on selected bio-motor physiological and performance variables among middle aged women

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ABSTRACT

The aim of this study was to investigate the effects of yogic practices and aerobic exercises on selected bio-motor physiological variables among middle-aged women. A total of 100 middle-aged women (aged 40–60 years) participated in the study and were randomly assigned to three groups: Yogic practices group (n = 20), aerobic exercises group (n = 20), and control group (n = 20). The yogic practices group engaged in regular yoga sessions consisting of asanas (postures), pranayama (breathing exercises), and meditation. The aerobic exercises group participated in supervised aerobic activities such as jogging, cycling, and aerobic dance. The control group did not engage in any specific exercise program. The intervention period lasted for 12 weeks. Pre- and post-intervention assessments were conducted to evaluate the selected bio-motor and physiological variables, including flexibility, strength, aerobic capacity, and balance. Significant improvements were observed in all measured variables in both the yogic practices and aerobic exercises groups compared to the control group. The yogic practices group demonstrated significant improvements in flexibility, strength, aerobic capacity, and balance. Similarly, the aerobic exercises group showed significant enhancements in flexibility, strength, resting pulse rate, and vital capacity. The findings of this study indicate that both yogic practices and aerobic exercises have a positive impact on selected bio-motor physiological variables among middle-aged women. Regular engagement in yoga and aerobic activities can lead to improvements in flexibility, strength, resting pulse rate and vital capacity. These results suggest that incorporating both forms of exercise into a comprehensive fitness routine can be beneficial for the overall health and well-being of middle-aged women.

Keywords: Aerobic exercises, Bio-motor physiological variables, Flexibility, Middle-aged women, Resting pulse rate and vital capacity, Strength, Yogic practices

Exercise as a therapeutic intervention for metabolic diseases: Exploring mechanisms and clinical implications

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ABSTRACT

Metabolic diseases, including obesity, Type 2 diabetes, and cardiovascular disorders, have reached epidemic proportions globally, posing significant health, and economic burdens. Emerging evidence suggests that regular exercise plays a key role in the prevention and management of these conditions. This abstract highlights the mechanisms underlying the beneficial effects of exercise on metabolic diseases and explores its clinical implications. Exercise exerts multiple physiological effects that contribute to the prevention and management of metabolic diseases. First, regular physical activity enhances insulin sensitivity and glucose uptake in skeletal muscles, thereby reducing the risk of insulin resistance and Type 2 diabetes. In addition, exercise promotes weight loss and weight maintenance by increasing energy expenditure, improving lipid metabolism, and preserving lean body mass. Moreover, physical activity has direct cardioprotective effects, including lowering blood pressure, improving lipid profiles, and reducing systemic inflammation, thus mitigating the risk of cardiovascular diseases. In recent years, a growing body of evidence has shed light on the molecular mechanisms mediating the benefits of exercise on metabolic health. These mechanisms involve activation of various signaling pathways, such as AMP-activated protein kinase (AMPK) and peroxisome proliferator-activated receptor gamma coactivator 1-alpha (PGC-1α), which regulate energy metabolism, mitochondrial biogenesis, and oxidative stress. Furthermore, exercise-induced myokines, such as irisin and interleukin-6, exert systemic effects on adipose tissue, liver, and other organs, modulating inflammation, lipid metabolism, and insulin sensitivity. Understanding the clinical implications of exercise in metabolic diseases is crucial for optimizing treatment strategies. Exercise prescription should be tailored to individual needs, considering factors such as age, fitness level, and comorbidities. Implementation of structured exercise programs, including aerobic and resistance training, in clinical settings can lead to significant improvements in metabolic parameters and overall health outcomes. Moreover, integration of exercise interventions with pharmacological and dietary approaches may provide synergistic effects, enhancing the efficacy of multidisciplinary treatment strategies. In conclusion, exercise represents a powerful therapeutic intervention for metabolic diseases. Its beneficial effects encompass a wide range of physiological and molecular mechanisms that improve insulin sensitivity, lipid metabolism, and cardiovascular health. By recognizing the clinical implications of exercise, health-care professionals can effectively incorporate exercise interventions into comprehensive treatment plans, ultimately alleviating the burden of metabolic diseases and improving the overall well-being of individuals worldwide.

Keywords: Exercise and metabolism, Metabolic diseases

Yoga: An oldest form of exercise for mental health and well-being in modern times

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ABSTRACT

Yoga is the oldest form of exercise that our ancestors lived and leaves for us to enjoy the pursuits and be blessed with good health. The origins of Yoga can be traced back to ancient India somewhere around 5000 years ago as the written texts suggest. The ancient yogic traditions were developed as a holistic practice comprised with physical posture (asanas), breath control (pranayama), meditation (dhyana) which guides us an ethically principled and harmonious balanced life. By practicing yoga, one can achieve a quiet mind; positive mental health is a state of well-being in which every individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully and can make a positive contribution to his society. Yoga's aim is to create compassion within and a deep sense of unity and oneness with all forms of life as we all know through a flexible body, we gain a flexible mind. Well-being refers to the experience of health, happiness and prosperity which includes good mental health high life satisfaction a sense of meaning or purpose and ability to manage stress. Post-COVID mental health concerns are escalating globally and our greatest loss while suffering from poor mental health is the inability to appreciate what we currently possess. **Objectives:** The aim and objectives of the study deals with the impact of yoga exercises along with breathing and relaxation techniques one can achieve sound mental health and well-being. **Methods:** For this study 30 people were chosen from different geographical locations a group ranges from 25 years to 76 years and the method used is qualitative studies. This study helps me to understand the true effectiveness of Yoga, Yoga mudra and relaxation techniques impact on people who were suffering with stress and anxieties depression mild to moderate range along with other lifestyle diseases. **Results:** After giving counseling sessions according to their particular problems, they were given Yogic exercises and relaxation techniques; a visible change is being observed in them from the first months onwards; they seem happier, more connected and contented with their lives than earlier. I have done this entire study during COVID periods, so no medical interventions were there at all. All are leading happy and healthy life now and they have included Yoga in their daily routine.

Keywords: Breathing techniques, Meditation, Mental health, Well-being, Yoga

Exercise prescription for ageing women – challenges, considerations, and guidelines

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ABSTRACT

The percentage of aged population is fast growing worldwide. Aging women experience very unique physical, physiological, and psychological changes. While women transit beyond the age of 50 years, maintaining wellness becomes a serious concern. The formulation of exercise prescription for this population poses unique challenges and considerations that must be carefully taken into account to achieve the best desired outcome. The important challenges in aging women are physiological changes such as decreased muscle mass, bone density, and hormonal imbalance that would increase the risk of Osteo arthritis and Osteoporosis. These challenges require personalized exercise prescription with a blend of balanced intensity, duration and frequency in accordance with their health status and fitness levels. The exercise prescription must follow holistic approach that interplay between physical, physiological, psychological, and social factors as they hinder adherence to regular exercise. Considering these, suitable tailor made programs with flexible workout schedules with integration of stress management techniques will be effective to achieve the desired goals of wellness. The guidelines to formulate tailor made exercise prescription should be based on comprehensive assessment of medical history, initial fitness, joint mobility, and cognitive abilities. It is important to set individualized health goals and integrate endurance, strength, flexibility, and balance components with progressive training load to improve functional capabilities without injury risk. Proper emphasis should be on weight bearing and resistance exercises that would reduce risk of injuries and also on mind body integrative activities like Yoga to improve mental wellness. The aging women must be given enough social support to adhere to regular exercise and it is very important to create awareness about benefits of regular exercise and motivate them. It can be concluded that formulating tailor-made exercise prescription for aging women is critical in promoting their wellness and functional independence. By understanding the challenges faced by this population, fitness experts and health-care professionals can formulate guidelines and personalized exercise prescription for them to lead active, quality, independent, and fulfilling lives.

Strategies to increase physical activity

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ABSTRACT

Global physical activity level have been stagnating since the 2000s, with around 80% of adolescents and 28% of adults not achieving the recommendations. As a result, a pandemic of physical inactivity is occurring, with far-reaching health consequences along with a substantial economic burden, it has been reported that 10% of all deaths, from NCDs, can be attributed to physical inactivity. There are 300 million school-going and 80 million out-of-school children in India between the age group of 5–18 years. Survey of Indian council of Medical research has indicated that 20% of children are is overweight or obese; another survey indicated that 40% of primary school children are underweight and obesity in 12–19 years and the number has tripled since 1970. About 90% of Indians believe that schools and workplaces are responsible for creating a healthy and active environment. Several studies have shown that extending of focus beyond academics to sports and other activities improves classroom attendance and interest in studies. Sports and physical activity require innovative and scientific model which can play a crucial role in the implementation of health-related SDGs and further help in the achievement of "Healthy/fit India." Sports science and technology in India have changed the way sport is and physical activity are played and perceived. India has developed a sports ecosystem that is leading to increased participation in sport and physical activity. Government of India has taken number of strategical measures for the development of sports and physical activity. India has launched Fit India plan to achieve health-related SDGs through sport and physical activity. Application of scientific research and innovative technology on or off the field has impacted sport outcomes in a profound way and is essential to sporting success. However, India need to make an impactful change by strategical planning and execution on building a sports and fitness culture in the country, to create a generation of fitter, healthier kids, socially aware, and have the right life skill. A sustainable model for holistic fitness of children and youth needs to be designed which can include more innovative approaches, collaboration between school and community, multidisciplinary approach. Redesigning curriculum of schools by incorporating physical activity such as yoga, dance and sport to promote fitness, and cognitive development. Increasing physical activity requires a systems-based approach. There cannot be one single solution, there is a need to diagnose and make improvement the way the Physical activity system performs its required function, for different population across all life stages.

Keywords: Healthy fit, Innovative technology, Physical activity

Magic of meditation

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ABSTRACT

Introduction: Mind is known to play a key role in achieving success in the field of sports. Well known elite-athletes, such as Michael Phelps and Lanny Bassham, have highlighted the role of mind power when they performed at the peak of their careers. The world now accepts the role of meditation in enhancing physical performance, concentration, and focus, which are of great importance to a sportsperson. In addition, the impact of meditation in healing-physically and mentally, enhancing self-motivation, overcoming pain is also documented, but less explored. **Purpose:** Using meditation can help calm the mind and hasten the healing of the body as it improves our control over thoughts and emotions. Hence, we present an overview of simple Rajayoga meditation technique to help sportspersons achieve enhanced performance and quicker recovery from injuries. **Methods:** Traditional breathing techniques help in creating awareness of the thoughts; however, to enhance the mental strength, the "thought muscle" needs to be developed. The technique of easy Rajayoga meditation requires a focused synchronization of thoughts and senses, that is, the sense of sight, sound, smell, touch, and taste should become attuned to the thoughts. With clarity and repetitions, the subject experiences a sense of awareness of what's happening inside, including which body organ feels stretched or injured, which emotion is pulling one down and what motivation do they seek. The first step of self-awareness is like a root cause analysis which can be subsequently used to advance the meditation practice with an aim to resolve the cause of discomfort, pain, and disease. **Results and Discussion:** Without proper training of the mind, individuals often drain their mental power due to mood swings, self-discouragement, low self-esteem, over-confidence, and even lack of work-life balance. This severely affects body's ability to perform, and recover after a strenuous workout or injury, which is especially important for sportspersons. To access the internal, vital source of energy meditation is a proven, natural, and effective way. **Conclusion:** Meditation is a skillful process of channelizing the thought energy toward positively disciplining the mind, develop a power to relax, and recover both the mind and body. Meditation helps to perform under pressure and rejuvenate at will to give optimal physical, emotional, social, or intellectual performance.

Keywords: Healing, Meditation, Mind body, Positive imagery

Power of Mind to Increase Adherence to Exercise Regimes

BK EV Gireesh

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ABSTRACT

Train your mind, and your body will follow. The real workout starts with the thoughts you feed your soul. The strength of your muscles is limited, but the power of your mind is limitless. Your body can withstand almost anything, it's your mind that you must convince. Believe in your potential and watch your fitness soar. Visualization is your strongest workout tool. See yourself succeeding and your body will follow suit. You body achieves what your mind believes. Cultivate a mindset of success, and your exercise journey will know no bounds. Progress is built on consistency, and consistency is a product of your disciplined mind. Train your thought, train your body. The mind-body connection plays a significant role in achieving fitness goals. Mind power plays a crucial role in adhering to exercise regimes. One's mindset and mental attitude have a significant impact on your ability to stay consistent, motivated, and committed to your fitness goals. Developing and maintaining a positive mindset can greatly help in adhering to an exercise regime. Some tips to cultivate a positive mindset are: -

1. Setting positive intentions: Remind oneself of the benefits such as improved energy, strength, or mental well-being. Focus on the positive outcomes rather than dwelling on any perceived challenges.
2. Practice Positive Self-Talk: Be mindful of your self-talk during exercise. Replace negative thoughts or self-criticism with positive and encouraging statements. Remind yourself of your capabilities, progress you've made, and the effort you're putting in.
3. Find Joy in the Process: Shift your focus from solely outcome-oriented goals to finding joy in the exercise itself. Embrace the physical sensations, enjoy the music or surroundings, appreciate your body, and cultivate a sense of gratitude for being able to exercise.
4. Celebrate Small Wins: Acknowledge and celebrate even the smallest achievements along your exercise journey. It will boost motivation and confidence.
5. Surround Yourself with Positivity: Surround yourself with positive influences and environments like uplifting social media accounts, online communities of like- minded individuals, supportive workout buddy who can provide encouragement and accountability.
6. Visualize Success: Take a moment to visualize yourself successfully completing your exercise routine and achieving your fitness goals. It can help enhance focus, motivation, and belief in your ability to adhere to your exercise regime.
7. Practice Meditation: Incorporate mindfulness techniques into your exercise routine. Pay attention to your body, breath, and sensations during the workout. Be present in the moment, fully engaging with each movement and appreciating the benefits it brings to your body and mind.
8. Reflect on the Positive Impact: Regularly reflect on the positive impact on your overall well-being like your strength, stamina, mood, or stress levels. Keep a journal to note these positive changes.
9. Embrace Challenges as Growth Opportunities: It will help you develop resilience, determination, and a deeper understanding of your own capabilities.
10. Be Kind to Yourself: Practice self-compassion throughout your exercise journey. Treat yourself with kindness, understanding and forgiveness. Remember that progress takes time and setbacks are normal. Treat yourself with the same kindness and encouragement you would offer to a friend.

There can be various reasons why people struggle to adhere to exercise regimes. The common factors that may contribute to difficulties in maintaining consistency are: -

Lack of motivation, unrealistic expectation, lack of time, lack of support, boredom or lack of variety, physical discomfort or pain, Mental and emotional barriers, lack of planning or structure, negative experiences or past failures, environmental factors. Everyone's circumstances and barriers may differ. By understanding these common reasons, individuals can identify the specific factors affecting adherence and work towards finding solutions. Tailoring the exercise regime, seeking, and implementing strategies can help improve adherence to create a sustainable exercise routine.Some ways to increase adherence to exercise regimes are: -

Set realistic goals, find activities you enjoy, establish a routine, mix it up, find a workout buddy, track your progress, reward yourself, make it social, be flexible, listen to your body. Remember, adherence to an exercise regime is a personal journey. It is important to find what works best for you and to approach it with a positive mindset. Successful sports personalities often possess specific mindsets that contribute to their ability to adhere to exercise regimes consistently. Some key mindset traits commonly found are: Discipline and determination, goal orientation, positive self-belief, strong work ethic, resilience, focus and concentration, perseverance, self- motivation, positive mindset and mental toughness, love, and passion for the sports. While these mindset traits are commonly found in successful athletes, it's important to remember that everyone's journey is unique. Developing these qualities takes time, effort, and self-reflection. Adopting a positive and determined mindset can contribute significantly to adherence and success of an exercise regime.

Physical education program for promotion of health among school students in India

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ABSTRACT

The school's physical education program is a primary contributor to building a strong foundation for the development of broad-based physical competencies and opportunities for recreational participation of the School Students in India. Building on the physical education program, the sports Cocurricular activities program provides opportunities for specialization in a sport, as well as broad-based development within the specialized sport and across other sports. Together with other school programs, physical education and sports contribute to Preamble Physical Education and Sports Development Framework Preamble v holistic education and the development of 21st Century Competencies to better prepare each individual to thrive in a fast-changing and highly-connected world. The PE program is an integral component of India school curriculum. The learning areas addressed during Physical education classes are: Traditional Sports, Yoga, Kabaddi and Kho, Mass Drills exercises, etc. The students acquires wide range of motor skills, develops good health, fitness, etc. To strengthen our Holistic Health Program, we infuse these elements through a whole-school approach. First, in our Physical Education lessons – besides focusing on movement competencies which are fundamental towards equipping pupils to be proficient in sports and games – also include components of food and nutrition. Second, we also participate in the Healthy Meals in Schools Program to ensure our pupils eat right and learn the importance of maintaining a healthy diet. Third, we also work with parents so that they can help provide a healthy diet for their children outside of school. The proper exercise, good food will contribute to the holistic wellness.

Keywords: Health, Traditional sports, Yoga

Vitamin D insufficiency in sports and non-sports individuals: A retrospective investigation in India

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ABSTRACT

Introduction: Vitamin D (Cholecalciferol) insufficiency affects a staggering number of individuals worldwide, surpassing one billion. In tropical countries like India, Vitamin D deficiency remains highly prevalent across diverse age groups and genders. Our recent exploratory observations underscore the importance of adequate Vitamin D levels for optimizing physical performance and overall health, both in sports and non-sports settings. **Methods:** This retrospective study encompassed 6330 non-sports individuals and 600 sports individuals aged between 12 and 65 years, who sought medical treatment for musculoskeletal disorders (MSD) and disc diseases. Blood levels of Vitamin D (25-OH) were evaluated using accredited laboratories' standard CLIA method. The data spanned a 12-year period and included information on subjects' dietary habits and sunlight exposure. **Results:** Our findings revealed a notable prevalence of Vitamin D insufficiency and deficiency among both sports and non-sports individuals. Notably, age and gender did not exhibit significant associations with Vitamin D deficiency. Factors such as obesity (percent body fat ≥30), darker complexion, and limited outdoor exposure were linked to higher rates of Vitamin D deficiency. Among sportspersons, table tennis players exhibited the highest deficiency at 60%, followed by badminton (46%), shooting (41%), tennis (26%), cricket (23%), and athletics (17%). For non-sports individuals, a striking 97.6% had insufficient Vitamin D levels (<30 ng/mL), with 78.9% classified as severely deficient (<15 ng/mL). **Discussion:** Our retrospective study emphasizes the crucial role of Vitamin D in optimizing physical performance and overall well-being. Chronic Vitamin D deficiency, along with other micronutrient deficiencies, is potentially influenced by sociocultural changes, inadequate dietary patterns, reduced sunlight exposure, certain dependencies, and underlying diseases. Surprisingly, Vitamin D deficiency was observed even among sports individuals, possibly influenced by shifts in dressing habits, sunscreen usage, dietary changes, and subclinical malabsorption. **Conclusion:** The prevalence of Vitamin D insufficiency represents a significant global health concern, warranting urgent attention. Implementing strategies such as food fortification, raising awareness regarding sunlight exposure, advocating for pharmacological supplementation, and regular monitoring of blood levels are critical in addressing this issue.

Keywords: Cholecalciferol, Micronutrients, Musculoskeletal disorders, Pandemic, Vitamin D insufficiency

Dose response profile to improve cardiovascular fitness

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ABSTRACT

Research during the past several years confirms the health benefits of regular physical activity, including better cardiovascular function with reduced risks of morbidity and mortality from cardiovascular heart disease (CHD). The growing research evidence also shows that the same physical exercises induce varied outcomes across persons. Try to better know this interindividual difference in response to acute and regular physical exercising, most research, so far, has focused on non-modifiable factors such as sex and different genotypes, while quite little attention has been paid to exercise prescription as a modifiable factor. With a modified exercise prescription, dosage can be made comparable across individuals, a procedure that is necessary to better understand the dose response relationship in exercise. This improved understanding of dose response relationships could help to design well-organized physical training approaches for cardiovascular fitness. Hence, the purpose of this lecture is to shed light on differences in exercise prescription and their relation to the dose and the interindividual variations in cardiovascular fitness.

Enhancement of performance of players with “NLP” visualization mental training

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ABSTRACT

The tough challenges encountered by a sports person while participating, competing and winning national and international events are always the discouraging elements that a sportsman spirit come face to face with. The physiological side that is intensely subjected by training modules, high endurance training sessions, and anticipation based extreme pressure from trainers creates a kind of confidence. When such confidence crumbles despite all efforts above, a sudden vacuum fills and dispirits the accumulated credibility over self. This is where the critical participation of mental faculties through researched, tested, and channelized studies through NLP visualization techniques (balloon exercise) helps to overcome from the prevailing inadequacies that develop at later stages in high competition environment. This precautionary measure taken and implemented on awareness basis to sports personnel who prepare for greater challenges to be successful in the competitions. This NLP training program entails a 4-week training with a batch of ten sports personnel ages ranging from 16 to 20 years (M = 18 years), it must be done in a comfortable environment by giving the psychoeducation and after making them understand how this model works with brain and body training was given to them. A pre-test, intervention, and post-test design was used. In the pre-test, athletes’ performance in their events was assessed. Then, all participants received mental training based on the NLP visualisation model. For 4 weeks, athletes rehearsed the mental training. The post-test was conducted after the intervention to evaluate athletes’ performance. The results showed that NLP visualization significantly improved athletes’ performance. Athletes who received NLP visualization performed better in the post-test than they did in the pre-test. This study suggests that NLP visualization is an effective technique for improving sports performance. This paper deals with one of the most effective methods NLP visualizations (balloon exercise), how it helps the players to give the effective performance in the competitions.

Keywords: Balloon exercise, Mental training, NLP visualization, Performance

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Research Article

Effect of Tabata training on selected endurance parameters of school boys

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ABSTRACT

Tabata is high-intensity interval training a cardiovascular workout that elevates your heart rate and burns many calories in a short amount of time. These skills are to be tuned in right stage of adolescent's boys so that we could have the society with healthy life. By keeping this thought, an attempt is made to assess the Tabata training status of school boys. In this experiment, we critically reviewed the available literature related to Tabata training and its effects on physiological level in team sport athletes. The study experimented effect of Tabata training on selected endurance parameters of 60 school level boys from Coimbatore district at the age group 14–17 years of age, the selected subjects were divided into two equal groups consisting of 30 boys. The influence of the Tabata training was assessed on endurance parameters. Treatment Group I underwent Tabata training, Group II acted as control group (CG). All the sixty subjects were inducted for pre- and post-test on endurance parameters were cardiorespiratory endurance and abdominal endurance. The training load was increased from the maximum working capacity of the subject doing pilot study. The Tabata training was given to the experimental group for 3 days per week (Monday, Wednesday, and Friday) for a period of 12 weeks. The CG was not given any sort of training except their routine work. The endurance parameters, namely, cardiorespiratory endurance, were assessed by cooper 12 min run/walk test and abdominal endurance was assessed by sit-ups that were assessed before and after training period. The result from "t" test and inferred that 12 weeks Tabata training treatment produced identical changes over endurance parameters of school boys. Further, the findings confirmed the Tabata training is suitable protocol to bring out the desirable changes over endurance parameters of school boys.

Keywords: Abdominal endurance, Cardiorespiratory endurance, School boys, Tabata training

INTRODUCTION

Tabata training was discovered by Japanese scientist Dr. Izumi Tabata and a team of researchers from the National Institute of Fitness and Sports in Tokyo. Tabata and his team conducted research on two groups of athletes. The first group trained at a moderate intensity level while the second group trained at a high intensity level. The moderate intensity group worked out 5 days a week for a total of 6 weeks; each workout lasted 1 h. The high-intensity group worked out 4 days a week for 6 weeks; each workout lasted 4 min and 20 s (with 10 s of rest in between each set). The results Group 1 had increased their aerobic system (cardiovascular), but showed little or no results for their anaerobic system (muscle). Group 2 showed much more increase in their aerobic system than Group 1, and increased their anaerobic system by 28%. In conclusion, high intensity interval training (HIIT) has more impact on both the aerobic and anaerobic systems.

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Each exercise in a given Tabata workout lasts only 4 min, but it is likely to be one of the longest 4 min you have ever endured. The structure of the program is as follows:

- Work out hard for 20 s
- Rest for 10 s
- Complete 8 rounds.

One pushes oneself as hard as they can for 20 s and rest for 10 s. This is one set. It completes eight sets of each exercise. One can do pretty much any exercise one wish. One can do squats, push-ups, burpees, or any other exercise that works large muscle groups. Kettlebell exercises work great, too.

An example of a Tabata workout looks like this:

1. Push-ups (4 min)
2. Bodyweight Squats (4 min)

3. Burpees (4 min)
4. Mountain Climbers (4 min).

Start with push-ups. Perform them for 20 s at a high-intensity. Rest for 10 s, and then go back to doing push-ups for 20 s. Once you complete eight sets of push-ups, rest for 1 min. Next, and move on to squats, and repeat the sequence of 20 s on, 10 s off. Once you finish eight sets of squats, rest for 1 min, and then do burpees. After burpees, finish the workout with mountain climbers. Tabata is great to get a quick workout in if you are short on time, you need to switch up your routine, or you want improve endurance and speed. Incorporate this type of workout into your fitness routine and produce results. In line with the Tabata training, the type of exercise that is considered to be able to significantly contribute in elevating the strength and speed is HIIT. HIIT is a type of cardiovascular exercise that combines high-intensity exercise with moderate or low-intensity exercise in a certain time interval. For example, HIIT is to combine sprint training with jogging, such as: 60 s of jogging, then after 60 s, continue sprint training for 30 s, and so on. This type of exercise can be done anywhere and anytime, such as on jogging track or in the gym with treadmill equipment. HIIT is very effective because HIIT can enhance heart performance which has an impact on the body's metabolism which also enhances sharply. Metabolism here deals with the body's ability to turn fat into energy. In addition to metabolism increases during exercise, the metabolism also increases at rest so that the body remains in burning fat condition at rest (Munandar *et al*., 2021).

Hypotheses

It was hypothesized that, the Tabata training would produce significant changes over endurance parameters of school boys.

METHODS

Sixty physically active and interested school level boys were randomly selected as subjects and their age ranged between 14 and 17 years. The subjects are categorized into two groups, namely, Tabata training group (TTG) and control group (CG) each group had 20 subjects. The selected criterion variables cardiorespiratory endurance was assessed by 12 min run/walk test; abdominal endurance was assessed by sit-ups test.

Tabata Training Program

The training program was lasted for 60 min for a session in a day, 3 days in a week for a period of 12-week duration. These 60 min included Tabata training for 40–50 min and 10 min warm-up, and 10 min warm down. Every 4 weeks of training 5% of intensity of load was increased from 65% to 80% of work load.

Statistical Analysis

The means and standard deviations of TTGs were calculated for cardiorespiratory endurance and abdominal endurance for the pre- as well as post-tests. Statistical significance was set to a priority at $P < 0.05$. All statistical tests were calculated using the Statistical Package for the Social Science.

Table 1 reveals the computation of mean, standard deviation and "t" ratio on selected variables, namely, cardiorespiratory endurance and abdominal endurance of TTG. The obtained "t" ratio on cardiorespiratory endurance and abdominal endurance was 14.28 and 21.20, respectively. The required table value was 2.04 for the degrees of freedom 1 and 29 at the 0.05 level of significance. Since the obtained "t" values were greater than the table value, it was found to be statistically significant.

From the computation of mean, standard deviation and "t" ratio on selected variables, namely, cardiorespiratory endurance and abdominal endurance of CG. The obtained "t" ratio on cardiorespiratory endurance and abdominal endurance were 1.71 and 0.94, respectively. The required table value was 2.04 for the degrees of freedom 1 and 29 at the 0.05 level of significance. Since the obtained "t" values were less than the table value it was found to be statistically not significant.

DISCUSSION ON FINDINGS

Tabata training is an excellent way to simultaneously improve cardiorespiratory endurance and muscular endurance. While the original study involved stationary bike, one can use the Tabata protocol with almost any activity or cardio machine. For example, in his tabata cardio workout here are varieties of body weight exercise that it done with full intensity will get our heart soaring. One must try adding Tabata training once a week to see how the body responds. The results of the study indicated that the cardiorespiratory endurance and abdominal endurance were improved significantly after undergoing Tabata training. The changes in the selected parameters were attributed the proper planning, preparation and execution of the training package given to the players. The findings of the present study had similarity with the findings of the investigations referred in this study.

Popowczak *et al*., (2022) speculated that Tabata Training Program can help regulate body weight and induce changes in body fat and increase cardiorespiratory endurance and other health related physical fitness components.

Salwa *et al*., (2022) examined high-intensity and frequent Tabata exercises in a short time interspersed with relatively short breaks, training time (20s), rest period (10s), an average

Table 1: Characteristics of training groups (*n*=20) at pre training mean

Variable	TTG	CG
Age (Y)	14–16	14–16
Height (cm)	148.30	154.20
Weight (kg)	50	47

Table 2: Computation of "t" ratio on selected parameters of school level boys on experimental and control group (Scores in numbers)

Group	Test	Mean	SD	T ratio
	Cardiorespiratory endurance			
Tabata training Group	Pre test	2450.75	41.40	14.68*
	Post test	2538.25	54.22	
	Abdominal Endurance			
	Pre-test	40.15	1.72	21.20*
	Post-test	47.30	1.71	
	Cardiorespiratory endurance			
Control Group	Pre-test	2450.25	42.75	1.71
	Post-test	2451.25	42.14	
	Abdominal Endurance			
	Pre-test	40.05	1.79	0.94
	Post-test	40.80	1.80	

*significant level 0.05 level (degree of freedom 2.04, 1 and 29)

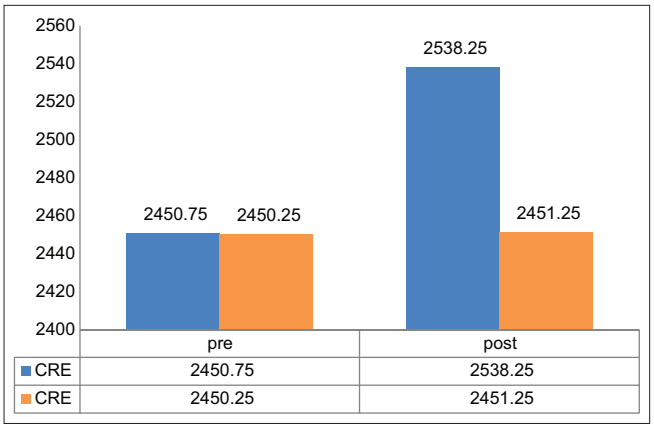

Figure 1: Bar diagram shows the mean values of pre- and post-test on cardiorespiratory endurance of experimental and control groups (Scores in meters)

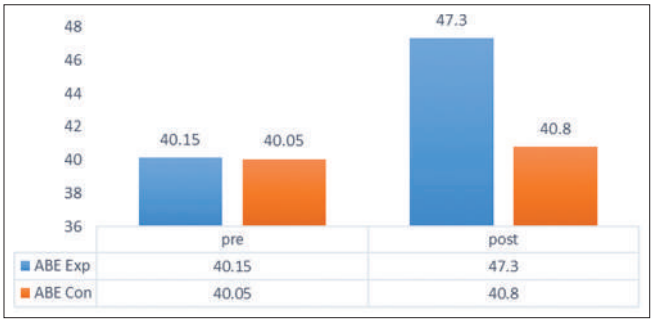

Figure 2: Bar diagram shows the mean values of pre- and post-test on abdominal enduarnce of experimental and control groups (Scores in counts)

of (8), and repetitions in total (4m) per training, which in turn led to the development of endurance variables.

Samer *et al*., (2022) assessed significant differences between the control and experimental group and in favor of the experimental group in the cardiorespiratory fitness variable.

Embrhts *et al*., (2013) relative exercise intensity and physiological responses to traditional steady-state exercise are well-documented, there is limited research regarding the relative exercise intensity and energy expenditure of Tabata training.

However, the subjects participated in the CG did not improve their cardiorespiratory endurance and muscular endurance.

The result of the present study indicates that the Tabata training methods is appropriate protocol to cardiorespiratory endurance and muscular endurance. The discrepancy between the result and the result of previous studies might be attributed to several reasons, such as the training experience level of the subjects, the training program, in intensity used and the duration of the training program.

CONCLUSIONS

Based on the results of the study, it is referred that 12 weeks of Tabata training program were found to be most effective training protocol to bring out desirable changes over cardiorespiratory endurance and muscular endurance of school boys.

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Research Article

The link between exercise and mental health

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ABSTRACT

Exercise is widely known to have many physical health benefits, such as preventing and managing chronic diseases such as diabetes, cardiovascular disease, and obesity. However, the mental health benefits of regular exercise are often overlooked. Exercise can be a powerful tool to help improve mental health, with numerous studies demonstrating the positive effects that it has on symptoms of depression, anxiety, and stress. The exact mechanisms behind the mental health benefits of exercise are not fully understood, but it is believed that physical activity triggers the release of certain hormones and neurotransmitters that help regulate mood and emotions. Exercise has been shown to increase levels of serotonin, endorphins, and dopamine, which are all neurotransmitters involved in mood regulation and feeling of pleasure. Regular exercise also increases levels of endocannabinoids, a group of chemical substances that are involved in regulating appetite, sleep, and pain. The mental health benefits of exercise have been widely studied and documented. Exercise has been shown to reduce symptoms of depression, anxiety, and stress and can even help prevent these conditions from developing in the first place. Exercise can also help improve mood and self-esteem, reduce fatigue, improve sleep quality, and increase mental alertness, concentration, and productivity. In addition to the direct mental health benefits of exercise, it can also help reduce the risk of developing other mental health disorders, such as substance abuse and eating disorders. Regular exercise can also reduce the risk of suicide and self-harm and increase feelings of well-being and self-confidence. Regular exercise can be an important part of maintaining good mental health. For those who are already struggling with mental health issues, exercise can be a powerful tool to help manage symptoms and improve overall well-being. People should aim to get at least 30 min of moderate physical activity most days of the week and should consult with their doctor if they are unsure about how to get started. It is important to remember that exercise should not be used as a replacement for other forms of treatment for mental health conditions, but can be a valuable addition to a comprehensive treatment plan.

INTRODUCTION

Exercise is a key factor in improving mental health. It has been found to reduce stress, anxiety, and depression, as well as improve mood and self-esteem. Exercise has also been known to help manage symptoms of mental illness, such as bipolar disorder and schizophrenia, and even enhance cognitive functioning. The benefits of exercise on mental health extend to those with chronic physical health conditions, such as diabetes and heart disease. Exercise is an important part of overall health and well-being, and it is essential to start and maintain a regular exercise routine.

Exercise, when combined with other lifestyle changes, can have a significant positive effect on mental health. Regular physical activity helps to reduce stress, anxiety, and depression, while increasing energy and alertness. Exercise also helps to manage symptoms of mental illness, such as bipolar disorder and schizophrenia. In addition, exercise can help to improve cognitive functioning and even reduce the risk of developing dementia.

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Exercising regularly can also help to improve overall well-being and self-esteem. Exercise helps to increase endorphins, which are hormones that help to regulate mood. It has also been found to reduce fatigue and improve sleep quality. In addition, exercise can provide an outlet for stress and frustration, helping to reduce feelings of anger and anxiety.

Regular exercise can also help to improve a person's physical health. Regular physical activity helps to reduce the risk of developing chronic illnesses, such as diabetes and heart disease. In addition, exercise helps to strengthen the body's muscles

and bones and can even help to reduce the risk of developing certain types of cancer.

THE PURPOSE OF STUDY

The purpose of this study is to evaluate the impact of exercise on mental health. Mental health is a complex issue which affects individuals from all walks of life. Exercise has been touted as one potential method to improve mental health outcome; however, there is limited evidence to support this claim. The purpose of this study is to evaluate the impact of exercise on mental health outcomes in a controlled study.

The study will involve a sample of participants of various ages, genders, and backgrounds. Participants will be randomly assigned to either an exercise group or a control group. The exercise group will participate in a supervised exercise program, while the control group will not participate in any exercise program. The study will track the mental health of both groups before and after the exercise program. Outcome measures will include psychological tests, self-reported measures of well-being, and biological markers of mental health. The results of this study will provide insight into the impact of exercise on mental health. It will help to clarify whether exercise is an effective intervention for improving mental health. The findings of this study will be used to inform the development of effective exercise interventions for mental health promotion.

BENEFITS OF EXERCISE ON MENTAL HEALTH

Exercise has been proven to have significant benefits for both physical and mental health. It has been linked to improved moods, better sleep patterns, improved self-esteem, and reduced stress levels. Exercise can also reduce the risk of developing mental health problems, such as depression, anxiety, and substance abuse. In this paper, I will discuss the benefits of exercise on mental health.

The first benefit of exercise on mental health is improved moods. Exercise has been shown to release endorphins, which are hormones that act as natural pain killers and can improve moods. In addition, exercise can reduce stress levels, which can have a positive impact on mood. Exercise can also help to distract from negative thoughts, which can lead to increased feelings of positivity and improved mental well-being.

The second benefit of exercise on mental health is improved sleep patterns. Exercise has been shown to improve sleep quality, which is essential for good mental health. Exercise can also increase energy levels, which can help individuals stay alert throughout the day and reduce fatigue.

The third benefit of exercise on mental health is improved self-esteem. Exercise can improve physical appearance, which can lead to increased self-confidence and improved self-image. In addition, exercise can provide a sense of accomplishment and can help individuals feel better about themselves.

The fourth benefit of exercise on mental health is reduced stress levels. Exercise can act as a form of meditation, allowing individuals to focus on their breathing and clear their minds. Exercise can also help to reduce the physical symptoms of stress, such as headaches and muscle tension. In addition, exercise can be a form of relaxation, allowing individuals to forget their worries and take time for themselves.

Exercise has been found to have numerous benefits on mental health. Research has shown that exercise can reduce symptoms of depression and anxiety which improve cognitive function and enhance overall quality of life. Studies have also found that regular exercise can improve sleep patterns, reduce stress levels, and reduce the risk of developing mental health disorders such as depression and anxiety. In addition to these mental health benefits, exercise has also been found to have physical benefits, such as improved cardiovascular health, increased muscle tone, and improved body composition.

TYPES OF EXERCISE ON MENTAL HEALTH

Exercise has been proven to be beneficial for both physical and mental health. Exercise is often recommended by professionals as a way to reduce stress, manage depression, and improve overall mental health. With so many different types of exercise available, it can be difficult to know which type is best for improving mental health. This paper will discuss the various types of exercise that have been shown to be beneficial for mental health and how they can be used effectively to improve overall well-being.

Aerobic Exercise

Aerobic exercise is any type of exercise that gets the heart rate up and causes the body to use oxygen. Examples of aerobic exercise include walking, running, cycling, swimming, and aerobics classes. Studies have found that aerobic exercise can be beneficial for improving mental health by reducing stress, improving mood, and increasing self-esteem. It can also help to improve concentration, reduce anxiety, and increase energy levels.

Strength Training

Strength training is any type of exercise that uses resistance to build muscle strength. Examples of strength training exercises include weightlifting, bodyweight exercises, and resistance bands. Research has found that strength training can

be beneficial for mental health by improving self-esteem and reducing symptoms of depression and anxiety. It can also help to improve cognitive function and reduce stress.

Yoga

Yoga is a form of exercise that combines physical poses with breath work and meditation. Studies have found that yoga can be beneficial for mental health by reducing stress, improving mood, and increasing self-esteem. It can also help to reduce anxiety and improve concentration.

Stretching

Stretching is any type of exercise that involves gently stretching the body to improve flexibility and range of motion. Research has found that stretching can be beneficial for mental health by reducing stress, improving mood, and increasing energy levels. It can also help to improve concentration and reduce anxiety.

Mindfulness

Mindfulness is a type of meditation that focuses on being aware of the present moment without judgment. Studies have found that mindfulness can be beneficial for improving mental health by reducing stress, improving mood, and increasing self-esteem. It can also help to reduce anxiety and improve concentration.

There are many different types of exercise that can be beneficial for mental health. Such as running or biking is an excellent form of exercise for improving mood and reducing stress levels. Resistance training, such as weightlifting or calisthenics, is another type of exercise that can help improve overall mental well-being. Yoga and tai chi are excellent forms of exercise for calming the mind and body, while strength training and interval training can help improve overall physical and mental strength.

METHODOLOGY

The methodology used in this research will involve a review of the existing literature on the use of exercise to improve mental health. This review will include an examination of the evidence-based research that supports the use of exercise for this purpose. This review will also include a critical analysis of the different methods of exercise that can be used to improve mental health.

The research will also involve a survey of individuals who have used exercise to improve their mental health. The survey will focus on the types of exercise that were used, how often the exercise was done, and the results that were achieved. The survey will also explore the individual's motivation for beginning the exercise program and their experience with the program.

RESULTS OF STUDIES

The results of studies on the effects of exercise on mental health have shown that exercise can have a positive effect on mental health. Aerobic exercise, strength training, and yoga have all been found to reduce symptoms of depression and anxiety, as well as improve overall mood and reduce stress levels. Exercise can be used to help alleviate symptoms of mental health disorders and should be incorporated into treatment plans for those suffering from mental health disorders.

CONCLUSION

Exercise is an important component of physical and mental health. Exercise can have numerous benefits on mental health, including improved mood, lower stress levels, and increased overall mental well-being. There are many different types of exercise that can be beneficial for mental health, and it is important to find an exercise program that is tailored to individual needs and goals. In addition, it is important to remember that exercise is only one component of a comprehensive approach to mental health and to incorporate other strategies as well.

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Research Article

Analysis of physical fitness status of secondary schools in Ranga Reddy district

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ABSTRACT

Physical fitness is a general state of health and well-being or specifically the ability to perform aspects of sports or occupations. Physical fitness is generally achieved through correct nutrition, exercise, hygiene, and rest. It is a set of attributes or characteristics that people have or achieve that relates to the ability to perform physical activity. The study is to determine the physical fitness status of secondary schools boys in Ranga Reddy district. Method and materials for this study 500 boys, aged 11–16 years, were selected as subjects, at random from the schools adapted by secondary schools of Ranga Reddy district. The selected subjects were tested for their height, weight, speed, explosive power, flexibility, agility, and cardiorespiratory endurance using standardized tests and procedures. Statistical technique the data collected was subjected to statistical analysis by means of one-way analysis of variance. The confidence interval was fixed at $P < 0.05$ in all cases. Findings of the study: Partaking in games and sports has long been assumed to provide health benefits to young players. In spite of certain reservations about this conjecture, the studies of some (Rossi *et al*., 2004; Skolnick, 1993; and Aaron *et al*., 1995) have shown that health benefits accrue to young people who participate in sports. The results of the present study exhibit a mixed trend influence of sports participation. Conclusion of this study reveals that most of the boys of secondary school boys are getting taller and heavier with age, which ensures that the growth and development process were not hindered by means of systematic training program. However, the result of this study necessitates rigorous training regimen for improving the physical fitness status of boys with regard to their age, as most of the fitness parameters level were not evidently varied among age categories of schoolboys.

Keywords: Agility and cardiorespiratory endurance, Explosive power, Flexibility, Physical fitness

INTRODUCTION

Physical fitness is a general state of health and well-being or specifically the ability to perform aspects of sports or occupations. Physical fitness is generally achieved through correct nutrition, exercise, hygiene, and rest. It is a set of attributes or characteristics that people have or achieve that relates to the ability to perform physical activity. Before the industrial revolution, fitness was the capacity to carry out the day's activities without undue fatigue. However, with automation and changes in lifestyles, physical fitness is now considered a measure of the body's ability to function efficiently and effectively in work and leisure activities, to be healthy, to resist hypo kinetic diseases, and to meet emergency situations.

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A comprehensive fitness program tailored to an individual typically focuses on one or more specific skills, and on age-or health-related needs such as bone health many sources also cite mental, social, and emotional health as an important part of overall fitness. This is often presented in text books as a triangle made up of three points, which represent physical, emotional, and mental fitness. Physical fitness can also prevent or treat many chronic health conditions brought on by unhealthy lifestyle or aging. Working out can also help people sleep better. To stay healthy, it is important to engage in physical activity.

Customarily, the role of schools in providing and promoting physical activity has been during the school day and on the school campus immediately after school hours. Although there have been exceptions, school-based programs usually have been sponsored by the schools themselves and supervised by school employees. However, enormous potential appears to exist for schools to expand their role in providing students with additional physical activity by building institutional

relationships with community-based providers of physical activity. Such relationships could manifest in several ways. Schools can make their facilities available to community-based organizations during after-school, weekend, and summer vacation. Furthermore, schools can collaborate with community organizations in promoting physical activity programs to students and their parents. Because transportation can be a barrier to students' participation in after-school programs, schools can collaborate with community organizations, including transit authorities, to ensure that students have the opportunity to participate in programs beyond the school day.

Although school-community linked physical activity programs offer much promise, little research has addressed the efficacy of such initiatives for increasing physical activity in children and youth. The nurturing of young players was carried out by secondary schools, it is an attempt which was made to record and report the physical fitness status of schoolboys of different ages.

Objective of the Study

The study is to determine the physical fitness status of secondary schools boys in Ranga Reddy district.

Hypothesis

There may not be any significant difference on secondary schools boys in relation to their physical fitness status

MATERIALS AND METHODS

For this study 500 boys, aged 11–16 years were selected as subjects, at random from the schools adapted by secondary schools of Ranga Reddy district. The selected subjects were tested for their height, weight, speed, explosive power, flexibility, agility, and cardiorespiratory endurance using standardized tests and procedures. Statistical technique the data collected were subjected to statistical analysis by means of one-way analysis of variance (ANOVA), and Bonferroni corrections *post hoc* test. The confidence interval was fixed at $P < 0.05$ in all cases.

RESULTS AND DISCUSSION

The data on height, weight, speed, explosive power, flexibility, agility and cardiorespiratory endurance were analyzed for statistical significant age difference using one-way ANOVA. Thereafter, *post hoc* tests were performed using Bonferroni corrections.

The descriptive statistics depicted in Table 1 reveals that all the variables confined to this study improved with age of the schoolboys. However, the speed, agility, and cardiorespiratory endurance of the schoolboys were slightly impinged at the age of 15 and 16 years, which might be the result of academic stress, lack of motivation, sports performance saturation, gain in body mass, so on and so forth that needs to be investigated further.

Table 2 shows that statistically significant difference exists between different ages on height, weight, speed, explosive power, flexibility, agility, and cardiorespiratory endurance as the obtained F (5, 910) = 90.449, 80.890, 10.275, 33.143, 14.216, 31.856, and 6.599, respectively, ($P < 0.05$). Since, six different age categories were considered in this study, the statistical analysis was further continued to *post hoc* test using Bonferroni corrections to find out the paired mean differences.

Table 1: Mean and standard deviations on physical fitness components

Variables	Descriptive	Age groups					
	n	11 years	12 years	13 years	14 years	15 years	16 years
		112	222	249	196	99	38
Height	Mean	137.34	142.38	147.54	150.82	155.35	161.66
	SD	7.05	7.94	9.11	9.32	8.96	7.19
Weight	Mean	27.74	31.03	34.22	37.21	41.19	46.11
	SD	4.98	6.27	7.31	7.00	7.90	7.25
Speed	Mean	5.78	5.75	5.54	5.41	5.51	5.45
	SD	0.52	0.57	0.63	0.64	0.57	0.52
Explosive power	Mean	1.48	1.55	1.61	1.68	1.72	1.87
	SD	0.16	0.18	0.21	0.25	0.23	0.23
Flexibility	Mean	3.63	4.15	5.59	5.69	7.00	7.53
	SD	2.86	3.34	4.09	4.21	4.94	5.36
Agility	Mean	18.40	17.81	17.08	16.56	16.74	15.61
	SD	1.48	1.70	1.62	1.74	1.89	1.47
Cardio respiratory endurance	Mean	3.79	3.67	3.51	3.48	3.44	3.51
	SD	0.58	0.55	0.53	0.68	0.72	0.67

Table 2: The analysis of variance on physical fitness components

Variables	SOV	Sum of squares	df	Mean square	F	Sig.
Height	B	33166.969	5	6633.394	90.449	0.000
W	66737.778	910	73.338			
Weight	B	18807.955	5	3761.591	80.890	0.000
W	42317.551	910	46.503			
Speed	B	18.145	5	3.629	10.275	0.000
W	321.401	910	0.353			
Explosive power	B	7.380	5	1.476	33.143	0.000
W	40.528	910	0.045			
Flexibility	B	1127.764	5	225.553	14.216	0.000
W	14437.968	910	15.866			
Agility	B	446.681	5	89.336	31.856	0.000
W	2551.975	910	2.804			
Cardiorespiratory endurance	B	12.098	5	2.420	6.599	0.000
W	333.643	910	0.367			

Table 3: The *post hoc* tests on physical fitness components

Age in years		Height	Weight	Speed	Explosive power	Flexibility	Agility	Cardiorespiratory endurance
I	J							
11	12	05.039*	03.286*	0.0270	0.0680	0.5150	0.584*	0.1130
	13	10.199*	06.476*	0.237*	0.125*	1.952*	1.319*	0.281*
	14	13.477*	09.473*	0.370*	0.199*	2.055*	1.843*	0.308*
	15	18.014*	13.451*	0.269*	0.238*	3.366*	1.657*	0.344*
	16	24.319*	18.364*	0.3260	0.388*	3.892*	2.789*	0.2810
12	13	05.160*	03.190*	0.210*	0.0570	1.438*	0.735*	0.168*
	14	08.438*	06.187*	0.343*	0.132*	1.540*	1.259*	0.196*
	15	12.975*	10.165*	0.242*	0.170*	2.851*	1.074*	0.232*
	16	19.280*	15.078*	0.2990	0.321*	3.378*	2.206*	0.1690
13	14	03.278*	02.997*	0.1330	0.075*	0.1020	0.524*	0.0280
	15	07.815*	06.975*	0.0310	0.113*	1.414*	0.3380	0.0640
	16	14.120*	11.888*	0.0890	0.264*	1.9400	1.470*	0.0010
14	15	04.537*	03.978*	0.1010	0.0380	1.3110	0.1860	0.0360
	16	10.842*	08.891*	0.0440	0.189*	1.8380	0.947*	0.0270
15	16	06.304*	04.913*	0.0580	0.151*	0.5260	1.132*	0.0630

From Table 3, it is understood that almost each of the paired mean differences on height, weight, and agility varied between ages. It is also found that the adjacent age categories did not vary considerably between them with regard to speed, explosive power, flexibility, and cardiorespiratory endurance, while the speed, flexibility, and cardiorespiratory endurance of the boys aged 14–16 years were not good enough as it is imaginary to be.

Findings of the Study

Partaking in games and sports has long been assumed to provide health benefits to young players. In spite of certain reservations about this conjecture, the studies of some (Rossi *et al*., 2004; Skolnick, 1993; Aaron *et al*., 1995) have shown that health benefits accrue to young people who participate in sports. The results of the present study exhibit a mixed trend influence of sports participation.

CONCLUSION

The findings of this study reveal that most of the boys of secondary school boys are getting taller and heavier with age, which ensures that the growth and development process

were not hindered by means of systematic training program. However, the result of this study necessitates rigorous training regimen for improving the physical fitness status of boys with regard to their age, as most of the fitness parameters level were not evidently varied among age categories of schoolboys.

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Research Article

Effects of different intensities in aerobic running while resting: Blood glucose, platelet count, and plasma fibrinogen among Type II diabetes in Telangana

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INTRODUCTION

Occurrence of degenerative diseases like hypertension, an atherosclerosis, etc., is inversely related to the physical activity involvement. Decreasing physical activity trends across the globe has seen rapid increase in these types of diseases especially the cardiovascular metabolic disorders like diabetes mellitus. Several scientific studies in the field of fitness management have conclusive evidences that the regular involvement in physical activity can prevent several degenerative diseases and as well can control them effectively by bringing positive changes in several risk factors and biomarkers of these diseases. Circulating platelets and monocytes are thought to release substances at the injury site that stimulate the migration of smooth muscle cells also fill with fats. In addition blood cells substances that are thought to result in further proliferation of the arterial smooth muscle. The smooth muscle cells have difficulty removing cholesterol, so this substance tends to accumulate, gradually increasing the size of the lesson.

Atherosclerosis develops because of smooth muscle proliferation, lipid accumulation, and connective tissue formation in the arterial intima. Hyperglycemia in diabetics may indirectly cause for earlier precipitation of atherosclerosis. Diabetics are an important component of the complex of "common" cardiovascular risk factors and are responsible for acceleration and worsening of atherothrombosis. Diabetes is a group of metabolic disorders characterized by hyperglycemia resulting from defects in insulin secretion, insulin action (hepatic and peripheral glucose long-term damage, dysfunction, and failure of different organs, especially the eyes, kidneys, nerves, heart, and blood vessels). Major cardiovascular events cause about 80% of the total mortality in diabetic patients. In terms of major cardiovascular events, coronary heart disease and ischemic stroke are the main causes of morbidity and mortality in diabetic patients.

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Physical Fitness

The term physical fitness in view of a coach or a sports trainer is something different. In their view, the term physical capacity to tackle the external load that is placed by various exercises and excels in physical performances of the various sports and games situations. These people describe the physical fitness in terms of the capacity to do work. Physical fitness is the individual's ability to meet the requirements of their environment.

Aerobic Running

Aerobic training improves flexibility as well as aerobic fitness. In other words aerobics is a progressive physical conditioning program that stimulates cardiorespiratory activity for a time period sufficiently long to produce beneficial changes in the body. Walking, jogging, running, swimming, cycling, rope-skipping, dancing, ball games, and racket games are aerobic exercises. They are classified as aerobic activities because they work the larger muscles in the body, particularly those in the lower limbs. They are generally considered to be the most important activities for everyone irrespective of age, sex, level of health, fitness, or socioeconomic status. This is the most effective exercise for reduction of obesity. Aerobic exercises are usually the most highly recommended for all the exercises and are suitable for all including patients with cardiovascular problems.

Diabetes

Diabetes is a disorder of carbohydrate metabolism characterized by high blood sugar levels (hyperglycemia) and presence of sugar in the urine (glycosuria). It develops when there is inadequate production of insulin by the pancreases or an inability of insulin to facilitate the transport of glucose into the cells. Insulin is a hormone that reduces the amount of glucose circulating in the blood by facilitating its transport into the cells.

TERMINOLOGY AND CLASSIFICATION

Type- I diabetes is caused by the inability of the pancreases to produce sufficient insulin as a result of failure of the B-cells in the pancreases. Thus, this type is also referred to as insulin dependent diabetes mellitus (IDDM). Type 1 diabetes accounts for only 5–10% of all cases of diabetes.

Type- II diabetes is the result of the ineffectiveness of insulin to facilitate the transport of glucose into the cells and is a result of insulin resistance. It is also referred to as non-IDDM. Type 2 diabetes accounts for 90–95% of all cases of diabetes. Insulin resistance refers to the condition where a "normal" insulin concentration in the blood produces a less than normal biological response. Insulin's primary function is to facilitate the transport of glucose from the blood into the cell, across the cell membrane.

A third type of diabetes, gestational diabetes, is a form of diabetes that develops in pregnant women and their fetuses in 2–5% of all pregnancies. Fortunately, it usually disappears in both mother and baby after delivery. Unfortunately, when gestational diabetes is present, there can be complications during pregnancy.

Blood Glucose

The blood sugar concentration or blood glucose level is the amount of glucose (sugar) present in the blood of a human or animal. The body naturally tightly regulates blood glucose levels as a part of metabolic homeostasis.

Glucose is the primary source of energy for the body's cells and blood lipids (in the form of fats and oils) are primarily a compact energy store. Glucose is transported from the intestines or liver to body cells through the bloodstream and is made available for cell absorption, through the hormone insulin, produced by the body primarily in the pancreases.

Blood Platelets

Platelets are produced by megakaryocytes in bone marrow and are in small, 2–3 um in diameter, irregularly shaped clear ell fragments. The average lifespan of a platelet is just 5–9 days, normally. A hormone usually produced by the liver and kidneys regulates megakaryocyte and platelet and each megakaryocyte produces between 5000 and 10,000 platelets, circulates in the blood of mammals, and is involved in hemostasis, leading to the formation of blood clots. Excessive bleeding an occur if the number of platelets is too low, otherwise, if the number of platelets is too high, blood clots can form (thrombosis) and may obstruct blood vessels, result in such events as a stroke, myocardial infarction, pulmonary embolism or the blockage of blood vessels to other parts of the body, such as the extremities of the arms or legs.

Plasma Fibrinogen

Hepatocytes synthesize fibrinogen, a 340 KD a glycoprotein, in the liver. 7 um fibrinogen (factor I) or concentration in blood plasma is 1.5–4.0 g/L (normally measured using the Clauss method) is a soluble plasma glycoprotein, converted by thrombin into fibrin during blood coagulation. General population by considering fibrinogen, as a strong cardio-vascular risk factor, and increased fibrinogen plasma concentrations would report in Type 2 diabetic patients. Clinical diabetic micro proceeded by alterations of fibrinogen and macrovascular complications and therefore potentially contributes to their onset.

Statement of the Problem

The purpose of the study was to verify experiment, analyze, and understand the effects of selected different intensities of aerobic running on resting state blood glucose, blood platelet count, and plasma fibrinogen for a period of 5 months on the precipitating factors which are considered as degenerative diseases like macro and microvascular complications on the previously untrained adult men in the age group between 35 and 40 years with Type II diabetes.

Objectives of the Study

To identify whether the selected four different intensities of aerobic running induces and carry any significant changes in the selected criterion variables, namely, resting state blood glucose, platelet count, and plasma fibrinogen. To study and analyze which intensity of aerobic running would bring comparatively more significant changes when compared with in the different intensities on the selected criterion variables of the study, namely, resting state blood glucose, platelet count, and plasma fibrinogen.

Hypothesis

The selected different intensities of aerobic running origin significant changes in the selected criterion variables. Medium and sub-maximal intensity aerobic running would cause more significant changes in the selected criterion variables when compared to the other two selected intensities, namely, low intensity aerobic running and maximal intensity aerobic running.

Significance of the Study

Benefiting physical fitness and participation in regular physical activity and maintaining healthy lifestyle happens to be the major intension of modern day humans. They are so many concerned to live healthy and qualitative life without any ailments especially degenerative ailments. The physical educationists and fitness professions across globe and more concerned in improving different ways and means to harness the precipitating factors of the degenerative diseases.

Selection of Individuals

The purpose of the study was to verify, experiment, analyze, and understand the effects of selected different intensities of aerobic running on resting state blood glucose, blood platelet count, and plasma fibrinogen for a period of 5 months on the precipitating factors which are considered as degenerative diseases like macro and microvascular complications on the previously untrained adult men.

For the present study, 100 Type 2 diabetic individuals out of 2584 (n = 2584) employees working in different cadres from Telangana Revenue Department, Electricity Department, Police Department, Education Department and is presently working in Telangana, India, and who were willing for physical exercise programs as a treatment protocols to control their diabetes biomarkers were selected randomly as individuals. The age group of the individuals ranged between 35 and 40 years. The selected individuals were divided into four experimental groups with twenty subjects (n = 20) in each group.

Collection of Data

The data on selected dependent variables, namely, resting state blood glucose, blood platelet count, and plasma fibrinogen level were collected by conducting pre-test and post-test measurements, by were trained and graduated testers 1 day before and after the training protocols, respectively.

Resting State Blood Glucose

Qualified biochemists the biochemical laboratory collected the blood samples from the individuals with glucometer, that is, a glucose meter is a medical device for determining the approximate concentration.

Analysis and Interpretations of the Data

The pre-test and post-test values of the selected variables, namely, resting state blood glucose, platelet count, and plasma fibrinogen level are compared for the variance through the technique of analysis of covariance (ANCOVA) with a testing significant level of 0.05. The ANCOVA was done on the basis of the pre-test and post-test values.

The effects of four different intensities of aerobic running, namely, low, medium, sub maximal, and maximal were compared with the control group with the above statistical technique. To understand the significant difference among the groups and to find out the comparative effects of the three variable protocols of the selected experimental variables, the Scheffe's *post hoc* individual comparison tests were done. The *post hoc* comparison tests were conducted with the help of the post-test adjusted mean values adjusted on the pre-test values.

Results of the Study

All the four groups of experimentation who trained with low, medium, sub maximum, and maximum intensities, respectively, of aerobic running experienced significant reductions in the resting state blood glucose levels. Hence, aerobic running starting from low intensity to maximal intensity proved effective in bringing down the resting state blood glucose of the individuals of the study.

Although there was significant difference between the submaximal intensity aerobic running and maximal intensity aerobic running groups, submaximal intensity aerobic running group proved better descriptively among the two intensities and caused more significant decrements in resting state blood glucose of the individuals of the study. Hence, submaximal intensity aerobic running proved most effective when compared to the maximal intensity, medium intensity, and low intensity

aerobic running in reducing significantly the resting state blood glucose levels of the individuals of the study. Medium intensity and low intensity aerobic running also proved effective in reducing the resting state blood glucose levels of the individuals of the study significantly.

This explains the importance of the aerobic running in controlling the resting state blood glucose levels of the individuals. Hence, any intensity of aerobic running could be adopted to control the resting state blood glucose levels of the individuals keeping the intensity of the aerobic running, condition level, age, and sex specifically.

CONCLUSION

All the four experimental groups of the study with low, medium, sub maximum, and maximum intensities, respectively, experience significant reductions in the resting state plasma fibrinogen levels. Hence, any intensity including the low intensity aerobic running proved effective in the metabolism of the plasma fibrinogen and caused reductions in resting state plasma fibrinogen significantly. Both maximal and submaximal intensity aerobic running groups experienced similar effects in the metabolism of the plasma fibrinogen and experienced no significant difference between them.

Maximal intensity aerobic running proved more effective, when compared to the medium intensity aerobic and low intensity aerobic running. Furthermore, the sub maximal intensity aerobic running group experienced significant reduction in the resting state plasma fibrinogen levels when compared to the low intensity aerobic running group. This clearly indicates that the high intensity aerobic running was more favorable and brings significant favorable changes in the metabolism of the plasma fibrinogen causing significant reductions in the resting state plasma fibrinogen.

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Research Article

Exercises for fitness and liable injuries in sports and games

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ABSTRACT

In modern sports and games, it is essential to have vigorous practice and exercises to fit a hundred percent and represent their organization well. In this article, the essential exercises for fitness and probability to lead were discussed with examples of three essential games. It is concluded that not only the fitness, but the probability of injuries also should be taken care of for an optimum display by the players in a particular sport and games. The shortened and fast-paced formats of sports result in more frequent number of injuries on the field. Although advancements in medical care are available, the required recovery time may not be adhered to due to various pressures. This can lead to serious injuries and, worse, end sports careers.

Keywords: Exercises, Fitness, Injuries, Optimum, Probability

INTRODUCTION

Nowadays, with the advent of higher technical knowledge of sports and games, it leads to high and vigorous exercises depending on the type of sports and games. Exercise is also known as physical activity. In simple terms, exercise is any movement that works your body at a greater intensity than your usual level of daily activity. Exercise raises your heart rate and works your muscles and is most commonly undertaken to achieve the aim of physical fitness.

Exercise can help prevent excess weight gain or help maintain weight loss. When you engage in physical activity, you burn calories. The more intense the activity, the more calories you burn. Exercise combats health conditions and diseases. Regular physical activity can improve your muscle strength and boost your endurance. Exercise delivers oxygen and nutrients to your tissues and helps your cardiovascular system work more efficiently. Moreover, when your heart and lung health improve, you have more energy to tackle daily chores. Regular physical activity can improve energy levels and increase your confidence about your physical appearance, which may boost your sex life.

Now it is also recognized that various exercises sometimes lead to injuries which may be disasters for sports and games activities. If we take an example of cricket, which is a popular game now. Cricket is a popular global sport that requires a combination of physical fitness, skill, and strategy. Although a non-contact sport, overuse, and impact injuries are common since players engage in a wide range of physical activities, including running, throwing, batting, bowling, catching, and diving. Practice catching the ball can be either running forward or running backward. In general, two players will run parallel and then another ball catching it. In these exercises, if proper precautions are not taken, the player will get injured, either by falling or hit by the cricket ball.

While there is net practice, the blower will throw the ball at the batsman and it hits the batsman who is not attentive or has not been acquainted with the bowling fast. The batsman can injure himself in net practice itself. Hence, these injuries are to be taken care of. The coach and physiotherapist should look into the physical fitness of the player cussed and the probability he/she will get injuries.

The recent death of Australian cricketer Phil Hughes due to a head injury has shocked the cricketing fraternity. Earlier, Raman Lamba of India had also succumbed to a hit on his head while fielding. In 2012, Mark Boucher suffered a cut to his eye and had to announce his international retirement. Shikhar Dhawan, Vijay Shankar, and Bhuvneshar Kumar have suffered injuries in the Cricket World Cup 2019 and had to be ruled out.

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Players crashing into each other, jostling, and pushing to gain a better position have become the norm in today's sport. Injuries are waiting to happen, in spite of precautionary measures on the field. Players may pull a muscle while stretching themselves beyond their limits or throwing themselves in the path of a moving ball to stop it. The injury may be a minor one which can be treated on the field by the physician or a serious one where the player is walked off or carried away from the field.

A minor injury may be treated immediately and the player can get back to the game. There is just a gap of a few minutes which is availed by the others for refreshing themselves. There is extreme relief both to the player and also the team as substituting is quite tricky, especially in the middle or toward the end of the game. After the game, the player is taken under the care of the medicos to ensure that there is no relapse of injury or secondary injuries. Injuries on the field can be serious such as fractures, muscle pulls, ligament, and tears which may require the player to be hospitalized immediately. This can be devastating for the player as well as the team. The fact that the player will not be able to compete for an uncertain period of time is very depressing. It will cripple the player financially, physically, and mentally. The type and severity of injury determine the future prospects of the player. It may also mean the end of a great sporting career.

This is the case of one game. Vigorous of exercise and probability of getting injuries vary from game to game. For example, we play another game like volleyball. The jumping, landing internal rotation of the shoulder during serves and spike exercises, are essential. The same line centers should be there, the play should not fall. The players are well-drilled to receive the cut shorts from the opponents. If it is not talking properly also there will also be injures. Volleyball has become an increasingly competitive and popular sport. Young players not only play for middle or high school teams but also try out for traveling or league teams between seasons. This continuous play of one sport can lead to overuse injuries in the shoulders, knees, and other areas of the body. A varied workout routine with proper rest periods helps prevent overused volleyball injuries. Taking part in proper volleyball training, including a program that addresses strength and conditioning, and flexibility, will increase power, endurance, and agility. A comprehensive training program can help young volleyball players stay injury free and on the court.

India gets almost first place in the national games of Kabaddi. Kabaddi is one of the oldest sports in India. During the game, the raider goes into the area of the defenders to win points and then come back home. Here is a look at the various stages during which injuries are possible and needless to say, it is an extremely physical sport that requires the utmost fitness and stamina from the player. There is a lot of physical talk involved in the game. If the referee is not carried, then there is every probability that the player gets injured easily. Breathing exercises and Yoga are now becoming essential to improve the lung capacity and time one can maintain your breath. Hence, in this article, we have not only mentioned the referee exercise and fitness for the players but also the necessary processes so that they are do not get injuries. It is necessary to add that a player should be physically fit (without injuries). Hence, that they represent themselves well in the games and sports.

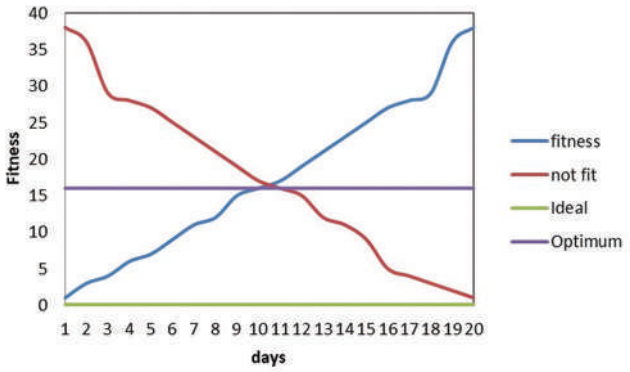
PURPOSE OF THE STUDY

Sports injuries are commonly caused by overuse, direct impact, or the application of force that is greater than the body part can structurally withstand. Proper management of a specific sports injury should be customized to educate the player about their injury, avoid further damage, ensure proper healing, and allow for a safe return to their sport. Managing a sports injury correctly can minimize the risk of long-term damage to a muscle, tendon, ligament, bone, or joint.

METHODOLOGY

The data have been collected from three prominent games, such as Cricket, Volleyball, and Kabaddi. This data can be analyzed by a graphical method. From this, we can understand injuries at the time of exercises. Based on this analysis, we can suggest sports exercise management. The quality of protective equipment – padding, helmets, shoes, and mouth guards – has helped to improve safety in sports and games. Stretching exercises can improve the ability of muscles to contract and perform, reducing the risk of injury.

RESULTS



Exercise is a subset of physical activity that is planned, structured, and repetitive and has as a final or an intermediate objective the improvement or maintenance of physical fitness. Physical fitness is a set of attributes that are either health-or skill-related. Different injuries occur in different games and sports due to lack of exercise. More exercises the play will fit.

Less exercise he cannot improve the sports and games. Hence, exercises are very important, in not only daily life but very important in sports and games.

DISCUSSION

The purpose of this study was to review the physical exercise training programs that have been effective in lowering the injury incidence among sports and games players. Injured players have to be put under medical supervision and treated as per the diagnosis. They have to be rehabilitated to get back to their pre-injury state at the earliest. The players are given access to state-of-the art medical facilities with highly advanced infrastructure. Although the teams are separated by a net, there is still a risk of acute injury in both volleyball and beach volleyball. Ankle sprains are the most common injury. Many players have sprained both ankles several times. Sprained fingers are also common, but these injuries are usually mild, allowing for the player to resume training fairly quickly. Acute knee injuries are far less common for volleyball players than for handball or football players, but young female players are still susceptible to knee ligament injuries.

Players who train hard more commonly struggle with overuse injuries. Among elite players, young and older, knees, shoulders, and lower back are often troublesome. About 40% of male elite players suffer from jumper's knee. These knee problems usually develop during the late teens. For young female players, patella femoral pain syndrome is the most common knee problem to prevent injuries to the head and face, the players need to be cautious with their movements and be aware of their surroundings. Regulations can also be put in place to prohibit players from using too much force when in contact with the head region.

CONCLUSION

The present paper understands the importance of various exercises to keep the player fit. This article emphasizes the need to supervise the injuries during the fitness and regress exercises period. A player will be successful if he not only undergoes regretted fitness exercises, but also is filly fit 100% with injuries. It is essential that coaches and physical trainers have a solid understanding of how to prevent injuries in sports and games. As the saying goes "no pain no gain," here the lure of rewards is pushing players toward extremes and hurting their bodies in the process. For a player to survive in today's sports world, he has to be realistic and practical, put in hard work and be prepared for such injuries. This sort of mindset is very much important for the players if they wish to pursue a career in sports. Injuries should not hinder players from entering sports. They must accept them as a part of the game. Coaches and practitioners should be mindful to manage intra and intersession fatigue, and use fatigue management strategies in an attempt to decrease the frequency of acute non-contact injuries incurred during volleyball practice and other training activities.

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Review Article

Occurrence of ankle injuries by aging to cricket players and its initial treatment techniques

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INTRODUCTION

Cricket is one of favorable, which is the game of choice in India; it has got its own craze in games. Every sportsman has a dream of winning a medal; however, it is not possible to all but to a few. Sports are the combination of so many factors. For winning people used to exert much pressure without their knowledge, many cricket players are suffering from ankle injuries due to that if one plays a sport, he is bound to get hurt. Examples of sportsmen affected by muscle pull and ankle injuries were Alexandra Stevenson, Rafael Nadal, Sportsmen affected by Shin Splints were Monica Seles, Grant Hill, and James Kirtley: Sportsmen affected by lower-back pain were Andre Agassi, John Terry, Sportsmen affected by shoulder impingement were Roger Federer, Maria Sharapova, Andy Roddick: Sportsmen affected by Runner's knee were Serena Williams, Danielle Slaton, Pavel Bure, Sportsmen affected by Tennis Elbow were Sachin Tendulkar: Sportsmen affected by Achilles Tendinitis (Ankle) were Shaquille O'Neal, Sportsmen affected by Groin Strain were Chris Gayle, Simon Jones; and Sportsmen affected by Concussion were Steve Young and Sportsmen affected by Ankle Sprain were Tillakaratne Dilshan, Serena Williams Thus, it became common for every sportsmen bound to get hurt. Sports performance is nothing but carrying out of specific physical routines or procedures by one who is trained or skilled in physical activity. Examples are to hit the ball in air in cricket, while bolling are even while fielding the ball in the air in cricket.

INJURY RISK FACTORS IN CRICKET PLAYERS

Competitive sports make a tremendous demand on the physical condition, vitality, endurance, and mental powers of the participant. Only athletes in the finest condition can withstand the wear and tear of a competitive season. Only the fittest can play to the best of their ability. Athletes whom are not in proper condition and the elderly players are more prone to injury and might never take the team. Most of the ankle injuries occur after smashing the ball in air and landing on heals and even after blocking and uneven landing (landing on heals or on complete foot instead of landing on toes).

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ANATOMY OF ANKLE JOINT

The ankle, or the talocrural region or the jumping bone (informal) is the area where the foot and the leg meet. The ankle includes three joints: The ankle joint proper or talocrural joint, the subtalar joint, and the inferior tibiofibular joint.[3-5] The movements produced at this joint are dorsiflexion and plantarflexion of the foot which becomes rigid by aging. In common usage, the term ankle refers exclusively to the ankle region. In medical terminology, "ankle" (without qualifiers) can refer broadly to the region or specifically to the talocrural joint.

ANATOMICAL TERMINOLOGY

The main bones of the ankle region are the talus (in the foot), and the tibia and fibula (in the leg). The talocrural joint is a synovial hinge joint that connects the distal ends of the tibia and fibula in the lower limb with the proximal end of the talus. The articulation between the tibia and the talus bears more weight than that between the smaller fibula and the talus.

The bony arch formed by the tibial plafond and the two malleoli is referred to as the ankle "mortise" (or talar mortise). The mortise is a rectangular socket. The ankle is composed of three joints: the talocrural joint (also called talotibial joint, tibiotalar joint, talar mortise, talar joint), the subtalar joint (also called talocalcaneal), and the inferior tibiofibular joint. The

joint surface of all bones in the ankle is covered with articular cartilage which becomes tightened by age.

The distances between the bones in the ankle are as follows:

- Talus – medial malleolus: 1.70 ± 0.13 mm
- Talus – tibial plafond: 2.04 ± 0.29 mm
- Talus – lateral malleolus: 2.13 ± 0.20 mm
- Decreased distances indicate osteoarthritis.

LIGAMENTS

The ankle joint is bound by the strong deltoid ligament and three lateral ligaments: the anterior talofibular ligament, the posterior talofibular ligament, and the calcaneofibular ligament.

The deltoid ligament supports the medial side of the joint, is attached at the medial malleolus of the tibia, and connects in four places to the talar shelf of the calcaneus, calcaneonavicular ligament, the navicular tuberosity, and to the medial surface of the talus.

The anterior and posterior talofibular ligaments support the lateral side of the joint from the lateral malleolus of the fibula to the dorsal and ventral ends of the talus.

The calcaneofibular ligament is attached at the lateral malleolus and to the lateral surface of the calcaneus.

The flexor retinaculum of foot extends from the medial malleolus to the medical process of the calcaneus, and the following structures in order from medial to lateral: the tendon of the tibialis posterior muscle, the tendon of the flexor digitorum longus muscle, the posterior tibial artery and vein, the tibial nerve, and the tendon of the flexor hallucis longus muscle.

The fibular retinacula hold the tendons of the fibularis longus and fibularis brevis along the lateral aspect of the ankle region. The superior fibular retinaculum extends from the deep transverse fascia of the leg and lateral malleolus to calcaneus. The inferior fibular retinaculum is a continuous extension from the inferior extensor retinaculum to the calcaneus.

FUNCTION

Historically, the role of the ankle in locomotion has been discussed by Aristotle and Leonardo da Vinci. There is no question that ankle push-off is a significant force in human gait, but how much energy is used in leg swing as opposed to advancing the whole-body center of mass is not clear.

OCCURRENCE OF ANKLE INJURIES

Approximately 64% of all sports injuries are sprains to the ankle, representing one ankle injury each season for every 16 participants. In high-risk sports, such as jumping, ankle is the most commonly injured joint especially for the elderly in the body, likely due to the functional demands placed on the joint and its complex anatomy. Ankle injuries constitute nearly 25% of all acute injuries treated in physician's hospitals, emergency rooms, and outpatient clinics. However, only 10% of these represent the most severe ankle injuries and even with meniscus tears and anterior cruciate ligament tears being the most common. Half of ankle ligament injuries are related to sports. The annual incidence of deltoid ligament injuries in the elderly sportsmen of ankle injuries is more

TREATMENT

PRINCE treatment is the best treatment to protect the ankle injuries.

- p-protect the limb
- R-rest to the affected ankle
- 1-immobilize the ankle
- N-non-steroidal anti-inflammatory drugs
- C-cool the part for vasoconstriction
- E-elevate the limb to control edema and bleeding if it is open injury

ULTRASOUND

Treat the ankle sprain with ultrasound for 8–10 min with the intensity of 1.2 W/cm^2. It promotes healing that it reduces pain and even it reduces swelling and it promotes healing.

EXERCISES

Ankle should be immobilized and toe movements should be encouraged. After healing isotonic exercises and ROM exercises may be motivated for rehabilitation after healing followed by strengthening for ankle example, ankle, foot, and toe exercises.

CONCLUSION

Proper care must be taken while playing cricket players by the advancement of age, if injury occurs immediate remedial measures which must be provided.

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Research Article

Feasibility and acceptability of treadmill training on metabolic effect among women

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ABSTRACT

The aim of this study was to find out the feasibility and acceptability of treadmill training on metabolic effect among women. To find out the feasibility and acceptability of treadmill training on metabolic effect, through cardiopulmonary fitness variable, tidal volume, and forced vital capacity among women were selected for this study. Sixty sedentary women in the age group from 25 to 35 were randomly selected and assigned into four groups, as experimental Group I, experimental Group II, experimental Group III, and control group; consisting of 15 in each group. The experimental groups were asked to undergo treadmill running under three different inclinations and control group did not participate in any special training. Experimental groups underwent 8 weeks treadmill running with 5% inclination, experimental group underwent 8 weeks treadmill running with 10% inclination and experimental Group III underwent 15% inclination. Pre-test scores were obtained using standard tests on selected cardiopulmonary fitness variable, tidal volume, and forced vital capacity of all the subjects before the experimental period and the post-test scores were obtained immediately after the 8-week experimental period. The difference between the pre-test and post-test means was the effect of treadmill training on different inclinations, to determine the feasibility of treadmill training among women. To test statistical significance, the obtained data were subjected to statistical treatment using ANCOVA. The results of the study showed that metabolic variables tidal volume and forced vital capacity were significantly altered by three different inclinations of treadmill training among women. The improvements of treadmill training on 15% inclination was significantly better than 5% and 10% inclination treadmill training on tidal volume while on forced vital capacity, there were no significant differences among treatment groups. It was concluded that treadmill exercises of different inclinations significantly contributed to alter the metabolic variables; tidal volume and forced vital capacity are feasible for implementation and accepted by the subjects as they found to be beneficial for improving their overall health.

Keywords: Feasibility, Metabolic effect among women, Treadmill training

INTRDOCUTION

Proper growth and maintenance of good health and participation in daily physical activities is an indispensable one. The high level of physical fitness comes from years of daily experience in a selected variety of vigorous physical activities. It is a biological principle that function builds structure and structure decides function. Man needs vigorous exercises for growth and development. To perform the daily activities in a more efficient manner, a condition of muscles, their strength and endurance are essential to man. A muscle must be overloaded in order to be strengthened (Hooks 1962).

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Every human being participates in some kind of sports activity or physical exercise during the course of his life. This exercise may assume different forms for different individuals. It may be walking, jogging, cycling, working in a factory, participation in games and sports, etc. Regular participation in exercise program markedly influences physical, physiological, and mental fitness of an individual.

A treadmill is an exercise machine for running or walking while staying in one place. The word treadmill traditionally refers to a type of mill which was operated by a person or animal treading steps of a wheel to grind grain. Treadmills offer the benefit of reduced impact since all treadmills offer some sort of shock absorption. Exercising on a treadmill can reduce the strain to the ankles, knees, and lower back of users.

The advantages of treadmill can be grouped into three categories, namely, advantages as a cardiovascular exercise, advantages as an indoor activity, and advantages as a machine. As a cardiovascular exercise, running or walking on a treadmill can be an effective way to work out, like other complex cardiovascular exercises (similar to non-treadmill walking/running). As with all exercise, regular treadmill use increases endurance.

Metabolism is the complex set of chemical reactions that our body uses to maintain life, including energy production. Special enzymes break down food or certain chemicals so the body can use them right away for fuel or store them. Furthermore, certain chemical processes break down substances that your body no longer needs, or make those it lacks. When these chemical processes do not work properly due to a hormone or enzyme deficiency, a metabolic disorder occurs. Inherited metabolic disorders fall into different categories, depending on the specific substance and whether it builds up in harmful amounts (because it cannot be broken down), it's too low or it's missing (Mayo Clinic, 2022).

Metabolic syndrome is a cluster of conditions that occur together, increasing the risk of heart disease, stroke, and Type 2 diabetes. These conditions include increased blood pressure, high blood sugar, excess body fat around the waist, and abnormal cholesterol or triglyceride levels. Having just one of these conditions does not mean one has metabolic syndrome. However, it does mean one has a greater risk of serious disease. Moreover, if one develops more of these conditions, the risk of complications, such as Type 2 diabetes and heart disease, rises even higher.

Metabolic syndrome is increasingly common and up to one-third of adults have it. If one has metabolic syndrome or any of its components, aggressive lifestyle changes can delay or even prevent the development of serious health problems (Mayo clinic, 2022).

Hansen (2015) contributed to the understanding of voluntary human rhythmic leg movement behavior and control. This was achieved by applying pedaling as a movement model and exposing healthy and recreationally active individuals as well as trained cyclists to for example cardiopulmonary and mechanical loading, fatiguing exercise, and heavy strength training. Moreover, extensively discussed on the feasibility of treadmill training through pedaling movement in treadmill. Pereira *et al*. (2015) analyzed the fatigue process at distinct intensity efforts and to investigate its occurrence as interactions at distinct body changes during exercise, using complex network models. The feasibility of treadmill running with different network models was studied and found nodes, links, and network metrics are sensibility according to increase of efforts intensities, been the velocity a key factor to exercise maintenance at models/intensities. Aldous *et al*. (2014) investigated the reliability and validity of a novel non-motorized treadmill-based soccer simulation using a novel activity category called a "variable run" to quantify fatigue during high-speed running and found the variable run phase showed significantly decreased ($P \leq 0.05$) in the past 15 min (89 ± 6 m) compared with the first 15 min (85 ± 7 m), quantifying decrements in high-speed exercise.

The review of related studies proved that attempts were made to find out the effect of treadmill training on different physical and physiological variables; however, it was found that there was further scope to find out the feasibility and acceptability of treadmill training on metabolic effects, cardiopulmonary fitness measured through tidal volume and forced vital capacity among women; hence, this research was undertaken.

METHODOLOGY

To find out the feasibility and acceptability of treadmill training on metabolic effect, metabolic effects were measured through cardiopulmonary fitness variable, tidal volume, and forced vital capacity among women. To achieve the purpose of this study, 60 sedentary women in the age group from 25 to 35 years were randomly selected from Vijayawada, who participated in the fitness center. The subjects were randomly assigned into four groups, as experimental Group I, experimental Group II, experimental Group III, and control group; consisting of 15 in each group. The experimental groups were asked to undergo treadmill running under three different inclinations and control group did not participate in any special training. Experimental Group I underwent 8-week treadmill running with 5% of inclination, experimental group underwent 8-week treadmill running with 10% of inclination, and experimental Group III underwent 15% of inclination. The control group did not participate in any special exercises except of their routine. Pre-test scores were obtained using standard tests on selected cardiopulmonary fitness variable, tidal volume, and forced vital capacity of all the subjects before the experimental period and the post-test scores were obtained immediately after the 8-week experimental period. The difference between the pre-test and post-test means was the effect of treadmill running on different inclinations, to determine the feasibility of treadmill training among women. To test statistical significance, the obtained data were subjected to statistical treatment using ANCOVA. In all cases, 0.05 level was fixed to test the hypothesis of the study.

RESULTS

To test the feasibility and acceptability of treadmill training, the investigator experimented with treadmill training consisting of nine specific exercises under three different inclinations on metabolic variables, cardiopulmonary variables, tidal volume,

and forced vital capacity. The obtained data were statistically analyzed and presented in Tables 1 and 2.

DISCUSSIONS

The results presented in Table 1 proved that metabolic effects assessed through tidal volume and forced vital capacity were significantly improved due to treadmill training exercises under different inclinations as the obtained F value on adjusted means of 67.32 and 9.75 were greater than the required table F value of 2.72. To find out which of the inclination has more effect on the selected metabolic variable, the paired adjusted mean comparisons were made and the results presented in Table 2, on both tidal volume and forced vital capacity. The *post hoc* analysis proved that all the three experimental protocols significantly altered tidal volume compared to control group. As for the treadmill running effects under different inclinations, treadmill exercises under 15° inclination were significantly

Table 1: Computation of analysis of covariance due to tread mill running on different levels of inclination and control group on tidal volume and forced vital capacity

	5° inclination group	10° inclination group	15° inclination group	Control group	SOV	Sum of squares	Df	Mean squares	Obtained F
ANCOVA results on tidal volume									
Pre-test Mean	49.30	49.50	47.50	49.00	B	49.35	3	16.45	0.53
SD	7.26	5.49	4.62	4.38	W	2342.20	56	30.82	
Post-test Mean	50.40	51.60	51.50	49.00	B	59.40	3	19.80	0.67
SD	7.49	5.17	4.62	4.38	W	2243.60	56	29.52	
Adjusted Post-test Mean	49.94	50.95	52.78	49.33	B	135.07	3	45.02	67.32*
					W	50.16	55	0.67	
ANACOVA Results on Forced Vital Capacity									
Pre-test Mean	4175.38	4250.86	4170.77	4126.2	B	120313	3	40104	0.23
Std Dev	551.85	260.90	437.79	365.34	W	9768361	56	174435	
Post-test Mean	4506.59	4516.98	4386.65	4139.1	B	1389571	3	463190	2.45
Std Dev	550.41	329.53	406.04	425.04	W	10598939	56	189267	
Adjusted Post-test Mean	4511.79	4449.82	4396.26	4191.5	B	862873	3	287624	9.75*
					W	1623221	55	29513	

SOV: Source of variance, B: Between, W: Within, Required $F_{(0.05),\,(df\,3,56)}$ =2.72, *Significant at 0.05 level of confidence

Table 2: Multiple comparisons between treadmill training on different inclinations and control groups and Scheffe's *post hoc* analysis on tidal volume and mean arterial blood pressure

5° inclination group	10° inclination group	15° inclination group	Control group	Mean Diff	CI
Adjusted Mean Comparisons on Tidal Volume					
49.94	50.95			−1.01*	0.74
49.94		52.78		−2.84*	0.74
49.94			49.33	0.61	0.74
	50.95	52.78		−1.84*	0.74
	50.95		49.33	1.62*	0.74
		52.78	49.33	3.45*	0.74
Adjusted Means of Forced Vital Capacity					
4511.79	4449.82			61.97	179.19
4511.79		4396.26		115.53	179.19
4511.79			4191.47	320.32*	179.19
	4449.82	4396.26		53.56	179.19
	4449.82		4191.47	258.35*	179.19
		4396.26	4191.47	204.79*	179.19

*Significant at 0.05 level

superior than 5° inclination and 10 degree inclination in altering metabolic variable, tidal volume.

As for metabolic variable forced vital capacity, the adjusted mean comparisons proved that all the three different inclinations of treadmill exercises significantly altered the selected metabolic variable compared to control group. However, the results proved that there were no significant differences among treatment groups, namely, treadmill exercises in 5%, 10%, and 15% of inclinations.

The results of the study proved that manipulation treadmill exercises under different inclinations are feasible for implementation among women and most of the women underwent the training found the beneficial effects of treadmill training for improving their metabolic variables and acceptable for their overall health.

It was thus concluded that treadmill exercises of different inclinations significantly contributed to alter the metabolic variables, tidal volume, and forced vital capacity are feasible for implementation and accepted by the subjects as they found to be beneficial for improving their overall health.

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Research Article

A study of exercises and certain yogic practices on health-related physical fitness

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ABSTRACT

The purpose of this study was to investigate the response "A Study of Exercises and Certain Yogic Practices on Health-related Physical Fitness." The subjects were assigned to four groups by random sampling procedure as suggested by Robert and James (l969). Training program for experimental groups "A," "B," and "C" consisted of yogic practices, exercises and combined program. The controlled group "D" consisted of daily routine. The performance of subjects in AAPHERD health-related physical fitness test was recorded prior and after the experimental period. Eighty subjects of Arts and Engineering class students of Andhra University, Visakhapatnam, Andhra Pradesh, were selected for the study. The average age of subjects was 18–23 years. The subjects were divided into four groups. Experimental groups A, B, and C and a control group D, each group of 20 subjects. The subjects were equated before collecting the data. The experiment was conducted for a period of 12 weeks, excluding the period required for measurement in the criterion measures. It was begin and end within the experimental period. The experiment groups A done 12 yogic practices and pranayams. To establish the comparative effect of the yogic practices, exercises and health-related physical fitness, the data were examined by applying analysis of co-variance. The level of significance was 0.05%.

Keywords: Exercises, Health-related physical fitness, Yogic practices

INTRODUCTION

In the contemporary living style, physical fitness, health, and nutrition seem to have gained a place of priority. One of the most important goals of physical education program is to develop physical fitness. Physical fitness is considered as a pre-requisite to healthful and recreational living and is not an end into itself. Physical fitness can be health related in as much as it preserves healthful function of the body over extended periods of time in adults life. Health-related physical fitness components are those developments which are related to certain diseases. Physical education acts as an intermediary between health and fitness, while the degree of physical fitness depends on the individual's state of health, constitution, present, and previous activities.

Yoga

In Patanjali's Yoga-darsan an asana is defined as Sthirasukhamasanam (any posture that can be maintained with comfort is an "asana." Prayatnasaithil yanantsamapattibhyam (lack of effort and contemplation as if it is never going to end characterize it). Apart from contraction and relaxation, there is third state of muscle which is known as the "Catch" state. It is the ligament like contracted state of muscle which has been well studied biologically in the bivalve mollusks. It is characterized by maintenance of high tension without consumption of energy. A catch state could be very useful for a yogi which in to stay in a single posture for prolonged period for other advanced practices.

Health-related Physical Fitness

Health-related physical fitness is defined as fitness related to some aspect of health. This type of physical fitness is primarily influenced by an individual's exercise habits, thus, it is a dynamic state and may change, and physical characteristics that constitute health related physical fitness include strength and endurance of skeletal muscles, joint flexibility, body composition, and cardiorespiratory endurance. Health-related fitness is the ability of the heart, lungs, muscles, and joints to perform well. Regularly physical activity promotes physical fitness; physical fitness is the condition of the body that results from regular physical activity.

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Component of Health related Physical Fitness

Cardiovascular endurance

Cardiovascular, which is synonymous with cardiopulmonary exercise or "cardio," is aerobic physical activities that last longer than 90 s aerobic fitness is the ability to exercise the entire body for long period of time. It requires a strong heart healthy lungs blood vessel to supply the body with oxygen.

Activities to improve fitness in this area include running, swimming, and aerobic dance. A person must do the activity continuously for a minimum of 20 min within his target heart rate zone. Cardiovascular/aerobic activity should be done a minimum of 3 days per week. Every other day is preferable. The mile or the pacer will measure fitness testing in this area.

Statement of the Problem

The purpose of this study was to investigate the response "A study of exercises and certain yogic practices on health related physical fitness."

METHODOLOGY-SELECTION OF SUBJECTS

Eighty subjects of Arts and Engineering class students of Andhra University, Visakhapatnam, Andhra Pradesh were selected for the study. The average age of subjects was 18–23 years. The subjects were divided into four groups. Experimental groups A, B, and C and a control group D, each group of 20 subjects. The subjects were equated before collecting the data. The experiment was conducted for a period of 12 weeks, excluding the period required for measurement in the criterion measures. It was begin and end within the experimental period. The experiment groups A done 12 yogic practices and pranayams. The experimental group B performed exercise program whereas "C" grouped done combined activities. The control group "D" was consists of daily routine. The performance of all the subjects of AAPHERD health-related physical fitness test was recorded prior and after the experimental period.

Criterion Measure

The AAPHERD Health-related physical fitness test contains four items intended to assess an individual's status on four components of health-related physical fitness, brief statements indicating the reasons for their selection and the test items chosen to represent them.

AAPHER Health Related Physical Fitness Test

In 1980, the concept of fitness testing was modified due to the inclusion of additional emphasis on health-related physical fitness test items. Subsequently AAPHER, 1976 fitness test, which was developed to measure the general motor ability of young boys, was again revised in 1980 and was converted to AAPHER Health-related Physical Fitness Test. It intends to assess an individual's four components of health-related physical fitness, namely, cardiorespiratory function, body composition (leanness/Fatness), flexibility, and abdominal and low-back musculoskeletal function.

Cardiorespiratory Function Test-9 min Run-walk

Equipment

Track or marked area and stopwatch.

Test administration

The subject is asked to take a standing start, to be ready, and Go. The subject covers as much distance as possible in nine minutes. If the track and running area is marked at every 200 yards, the tester can count the number of laps completed and additional incomplete lap distance covered in 9 min, respectively. Although the tester has to encourage all the subjects to run the entire period of 9 min but interspersed walking is allowed and total distance covered exactly in 9 min is recorded and connected up to one yard.

Scoring

The interval between the starting signal and the instant subject crosses the finish line is the score of the test. The time is recorded correctly up to tenth of a second.

Triceps Skin Fold

The triceps skin fold is measured more commonly than any other part, because it is so accessible. It is closely correlated with percentage of body fat with total body fat.

Procedure

It was measured in the midline of the posterior aspect of the right arm, over the triceps muscles, at a point mid way between the lateral projection of the acromian process of the scapula and the inferior margin of the olicranon process of the ulnar. The level of the measurement is determined by measuring the distance between the lateral projection of the acromial process and the inferior border of the olicranon process of the ulna using a tape measure, with the elbow flexed at 90°. The tape was placed with its zero mark on the acromial and stretched along the upper arm extending below the elbow. The midpoint was marked on the lateral side of the arm. The subject was measured standing and skin fold was measured with the arm, hanging loosely and comfortably on the subject's side. The triceps skin fold is picked up with the left thumb and index finger, approximately 1 cm proximal to the marked level, and the tips of the calipers are applied to the skin fold at the marked level.

Procedure of Experiment

The experiment was conducted for a period of 12 weeks excluding the period required for the measurement, in the criterion measure at the beginning and the end of the experimental period.

The experimental group "A" did 12 yogic practices program as given below:

1. Srishasana
2. Sarvangasana
3. Matsyasana
4. Halasana
5. Bhujangasana
6. Salbhasana
7. Dhanurasana
8. Aradhamatsyandrasana
9. Pachimotana
10. Mayrasana/shavasana
11. Kapal Bhati
12. Anlom vilom

The experimental group "B" did 10 exercises program as given below:

1. Spinal rock
2. Back over
3. Side stretcher
4. Alternative prone lift
5. One leg jumping
6. Line walking after front roll
7. 5 meters dash
8. Raising the hands with folded hands
9. Walking on hands with partner
10. Stride stretcher

The experimental group "C" did exercise and yogic practices program combined. The experimental groups practiced 6 days in a week.

Training Program

The whole training program for the experimental group "A," "B," and "C" was carefully and systematically planned. The experimental groups "A," "B" and "C" underwent the training program on yogic practices, exercises and the combined respectively under the guidance of three assistance at same place and time under careful supervision of the research scholar for a period of 12 weeks in the 6 day week. The objective reflected exactly what was expected of the subjects after going through the training program. The control group "D" was not allowed to undergo the training program.

Experimental Design

The subjects were assigned to four groups by random sampling procedure as suggested by Robert and James (1969). Training program for experimental groups "A," "B" and "C" consisted of yogic practices, exercises and combined program. The controlled group "D" consisted of daily routine. The performance of subjects in AAPHERD health related physical fitness test was recorded prior and after the experimental period.

Statistical Procedures

To establish the comparative effect of the yogic practices, exercises and health related physical fitness, the data were examined by applying analysis of co-variance. The level of significance was 0.05%.

ANALYSIS OF DATA AND RESULT OF THE STUDY

The Analysis of co-variance for Cardio respiratory indicated that the resultant F ratio of 1.82 was not significant in case of pre-test.Means indicating that initial means differences among the group was not significant. The post test means of all the four group yielded an F ratio of 18.69 which was significant. The differences between the adjusted final means for four groups were found significant as the obtained F ratio was 17.54, Tabulated F ratio being 2.74.

As the difference between the post-test means and the adjusted final means for four groups were found significant, the critical difference for adjusted mean was applied to find out which of the differences between the post test mean were most significant. Differences between the paired adjusted final means are shown in Table 4.

The analysis of data in the table had revealed that combined, exercise and yogic practices program is more effective in enhancing the cardiorepiratory endurance performance than individual programs of yoga and exercise. However yoga

Table 1: Significance of difference between pre-test and post test means of experimental groups and the control groups in cardiorespiratory endurances test

Group	Pre-Test	Post-test	Mean difference	DM	"t" ratio
Asanas	1.42	1.59	0.18	0.017	10.57*
Exercise	1.62	1.77	0.16	0.014	11.6*
Combined	1.66	1.82	0.157	0.011	15.7*
Control	1.43	1.40	−0.033	0.011	-3.3

Difference *Significant at 05 level

Table 2: Significance of difference between pre-test and post test means of experimental groups and the control groups in triceps skinfold

Group	Pre-test	Post-test	Mean difference	DM	"t" ratio
Asanas	10.08	8.6	1.58	0.30	5.42*
Exercise	9.75	8.38	1.38	0.25	5.77*
Combined	10.91	8.23	2.69	0.30	9.13*
Control	9.23	9.84	−0.6	0.52	1.20

Difference *Significant at 05 level

Table 3: Analysis of covariance of the means of three experimental groups and the control group in cardiorespiratory endurance test

	Group				Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F
	Asanas	Exercise	Combined	Control					
Pre-test mean	1.409	1.611	1.650	1.425	Between	0.932	3	0.32	1.82
					Within	13.65	76	0.78	
Post-test mean	1579	1.77	1.806	1.393	Between	2.14	3	0.72	18.69*
					Within	0.039	76	0.039	
Adjusted post-test mean	1.554	1.742	1.779	−1.413	Between	1.579	3	0.527	17.54
					Within	2.321	76	0.031	

*Significant at 0.05 level *n*=20, B: Between group variance, W: Within group variance, F ratio needed for significance at 0.05 level of confidence 2. 74

Table 4: Paired adjusted final means and differences between means for the three experimental groups and the control group in cardiorespiratory endurance test

Mean				Difference between means	Critical difference for adjusted mean
Asanas	Exercise	Combined	Control		
1.56	1.75			0.189*	0.10
1.56		1.79		−0.038	0.10
1.56			−1.42	0.329*	0.10
	1.75	1.79		−0.226*	0.10
	1.75		−1.42	0.142*	0.10
		1.79	−1.42	0.337*	0.10

*Significant at 0.05 level

program proved to be least effective in improving the cardio respiratory endurance performance.

The Analysis of co-variance for triceps skin fold indicated that resultant F ratio of.48 was not significant in case of pre-test. Means indicating that initial means differences among the group were not significant. The post test means of all the four group yielded of F ratio 0.72 which was also not significant. The difference between the adjusted final means for four groups were found significant as the obtained F ratio was 17.70, tabulated F ratio being 2.74.

Since the difference between the adjusted final means for four groups were found significant, the critical difference for adjusted mean was applied to find out which of the differences between the paired adjusted final means were most significant.

Differences between the paired adjusted final means are shown in the Table 6 triceps skin fold.

It is evident from the table that all the three program were significantly effective in reducing triceps skin fold of the subjects. However no significant difference in the triceps skin fold thickness of the three experimental groups was seen

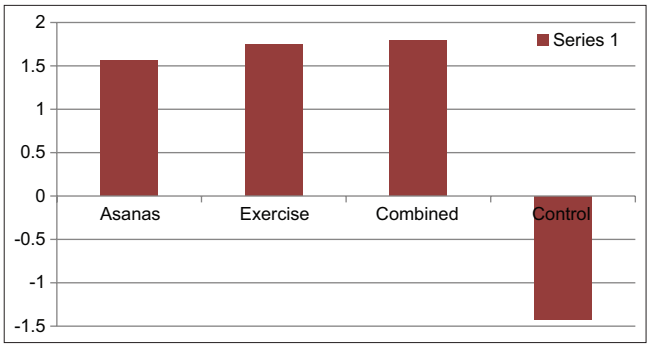

Figure 1: Paired adjusted final means and differences between means for the three experimental groups and the control group in cardiorespiratory endurance test

DISCUSSION OF FINDINGS

The analysis of data revealed that the three experimental groups trained by exercises, yogic practices, and combined exercises and yogic practices, showed significant gain in performance of health related physical fitness (cardio respiratory endurance) The mean gain achieved by combined exercise and yogic practices groups was higher in cardio respiratory yogic program was also more effective that asanas program in reduction of triceps thickness. The control group did not show any significant increase in the performance of health related physical fitness.

Table 5: Analysis of covariance of the means of three experimental groups and the control group in triceps skin fold

	Group				Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F
	Asanas	Exercise	Combined	Control					
Pre-Test Mean	10.08	9.746	10.906	9.23	Between	29.930	3	9.9764	0.48
					Within	1582.46	76	20.8218	
Post-Test Mean	8.6	8.376	8.226	0.84	Between	32.8786	3	10.9596	0.72
					Within	1165.92	76	15.3411	
Adjusted Post -Test Mean	8.3946	8.49479	8.368326	9.89229	Between	91.1683	3	30.3895	17.70*
					Within	128.866	76	1.7183	

*Significant at 0.05 level *n*=20, B: Between group variance, W: Within group variance, F ratio needed for significance at 0.05 level of confidence 2.74

Table 6: Paired adjusted final means and differences between means for the three experimental groups and the control group in triceps skin fold

Mean				Difference between means	Critical difference for adjusted mean
Asanas	Exercise	Combined	Control		
8.40	8.50			−0.10	0.09
8.40		8.38		0.04	0.90
8.40			9.99	−1.51*	0.90
	8.50	8.38		0.13	0.90
	8.50		9.99	1.41*	0.80
		8.38	9.99	−1.53*	0.90

Significant at 0.05 level

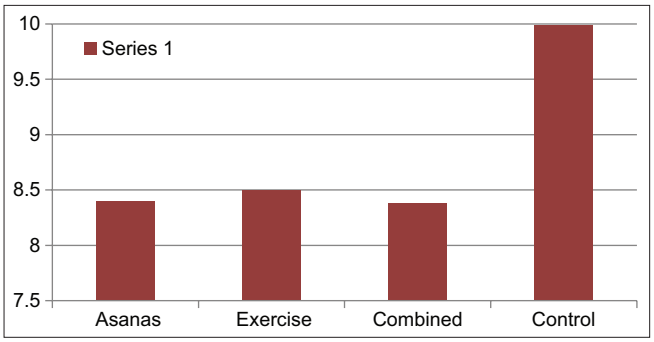

Figure 2: Paired adjusted final means and differences between means for the three experimental groups and the control group tricep skin fold

The result of the study confirm the notion that exercise and yogic practices improves health related physical fitness, when administered according to the set principles of training in a progressive manner and perform in proper way.

Our findings tend to support the findings of Hular (1995), Robin (1986). This finding calls for a changed exercises and yogic practices program (combined) for better result in muscular endurance. The improvement in muscular endurance was due to the fact that physical exercise, yogic practices and combined practice optimize the active body mass greater the active body mass, greater the maximal or absolute strength. The myosin and Actine filament increase.

Exercise and yogic practices are performed to increase the size of the muscle cross-section intra and inter muscular coordination, anatomical structure, as well as the elasticity of muscles and they make the muscles' hypertrophied and they increase their strength by increasing muscle mass (therefore total body mass). Regular exercise develops muscles fiber and they can improve the muscular strength. Our findings are supported by Satti and Gollinick (1983), Ganguly and Gharote (1989) who all had emphasized the importance of exercise and yogic practices for improving performance in health related physical fitness.

Cardiorespiratory endurance could be improved by the practice of exercise. It was also founded that for some health related variables yogic practices are more effective in comparison to exercise but when these both groups are compared with the combined of exercise and yogic program, a significant improvement in health related fitness variables of the study was seen.

Earlier researcher revealed that both short term and long term yoga practices help in improving cardiorespiratory endurance (Ganguly and Gharote, 1989, Ganguly *et al*., 1998, Maily and Samahta, 2004). Due to fact that combined practices, physical exercise and yogic practices had caused and increased the size of lungs, stretch of the alveoli and improvement upon the efficiency in intercostals muscles. Hence an increased efficiency in lungs, which now bears less strain, increases the cardiorespiratory endurance.

The first effect of yogic training program on the cardiorespiratory endurance initiates changes in the heart. Training has been shown to increase the size of the heart. The increase in heart size may arise due to an increase in the size of the heart cavities (ventricles and atria) as well as an increase in the thickness of the walls of the heart. The benefits to the cardiovascular system realized by an increase in the heart size include the larger atria and ventricles which allow a greater volume of the blood to be pumped each time, the heart beats and the increased thickness on the walls of heart also increases in the stroke volume.

Increased capillarization (number of capillaries in a given space) is another benefit that may rise as a result of cardio respiratory endurance training. An increased capillarization allows a greater surface area and reduces distance between the blood and the surrounding tissues, thus increasing diffusion capacity of oxygen and carbon dioxide as well as increase in the transport of nutrients to cells.

The present findings suggested that exercise with the yogic practices together can be best method for improving the cardio respiratory endurance. Our findings are also supported by the findings of Nandi and Adhikari (1999), Khodeskar (1988), Robson (1973).

According to different studies, with yogic practices and pranayama one can expect an additional loss amounting to between 0.2 lbs depending on the frequency and duration on the yogic practices, pranayama perforemed.

Although this might not seem like a great deal, it is important to remember that moderate breathing exercise is a key factor in preventing weight regain following a restricted calorie diet. Yogic practices and exercise practices help counteract the lenient environment that, often time's influences reduced obese subjects to regain weight.

We know that any energy providing source like carbohydrates, protein and fat can provide energy only in the presence of oxygen. Doing yogic practices, pranayama enhances the oxygen level of the body which initiates greater utilization of fat as metabolic fuel.

Athlete's physical education teacher, coaches, and sports scientists always researches ways to improve performance through efficient, effective procedures. Not only does this study reinforce the effectiveness of exercises and yogic practices techniques for increasing the health related physical fitness but may also provide information on ways in which the time can be saved and at the same time the health related physical fitness can be improved effectively.

CONCLUSIONS

Based on the understanding after deliberate discussion with experts and the supervisor and also in light of the above understanding following conclusions were finally drawn:-

1. There is significant difference in pre and post test mean values of Cardio-respiratory Endurance for yogic practices, combined group as the obtain t-values are 10.56, 11.5, 15.6 respectively at.05 level of significance.
2. There is significant difference in pre and post test mean values of Body composition (triceps skin fold) for yogic practices, combined group as the obtain t-values are 5.41, 5.76 and 9.12 respectively at 0.05 level of significance.
3. The post test means of the entire four groups for cardio-respiratory endurance yielded an F ratio of 18.68 which was significant. The differences between the adjusted final means for four groups were found significant as the obtained F ratio was 17.53, Tabulated F ratio being 2.74.
4. It is concluded that yogic and exercise programs significantly improve the health related physical fitness.
5. The yogic program is more effective than exercise program in the health related physical fitness.
6. A combined exercise yogic program is more effective in health related physical fitness than the individual programs of yoga and exercise.

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Research Article

Effect of floor aerobic and step aerobic exercises on respiratory parameters

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ABSTRACT

The aim of this study was to find out the effect of floor aerobic and step aerobic exercises on respiratory parameters, respiratory rate and resting pulse rate of obse college men. Sixty obese men were selected from different colleges in Andhra Pradesh. The subjects were determined through their BMI that men with 30 kg/m^2 and above of Body Mass Index is considered as obese men. The subjects were assigned as experimental group I-(step aerobic exercises), Experimental Group II (floor aerobic exercises) and control group respectively of 20 in each group. Pre tests were conducted for all the 60 subjects on selected respiratory variables, resting heart rate and respiratory rate. After the experimental period of 12 weeks post test were conducted and the scores were recorded. The ANCOVA results proved both floor aerobics and step aerobics exercises had significant effect on selected respiratory parameters among obse men students. Comparing between the treatment groups, the step aerobics group was found significantly better than floor aerobics in altering respiratory parameters, respiratory rate and resting pulse rate. It was concluded that step aerobics exercises were significantly better than floor aerobics in altering respiratory parameters of obese men students.

Keywords: Floor aerobics, Respiratory rate, Resting pulse rate, Step aerobics

INTRODUCTION

Aerobic exercise refers to exercise that involves or improves oxygen consumption by the body. Aerobic means "with oxygen" and refers to the use of oxygen in the body's metabolic or energy-generating process (Concise Oxford English Dictionary). Many types of exercise are aerobic and by definition are performed at moderate levels of intensity for extended periods of time. To obtain the best results, an aerobic exercise session involves a warming-up period, followed by at least 20 min of moderate to intense exercise involving large muscle groups, and a cooling-down period at the end.

Aerobic exercise comprises innumerable forms. In general, it is performed at a moderate level of intensity over a relatively long period of time. For example, running a long distance at a moderate pace is an aerobic exercise, but sprinting is not. Playing singles tennis, with near-continuous motion, is generally considered aerobic activity, while golf or two-person team tennis, with brief bursts of activity punctuated by more frequent breaks, may not be predominantly aerobic. Some sports are thus inherently "aerobic," while other aerobic exercises, such as fartlek training or aerobic dance classes, are designed specifically to improve aerobic capacity and fitness (Kolata 2002).

The major benefits of aerobic exercises are stronger and more efficiently operating heart and lungs, more energy, physical flexibility, conditioned muscles, proper use of fats, and effective burning of calories. The increased oxygen flow gained through aerobics re-energies by giving anyone more energy and a "re-awakening" of his senses (Kolata 2002). In other words, as the heart pumps more blood with fewer beats the body systems are in sync, allowing the subject to take in more oxygen. When everything is operating smoothly, your body can efficiently transport and utilize oxygen with no obstructions, the nucleus of this whole system is the heart. Each heartbeat is responsible for propelling the oxygenated

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blood through the proper blood vessels. Aerobic training will produce an increased capacity for pumping larger volumes of blood to accommodate the need for extra energy and extra oxygen (Kolata 2002).

The step aerobics was developed by Miller (1989) while she was recovering from a knee injury, a trend that took the aerobics industry by storm. This extremely popular style involves stepping up and down from a platform 15 to 30 cm (6–12 inches) high while performing different step combinations (Donatelle 2005).

Step aerobics exercises produce forces that will stretch, squeeze, bend, twist, and vibrate the bones, muscles, joints, tendons, and ligaments. Regular exposure to moderately high level of force is actually desirable because mechanical stress will produce structural changes that toughen important anatomical structures. For example, over a period of time, the force exerted on the body during moderately vigorous exercise can increase the density of bone so that it resists cracking and breaking. Exercise can also increase the tensile strength of tendons and ligaments so that they are less likely to be stretched or torn.

Researchers reported that the energy cost of step training increased steadily as platform height was increased. The average values of the energy cost of stepping at the lower end of the range (4" and 6" platform heights) are approximately equivalent to the values obtained for brisk walking on horizontal ground. As the upper end (10" and 12" platform heights), the range of values reported is similar to those obtained for jogging at a speed of 5–7 miles per hour. However, the estimates of energy cost at any one platform height vary from group to group. These differences probably reflect the differing fitness level of the subjects used in the investigations, and the different choreographic routines used by each of the groups (Donatelle 2005).

The overall energy cost of any routine will depend on the combination of steps that are used by the choreographer. Any routine that has a large proportion of steps that has a large proportion of lunges and traveling alternating lead steps will have greater energy cost than a routine that consists largely of basic steps and lateral steps across the top of the platform (Levinson *et al*. 1996).

The functional capacity of the cardiorespiratory system, heart, lungs, and blood vessels are described through aerobic capacity of an individual. It is a function both of cardiorespiratory performance and the maximum ability to remove and utilize oxygen from circulating blood. To measure cardiorespiratory capacity, a subject will undergo progressively more strenuous exercise from an easy walk-through to exhaustion. The higher the measured cardiorespiratory endurance level, the more oxygen has been transported to and used by exercising muscles, and the higher the level of intensity at which the individual can exercise. More simply stated, the higher the aerobic capacity, the higher the level of aerobic fitness. The Cooper test can be used to assess functional cardiorespiratory endurance (Kaloy, 2007).

Chen *et al*. (2021) provided a review of data from randomized and quasi-randomized controlled trials comparing the training group (aerobic exercise in water or land) and control group (CG, usual care) in chronic obstructive pulmonary disease (COPD) and concluded that medium to high-quality evidence shows that aerobic exercise can effectively improve dyspnea and exercise capacity in COPD patients. Compared with land-based aerobic exercise, water-based aerobic exercise had a significant additional effect in improving the endurance exercise capacity of COPD patients. Burge *et al*. (2020) reviewed a diverse range of interventions where improvements were demonstrated. Cheung *et al*. (2021) explored the feasibility and preliminary effects of aerobic exercise and tai chi interventions on survival and well-being among advanced lung cancer patients and explored the feasibility and preliminary effects of aerobic exercise and tai chi interventions on survival and well-being among advanced lung cancer patients.

Jones *et al*., (2009) evaluated cardiorespiratory fitness, skeletal muscle function, and body composition of patients with newly diagnosed and untreated, post-surgical primary malignant glioma and concluded postsurgical glioma patients have markedly reduced cardiorespiratory fitness, isokinetic strength, and CSA. Prospective studies are now required to determine whether such abnormalities influence treatment toxicity and clinical outcome as well as to test the effect of appropriately selected interventions to prevent and/or mitigate dysfunction. Goulopoulou *et al*. (2009) examined the effect of aerobic exercise training on vagal and sympathetic influences on the modulations of heart rate and systolic blood pressure in response to an oral glucose load in obese individuals with and without type 2 diabetes mellitus and found improved cardiac autonomic modulation. The review of related researches proved that different physical exercises, especially aerobic exercises contributed to managing the respiratory parameters of different groups of people. It was further proved that there was further scope for research to find out the effects of aerobic and step aerobic exercises on selected respiratory parameters of obese men students.

METHODOLOGY

Sixty obese men were selected from different colleges in Andhra Pradesh. The subjects were selected at random. They were in the age group of 20–25 years. The obesity of the subjects was determined through a person's BMI by the following formula: Metric: BMI = kg/m^2. For the purpose of

this study, men with 30 kg/m^2 and above of body mass index are considered as obese men. The groups were assigned as experimental group I-(step aerobic exercises), experimental group-II (floor aerobic exercises), and CG, respectively. Pre-tests were conducted for all 60 subjects on selected respiratory variables, resting heart rate, and respiratory rate. After the experimental period of 12 weeks, a post-test was conducted and the scores were recorded. The difference between the pre-and post-test scores was the effect of respective exercise protocols on selected respiratory parameters and to test the statistical significance, ANCOVA was used.

RESULTS

DISCUSSION

The results presented in Table 1 showed that obtained adjusted means on respiratory rate among step aerobics was 27.36 followed by the floor aerobics group with the mean value of 29.45, and CG mean values of 33.74. The differences among pre-test scores, post-test scores, and adjusted mean scores of the subjects were statistically treated using ANCOVA, and F values obtained were 1.56, 22.64, and 31.62, respectively. It was found that obtained F value on pre-test scores was not significant and the obtained F values on post-test and adjusted means were significant at 0.05 level. The obtained adjusted means on resting pulse rate among step aerobics was 70.25, followed by the floor aerobics group with the mean value of 71.42 and CG mean values of 73.98. The differences among pre-test scores, post-test scores, and adjusted mean scores of the subjects were statistically treated using ANCOVA, and F values obtained were 0.98, 9.33, and 47.21, respectively. It was found that obtained F value on pre-test scores was not significant and the obtained F values on post-test and adjusted means were significant at 0.05 level.

The *post hoc* analysis presented in Table 2 proved that due to 12 weeks of treatment, the step aerobics group and floor aerobic group significantly reduced respiratory rate than CG. The *post hoc* analysis between the experimental groups proved that step aerobics exercises were proved to be significantly better than floor aerobic exercises in reducing the respiratory rate.

The *post hoc* analysis proved that the step aerobics group and floor aerobic group significantly reduced resting pulse rate than CG. The *post hoc* analysis between the experimental groups proved that there was a significant difference between step aerobics exercises and floor aerobic exercises group and proved that step aerobics was significantly better than floor aerobic exercises in reducing the resting pulse rate. Thus, the findings of this study proved that step aerobic exercises were significantly better than floor aerobics in altering respiratory parameters among obese men students.

The findings of this study were in agreement with the findings of Benelli *et al*. (2004) who found that exercise in water significantly reduces heart rate and blood lactate production compared with the same exercise performed on

Table 1: Computation of analysis of covariance on respiratory parameters

	Step aerobics group	Floor aerobics group	Control	Source of variance	Sum of squares	df	Mean squares	Obtained F ratio
Results on respiratory rate								
Pre-test mean	33.15	32.25	34.60	Between	56.23	2	28.12	1.56
				Within	1029.10	57	18.05	
Post-test mean	27.25	28.80	34.50	Between	583.03	2	291.52	22.64*
				Within	733.95	57	12.88	
Adjusted post-test mean	27.36	29.45	33.74	Between	410.75	2	205.38	31.62*
				Within	363.73	56	6.50	
Mean Diff	−5.90	−3.45	−0.10					
Results on resting pulse rate								
Pre-test Mean	73.65	73.30	74.95	Between	30.23	2	15.12	0.98
				Within	883.70	57	15.50	
Post-test Mean	69.95	70.80	74.90	Between	280.23	2	140.12	9.33*
				Within	855.95	57	15.02	
Adjusted Post-test Mean	70.25	71.42	73.98	Between	142.23	2	71.11	47.21*
				Within	84.35	56	1.51	
Mean Diff	−3.70	−2.50	−0.05					

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16, *Significant

Table 2: Scheffe's confidence interval test scores on respiratory parameters selected

Means			Mean difference	Required CI
Step aerobics exercise group	Floor aerobic exercise group	Control group		
For respiratory rate				
27.36	29.45		2.09*	2.01
27.36		33.74	6.38*	2.01
	29.45	33.74	4.29*	2.01
For resting pulse rate				
70.25	71.42		1.18	0.97
70.25		73.98	3.74	0.97
	71.42	73.98	2.56	0.97

*Significant at 0.05 level

land. Laukkanen *et al*. (2001) found that heart rate during floor and step aerobic classes at three intensity levels and found differences in heart rate and %HRmax between the intensities (light vs. moderate, moderate vs. heavy and light vs. heavy) were significant within both groups (all, $P < 0.01$). Thus, the findings of this study were in agreement with previous findings of the researchers cited.

CONCLUSIONS

It was concluded that step aerobics exercises were significantly better than floor aerobics in altering the respiratory parameters of obese men students.

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Research Article

Comparison of selected physical fitness components among football, kabaddi, and kho-kho players

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ABSTRACT

The study is to compare selected physical fitness components among football, kabaddi, and kho-kho players. Twenty school football players, 20 school kabaddi players, and 20 school kho-kho players were selected on random basis as subjects from the Andhra Pradesh schools. The students of the 1st and 2nd year of higher secondary class were selected and their age ranged between 15 and 18 years. Speed, agility, and cardiovascular endurance were the common requirements for any sports and games and hence, selected for this study. Standard tests, 50 M sprint, shuttle run, and 600 m run were selected to measure speed, agility, and cardiovascular endurance of the subjects. The results of this study showed that football players have better physical fitness components speed and cardiorespiratory endurance than kabaddi and kho-kho players, while kho-kho players were better than football and kabaddi players on agility. It was concluded that football players were better than kabaddi and kho-kho players on speed and cardiorespiratory endurance and kho-kho players were found to be better than football and kabaddi players.

Keywords: Agility, Cardiorespiratory endurance, Football, Kabaddi, Kho-Kho, Speed

INTRODUCTION

Performance of an athlete in a sport or event depends on physical and motor and psychological component. In general, these variables are performance oriented and are dependent on the functioning of different systems of the body in an integral manner. The strength and power are essential qualities required for excellence in sports. A proper and specific training tend to improve most of the physical variables by which a definite improvement in the performance of the athlete could be achieved. In majority of the sports events and competitions, it is the performance in the physical and motor variables such as speed, power, agility, endurance with balance, and coordination which contribute to one's ability to perform difficult and complex skills. The relationship between the soundness of the body and the activity of the mind is subtle and complex. In this sense, motor fitness, physical fitness, and physiological components are the basis of all activities in our society (Yobu, 2004).

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Football

Football is not a matter of life and death. It is much more important than that. Almost all the countries play it and of course, millions of people watch it. It is apparently one of the ancient sports and it is the direct ancestor of American Football, Canadian Football, Rugby, and several other similar sports. Football is a manly game, which requires running and body movements in different directions. The game is played mostly with the legs hands and total body moments are also involved in the game. However, while using various skills such as kicking, passing, throwing, heading, and clipping, in the actual game situation, time becomes so important to the very success of the game. In addition, the game requires a good stamina speed, strength, agility, and coordination balance etcetera to excel in the game. Football is a game which calls for strenuous continuous, thrilling action and, therefore, appeals to the youth of the world. The skills involved are simple and natural and yet are highly stimulating and satisfying to any player. The skills are kicking, running, jumping throwing, dribbling, dodging, and outfitting an opponent (Thomas 1969).

Kabaddi

Kabaddi is primarily an Indian game, not much is known about the origin of this game. There is however concrete evidence, that

the game is 4000 years old. It is a rather simple and inexpensive game (Ask Jeeva.com). Kabaddi is basically an outdoor teach game, played in the tropical countries of Asia. This indigenous game of India was adopted by other countries in Asia, Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Malaysia, and more recently by Japan and China. The game has made it very popular and it is rightly called the game of masses since spectators totally involve themselves and the players have a great deal of encouragement. The game required no equipments and the rules of the game are very easy to comprehend. The Amateur federation of India a new body came into existence in the year 1972. With prime motive of organizing competition at the national level, the rules and regulation were brought out in print for the 1st time in 1928 (Saha 1992). A sport that is no longer regional is kabaddi. It is said to be the brainchild of Lord Krishna. A sport devised to keep his army fit by different names in some states. A lone barefoot players from a team mutters kabaddi, thumps his thighs, kicks his heels, clap his hands, then rubs them menacingly, and raids the territory of his enemies. If he runs out of breath in enemy territory, he is declared "dead." Death results if the opposing team succeeds in grabbing him and holding on until he can no longer utter kabaddi. Kabaddi has been related to Yoga. Since pranayama of yoga, which means taking a deep breath and withholding it plays a master role in a kabaddi in the term of "cant." "Cant" which as relation to pranayama by which internal organs are controlling breath as in yoga together with physical activity as in any other sports. Kabaddi has been recognized in three forms in India, namely, surjeevani, gamine, and amar. Kabaddi was introduced in Indian Olympic Game at Calcutta in 1938. The first men's national was held in Calcutta in 1955. The national championship held in New Delhi effects ever made demonstrate the game in the world youth festival held at Moscow in 1957. The first world Kabaddi Championship in the history of game was organized in Hamilton, when approximately 14,000 people packed Copps Coliseum to watch starts from India, Pakistan, Canada, England, and the United States. The players alert and watchful resort to intimidating posture, quick lungs, and feinting maneuvers. The sport calls for gumption, agility, and lightning reflex, the capability to keep up the war cry.

Kho-Kho

Kho-kho is purely an Indian game which has been played from ancient times. The word kho is derived from the Sanskrit word "Syu" which means get and go. Again the selection of the word "kho" can be connected to Yogas Encyclopedia of India spirits, medicine. The game has its origin in Maharashtra. Now, all most all states are playing this game. It is an indigenous game played in small areas, the game has been popular state and national level and it has been introduced in Calcutta S.A.F games and Madras S.A.F. games. November 22, 1987 was written in red letters in the history of the game kho-kho. Asian kho-kho federation was formed in November 27, 1987, at Calcutta for taking the game into abroad. The kho-kho player's performance depends the high level of motor finest factors such as speed, endurance, agility, power, flexibility, balance, reaction time, neuromuscular co-ordination, explosive strength, speed of movement, and match practices are the principal qualities which should go with the kho-kho players. The coach and game expert must be looked for to develop these abilities in the kho-kho players through implement the various training methods. Nowadays, more development noticed in this game if they are physical fitness (Singh and Moriya 2017).

Jesudoss (2019) compared the physical fitness variables between kho-kho and kabaddi and showed that there was a significant difference in endurance and flexibility between kho-kho and kabaddi players of higher secondary school girls. Sandeep and Kumar (2016) compared on physical fitness variables of kho-kho and kabaddi players of high school boys of Bangalore south. It was found differences between kabaddi and kho players on strength, explosive strength, agility, and speed. Karuna and Barman (2017) compared physical fitness profiles of trained, untrained, kabaddi, and kho-kho players and found that kho-kho players were better in flexibility, abdominal muscular strength, and endurance and kabaddi players were better in explosive leg strength. Shobha (2019) compare the selected physical fitness components of kabaddi and kho-kho intercollegiate male players of Bangalore University and revealed that there is a significant difference found between the means of selected physical fitness components such as flexibility, endurance, and agility. No significance difference found between the means of leg power. Mean value indicates that in flexibility, endurance, and agility, kho-kho players were better than kabaddi players, but, in case of leg power, kabaddi players are better than kho-kho players. Studies by Jana and Karak (2013) showed that there were no significant difference in lean body mass, body mass index, and percentage of body fat among football and kho-kho players which established an important fact that body contact sports and sports which require ample of endurance, strength, and agility, speed physical fitness remains same for the athletes involving in same type of sports. Most of the research studies have proved that kho-kho players are having good speed and agility compared to kabaddi player. Although a few work has been done regarding the comparison level of them with normal people or with other sports persons. Therefore, in the context of the previous studies, it has observed that kho-kho playing might have an impact on development of speed, agility, and explosive strength, which is not reported by any research studies till date. Therefore, the present study aimed at making a comparison of selected physical fitness variables among football, kabaddi, and kho-kho players.

METHODOLOGY

Twenty school football players, 20 school kabaddi players, and 20 school kho-kho players were selected on random basis as subjects from the Andhra Pradesh schools. The students of the 1st and 2nd year of higher secondary class were selected and their

age ranged between 15 and 18 years. The research scholar find physical fitness variables, speed, agility, and cardiovascular endurance were the common requirements for any sports and games and hence, selected for this study to compare the differences of selected variables among football, kabaddi, and kho-kho players. Standard tests, 50 m sprint, shuttle run, and 600 m run were selected to measure speed, agility, and cardiovascular endurance of the subjects. The subjects were oriented to the purpose of this study before administration of tests. The collected data were tabulated and subjected to statistical treatment using one-way ANOVA.

RESULTS

Table 1 shows that the obtained F value of 3.8348 was greater than the required table value of 3.15 to be significant at 0.05 level. Hence, it was accepted that there was significant differences between the groups in speed.

To test the significance of the *post hoc* differences between means, Scheffe's Test was applied and the obtained results are presented in Table 2.

The required Sceffe's confidence interval at 0.05 level was 0.548. The mean differences between kho-kho players and football players were greater than 0.548; hence, there exists significant differences between football players and kho-kho players in speed. However, as shown in Table 2, there was no significant difference between kho-kho players and kabaddi players and kabaddi players and football players.

Table 3 shows that the obtained F value of 4.51 was greater than the required table value of 3.15 to be significant at 0.05 level. Hence, it was accepted that there was significant differences between the groups in agility.

To test the significance of the *post hoc* differences between means, Scheffe's Test was applied and the obtained results are presented in Table 4.

The required Sceffe's confidence interval at 0.05 level was 0.72. The mean differences between kabaddi players and kho-kho players were >0.72; hence, there exist significant differences between kho-kho players and kabaddi players in agility. However, as shown in Table 4, there was no significant difference between kho-kho players and football players and kabaddi players and football players.

Table 5 shows that the obtained F value of 4.64 was greater than the required table value of 3.15 to be significant at 0.05 level. Hence, it was accepted that there was significant differences between the groups in cardiorespiratory endurance.

To test the significance of the *post hoc* differences between means, Scheffe's Test was applied and the obtained results are presented in Table 6.

Table 1: One-way ANOVA calculations between football, kabaddi, and kho-kho in speed

Source of Variation	Degrees of Freedom	Sum of Squares	Mean square	F ratio
Between the Groups	2	3.7122	1.8561	3.8348*
Within the Groups	57	27.173	0.4767	
Total	59	30.885		

*Significant at 0.05 level, Table value (0.05) (2, 57) = 3.15

Table 2: Comparison of means to test the significance of *post hoc* differences between football, kabaddi, and kho-kho players in speed

Kho-kho	Kabaddi	Football	Mean difference	Confidence interval
14.9	14.58		0.3205	0.548
14.9		14.29	0.609*	0.548
	14.58	14.29	0.2885	0.548

*Significant at 0.05 level

Table 3: One-way ANOVA calculations between football, kabaddi, and kho-kho in agility

Source of variation	Degrees of freedom	Sum of squares	Mean square	F ratio
Between the Groups	2	11.158	5.57	4.51*
Within the Groups	57	70.531	1.23	
Total	89	81.689		

*Significant at 0.05 level, Table value (0.05) (2, 57) = 3.15

Table 4: Comparison of means to test the significance of *post hoc* differences between football, kabaddi, and kho-kho players in agility

Kho-kho	Kabaddi	Football	Mean difference	Confidence interval
17.8	18.845		1.05*	0.72
17.8		18.22	0.425	0.72
	18.845	18.22	0.625	0.72

*Significant at 0.05 level

Table 5: One-way ANOVA calculations between football, kabaddi, and kho-kho in cardiorespiratory endurance

Source of variation	Degrees of freedom	Sum of squares	Mean square	F ratio
Between the Groups	2	2665.4	1332.7	4.64*
Within the Groups	57	16350	286.83	
Total	89	19015		

*Significant at 0.05 level, Table value (0.05) (2, 57) = 3.15

Table 6: Comparison of means to test the significance of *post hoc* differences between football, kabaddi, and kho-kho players in cardiorespiratory endurance

Kho-kho	Kabaddi	Football	Mean difference	Confidence interval
115.1	116.6		1.55	13.44
115.1		101.75	13.3	13.44
	116.6	101.75	14.85*	13.44

*Significant at 0.05 level

The required Sceffe's confidence interval at 0.05 level was 13.44. The mean differences between kabaddi players and football players were >13.44; hence, there exist significant differences between football players and kabaddi players in cardiorespiratory endurance. However, as shown in Table 6, there was no significant difference between kho-kho players and kabaddi players and kabaddi players and football players.

DISCUSSION

Tables 1 and 2 show the statistical analysis of the mean values of physical fitness component speed among football, kabaddi, and kho-kho players. The obtained F ratio was significant. The *post hoc* test proved that football players had best speed as they scored the lowest mean value of 14.292 s. This may be due to the fact that the football players' nature of play and their work outs made to attain more speed comparing to kho-kho and kabaddi players.

Tables 3 and 4 show the results on physical fitness component agility, as assessed through shuttle run. The obtained F ratio was greater than the required F ratio to be significant at 0.05 level. The *post hoc* analysis proved that kho-kho players proved better than kabaddi and football players. The game kho-kho involves dodging and quick start and quick reactions, the results too proved that kho-kho players were better in physical fitness component agility.

Tables 5 and 6 show the statistical results of physical fitness component cardiorespiratory endurance, as determined by 600 meters run/walk. The time completed by the subjects were analyzed by converting their time taken into seconds and the obtained F value was greater than the required F value to be significant at 0.05 level. The football players were found to be superior than kho-kho players and kabaddi players in completing 600 meters run/walk test. The nature of the game of football involves long runs as a result the football players would have trained to endure for longer periods than kho-kho and kabaddi players.

Dekel and Gershan (1996), in his study, proved that the association of intensity of physical activity reflects on their physical fitness levels. The findings of this study are also in agreement with the same. The results of this study were in agreement with the findings of Alpert *et al*. (1990) and Ashutosh *et al*. (1997) found that cardiorespiratory endurance can be improved by exercises. In this study, the active players' physical fitness component and cardiorespiratory endurance proved to be better.

CONCLUSIONS

It was concluded that football players were better than kabaddi and kho-kho players on speed and cardiorespiratory endurance and kho-kho players were found to be better than football and kabaddi players.

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Research Article

The influence of plyometric training with core training on selected motor fitness speed parameter of men volleyball players

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ABSTRACT

The research study was prepared on random group design involving *n* = 60 sixty men inter collegiate level participated Volley ball players. The Volley ball players were chosen for the study and were divided into four equal groups of *n* = 15 fifteen volley ball players each at random and designated as empirical group "A" trained with plyometric training group (PTG = I), empirical group "B" trained with core training group (CTG = II), empirical group "C" trained with combined training of plyometric training with core training (CPCTG = IV), and control group volley ball players "D" (CG = IV) did not participate any of the above training program apart from their regular training program. The treatment of plyometric training, core training, and combined training to the specific groups volley ball players was given 3 days per week on alternative days for a period of 12 weeks. The collected scores were treated with (ANCOVA) Analysis of Covariance was used to calculate "F" ratio to find the significant changes among all the four groups. Whenever the adjusted post-test means "F" ratio found significant, the Scheffe's *post hoc* test was applied to find the paired means difference to compare with critical value. All the collected scores were analyzed with computer SPSS statistical packages. The level of significance was fixed at 0.05 level of confidence.

Keywords: Core training, Plyometric training, Volley ball players

INTRODUCTION

A study of the individual reveals four general directions or phases in which growth and development take place, namely; physical development, motor development, and human relations development. Physical education plays an important part in contributing to each of these phases of human growth and development. The physical development objective deals with the program of activities which builds physical power in an individual through the development of the various organic systems of the body. It results in the ability to sustain adaptive effort, the ability to recover, and the ability to resist fatigue. The value of this objective is based on the fact that an individual will be more active, have better performance, and be healthier, if the systems of the body are adequately developed and functioned properly.

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Plyometric Training

The success in many sports and games, players' depends on explosive power. The players must able to use the muscular strength during game as quickly and forcefully as possible. These forms of activities can train the players in the form of speed-strength exercises (Yessis and Hatfield 1986) sports performances depend on power. An increase in muscles power athletes gives best performance whereas power mean amount of work a muscle can produce per unit of time (Paul *et al*., 2003). Several research studies results proved that plyometric exercises significantly increase the explosive power (Adams *et al*., 1992 and Ioannis *et al*., 2000).

Importance of plyometric exercises for volleyball players

- It improves the jumping skills of volleyball players for better shots and block opponents shots.
- It improves the quickness of volleyball players to move from side to sided and front to back.
- It increases the speed of the volleyball players through strength.

- Quick change of direction ability of volleyball players from the upward motion of a vertical jump to the down ward motion of a point-saving dig.

Core Training

The serve is a fundamental aspect of volleyball (Monge, 2007). The speed of hitting the volleyball with hands' determine by the execution of movements of a kinetic chain, which involves wrist, elbow, shoulder, trunk and hips (Gutierrez *et al*., 1994), muscles coordination during execution of kinetic chain performance (Masumura *et al*., 2009). Core training is a major element of training plans (Riewald, 2003). Core exercises performed with own body weight to increase the muscular strength of lumbo pelvic muscles and deep muscles to keep the spine balance during execution of movements (Atans 2013). Motor skill can be enhanced with physical core training. Core training is preferred in your training schedule because the core exercises can be done in the field without any equipment and contributes muscular strength and endurance development with in short time. Axel (2013) Core region anatomically, the whole muscles involve in the active movements and stability of the body connected with the skeletal system of the trunk region.

Statement of the Problem

The main purpose of this study is to investigate the influence of Plyometric training with core training on selected bio motor fitness, parameters (Speed) of men volleyball players.

METHODOLOGY

The investigator describes the details regarding methodology adopted for selection of men volleyball players, experimental designed are adopted, selection of independent and dependent parameter motor fitness, variable speed Selected parameters of motor fitness, variables, test and unit of measurements, orientation of volley ball players, competency of the investigator, instrument reliability used in this study, Inter class co-efficient of correlation values on selected criterion parameters, pilot study, collection of data, training schedule, administration of test, and statistical analysis of data had been explained in the methodology.

Selection of Men Volleyball Players

To achieve the main purpose of the research study, a total of 60 men intercollegiate level participated volley ball players were chosen randomly from Rajiv Gandhi University of Knowledge Technologies Nuzvid, Krishna district, of Andhra Pradesh from these only $n = 60$ volleyball players selected randomly. The age of the selected men volleyball players were ranged from 18 to 25 years as per college record (Mean average Age 21.14, height 168.12, and weight 66.18). The empirical treatment assigned such as plyometric training, core training, and combined plyometric training with core training for 12 weeks.

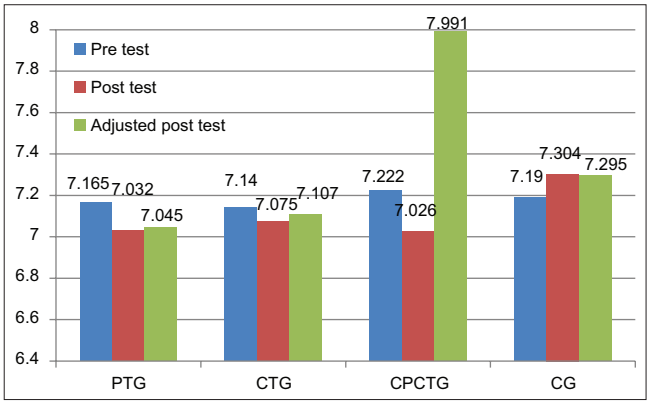

Figure 1: Clustered cylinder graphical presentation of pre test score mean, post test score mean and adjusted post score mean of ptg, ctg, cpctg and cg volley ball players on speed. PTG: Plyometric training group Volley ball Players, CTG: Core training group Volley ball Players, CPCTG: Combined Plyometric training and Core training group Volley ball Players, CG: Control group Volley players

Adopted Experimental Design

The research study was prepared on random group design involving $n = 60$ sixty men inter collegiate level participated Volley ball players. The Volley ball players were chosen for the study were divided into four equal groups of $n = 15$ fifteen volley ball players each at random and designated as empirical group "A" trained with plyometric training group (PTG = I), empirical group "B" trained with core training group (CTG = II), empirical group "C" trained with combined training of plyometric training with core training (CPCTG = IV), and control group volley ball players "D" (CG = IV) did not participate any of the above training program apart from their regular training program. The treatment of plyometric training, core training and combined training to the specific groups volley ball players were given 3 days per week on alternative days for a period of 12 weeks. The scores of selected motor fitness, parameters were obtained before the start of empirical periods (pre-test score) and after the 12 weeks of the empirical period (post-test score).

RESULTS

Table 1 shows the prior scores means, that is, values on speed of the PTG volley ball players, CTG Volley ball players, combined plyometric and CTG volley ball players (CPCTG), and control volley ball players group (CG) are 7.165, 7.140, 7.222, and 7.190, respectively. The calculated "F" value for prior scores means ware 1.28, lesser than the tabular value 2.77 for 3 and 56 (df) at 0.05 level of confidence. This result on prior score reveals that there are no statistically significant changes between three empirical groups volley players PTG, CTG, CPCTG, and CG control group volley ball players on speed.

The post scores mean values on speed of the PTG volley ball players, CTG Volley ball players, combined plyometric and CTG volley ball players (CPCTG), and control volley ball players group (CG) are 7.032, 7.075, 7.026, and 7.304, respectively. The calculated "F" value for post scores means was 22.08, higher than the tabular value 2.77 for 3 and 56 (df) at 0.05 level of confidence. This result on post score proved that there is statistically significant changes between three empirical groups volley players PTG, CTG, CPCTG, and CG control group volley ball players on speed.

The adjusted post-test mean values on speed of the PTG volley ball players, CTG Volley ball players, combined plyometric and CTG volley ball players (CPCTG), and control volley ball players group (CG) are 7.045, 7.107, 6.991, and 7.295, respectively. The calculated "F" value for adjusted post-test means was 121.87, greater than the tabular value 2.77 for 3 and 55 (df) at 0.05 level of confidence. This result on adjusted post-test declared that there are statistically significant changes between three empirical groups volley players, namely, PTG, CTG, CPCTG, and CG control group volley ball players on speed.

Table 2 display the paired mean differences on speed of four groups volley ball players namely PTG volley ball players, CTG volley ball players, combined plyometric and CTG volley ball players, and control group volley ball players.

The paired mean differences between PTG volley ball players and CTG volley ball players, PTG volley ball players and combined plyometric and CTG volley ball players, PTG volley ball players and control volley ball players group, CTG volley ball players and combined plyometric and CTG volley ball players (CPCTG), CTG volley ball players and control volley ball players group (CG) and combined plyometric and CTG volley ball players (CPCTG) and control volley ball players group (CG) were 0.060, 0.054, 0.250, 0.116, 0.188, and 0.304 higher than CI value of 0.047. So above table confirmed that there is significant differences exist between four groups on speed.

DISCUSSION ON HYPOTHESES

The investigator on the bases of statistical analysis acceptance and rejection of hypotheses had been made.

Table 1: Results of ancova on effect of plyometric training (PTG) core training (CTG) and combined training of plyometric and core training (CPCTG) compared with control group (CG) volley ball players on speed (In seconds)

TEst	PT group	CT group	CPCT group	C group	Source of variance	Sum of squares	df	Mean squares	Obtained F
Pre-test mean	7.165	7.140	7.222	7.190	Between	0.055	3	0.018	1.28
SD	0.13	0.13	0.72	0.12	Within	0.803	56	0.014	
Post-test mean	7.032	7.075	7.026	7.304	Between	0.778	3	0.259	22.08
SD	0.95	0.127	0.065	0.13	Within	0.658	56	0.012	
Adjusted post-test mean	7.045	7.107	6.991	7.295	Between	0.790	3	0.263	121.87
					Within	0.119	55	0.002	
Mean Diff	0.133	0.065	0.196	0.114	-	-	-	-	-

PTG: Plyometric training group, Volleyball players, CTG: Core training group Volleyball players; CPCTG: Combined plyometric and core training group Volleyball players, CG: Control group Volleyball players, *Significant

Required table F-ratio at 0.05 level of confidence for 3 and 56 (df) =2.77, 3 and 55 (df) =2.77

Table 2: Multiple comparisons of paired adjusted means of PTG, CTG, CPCTG and CG groups volley ball players and Scheffe's confidence interval test results on speed

Adjusted posttest means values					Required CI
PT Group	CT Group	CPCT Group	C Group	Mean difference	
7.045	7.107	-	-	0.060*	0.047
7.045	-	6.991	-	0.054*	0.047
7.045	-	-	7.295	0.250*	0.047
-	7.107	6.991	-	0.116*	0.047
-	7.107	-	7.295	0.118*	0.047
-	-	6.991	7.295	0.304*	0.047

PTG: Plyometric training group Volleyball players, CTG: Core training group Volleyball players, CPCTG: Combined plyometric and core training group Volleyball players, CG: Control group Volleyball players, *Significant

The research hypothesized that there would be significant enhancement due to the influence of plyometric training; core training and combined plyometric training with core training on selected motor fitness parameters namely speed, for men volleyball players. The statistical analysis report confirmed that all the selected motor fitness parameters, namely, speed of PTG volley ball players, CTG volley players and combined plyometric, and CTG volley ball players significantly improved with their respective training. So research first hypotheses accepted and null hypotheses rejected.

Discussion on Finding of the Results--Motor Fitness Variables--Speed

The study discovered that explosive strength exercises (Plyometric), core exercises, combined explosive strength exercises (plyometric), and core exercises increased the speed performance of the volleyball players to cover the 50 m distance in low time. The studies related to the above finding were Maheshkumar and Gladykirubakar (2014) study result recorded that plyometric exercises had significant impact to improve the speed performance of volley ball players. Bahri *et al*. (2017) The study proved that both training modalities (plyometric training and skill based conditioning training) modalities induced positive changes on sprinting performance, plyometric training is more effective in speed improvement of volley ball players than skill based conditioning program. Francesco *et al*. (2018) study strongly recommended that to encourage the coaches to implement the plyometric training for enhancement of speed performance of athletes. Sarika *et al*. (2019) concluded that both Swiss ball exercises program and plyometric training showed good result to enhance the speed performance of hockey players.

CONCLUSIONS

The conclusions are drawn on selected motor fitness, physiological, and volley ball skill related performance variables on the bases of statistical analyses report are given below.

Speed-50 Meters Dash

The statistical result on speed concluded that PTG volley ball players, CTG volley ball players, combined plyometric, and CTG volley ball players (CPCTG) 50 m dash speed performance positively gain comparative to control volley ball players group (CG). The study further proved that combined plyometric and CTG volley ball players (CPCTG) shown excellent performance on 50 m dash test comparative to isolated training group volley ball players, namely, PTG volley ball players, CTG volley ball players. Whereas PTG volley ball players speed on 50 m dash was better than CTG volley ball players.

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Research Article

Influence of yogic practices on selected psychophysiological variables among working women

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ABSTRACT

The aim of this study was to find out the influence of yogic practices on selected psycho physiological variables among working women. To facilitate the study, 30 working women were selected from Vijayawada, Andhra Pradesh, in the age group of the subjects were 25–35 years working in different industries. The psychological variables stress and anxiety and physiological variables, mean arterial blood pressure, and resting pulse rate were selected to be tested on the effect of yogic practices. Pre-tests were conducted for all the subjects on selected physiological and psychological components such as mean arterial blood pressure, resting heart rate, anxiety, and stress and the subjects were equated into two groups. The experimental groups participated in 6-week yogic practices. Moreover, the control group was not given any exposure. The post-tests were conducted on the above said dependent variables after the experimental period. The obtained means on anxiety of experimental group were 17.93 and control group was 21.27 with mean difference of 3.33. The obtained "t" value of 6.58 was greater than the required table "t" value of 2.14 to be significant at 0.05 level. The results on stress of experimental group were 24.80 and control group was 27.87 with mean difference of 3.07. The obtained "t" value of 2.68 was greater than the required table "t" value of 2.14 to be significant at 0.05 level. The obtained mean on physiological variable and mean arterial blood pressure of experimental group was 94.50 and control group was 97.57 with mean difference of 3.07. The obtained "t" value of 2.52 was greater than the required table "t" value of 2.14 to be significant at 0.05 level. These findings proved that yogic practices can contribute for altering anxiety, stress and mean arterial blood pressure among working women. The obtained mean on resting pulse rate of experimental group was 70.67 and control group was 73.00 with mean difference of 2.33. The obtained "t" value of 1.55 was less than the required table "t" value of 2.14 to be significant at 0.05 level. This proved that the resting pulse rate was not significantly altered among experimental group. It was concluded that that psychophysiological variables, anxiety, stress, and mean arterial blood pressure were beneficially altered among working women while there was no significant difference on physiological variable, resting pulse rate.

Keywords: Anxiety, Mean arterial blood pressure, Resting pulse rate, Stress, Working women

INTRODUCTION

Women in India have come a long way! From just a skilled homemaker women today have acquired skills and capabilities of not just being a homemaker but being at par with their male counterparts. This is the new generation of women who wants to pursue their dream career. However, this life is not a bed of roses for all. "The most glaring dilemma for me is the time factor. I am a media professional and at times I come home by midnight. My parents are not happy with the fact that I have chosen this field and I do not have a fixed office hour. And then your biological clock is ticking away, so there is another pressure of finding the right match and settling down," says a journalist (Dhurandher *et al*., 2016).

More conflict arises with the working mother. One has to fulfill the demand at work followed by various demands at home. In today's scenario, the husband and wife both work toward creating a balance with their work life as well as at home with their children. However, it is still difficult for women as she has to play multiple roles of a cook, a family maid, a tutor, a nurse as well as cater to the demands of office work. This can leave a working woman stressed and anxious; more so if the family is not supportive. "My office is quite far from my home. By the time I get home my husband takes care of my children's studies and sometimes also prepares food. He gets time as his office is nearby and he reaches home early. If it was not for his support; I would have left my job long time back,"

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says a working professional. "With equal pay comes equal responsibilities," says a training professional and a counselor. "There are a lot of dilemmas that a working woman has to go through. Glass ceiling effect – asking personal questions during an interview about family and marriage, biases for promotions, sexual harassment, lack of flexible working hours, lack of women mentors, and bosses in organizations are just to name a few. Moreover, even at home, a woman has to look after the child no matter how supportive her family or husband is. It is the woman who is blamed if the child does not perform well in school. A working mother is also always eager to get back home as soon as possible- so there are problems of late sittings in office. There is always a guilt factor as it is tough for women to pursue their career dreams. Sometimes women do take the advantage of being the fairer sex and want equal pay; don't want late sittings because of family problems but then they should also not crib about not getting promoted fast enough. You need to compromise somewhere," she advices (Dhanabhakyam and Malarvizhi 2014).

Among all this, it is also extremely important for the woman to take care of her health as she is more susceptible to illness due to stress and age factors. It is not a rosy picture but it is not that bad a scenario. Despite all the dilemmas and challenges women still find a way to pursue their dreams and dual working couples enjoy their chosen lifestyle. While two-third of working women suffer from lifestyle diseases, 53% of them skip meals and go for junk food due to work pressure and deadlines. According to a survey conducted by the Associated Chamber of Commerce and Industry (Assocham), 68% of working women in the age bracket of 21–52 years were found to be afflicted with lifestyle ailments such as obesity, depression, chronic backache, diabetes, and hypertension (IANS, 2009). The report further said that as 27% of females in urban India were employed, their health issues are a major concern both for society and business. The study "Preventive Healthcare and Corporate Female Workforce" also said that long hours and working under strict deadlines cause up to 75% of working women to suffer from depression or general anxiety disorder, compared to women with lesser levels of psychological demands at work.

Women employed in sectors that demand more time such as media, knowledge process outsourcing, and touring jobs are unable to take leave when unwell, and force themselves to work mainly due to job insecurity, especially during the current financial meltdown, the report said. However, it said, factors such exposure to industrial pollutants and environmental toxins, poor quality of sleep, lack of exercise, sunlight exposure, poor nutrition, excessive intake of alcohol, and drug abuse also cause depression. Highlighting the fact that women play vital and multiple roles, especially those who are employed, the report stressed on the need for a balance to be maintained by them both at home and workplace.

"Ignorance of healthcare can have multiple implications on her surrounding environment such as her family, workplace, and social network," the study. "Over 77% of respondents said, they avoided routine check-ups," the report stated indicating that the hectic schedule of balancing workplace and home, along with balancing between social and personal requirements lead to women ignoring their health. The report further stated that 47% of respondents spent less than Rs 500 on healthcare in a year, while 22% spent in the range of Rs 500–Rs 5,000 as they suffer ailments such as obesity, depression and spondylosis. Over 29% of respondents were found to be spending between Rs 5,000 and Rs 50,000 on healthcare annually. However, most of these respondents were found afflicted with high or low blood pressure, diabetes, heart diseases, asthma, urinary infection, and arthritis.

Working Women Prone to Psychological Distress

A research was conducted on psychological distress, assessed through the GHQ28. This questionnaire comprises four scales assessing the following psychosocial aspects: Somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression. On the basis of the answers to the 28 questions, a score is calculated for each worker, ranging from 0 to 28. The score value of "4" is usually chosen to define the psychological distress threshold. The first results of the Samotrace program reveal a higher prevalence of psychological distress among women – at 37.1% compared with 24.5% among men. More precisely, women recorded higher scores in relation to anxiety disorders than men – between 28% and 47% higher, depending on the occupation. Women also showed much higher levels for symptoms of depression – ranging from 53% to 75%, depending on the occupation, except for professionals and managers. Men, on the other hand, show a much higher rate of alcohol over consumption or dependence, (10.5% of men compared with 2.3% of women), while women use sleeping pills more regularly (5% of women compared with 2.2% of men).

Work-related Distress

A multivariate analysis on the first results of the Samotrace survey reveals a strong correlation between psychological distress and the psychosocial variables characterizing the work environment. The relation is noticeably high for imbalance in terms of effort-reward at work: the prevalence of psychological distress is 71.8% for men who are exposed to effort-reward imbalance and 23.2% for those who are not; the respective figures for women are 81.2% and 35.5%. Other significant correlations between psychological distress and psychosocial factors at work include the following: Over-commitment, working in a way that harms professional integrity, and exposure to threat or violence at work. The survey findings also reveal noticeable differences in psychological distress according to the sector of activity: A significantly higher prevalence of distress is found in sectors such as financial

services, public administration, and gas, electricity, and water supply. It is also the sectors of public administration, financial services, and community and personal services that show a higher proportion of men having problems with alcohol consumption. On the other hand, women working in public administration, financial services, and transport and communications are the most prone to use of psychotropic drugs.

Psychological disorders were defined in line with the pathologies outlined in the chapter on mental and behavioral disorders of the International Classification of Diseases (ICD-10) of the World Health Organization (WHO, 1992), along with "mental disorders" and "stress" as defined in occupational health. A significantly higher prevalence of psychological disorders was recorded in certain sectors of the economy – that is, for 4.9% of women and 2.5% of men in financial services, and for 2.7% of women and 1.5% of men in public administration. In terms of occupational category, high-skilled, white-collar female workers are mostly affected (3.7%) by psychological disorders, while for men the prevalence of such disorders is higher for those with medium levels of qualification (1.8%) (WHO, 2006).

Yoga is the science of right living and, as such is intended to be incorporated in daily life. The word "Yoga" derived from the Sanskrit root "Yujir Yogey" meaning to unite, to yoke, to joint, to put together. Yoga is not about mind over body. On the other hand, Yoga is about developing harmony between them, In Yoga, one use his/her mind to perceive and guide body. It works on all aspects of the person: The physical, vital. Mental, emotional, psychic, and spiritual. Yoga is defined as the silencing of the mind's activities which leads to complete realization of the intrinsic nature of the supreme being (Ross 1973). According to Indira Devi (1967), the aim of yogasanas is not only to develop the muscles and the body but also to regulate the proper activities of all the internal organs and glands that affect the nervous system and that which control our well-being to a much greater degree than we actually suppose.

Schell *et al*., (1994) conducted a study on physiological and psychological effects of Hatha-Yoga exercise in healthy women. It was found there were no substantial differences between the groups concerning endocrine parameters and blood pressure. The heart rate was significantly different in yoga group having a significant decrease in heart rate during the yoga practice. In the personality inventory, the yoga group showed markedly higher scores in life satisfaction and lower scores in excitability, aggressiveness, openness, emotionality, and somatic complaints. Madanmohan *et al*. (2003) studied the effects of yoga training on cardiovascular response to exercise and the time course of recovery after the exercise and found a significant increase in HR, systolic pressure, RPP, and DoP and a significant decrease in diastolic pressure. It is concluded that after yoga training, a given level of exercise leads to a milder cardiovascular response, suggesting better exercise tolerance. Chaya *et al*. (2006), investigated the net change in the basal metabolic rate (BMR) of individuals actively engaging in a combination of yoga practices (asana or yogic postures, meditation, and pranayama or breathing exercises) for a minimum period of 6 months, at a residential yoga education and research center at Bangalore. This study showed that there was a significantly reduced BMR, probably linked to reduced arousal, with the long term practice of yoga using a combination of stimulatory and inhibitory yogic practices.

The work environment, family burden, and the similar other conditions made a working women to feel psychological let down which in turn reflects on their physiological conditions. Yogic practices contributes for psycho physiological relief and provide strength in overcoming the psycho physiological conditions of different people. In this study, the investigator was interested to find out the effect of yogic practices on selected psycho physiological variables of working women.

METHODOLOGY

To facilitate the study, 30 working women were selected from Vijayawada, Andhra Pradesh, in the age group of the subjects were 25–35 years working in different industries. The psychological variables stress and anxiety and physiological variables, mean arterial blood pressure, and resting pulse rate were selected to be tested on the effect of yogic practices. The study was formulated as a true random group design, consisting of a pre-test and post-test. The subjects (n = 30) were assigned to two equal groups of 15 each based on their initial scores. The groups were assigned as experimental group and control group, respectively. Pre-tests were conducted for all the subjects on selected physiological, and psychological components such as mean arterial blood pressure, resting heart rate, anxiety, and stress through standard tests, such as mean arterial blood pressure was measured for by a period of 1 min and recorded in beats per minute. Resting pulse rate was measured by taking the number of breaths per minute. It was measured by bio-monitor. Anxiety was measured through standard questionnaire. This questionnaire was developed by Spielberger and stress was measured through standard questionnaire on stress authored by Everly and Gitdano. The experimental groups participated in 6-week yogic practices, consisting of Bhujangasana, Sarvangasana, Matsyasana, Nadi Shodhana Pranayama, Sheetali Pranayama, Bhramari Pranayama, and Savasana and the control group was not given any exposure. The post-tests were conducted on the above said dependent variables after the experimental period. The initial and final scores on selected psychological and physiological variables were tested for statistical significance using "t" test.

RESULTS

Table 1: The final mean, standard deviation, standard error, and obtained "*t*" value between experimental group and control group on anxiety

Groups	Means	MD	SD	SDM	Obtained "*t*"
Experimental group (*n*=15)	17.93	3.33	1.33	0.51	6.58
Control group (*n*=15)	21.27		1.44		

*Significant at 0.05 level, "*t*" value required at (0.05) (1, 14) = 2.14

Table 2: The final mean, standard deviation, standard error, and obtained "*t*" value between experimental group and control group on stress

Groups	Means	MD	SD	SDM	Obtained "*t*"
Experimental group (*n*=15)	24.80	3.07	1.82	1.14	2.68
Control group (*n*=15)	27.87		4.03		

*Significant at 0.05 level, "*t*" value required at (0.05)(1,14) = 2.14

Table 3: The final mean, standard deviation, standard error, and obtained "*t*" value between experimental group and control group on mean arterial blood pressure.

Groups	Means	MD	SD	SDM	Obtained "*t*"
Experimental group (*n*=15)	94.50	−3.07	4.80	1.22	2.52*
Control group (*n*=15)	97.57		2.54		

*Significant at 0.05 level, "*t*" value required at (0.05) (1,14) = 2.14

Table 4: The final mean, standard deviation, standard error, and obtained "*t*" value between experimental group and control group on resting pulse rate

Groups	Means	MD	SD	SDM	Obtained "*t*"
Experimental group (*n*=15)	70.67	2.33	4.17	1.50	1.55
Control group (*n*=15)	73.00		4.05		

Not significant at 0.05 level, "*t*" value required at (0.05) (1,14) = 2.14

DISCUSSIONS

The study was to find out the effect of yogic practices on selected psychophysiological variables among working women. The obtained mean on anxiety of experimental group was 17.93 and control group was 21.27 with mean difference of 3.33. The obtained "t" value of 6.58 was greater than the required table "t" value of 2.14 to be significant at 0.05 level. This proved that due to yogic practices, altered psychological variable, anxiety significantly among experimental group.

Table 2 shows the obtained mean on stress of experimental group was 24.80 and control group was 27.87 with mean difference of 3.07. The obtained "t" value of 2.68 was greater than the required table "t" value of 2.14 to be significant at 0.05 level. This proved that due to yogic practices, the stress was significantly reduced among experimental group.

The obtained means on physiological variable and mean arterial blood pressure of experimental group was 94.50 and control group was 97.57 with mean difference of 3.07. The obtained "t" value of 2.52 was greater than the required table "t" value of 2.14 to be significant at 0.05 level. This proved that due to yogic practices, the mean arterial blood pressure was significantly altered among experimental group.

The obtained mean on resting pulse rate of experimental group was 70.67 and control group was 73.00 with mean difference of 2.33. The obtained "t" value of 1.55 was less than the required table "t" value of 2.14 to be significant at 0.05 level. This proved that due to yogic practices, the resting pulse rate was not significantly altered among experimental group.

CONCLUSIONS

It was concluded that psycho physiological variables, anxiety, stress, and mean arterial blood pressure were beneficially altered among working women while there was no significant difference on physiological variable, resting pulse rate.

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Research Article

A study on resilience among female athletes

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ABSTRACT

The American Psychological Association defines resilience as "the process of adapting well in the face of adversity, trauma, tragedy, threats, or significant sources of stress" (Dündar, 2016). Psychological resilience plays an important role to improve the athletes' performance and fostering valuable life skills. In competitive sports setting athletes are able to cultivate their ability to effectively respond to negative situations through positive adaptation to adversely and stressors in athletic arena. In case of female athletes it is much necessary for them to develop psychological resilience to handle different challenges in sports as well as in daily life. In this study the objective of the present investigation is to analyse the resilience among female athletes. The sample of the present study comprised 75 female college athletes ($n = 25$ district, $n = 25$ state, and $n = 25$ national) who are continuing their undergraduate courses in different colleges of Cuttack, Odisha. The age of the female athletes varies from 18 to 22 years. For the purpose of data collection, resilience scale developed by (Annalakshmi, 2009) was used. One way ANOVA was applied to find out the significant difference among district, state and national level female college athletes on psychological resilience. The result was found to be significant at 0.01 level of significance. It means district, state and national level female college athletes are significantly differing from each other in their resilience.

INTRODUCTION

According to Walsh (2006), psychological resilience expresses the potential of getting stronger and deriving profit from a situation when faced with a difficulty in life (as cited in Akdoğan and Yalçın, 2018). Resilience is a key construct across disciplines, including psychology, medicine, physiology, and sports science (e.g. Bryan *et al*., Citation 2019; Gijzel *et al*., Citation 2020; Pincus and Metten, Citation 2010; Scheffer *et al*., Citation 2018). According to Richardson *et al*.'s (1990) psychological resilience model, while dealing with the problems experienced in life in the process of psychological resilience, they form protective individual and environmental support elements that will let them create better solutions and help them defend themselves against these problems. The stronger these elements are, the better their ability to cope with these problems.

In young female athletes, developing this resilience is particularly important because females face distinct challenges in many areas of life like friendships, body image, eating disorders, increased mental stress, internalized emotions, and a cycle of hormonal changes. The 'challenge' to 'peace' ratio is often heavy on the challenge side for most females, and as we'll learn later, too much challenge creates a decrease in resilience. Female athletes have particular experiences and vulnerabilities at odds with the development of resilience. Lunde and Gattario (2017) note that "young women who engage in sport have to face complex, ambiguous, and restricting norms and notions" that may impact their health and performance.

Research by (Sorkkila *et al*., 2019) reviewed the responses of 491 Finnish female student athletes in upper secondary school collected over the course of 3 years in a study that looked at the relationship between resilience, burnout and sport attrition. These authors found that the female athletes who reported more burnout symptoms demonstrated less resilience and were more likely than athletes without burnout symptoms to drop out from sport. Developing "mental toughness" or resilience will help an athlete perform well in the face of adversity. A resilient athlete is one who is able to overcome setbacks, remain confident, and focus on the present (Solomon and Becker, 2004).

According to (Pedro and Veloso, 2018), athletes' resilience "unveils" personal skills that protect individuals from the negative effects of stressful events. These skills allow athletes

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to have better and easier adaptation to negative or stressful circumstances often experienced in environment/individual interaction events. Studies have shown that resilience can also contribute to athletes' psychological well-being and to reducing psychological distress (Hosseini and Besharat, 2010; Nezhad and Besharat, 2010).

Purpose

The current study aims to assess the resilience of district, state and national level female college athletes.

Hypothesis

There will be no significant difference in resilience among district, state and national level female college athletes.

METHODS

The Sample

The sample of the present study comprised 75 female college athletes (n = 30 district, n = 30 state and n = 30 national) who are continuing their under graduate courses in different colleges of Cuttack. The age of the sample varies from 18 to 22 years.

Instrument

Resilience

For the purpose of measuring resilience of female athletes the Bharathiar University Resilience Scale (Annalakshmi, 2009) was used. BU Resilience scale is a self-report questionnaire that assesses psychological resilience. The scale has a total of 30 items and has been standardized in the Indian population. Items have a five-point scale ranging from "Not at all appropriate in describing you" to "Most appropriate in describing you". The total score of the subject represents their Resilience. The Cronbach's Alpha score of the scale is 0.876.

Procedure of Data Collection

All the female athletes were informed about the purpose of the present investigation. The standardized questionnaire was administered to all the samples during their off practice hours.

ANALYSIS AND RESULTS

Table 1 shows the analysis of variance on resilience among district, state and national level female college athletes. The f-value is found to be (6.76, $P < 0.01$) significant. This means district, state and national level female college athletes are differing from each other in resilience.

Table 1: Analysis of variance on resilience

Source	Sum of squares	df	Mean square	F
Between-treatments	691.44	2	345.72	F=6.76**
Within-treatments	3680.56	72	51.1189	
Total	4372	74		

DISCUSSION

The objective of the present study is to assess the resilience of district, state and national level female college athletes. One way ANOVA was applied to find out the significance of mean difference on resilience among district, state and national level female college athletes. The f-value is found to be (6.76, $P < 0.01$). The result was found to be significant. It means district, state and national level female college athletes are differing in their resilience. The result could be due to the fact that all three levels of female athletes have participated in different levels of sports competitions and have handled different challenges in due sport participation. As a result of which their resilience level is also found to be different. Hence, the hypothesis that there will be no significant difference in resilience among district, state and national level female college athletes is rejected.

CONCLUSION

The present investigation aimed at analyzing the difference in resilience among district, state and national level female college athletes. The result revealed significance difference among district, state and national level female college athletes on resilience. It means district level, state level and national level female college athletes are significantly differing in resilience. From the above study it is concluded that counseling to be given all the female athletes time to time to develop their confidence and resilience to handle the challenges in sports as well as in life.

Limitations

- The present study is limited by the sample size. Only 75 female college athletes were included in this study. Therefore, in further research data from male college athletes to be included for a better comparative analysis.
- In this present investigation, data were collected only from female college athletes from different colleges of Cuttack. So, in further research, data to be collected from different district of Odisha for a better analysis.

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Research Article

Relationship between arm strength, flexibility, and balance with shooting ability in hockey

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ABSTRACT

The aim of this study was to find out the relationship between arm strength, flexibility, and balance with shooting ability in hockey. To achieve this purpose, the investigator randomly selected thirty hockey players from Andhra Pradesh schools in the age group of 16–19 years. Static group design was used in this study. The relationship between arm strength, flexibility, and balance was related to the shooting ability. Using standard tests, selected subjects were tested in shooting ability, arm strength, flexibility and balance and the scores were recorded. To find out the shooting ability for distance of the subject in field hockey, "shooting test for distance" was conducted. Arm strength was measured through pull ups, Flexibility was measured through sit and reach test and balance was measured through "Rail Walking Test" The obtained data were tabulated and subjected statistical treatment through Pearson's Correlation Coefficient and Multiple Correlation. Table 1 shows that the correlation coefficient value computed between hockey shooting ability and flexibility was 0.365 which was greater than the required "r" value of 0.361 The remaining correlations, that is, hockey shooting ability with arm strength, hockey shooting ability with balance were 0.242 and 0.321 were less than the required "r" value of 0.361 to be significant at 0.05 level. Hence they were not significant. Multiple correlation coefficients were used to find relationship between shooting ability with independent variables put together. The results present in Table 2 shows the multiple R value obtained and required to be significant at 0.05 level between hockey shooting ability and arm strength, flexibility, and balance. The results indicated that there was significant relationship between the dependent and independent variables as the obtained R value of 0.459 was greater than the required value to be significant. It was concluded that there shooting ability in hockey was collectively contributed by arm strength, flexibility, and balance.

Keywords: Arm strength, Balance, Flexibility, Hockey players, Shooting ability

INTRODUCTION

Shooting is a beautiful attempt to score a goal toward the target with hitting action. Shooting is nothing but hitting the ball toward the target. Shooting accuracy is hitting the ball to the goal with an acute angle. The team which is having so many players with better shooting accuracy will have better chances to win a match because the winner is decided by the highest number of goals scored by a team. So a player with good shooting accuracy will definitely fetch goal to his team. Shooting is very essential to the hockey players. It is sending the ball to the goal in an acute angle with a faster action. Shooting is a hitting action to the goal. Shooting at the goal is hitting the ball towards the target. Shooting is very important skill in hockey. It is a faster hitting action done inside the circle to score a goal. Shooting is one of the skills which adorn hockey. In hockey, the winner is decided on the highest number of goals scored in a match by a team. To score a goal, the players shoot the ball with a faster hitting action to the goal. Adila Shahrin, (2020).

The hockey players should have good shooting accuracy to fetch goals. No team can win if that team players lack in shooting accuracy. The players who are good in shooting accuracy will score more goals and the team which has good players in shooting accuracy in hockey will score more goals. The shooting accuracy will fetch more goals. Therefore, to become a good player in hockey one has to counteract on improving the skills of hockey. There are various methods adopted by various teachers and coaches to improve the skills.

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Different type of drills was found and used to improve the different skills by different teachers and coaches. Researchers were also trying to invent new methods for improving the shooting ability in hockey. Skills can be learnt and improved through constant practice by various methods and by the use of various teaching aids also. We only improve the skills.

In general, performance can be improved by the nature of training based on experience. If sports performance has to improve various practice methods and training methods based on performance requirements should be implemented. Lawther (1972) states, "the peripheral perceptions of position of teammates and opponents are basic to success in many types of team contests for a fine combination. Each player should be able to give a pass to one of his own team mates thereby beating one or more opponents." Shooting accuracy is the most important factor for performing a fine skill. The ability to co-ordinate sight with action is a skill that is very difficult to develop. This skill improves to co-ordinate the eye with action. Developing peripheral vision is a part of the program. The player may be able to see the ball but not the man. Through training he may be able to see the man, the ball, and field. Peripheral vision is often called field of vision and refers to the ability of an individual to see the side, while looking straight ahead.

Miller and Josephine (1966) rightly pointed out that sufficient strength limits performance not only in sports but also in the daily function of life. It also helps to maintain in good posture. Arm strength is related to a type of endurance. Since the more efficient the muscles is in its work load, the longer it can function. Strength as a factor is indescribably related to other motor performance factors. It remains an entity in itself and is a salient element of the whole arm strength and in itself is not an indicant of capacity. Arm strength may be defined as the capacity of the individuals to exert muscular force. This force is revealed by the individual's ability to pull, push, lift, or squeeze an object on to hold the body in a hanging position. Maximum arm strength is applied in three ways. With a singular muscular contraction and the arm strength of the muscle is in proportion to its effective core section. Arm strength of muscle is necessary if one is to perform normal daily activities in an efficient manner. Arm strength in excess of this amount enables the player to perform the work more easily and effectively, including shooting ability in hockey.

Flexibility is involved in many motor patterns and its inadequate development may be regarded as another possible determent to achievement in certain game and sports. There is no set standard as to the amount of flexibility a person should possess. Hockey is the game which involves the total body movement and a game which is played always by bending and twisting the body parts. Therefore, it calls for larger degree of flexibility in all joints for proficiency in the game of hockey. Flexibility is the ability to move joints such as the shoulder, hip, and wrist joint easily. It has important asset in receiving and the development of flexibility helps to prevent certain muscle injuries that are common in hockey.

Balance is maintaining the equilibrium in our body. Balance gives a good stance. Balance is maintaining the equilibrium when our body is in motion. The game hockey consists of a lot of movements. So an individual needs better balance to play the better game. According to the book of Men's Hockey, (1974) "In every tactical move in hockey, one depends on team work and in the individual skills he has learnt good passing, controlling the ball, anticipation, speed to the ball and keeping his eyes on the ball. Tactics will succeed only through individual fundamental skills and with player's thinking as a team.

Cejudo *et al*. (2020) describe the lower-extremity flexibility profile of youth competitive inline hockey players and found The individual analysis of the flexibility values identified tightness in all players for one or more movement, except for hip abduction. Brocken *et al*. (2021) used reverse field hockey stick was used that requires a mirroring of arm and hand use and dominance (i.e., right hand on top of the hockey stick instead of the left hand). It was revealed that training with the reversed hockey stick led to significantly increased improvements compared to training with a regular hockey stick and concluded that modified equipment can be used to exploit positive transfer of learning by switching the limbs' roles. Guthrie *et al*. (2021) compared field-based tests of muscular strength and power and investigated their relationship. Sports included field hockey, volleyball, soccer, and softball. It was demonstrated strength and power differences among collegiate women's sports. Softball consistently outperformed others in bench press, back squat, and vertical jump, which may be due to the demand of power embedded in the nature of the sport. Farley *et al*. (2020) determine if physical fitness qualities were associated with performance of sport-specific technical skills in female, team-based ball players. And revealed clear associations between body composition and throwing/shooting (using hands) in junior ball players (15/15; 100%) and with movement with a ball in elite (6/9; 67%) and senior (6/6; 100%) ball players. Three uncertain associations were found between offensive technical skills and agility in elite ball players (3/8; 38%), and with speed in elite (6/14; 43%) and junior (7/18; 39%) female ball players. Hermiston, Gratto and Teno (1979) conducted a study on three hockey skills tests as predictors of hockey playing ability. And indicated that the Hermiston Hockey Ability Test was the best predictor ($r = 0.7$) with a relationship the other two tests showing a coefficient team of hockey, players' ability can best be assessed using the Hermiston Hockey Ability Test.

The review of related researches proved that there were different attempts to find out the association of fitness, learning abilities,

strength training etcetera with shooting ability among hockey players of different groups. However, it was found that there was further scope for research to pin point how far arm strength, flexibility, and balance have association with the shooting ability of hockey players and hence, this research study was attempted.

METHODOLOGY

To achieve this purpose the investigator randomly selected thirty hockey players from Andhra Pradesh schools in the age group of 16–19 years. Various factors have been contributing to hockey shooting ability, apart from the perfection of skill in the game and physical fitness. Based on the reviews, it was found that the players are equal in fitness and skills factors such as arm strength, flexibility, and balance seem to make a great difference between the players in their shooting proficiency. To test scientifically, the relationship between arm strength, flexibility, and balance was related to the shooting ability. Using standard tests, selected subjects were tested in shooting ability, arm strength, flexibility, and balance and the scores were recorded. Thus, static group comparison design was used in this study as the investigator wished to find out whether there was any significant relationship existed between the dribbling ability in hockey and arm strength, flexibility, and balance. To find out the shooting ability for distance of the subject in field hockey, "shooting test for distance" was conducted. The subjects were expected to shoot the ball from a given point to his maximum possible distance. Three trials were given to each subject and the best one was considered as his score in shooting ability. Arm strength was measured through pull ups, and the score was the number of pull ups performed by the subject. Flexibility was measured through sit and reach test and scores recorded in centimeters. Balance was measured through "Rail Walking Test" The score was the number of segments transverse before he lost his balance and stepped off the rail. Two trials were given and best was considered as his score. The obtained data were tabulated and subjected statistical treatment through Pearson's Correlation Coefficient.

RESULTS

The results presented in Table 1 are presented through bar diagram in Figure 1 for better understanding of the results.

To find out the correlations between shooting ability and arm strength, flexibility and balance, put together, multiple correlation was used and the results obtained are presented in Table 2.

DISCUSSION

In this study, the criterion variables shooting ability and the three independent variables, arm strength, and flexibility and were tested for through Pearson Correlation Coefficient. The scores of the hockey shooting ability of school hockey players were obtained through standard tests and correlated with arm strength, flexibility, and balance and are presented in Table 1.

Table 1: Correlation coefficient values between hockey shooting ability and arm strength, flexibility and balance

Criterion variable	Variable	Obtained value	Required value at 0.05 level
Hockey shooting ability	Arm strength	0.242	0.361
	Flexibility	0.365*	
	Balance	0.321	

"r" value 28, 0.361. *Significant at 0.05 level

Table 2: Multiple correlation between hockey shooting ability and arm strength, flexibility and balance of school hockey players

Criterion variable	Variables	Obtained R value	Required value at 0.05 level
Hockey Shooting Ability	Arm strength Flexibility Balance	0.459*	0.361

*Significant at 0.05 level

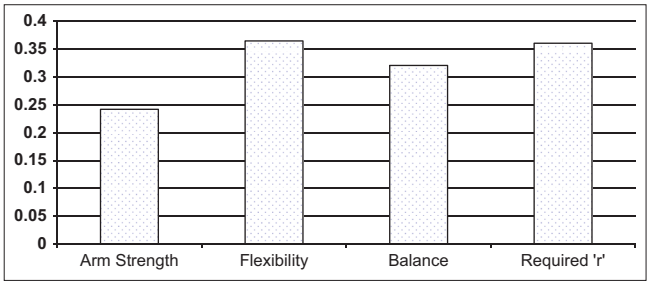

Figure 1: Bar diagram showing correlation coefficients of obtained and required "r" values between shooting ability and arm strength, flexibility, and balance

Table 1 shows that the correlation coefficient value computed between hockey shooting ability and flexibility was 0.365 which was greater than the required "r" value of 0.361 and therefore it was significant at 0.05 level of confidence with 28° of freedom.

The remaining correlations, that is, hockey shooting ability with arm strength, hockey shooting ability with balance were 0.242 and 0.321 were less than the required "r" value of 0.361 to be significant at 0.05 level. Hence, they were not significant.

Multiple correlation coefficients were used to find relationship between shooting ability with independent variables put together. The results present in Table 2 shows the multiple R value obtained and required to be significant at 0.05 level between hockey

shooting ability and arm strength, flexibility and balance. The results indicated that there was significant relationship between the dependent and independent variables as the obtained R value of 0.459 was greater than the required value to be significant.

Thus, the results of this study proved that there was significant relationship between dribbling ability and arm strength, flexibility and balance of the hockey players as the obtained multiple R was higher than the required R to be significant.

Thus, the results of this study proved that there was insignificant relationship between shooting ability and flexibility when selected independent variables correlated separately. However, when the individual variables were combined together and analyzed through multiple correlation coefficient the results proved that there was significant relationship between shooting ability and arm strength, flexibility, and balance as the obtained multiple R was higher than the required R to be significant.

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Research Article

Comparative study on motor abilities between Kabaddi and Kho-Kho players of Hyderabad

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ABSTRACT

The specialty of Indian games is to make players light-bodied, agile, ready-witted, supple, and daring. The games kabaddi and kho-kho are most popular in rural India. The objective of this study is to analyze motor ability differences among kabaddi and kho-kho players of the Government College of Physical Education, Domalguda, Hyderabad Telangana state. The selected variables for this study were motor ability: Agility, cardiovascular endurance, and reaction time. These variables were tested before and after 12 weeks of plyometric training. There was a significant difference in mean between kabaddi and kho-kho players on motor abilities, the significance was 0.000 at $P < 0.05$ level.

Keywords: Agility, Cardiovascular endurance, Plyometric, Reaction time

INTRODUCTION

Physical education is an educational process that has its aims, the improvement of human performance and enhancement of human development through the medium of physical activities selected to realize this outcome. Physical education includes the acquisition and refinement of motor skills, the development and maintenance of fitness for optimal health and well-being the attainment of knowledge about physical activities and exercise, and the development of positive attitudes toward physical activity as means of improvement in human performance.

Kabaddi, kho-kho, Yogasana, Malkhamb, Lathi, Phari-gadga, Atya-Patya, Langadi, Viti-dandu are peculiar indigenous activities preserved and handed over to the present generation. The specialty of Indian games is to make players light-bodied, agile, ready-witted, supple, and daring. Kho-kho is one of the most popular traditional sports in India. Kabaddi and kho-kho are an indigenous game. It is based on the natural principle of physical development. It is vigorous and fosters a healthy combative spirit among the youth. It is not merely running with speed but also a natural instinct to overtake, to pursue, to defense, and offensive raids.

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Kabaddi is a combative team game, played with absolutely no equipment, on a rectangular court, either outdoors or indoors with seven players on the ground on each side. Each side takes alternate chances at offense and defense. The basic idea of the game is to score points by raiding into the opponent's court and touching as many defense players as possible without getting caught on a single breath.

The individual who is physically fit has a proportionate developed body and posture, that is, usually good. One performs the activities with a high degree of motor proficiency. It is true that any kind of physical work in day-to-day life improves physical fitness. It depends on the intensity of the working does.

Kho-kho is a chase and tag game. The chaser chases the runner (defender) to dismiss him from the activity. The game is called kho-kho because it is obligatory on the part of the active chaser to utter "Kho" behind a seated chaser to hand over the chase to the seated chaser for the progress of the game. The game of kho-kho demands optimum physical fitness for the match, that is, speed, endurance, strength, coordinative ability, flexibility, and reaction time, which should go with the skilled ability to

enable players to withstand the strain of a long-time-bound activity.

In this research study, the scholar had experimented with plyometric training on the motor abilities of kho-kho and kabaddi players. Plyometric exercises are great for increasing overall explosive strength and speed, giving you an acceleration and power advantage over the competition.

METHODOLOGY

Selection of Subjects

The present study was conducted on 40 Government College of Physical Education students ranging age between 19 and 21 years. The subjects were randomly selected and training was conducted at Domalguda, Hyderabad, Telangana, India. The subjects were divided into four equal groups, namely, (1) the first group was kho-kho experimental group (n = 10), (2) the second one was kho-kho control group (n = 10), (3) the third group was kabaddi experimental group (n = 10), and (4) the fourth kabaddi control group (n = 10) [Table 1].

Selection of Variables

The research scholar experimented with plyometric training for the improvement of motor abilities. The administrating feasibility in terms of availability of instruments and time factor from the point of view of subjects were considered for the collection of data. The following variables were selected. The motor ability variables: Agility, cardiovascular endurance, and reaction time.

Table 1: Physical characteristics results between experimental and control groups

S. No.	Name of the group	Age (year)	Height (cm)	Weight (kg)
1	Kho-kho experimental group	20.70	166.80	56.10
2	Kho-kho control group	22.10	165.30	63.20
3	Kabaddi experimental group	20.90	166.20	59.90
4	Kabaddi control group	20.70	166.80	57.10

Research Design

The experimental groups were administered 12 weeks duration with different types of plyometric exercise programs for the improvement of motor abilities among kho-kho and kabaddi players of physical education trainees, Hyderabad. A proper warming-up period of 10 min duration was given before training sessions (3 days/week). The control group was not allowed to participate in any of the training programs except their daily routine practice. Measurements of motor ability variables were taken before and after treatment with the informed consent of all subjects. The training load was increased in a progressive manner, after every 2 weeks. The motor fitness data were collected by administering a shuttle run for agility, cooper 12 min run/walk for cardiovascular endurance, and ruler drop test for reaction ability.

Statistical Technique

After the data collected, they will be processed and critically analyzed to draw exact conclusions. In the present study, the collected data were analyzed using paired t ratio to find the mean differences in means, and ANOVA was used to test the variance among groups. The significance was set at 0.05 levels.

RESULTS

The above Table 2 shows the mean and magnitude of increase (MI) values of motor ability variables between pre-test and post-test of plyometric training and control groups. The experimental subjects were treated with plyometric exercises for 12 weeks of training and control group subjects did not treat any specific training except regular respective game activities. After the post-test experimental subjects' motor abilities, efficiency increased in the control group. The MI in agility (2.58%), cardiovascular endurance (1.06%), and reaction ability (7.14%) were high in kho-kho players than in kabaddi. However, the control group's motor abilities efficiency was not improved from pre- to post-test results.

The above Table 3 shows the statistical significance between the pre-test and post-test on motor abilities between

Table 2: Mean values of research variables between experimental and control groups

Group	Kho-kho players						Kabaddi players					
	Shuttle run		Cooper 12 m run		Ruler drop test		Shuttle run		Cooper 12 m run		Ruler drop test	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Exp.												
Mean	9.67	9.42	2529.5	2556.33	0.14	0.13	9.96	9.81	2577.33	2592	0.17	0.16
M.I%	2.58		1.06		7.14		1.50		0.57		5.88	
Cont.												
Mean	9.98	10	2570.33	2568	0.17	0.17	9.67	9.68	2529.5	2527.83	0.14	0.14
M.I%	−0.20		−0.09		0		−0.10		−0.06		0	

Table 3: Statistical results between experimental and control group

Groups	Shuttle run		F	Cooper 12 min run		F	Ruler drop test		F
	t	sig		t	Sig		t	Sig	
Kho-kho experimental	11.66	0.000	8.89	−25.35	0.000	0.300	8.97	0.000	15.13
Kho-kho control	−5.57	0.000	0.000	0.306	0.761	0.825	4.41	0.000	0.000
Kabaddi experimental	9.169	0.000		−17.71	0.000		21.7	0.000	
Kabaddi control	−3.37	0.002		1.62	0.115		17.85	0.000	

experimental and control groups. A significant difference was found between the pre-test and post-test among kho-kho and kabaddi players in agility, cardiovascular endurance, and reaction time, but scholar found negative and positive results in both control groups. Statistical significance was 0.000, $P < 0.05$ level. ANOVA test results showed that there was a significant difference found among groups in agility and reaction time; however, no significant difference was found in cardiovascular endurance.

CONCLUSION

The following conclusions are drawn from the present research work. The analysis explains through statistical interpretations were as follows:

1. Cardiovascular endurance was significantly improved in kho-kho players than in kabaddi players through plyometric exercise
2. Agility also improved in kho-kho players than in kabaddi players with training
3. Remarkable improvement in reaction ability was found in kho-kho players than in kabaddi players.

Recommendations

1. Same type of research may be conducted for female kho-kho and kabaddi players
2. The scholar also recommended that research may be conducted on psychological factors between kho-kho and kabaddi players
3. The scholar further recommends that there is a correlation study between motor abilities and playing abilities of kho-kho and kabaddi.

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Research Article

Effect of own body exercises and plyometric training on cardiovascular endurance and vital capacity among badminton players

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ABSTRACT

The aim of the study was to find out the effect of own body exercises and plyometric training on cardiovascular endurance and vital capacity among badminton players. The study was formulated as a true random group design consisting of a pre-test and post-test. The subjects ($n = 60$) were randomly assigned to three equal groups of 20. The selected subjects were divided into three groups randomly. Experimental Group I was considered as own body weight exercises group, experimental Group II was considered as plyometric exercises group, and control group was not involved in any special treatment. Pre-test was conducted for experimental Groups I and II and the control group on cardio respiratory endurance and vital capacity. Experimental groups underwent the respective training for 12 weeks. Immediately, after the completion of 12 weeks training, all the subjects were measured of their post-test scores on the selected criterion variables. The difference between the initial and final scores was considered the effect of respective treatments. To find out statistical significance of the results obtained, the data were subjected to statistical treatment using ANCOVA. In all cases, 0.05 level was fixed to test the significance of the study.

Keywords: Cardiovascular endurance and vital capacity, Own body exercises, Plyometric training

INTRODUCTION

Sports have a very important role in modern society. It is important for an individual, a group, a nation and indeed the world. Sports performance is the result and expression of the total personality of a sports man. The development of a sports man enabling him to achieve high level of performance is usually concerned in four areas, namely, physical power, social adjustment, psychological development, and physiological efficiency. Different activities make different demands on the organism with respect to circulatory, respiratory, metabolic and neurological, and temperature regulating functions.

The concept of sports has been changed now a day. Due to the innovations brought by different sports sciences in the field of sports, now there are a number of scientific methods to improve each and every quality, which determines the performance in each games and sports. The same time development is according to the rate of demand of each games and sports. This is the main reason why the performance standards are going higher day by day.

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Statement of the Problem

The purpose of the study would be to find out the effect of own body exercises and plyometric training on cardiovascular endurance and vital capacity among badminton players.

Limitations

Uncontrollable factors associated with the study were accepted as limitation and the following were considered as limitation of the research study:

1. Certain factors like rational habits such as life style, daily routine, diet, and climatic conditions were not taken into account in the study

2. The influence of vigorous academic activity of students could have discouraged or motivated the subjects during training and during testing period
3. The heterogeneous characters of the subjects in hereditary and environmental factors were recognized as a limitation
4. The subject's body type and socioeconomic status of the students were not taken into consideration.

Delimitations

1. Intercollegiate level badminton players of JNTU, Hyderabad, were considered for the purpose of this study
2. Badminton players in the age group of 19–22 were selected for this study
3. The influence of experimental treatments, cardiovascular endurance, and vital capacity find out the influence of specific experimental treatment for this purpose, the randomly selected 60 badminton players was divided into three groups, namely, experimental Group I, experimental Group II, and control group consisting of 20 players in each group
4. The following dependent and independent variables were selected for this study:

Dependent variables

i. Cardiovascular endurance
ii. Vital capacity.

Independent variables

i. 12-weeks own body weight exercises
ii. 12-weeks plyometric exercises.

METHODOLOGY

Selection of Subjects

The purpose of the study is to find out the effect of own body exercises and plyometric training on cardiovascular endurance and vital capacity among badminton players. For these purpose, intercollegiate level badminton players who participated at inter-collegiate level competitions in JNTU, Hyderabad, were selected. Sixty players in the age group of 19–22 were randomly selected as subjects for this study. The subjects were randomly selected into three groups, namely, experimental Group I, experimental Group II, and control group consisting of 20 in each. The subjects were oriented for the purpose of the study and all the subjects volunteered to undergo the treatments as the research would further enhance their abilities and contribute for the training methods.

Experimental Design

The study was formulated as a true random group design consisting of a pre-test and post-test. The subjects (n = 60) were randomly assigned to three equal groups of 20. The selected subjects were divided into three groups randomly. Experimental Group I was considered as own body weight exercises group, experimental Group II was considered

Table 1: Tests used to assess the cardiovascular endurance and vital capacity

S. No.	Variables	Tests	Units of measure
1	Cardiorespiratory endurance Vital capacity	Cooper's 12 min run/walk test Spirometer test	Meters Milliliters

Table 2: Intraclass correlation between test and retest for tester reliability

S. No.	Variables	Tests	Obtained 'r'
1	Cardiorespiratory endurance Vital capacity	Cooper's 12 min run/walk test Spirometer test	0.78* 0.82*

*Significant at 0.01 level

Table 3: Computation of analysis of covariance of cardiorespiratory endurance

	Own body exercises	Plyometric training	Control group	Source of variance	Sum of squares	df	Mean squares	Obtained F
Pre-test mean	2430.00	2448.50	2487.50	Between	34463.33	2	17231.67	1.24
				Within	789380.00	87	13848.77	
Post-test mean	2621.00	2614.50	2508.50	Between	159563.33	2	79781.67	6.20*
				Within	733730.00	87	12872.46	
Adjusted post-test mean	2641.63	2620.06	2482.30	Between	286825.75	2	143412.88	38.21*
				Within	210193.83	86	3753.46	
Mean diff	191.00	166.00	21.00					

Table F-ratio at 0.05 level of confidence for 2 and 87 (df)=3.10, 2 and 86 (df)=3.10. *Significant

as plyometric exercises group and control group was not involved in any special treatment. Pre-test was conducted for experimental Groups I and II and the control group on cardiorespiratory endurance and vital capacity. Experimental groups underwent the respective training for 12 weeks. Immediately after the completion of 12 weeks training, all the subjects were measured of their post-test scores on the selected criterion variables. The difference between the initial and final scores was considered the effect of respective treatments. To find out statistical significance of the results obtained, the data were subjected to statistical treatment using ANCOVA. In all cases, 0.05 level was fixed to test the significance of the study [Tables 1 and 2].

Criterion Measures

Test Administration

Cardiorespiratory endurance (cooper's 12 min run or walk test)

Purpose

To measure the cardio respiratory endurance.

Equipment

Whistle, stopwatch, 400 m track.

Procedure

Subjects assemble behind the starting line at the starting signal, they, run or walk as far as possible with in the 12 min time limit. An experienced pacer should accompany performers around the running area during the actual test. At the signal "to stop" performers should remain where they finished long enough for test administrators to record the distance covered. Ample time should be given for stretching and warm-up as well as cool down.

Scoring

The distance in meters covered in 12 min.

Vital capacity

Purpose

Determination of vital capacity.

Equipments

Spiro meter, chair, and nose clips.

Test description

The vital capacity of the subject was determined by the Spiro meter in sitting position. The subject was allowed to inspire the maximum amount of air voluntarily and then he was asked to blow into the dry Spiro meter to the maximum extent. While taking the test, the nose of the subject was clipped using a nose clip.

Scoring

The vital capacity of the subject was obtained from the movement of circular volume indicator which was set at "0" before the vital capacity measure was taken. The result was recorded in milliliter.

Results on Cardiorespiratory Endurance

The statistical analysis comparing the initial and final means of cardiorespiratory endurance due to own body exercises and plyometric training among badminton players is presented in Table 3.

Table 4: Scheffe's confidence interval test scores on cardiorespiratory endurance

Means				Required CI
Own body exercises group	Plyometric training group	Control group	Mean difference	
2641.63	2620.06		21.57	48.71
2641.63		2482.30	159.33*	48.71
	2620.06	2482.30	137.76*	48.71

*Significant

Table 5: Computation of analysis of covariance of vital capacity

	Own body exercises	Plyometric training	Control group	Source of variance	Sum of squares	df	Mean squares	Obtained F
Pre-test mean	3440.00	3550.00	3547.50	Between	157750.00	2	78875.00	0.46
				Within	9675375.00	87	169743.42	
Post-test mean	3635.00	3890.00	3660.00	Between	790333.33	2	395166.67	2.57
				Within	8759000.00	87	153666.67	
Adjusted post-test mean	3687.12	3863.04	3634.84	Between	570808.19	2	285404.10	4.25*
				Within	3759501.27	86	67133.95	
Mean diff	195.00	340.00	112.50					

Table F-ratio at 0.05 level of confidence for 2 and 87 (df)=3.10, 2 and 86 (df)=3.10. *Significant

As shown in Table 3, the obtained pre-test mean on cardiorespiratory endurance on own body exercises group was 2430.00, plyometric training group was 2448.50, and control group was 2487.50. The obtained pre-test F value was 1.24 and the required table F value was 3.10, which proved that there was no significant difference among initial scores of the subjects.

The obtained post-test mean on cardiorespiratory endurance on own body exercises group was 2621.00, plyometric training group was 2614.50, and control group was 2508.50. The obtained post-test F value was 6.20 and the required table F value was 3.10, which proved that there was significant difference among post-test scores of the subjects.

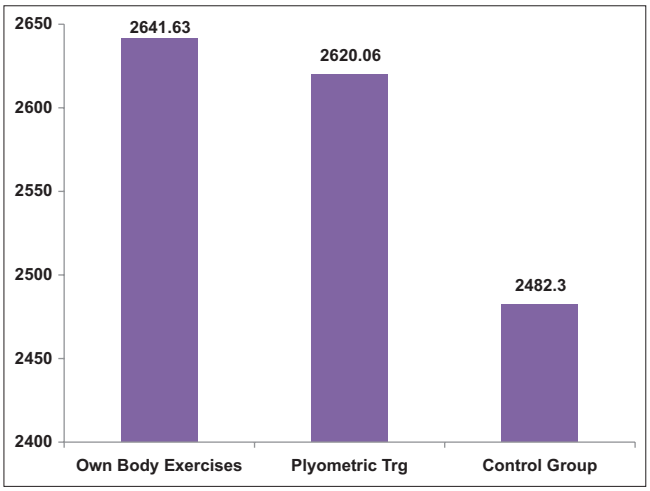

Figure 1: Bar diagram on ordered adjusted means on cardiorespiratory endurance

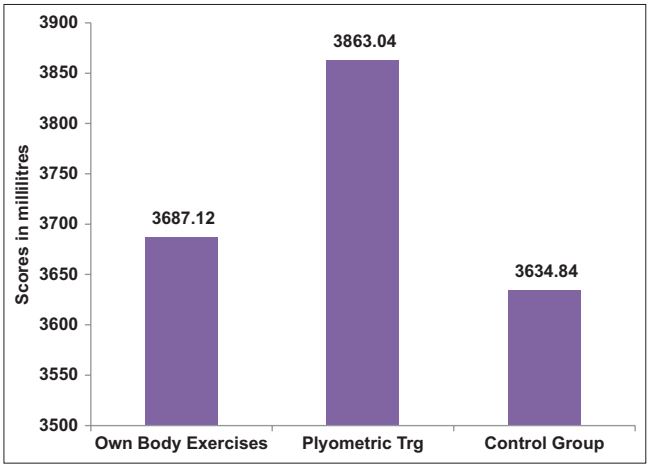

Figure 2: Bar diagram on ordered adjusted means on vital capacity

Taking into consideration of the pre-test means and post-test means, adjusted post-test means were determined and analysis of covariance was done and the obtained F value 38.21 was greater than the required value of 3.10 and hence, it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to *post hoc* analysis using Scheffe's Confidence Interval test. The results are presented in Table 4.

The *post hoc* analysis of obtained ordered adjusted means proved that there was significant differences existed between own body exercises group and control group (MD: 159.33). There was significant difference between plyometric training group and control group (MD: 137.76). There was no significant difference between treatment groups, namely, own body exercises group and plyometric training group (MD: 21.57).

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure 1.

Discussions on findings on cardiorespiratory endurance

The effect of own body exercises and plyometric training on cardiorespiratory endurance is presented in Table 3. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 38.21 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to *post hoc* analysis and the results presented in Table 4 proved that there was significant difference between Own body exercises group and control group (MD: 159.33) and plyometric training group and control group (MD: 137.76). Comparing between the treatment groups, it was found that there was significant difference between own body exercises and plyometric training group among badminton players.

Table 6: Scheffe's confidence interval test scores on vital capacity

Means				Required CI
Own body exercises group	Plyometric training group	Control group	Mean difference	
3687.12	3863.04		175.93	205.98
3687.12		3634.84	52.27	205.98
	3863.04	3634.84	228.20*	205.98

*Significant

Thus, it was found that own body exercises and plyometric training were significantly better than control group in improving cardiorespiratory endurance of the badminton players.

Results on Vital Capacity

The statistical analysis comparing the initial and final means of vital capacity due to own body exercises and plyometric training among badminton players is presented in Table 5.

As shown in Table 5, the obtained pre-test mean on vital capacity on own body exercises group was 3440.00, plyometric training group was 3550.00, and control group was 3547.50. The obtained pre-test F value was 0.46 and the required table F value was 3.10, which proved that there was no significant difference among initial scores of the subjects.

The obtained post-test means on vital capacity on own body exercises group was 3635.00, plyometric training group was 3890.00, and control group was 3660.00. The obtained post-test F value was 2.57 and the required table F value was 3.10, which proved that there was no significant difference among post-test scores of the subjects.

Taking into consideration of the pre-test means and post-test means, adjusted post-test means were determined and analysis of covariance was done and the obtained F value 4.25 was greater than the required value of 3.10 and hence, it was accepted that there were significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to *post hoc* analysis using Scheffe's Confidence Interval test. The results were presented in Table 6.

The *post hoc* analysis of obtained ordered adjusted means proved that there were no significant differences existed between own body exercises group and control group (MD: 52.27). There was significant difference between plyometric training group and control group (MD: 228.20). There was no significant difference between treatment groups, namely, own body exercises group and plyometric training group. (MD: 175.93).

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure 2.

Discussions on findings on vital capacity

The effect of own body exercises and plyometric training on vital capacity is presented in Table 5. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 4.25 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to *post hoc* analysis and the results presented in Table 6 proved that there was no significant difference between own body exercises group and control group (MD: 52.27) and there was significant difference between plyometric training group and control group (MD: 228.20). Comparing between the treatment groups, it was found that there was no significant difference between own body exercises and plyometric training group among badminton players.

Thus, it was found that plyometric training was significantly better than control group in improving vital capacity of the badminton players.

CONCLUSION

Within the limitations and delimitations of the study, the following conclusions were drawn.

1. It was concluded that 12-week own body weight exercises and plyometric training significantly improved cardiorespiratory endurance among badminton players compared to control group. Comparisons between the treatment groups proved that there was no significant difference on cardiorespiratory endurance.
2. It was concluded that 12-week plyometric training significantly improved vital capacity among badminton players compared to control group. Comparisons between the treatment groups proved that there was no significant difference on vital capacity.

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Research Article

A study on the benefits of physical activity and exercise in ageing of older adults

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ABSTRACT

The natural and physiological process of ageing is affected by multiple elements, including illness, extrinsic reasons, and intrinsic factors. Healthy dietary and exercise habits can help you age well. The advantages of physical activity and regular exercise on mortality and the prevention of chronic diseases that impair the lifespan and quality of life, in along with a healthy, balanced diet, and psychological well-being, are extensively researched. The article aims to present some light on how regular exercise and physical activity might delay the effects of ageing. There is encouraging research that suggests modest amounts of physical activity might effectively reduce the ageing process by protecting against several chronic illnesses.

Keywords: Ageing, Chronic diseases, Exercise, Older adults, Physical activity

INTRODUCTION

The demographic category that is evolving at the quickest rate is elderly people. By 2050, there will be close to 3.2 million centenarians worldwide, an increase of more than 18 times from the turn of the 21st century (UN, 2000). Examining novel approaches to enhance well-being and prevent disease at every stage of life is necessary given the growing emphasis on health and the steadily extending of the average lifespan. Investigating the variation in health and physical performance capacities among groups of higher functioning older individuals has been prompted by research into the factors that contribute to effective ageing.

According to several studies,[1-3] physical activity and exercise can help older adults in a variety of particular psychological and psychosocial ways. To maintain and enhance physical fitness, exercise must be a planned, structured, and repeated activity.[4-7] By exercising, the body performs rigorous work in a clinically regulated environment in line with muscle and joint function to build muscular tissues quickly.

Movement of the body caused by skeletal muscles during physical exercise results in an energy expenditure that is frequently expressed in kilocalories. Regular exercise reduces the chance of developing chronic diseases of old age, delays the physiological effects of ageing in a sedentary environment, and helps people stay independent and avoid impairment.[8,9]

According to Glatt *et al*.[10] Lupien and Wan,[11] ageing is a normal, physiological, and complicated process that is impacted by a variety of variables, including genetic, psychological, environmental, and disease-related factors. Even in the absence of obvious disease, most physiological systems begin to deteriorate structurally and functionally as we age.

Numerous tissues, organ systems, and bodily functions are impacted by these age-related physiological changes, which collectively may have an effect on older individuals' ability to maintain their physical independence and engage in activities of daily living.[12-14] This article's goal is to explain how physical activity and ageing impact older persons' physical health and fitness.

TYPES OF AGEING

Normal Ageing

Normal ageing is the gene-related reduction in physiological processes and activities. When the body's physiological reserve can no longer adjust to external stressors, it may result

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in frailty.[15] Age-related changes in the cardiovascular and muscular systems are accompanied by alterations in the skeletal system's reaction to exercise[16] With age, mechanical loading forces become less efficient in producing an estrogenic effect, suggesting a gradual loss of bone sensitivity to chemical and physical signals.[17]

Pathological Ageing

The accelerated ageing process known as pathological ageing primarily comes on by multiple health problems that arise during lifespan. These may include problems with senses, poor movement, cancer, digestive problems, memory loss, and heart diseases. These problems are commonly linked to undernutrition and malnutrition, which are linked to older people having worse prognoses in and of themselves.[18]

Successful Ageing

According to biomedical theories, good ageing is defined as maximizing the lifespan while avoiding mental and physical illnesses and impairment. They emphasize excellent health, high levels of autonomous physical functioning, performance, movement, and cognitive functioning, as well as lack of prolonged illness and other risk factors for disease. In addition, it describes how to adjust to change and make up for boundaries, as well as the preservation of mental and physical wellness and self-reliance in the absence of chronic disease. The ability to mature well varies greatly from person to person.[19]

PSYCHOLOGICAL WELL-BEING IN AGEING

Moderating and mediating effects concepts such as self-concept and self-esteem, exercises and physical activity have a significant impact on our psychological health. The presence of both positive and negative psychological attributes such as happiness, optimism, morale, depression, anxiety, self-esteem, self-efficacy, and vigor is essential to healthy ageing and depends on a variety of factors, including hereditary characteristics, social support networks, personality types, and personality types. Physical activity and regular exercise have been shown to significantly improve overall psychological health and well-being. Higher levels of physical fitness and involvement in AET are linked to a lower risk of developing clinical depression or anxiety.

EFFECTS OF EXERCISE ON HEALTH

Exercise, Life Expectancy, and Mortality

The advantages of physical activity on longevity have been researched and validated by a reputable and developing body of epidemiological research. In subjects without cardio vascular disease, regular physical activity has been linked to a decrease of 30% in the risk of both overall and cardiovascular death.[20]

Exercise for Protective Measures

Exercise appears to have numerous cardio preventive mechanisms that reduce the risk of death, including implications for endothelial function, autonomic tone, inflammatory conditions, and better risk factor management (Juneau and Nigam, 2003). Improved endothelial health may result in plaque passivation, which lowers the risk of new or periodic ischemic incidents as well as effects on autonomic control of the heart, which lowers the risk of unexpected cardiac death. These are the last frequent avenues of risk elimination.

Effects of Exercise on Cardio Respiratory Fitness

One of the best indicators of all-cause mortality, CVD, health status, and functional ability in older individuals is aerobic fitness, and represented as maximal whole body oxygen consumption, or VO_2 max. A value of 15–18 mL/kg/min is often needed to sustain instrumental activities of routine when VO_2 max diminishes with age according to Wilson and Tanaka,[21] VO_2 max in endurance-trained older participants is comparable to VO_2 max in sedentary young subjects, and regular exercise can somewhat offset the 5–10% decline in VO_2 max every decade.[22]

Effects of Exercise of Depression

High-intensity aerobic exercise has been shown to be inferior for treating depression when compared directly to simple exercise Resistance training was shown to be equal to aerobic training in young people with depression by,[23] and yoga was found to be just as helpful as aerobic exercise. According to a review of the research on exercise and depression, both young and elderly people can benefit from it, it is roughly as effective as antidepressants in clinical cohorts, aerobic and resistance training seems to have similar positive effects, and greater intensities provide the best results.

Effect of Physical Activity and Exercise on Fitness

The risk of cardiovascular disease, stroke, hypertension, Type 2 diabetes, osteoporosis, overweight and obesity, bowel cancer, breast cancer, and mood disorders has clearly been demonstrated to be reduced by consistent exercise and physical activity.[24] Due to the close relationship between cellular ageing processes and illnesses, it is challenging to examine the effects of physical activity on fundamental ageing mechanisms in humans. Exercise has become the only way for alteration in lifestyle; which has been demonstrated to increase the maximum lifespan in humans. Instead, consistent physical exercise extends the average life span through influencing the onset of chronic diseases (by reducing the impacts of secondary ageing). With the restoration of mobility in formerly sedentary older persons, it also reduces the effects of secondary ageing.

The advantages of exercise include regulation of arterial blood pressure, enhancement of oxygen, and nutrient supply

and utilization within active muscle, preservation of arterial blood balance, and heat dissipation. It also appears that in healthy older individuals, the immediate cardiovascular and neurological responses to resistance training are still well retained. The methods and the time period by which old men and women adjust to a specific training environment are altered by physiological ageing, and sex differences are appearing with regard to these mechanisms, although the body's adaptation potential is mostly conserved, at least into the seventh decade.

However, older people do show a higher decline in exercise tolerance and a greater chance of extreme temperatures and cold illness/injury, accordingly, compared to young people, during the combined needs of big muscle activity and heat and/or cold stress. The reduced degree of aerobic capacity in older persons may at least in part account for age disparities in fitness tolerance at higher temperatures in the environment. Older persons who stop exercising aerobically quickly lose their cardiovascular and metabolic fitness, but (neural) adaptations brought on by strength training appear to last longer, comparable to findings in younger groups.

RECOMMENDED EXERCISE FOR SUCCESSFUL AGEING

The first guidelines for physical exercise to enhance and sustain health in older adults were released by the American College of Sports Medicine and the American heart association in 2007.[24] Similar recommendations were also issued by INSERM in 2008. According to current standards, 30 min of moderate-level aerobic exercise 5 days per week or 20 min of intense intensity aerobic activity 3 days per week may maintain an individual physically fit.

In addition, those at high risk for falling should undertake balancing exercises, flexibility exercises, and muscular strength exercises twice per week for a minimum of 10 min each. Despite a minimum of 30 min of moderate-intensity exercise on a majority of the week is advised, a recent major observational study found that just a little bit of leisure-time exercise (15 min/day, 6 days/week) lowered the overall mortality rate, heart attack and stroke mortality, and cancer mortality.[25]

These findings ought to motivate a lot more people to engage in even a little bit of everyday exercise.[26] Walking, swimming, riding a bicycle, or any other dynamic action requiring a significant amount of muscular mass, that can be sustained continuously, and that stays within the aerobic range, are all examples of aerobic activities that focus on cardio respiratory health. According to Iwane *et al*.,[24] a number of at least 10,000 steps per day, or around seven kilometers of walking, seems to be a realistic estimate of daily activity for people who look to be in good health.

However, a sizable segment of the senior population suffers from comorbidities that make the previous tasks challenging or impossible, such as cognitive impairment, nutritional deficiency physical restrictions (such as arthritis), or poor psychosocial situations. With gradual endurance and strengthening exercises, flexibility drills, and balance training, the major goals of physical activity in these situations are to increase muscular strength, prevent/limit impairment, and maintain independent life. Aerobics can also help disabled patients become more physically fit.

This sort of workout alternates periods of activity with periods of recovering (rest) that are roughly equal in length. Undoubtedly, a monitored training program is advised if a particular person's safety is even remotely an issue. Furthermore, before beginning an exercise training program with exercises tailored to functional limits and coexisting conditions, a full clinical examination and exercise stress assessment must be conducted.

CONCLUSION

Through regulation of physiological processes and the preservation of functional reserve in senior citizens, exercise and physical activity may reduce the ageing process. It has been demonstrated in several studies that maintaining a modest level of exercise improves longevity, reduces the incidence of bone loss, and inhibits the growth of various malignancies. Exercises that target flexibility and balance should also be incorporated into a regular program to enhance cardiorespiratory fitness and muscular function. Surprisingly, the positive impact appears to be closely related to the concepts of training volume and intensity, the prescribed exercise must still be clarified. This will help scientific community to come up with even more specific recommendations, keeping in mind that the primary goal is to encourage a long-term commitment to regular physical activity in this rapidly growing population.

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Review Article

Health and fitness for healthy modern technological lifestyle – A study

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ABSTRACT

Modern technology has definitely made a big impact on the entire globe, mainly through the worldwide connections promoted by the internet, and cell phone technology. The study is to determine the health, fitness, and yoga for healthy modern technological lifestyle, the past modern life style patterns lead to adopting sedentary life style which combines eating high calorie diet and lack of physical activity. They are major risk factors for getting a lot of different diseases. The sedentary life style includes the wrong use of available high technology machines and transportation as well food habits. Physical inactivity is a major risk factor associated with a large number of lifestyle diseases such as cardiovascular disease, cancer, diabetes, and obesity. The finding of the study is to maintain a healthy lifestyle; the importance of physical activity cannot be underestimated. It is the single most important endeavor that one can participate in to promote health throughout a lifetime. For decades, epidemiological research has accumulated highlighting the health benefits associated with regular physical activity. Furthermore, there is overwhelming research illustrating the morbid and mortal consequences of being sedentary. Benefits of Physical Fitness: Staying active means keeping your body functioning at a high level. Regular exercise will maintain the performance of your lungs and heart to most efficiently burn off excess calories and keep your weight under control. Exercise will also improve muscle strength, increase joint flexibility, and improve endurance. Another main benefit of physical activity is that it decreases the risk of heart disease, the leading cause of death. In Conclusion the Technology will certainly influenced the way we live now and in the future but is it for the best or the worst is hard to tell. The man has been trying his best to bring more and more comfort and happiness to his life by discovering various devices so as to get the work done in minimum time and with least physical efforts and expenditure of energy. Physical fitness and Yoga are a powerful system which coordinates our scattered feelings, inner peace, and relations with others in a systematic way so that we become aware of many things inside us. Finally, maintaining people's health is a primary goal of any country that probably would make her spend millions of dollars to achieve it as people are the "real wealth of a country."

Keywords: Fitness, Health, Technological, Yogic exercises

INTRODUCTION

The modern lifestyle has a number of advantages which includes easing people's life, saving hundreds of people's lives by the new development of medicine and vaccines. On the other hand, different modern life style patterns have negative effects on health physically, psychologically, and socially. One of these modern ways of living is the high intake of fast foods. This is due to specific reasons such as the short time specified for eating and choosing healthy food.

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Lack of physical activity combination with fast foods leads to bad effects on the heart's health. Use of high technology machines is another way of modernity. Although use of these machines has helped in saving the time to do a lot of tasks, the wrong use of them will indirectly affect health. Another point is the advanced transportation which reduces the time needed to travel and made travelling an enjoyable time. Last, is the use of computers and internet in the communication, transfer of information, and entertainment as well. Altogether will constitute the elements of a sedentary life style. It means high fatty foods intake and lack of physical activity. Which both are caused by fast foods, depending on high technology machines and transportation, and sitting long hours in front of the computer.

TECHNOLOGICAL LIFE STYLE

Modern technology has definitely made a big impact on the entire globe, mainly through the worldwide connections promoted by the internet, cell phone technology, and hand-held calculation. Technology has indeed improved our lives. With the help of electronic components, we are able to read books online. Even the way students learned have changed, today they do not have to go to the library to look for notes and do their research works. Sitting at home, they download reports and eBooks. People used to grind lots of spices in mortar but with the mixer grinder, mothers' in the kitchen do not have to make much effort to grind the spices. To wash clothes, women either used to go to the river or they washed clothes on a concrete rock. It is no more the case; everybody owns a washing machine nowadays. Therefore, household appliances have facilitated our lives in many ways. Electronic component is not always beneficial as we think. Along with its existence, it has changes our lives drastically. Lots of issues have cropped in many lives, especially in the social life. Due to technology, many people rarely communicate with their parents, neighbors, some of them do not even have friends. Problematic like isolation, hypertension, obesity, and other health diseases and family problems are sprouting.

Technology has had and will keep affecting our lifestyle. With an excessive use of High Tech appliances, many adults and children as well have become obese. Remaining sitting all the in an office will obviously affect our health. Even adults are at risks in concerned with their health. Besides playing on games and working on their laptops and computers, they do not rely on any other activities. Second, due to obesity, children and adults have caught diseases such as diabetes, hypertension, depression, and many other diseases. Nowadays, many people have to undergo treatment due to such illness. People no more complete their 8 h of sleep. They do not have proper meal and some do not eat well. Hence, all these diseases have cropped up.

With the arrival of technology, everyone owns a laptop and a smartphone. With the routine life, both parents work nowadays and children rarely speak with their parents. After school, the children go to their rooms and start surfing. Moreover, they even dine in their rooms. They do not even go out for jogging or to have fresh air, hence, to speak or remember the name of their neighbor is far away. They keep sitting in front of their screen. The weird thing is that, they will prefer to talk to a stranger through social media rather than going out and have a chat with their friends. At office, we prefer to communicate through Skype or send emails instead of talking face to face to our colleagues. All those great devices that are supposed to help us to communicate are changing deeply our way of communication. Due to the lack of communication, technology has brought a drastic change in our lives. In any society, there are different cultural groups based on particular ethnicity. Although cultures vary, yet the common components such as symbol, language, values, festivals, and norms make social life possible. No doubt globalization has affected our life and has turned the world into a global village. Children no more play traditional games, like hide and seek, and chit-chat with their neighbors.

YOGA

The word Yoga is derived from the Sanskrit word "Yuj" which means to join or unite. The union referred to is that of the individual self-uniting with Cosmic Consciousness or the Universal Spirit. Yoga is believed to have evolved during the period of the "Sat Yuga," also called the Golden age. It was not until the discovery of the Indus-valley civilization, the largest civilization: That the knowledge about the origin of Yoga surfaced. The science of Yoga has its origin thousands of years ago, long before the first religion or belief systems were born. Yoga is an Indian physical Culture, which can be practiced by anyone, it requires a small amount of space and a strong desire for a healthier life. Yoga helps in building physical and mental health of an individual. Yogasana is a scientific procedure of exercise which affects the inmost parts of the body. Now, the Indian physical culture is accepted world over and around 200 countries are now enjoying the fruits of our culture by celebrating the International Day of Yoga on June 21 every year.

OBJECTIVE OF THE STUDY

The study is to determine health, fitness, and yoga for healthy modern technological lifestyle, the past modern life style patterns lead to adopting sedentary life style which combines eating high calorie diet and lack of physical activity. They are major risk factors for getting a lot of different diseases. The sedentary life style includes the wrong use of available high technology machines and transportation as well food habits.

PHYSICAL IN ACTIVITY ARE RISK FACTORS FOR MAJOR DISEASES

Physical inactivity is a major risk factor associated with a large number of lifestyle diseases such as cardiovascular

disease, cancer, diabetes, and obesity. Sport projects that specifically focus on health outcomes generally emphasize: An understanding of the most prevalent diseases and associated risk factors is crucial to conceptualize the role of sport in health prevention and promotion. In developing countries, sport is widely used as a tool to educate individuals and communities on the risk factors associated with HIV/AIDS. While HIV/AIDS and other communicable diseases continue to affect millions of people around the world, there is a significant increase in the global burden of non-communicable diseases related to lifestyle changes in physical inactivity, unhealthy diets, and tobacco use.

CARDIOVASCULAR DISEASES

Cardiovascular diseases include coronary heart disease and stroke and are the leading causes of death globally. Causes of cardiovascular disease are unhealthy diets, physical inactivity and tobacco use. Physical activity reduces the risk of cardiovascular disease by improving glucose metabolism, reducing body fat, and lowering blood pressure.

DIABETES

Diabetes is a disease which occurs when the body does not produce or properly use insulin and this may result in Type I or Type II diabetes. Diabetes may be prevented, or at least delayed, by weight loss, a healthy lifestyle, in particular, regular physical activity. Diet, drug therapy, and physical activity are also major components of the treatment of diabetes.

OBESITY

Obesity is an abnormal accumulation of fat that may impair health and unlike other diseases; social and environmental factors play a significant role in defining obesity. The incidence of obesity is a growing concern internationally with an estimated 400 million obese people in 2005. The global rise in the incidence of obesity is related to a shift in diet and decreased physical activity levels.

CANCER

Cancer is not a single disease with a single type of treatment and in fact, there are over 200 types of cancer involving abnormal growth of cells in different parts of the body. It has been estimated that 40% of all cancers may be prevented by a healthy diet, physical activity, and no tobacco use.

MENTAL HEALTH

One in four patients visiting a health service has at least one mental, neurological, or behavioral disorder (such as depression, anxiety or mood disorders) that may not be diagnosed or treated. There is evidence to suggest that physical activity can reduce the symptoms of depression and can also be help to ameliorate mental well-being through improved mood and self-perception.

IMPACT OF LIFESTYLE ON HEALTH

In recent decades, life style as an important factor of health is more interested by researchers. According to World Health Organization, 60% of related factors to individual health and quality of life are correlated to lifestyle, millions of people follow an unhealthy lifestyle, Hence, they encounter illness, disability, and even death. Problems such as metabolic diseases, joint and skeletal problems, cardiovascular diseases, hypertension, overweight, violence, and so on can be caused by an unhealthy lifestyle. The relationship of lifestyle and health should be highly considered.

Today, wide changes have occurred in life of all people. Malnutrition, unhealthy diet, smoking, alcohol consuming, drug abuse, stress, and so on are the presentations of unhealthy life style that they are used as dominant form of lifestyle. Besides, the lives of citizens face with new challenges. For instance, emerging new technologies within IT such as the internet and virtual communication networks lead our world to a major challenge that threatens the physical and mental health of individuals. The challenge is the overuse and misuse of the technology. Therefore, according to the existing studies, it can be said that lifestyle has a significant influence on physical and mental health of human being.

DISCUSSION AND FINDING OF THE STUDY

PHYSICAL FITNESS AND YOGA

Physical fitness is a general state of health and well-being and, more specifically, the ability to perform aspects of sports, occupations, and daily activities. Physical fitness is generally achieved through proper nutrition, moderate-vigorous physical exercise, and sufficient rest. The importance of physical fitness is a person who is fit is capable of living life to its fullest extent. Physical and mental fitness play very important roles in your

lives and people who are both, physically and mentally fit, are less prone to medical conditions as well. There are five components of physical fitness you need to consider:

- Muscular Strength. This is the "power" that helps to lift and carry heavy objects.
- Muscular Endurance. Endurance is the ability of muscles to perform contractions for extended periods of time.
- Cardiovascular Endurance. Cardiovascular endurance is the body ability to keep up with exercise such as running, jogging, swimming, cycling, and anything that forces the cardiovascular system (lungs, heart, and blood vessels) to work for extended periods of time.
- Flexibility. Flexibility training ensures that your body can move through its entire range of motion without pain or stiffness.
- Body Fat Composition. Body fat composition refers to the amount of fat on our body.

YOGA IN MODERN LIFESTYLE

Yoga has spread all over the world by the teachings of eminent Yoga masters from ancient times to the present date. Today, everybody has conviction about Yoga practices toward the prevention of disease, maintenance, and promotion of health. Millions and millions of people across the globe have benefitted by the practice of Yoga and the practice of Yoga is blossoming and growing more vibrant with each passing day.

Yoga has become a part and parcel of physical educational and it is getting its due weight age at various levels such as schools, colleges, club, and senior citizens are also doing yogic practices to delay the ageing process and to avoid various medical ailments. Studies on Padmasana, Siddhasana, Pachimottanasana, Bhujangasana, Dhanurasana, Kurmasana etc., have revealed some degree of specificity in terms of cardiorespiratory adjustments. Various studies have shown that regular practice of asanas and pranayama can help aliments such as arthritis, arteriosclerosis, chronic fatigue, astama, varicose veins, heart conditions, temperature, heart beat, and blood pressure. Practice yoga to avoid the disastrous consequences of the sedentary urban lifestyle. A set of yogic postures combined with pranayama, if practiced daily, can protect from modern lifestyle diseases.

- Surya Namaskar is not only a great warm up exercise but it also helps to shed those extra pounds
- Cobra pose strengthens the upper back and helps correct the bad posture caused by long desk jobs
- Eye, neck, shoulder, wrist, and ankle rotations help counter stiffness while sitting at a desk
- Shalabhasana relieves lower back pain that is caused by hours of perching on a chair
- Downward Dog Pose and Sarvangasana help to reverse the blood flow in your body, thereby preventing baldness and premature graying
- Gomukhasana prevents cervical pain, which is becoming increasingly common. This asana can be practiced while seated on a chair.

Yogic exercises recharge the body with cosmic energy. This facilitates

- Attainment of perfect equilibrium and harmony Promotes self-healing
- Removes negative blocks from the mind and toxins from the body
- Enhances Personal power
- Increases self-awareness
- Helps in attention focus and concentration, especially important for children
- Reduces stress and tension in the physical body by activating the parasympathetic nervous system.

BENEFITS OF PHYSICAL FITNESS

Staying active means keeping your body functioning at a high level. Regular exercise will maintain the performance of your lungs and heart to most efficiently burn off excess calories and keep your weight under control. Exercise will also improve muscle strength, increase joint flexibility, and improve endurance. Another main benefit of physical activity is that it decreases the risk of heart disease, the leading cause of death. In addition, it can decrease your risk of stroke, colon cancer, diabetes, and high blood pressure. Regular exercise has been long associated with a fewer visits to the doctor, hospitalization, and medication. Exercising does not have to be something boring and dreaded. It can be something that you enjoy that helps to increase the overall happiness in your life, as well as relieve symptoms of stress, depression, and anxiety. Try to find some activities that give you pleasure or even a buddy to do them with so that exercise is a fun and enjoyable activity.

Any type of moderate activity such as walking, swimming, biking, or organized sports can contribute to your physical fitness. Explore your fitness options at your local gym, community center, or community college for courses and organized activities that may suit your lifestyle and interests. To get the most benefit, you should begin by warming up for 5–10 min to increase your blood flow and prepare your body for activity. Follow the warm up with several minutes of stretches to increase your flexibility and lower your risk for injury. Complete your selected exercise or activity for 20–30 min and conclude the workout with 5–10 min of cool down and stretching. Everyone! It is important for all people to stay active throughout their lives. Because of busy work and home lives, more than 75% of Indians do not get the recommended amount of physical fitness daily and these numbers generally increase with age. Throughout adulthood is one of the most important times to maintain an exercise regimen. This is the ideal time

to maintain your weight, build strong bones and prevent many chronic health problems such as high blood pressure, heart disease, and diabetes. Many adults do too much exercise at once. After a long work-week, many people try to fit lots of activity into the weekend and push their bodies excessively. This sudden increase in activity can raise the risk of injury which would then stop activity for weeks. Experts recommend working out several times over the course of a week with varying exercises for the most benefit to your health.

CONCLUSION

Technology will certainly influenced the way we live now and in the future but is it for the best or the worst is hard to tell. The man has been trying his best to bring more and more comfort and happiness to his life by discovering various devices so as to get the work done in minimum time and with least physical efforts and expenditure of energy. Physical fitness and Yoga are a powerful system which coordinates our scattered feelings, inner peace, and relations with others in a systematic way so that we become aware of many things inside us. Yoga techniques are based on the stretching principle which would create balance in all the opposing factors and to bring about equilibrium, peace, and unity in body and mind. Regular physical activity helps develop child's movement skills. It also helps bones become stronger and builds a healthy heart and stronger muscles. Physical activity also helps to keep a healthy body weight. Moderate intensity exercise can even help to relieve some chronic (long-term) pain conditions by maintaining physical function and decreasing fatigue. Aside from providing general physical benefits, regular activity can also help ease symptoms of premenstrual syndrome in girls.

Physical exercises and the physical components of yoga practices have several similarities, but also important differences. To sum up, different modern life style patterns affects our health in different aspects physically, psychologically, and socially. Hence, if the people's awareness about these effects does not increase, this may lead to dangerous consequences in the near future. Adopting this life style patterns and especially sedentary life style for long time might threaten people's life. If this happens, then the community health will be affected and we will be having high percentage of diseased and disabled persons. Which finally reduce individual's productivity and development of their own communities. The best way for reducing the effects of these modern patterns of living is by educating people about its effects on their lives. Particularly concentrating in educating children as changing the way these children live will affect future generations coming after them as well. Another part of resolving the problem is the proper use of high technology machines and advanced transportations. Such proper way means correct use in benefiting the humanity not affecting it and increasing the self-dependency in doing different tasks of the day. Promoting healthy life style which includes proper eating, physical activity, and better way of communicating and socializing in the community will have its positive impacts. Furthermore, it will reduce the risk of getting so many diseases which cardiovascular diseases and cancers are at the top of them. Finally, maintaining people's health is a primary goal of any country that probably would make her spend millions of dollars to achieve it as people are the "real wealth of a country."

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Review Article

Exercise and sociology: Exploring the interplay between physical activity and social factors

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ABSTRACT

Exercise is a multifaceted phenomenon that goes beyond individual health and encompasses various social dimensions. This research paper aims to examine the relationship between exercise and sociology, focusing on how physical activity is influenced by social factors and the sociological consequences it entails. By drawing on sociological theories and empirical studies, this paper provides a comprehensive analysis of the interplay between exercise and various social aspects such as social structures, cultural norms, social inequalities, and social capital. In addition, it explores the implications of exercise from a sociological perspective.

INTRODUCTION

Regular physical activity is crucial for maintaining good health and well-being, but its significance extends beyond individual benefits. The study of exercise from a sociological perspective helps us understand how social factors shape physical activity patterns, and how exercise, in turn, influences social structures and relationships. This section provides an overview of the research objectives and the significance of studying exercise within a sociological framework.

THEORETICAL FRAMEWORK

This section explores key sociological theories and concepts that inform the understanding of exercise as a social phenomenon. The social construction of exercise emphasizes how societal norms and values shape our perceptions and practices related to physical activity. Symbolic interactionism examines how exercise is influenced by social interactions and meanings attached to physical activity. Social capital theory highlights the role of social networks and relationships in facilitating or inhibiting exercise participation. In addition, the concept of social inequality explores how factors such as gender, race/ethnicity, and socioeconomic status intersect with exercise behavior.

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SOCIAL FACTORS INFLUENCING EXERCISE

This section delves into specific social factors that influence exercise behavior. Gender plays a significant role in shaping exercise patterns, with societal expectations and gendered norms affecting participation rates and preferences. Similarly, race/ethnicity influences exercise engagement, as cultural contexts and experiences of racial discrimination impact access to resources and opportunities for physical activity. Socioeconomic status is another crucial determinant, as individuals from lower socioeconomic backgrounds often face barriers such as limited access to facilities and financial constraints. Cultural norms and social support systems also shape exercise behavior, as cultural values and social networks influence attitudes and motivations toward physical activity.

SOCIOLOGICAL CONSEQUENCES OF EXERCISE

Engaging in exercise has broader sociological consequences that extend beyond individual health outcomes. This section explores how exercise impacts various aspects of social life. The positive effects of exercise on health and well-being have

implications for health-care systems and public health policies. Exercise can also serve as a means for social integration and socialization, as participation in sports and fitness activities fosters community bonds and social relationships. Furthermore, exercise contributes to identity formation, shaping individuals' self-perception and group affiliations. In addition, exercise can be a catalyst for social movements and collective action, promoting social change and advocacy for healthier environments.

METHODOLOGICAL APPROACHES TO STUDYING EXERCISE AND SOCIOLOGY

This section discusses the methodological approaches used in research on exercise and sociology. Quantitative research methods, such as surveys and statistical analyses, provide insights into exercise patterns and associations with social variables. Qualitative research methods, such as interviews and observations, allow for a deeper exploration of individuals' experiences and meanings attached to exercise. Mixed-methods approaches combine quantitative and qualitative methods, providing a more comprehensive understanding of the complex interplay between exercise and social factors.

CASE STUDIES: EXERCISE AND SOCIAL CONTEXTS

This section presents case studies that illustrate the interrelation between exercise and different social contexts. Examples include the role of physical education in schools, workplace wellness programs, community-based exercise initiatives, and the influence of sports and leisure activities on social interactions and identities. These case studies provide concrete examples of how social factors intersect with exercise in specific settings.

POLICY IMPLICATIONS AND RECOMMENDATIONS

This section discusses the policy implications that arise from the sociological understanding of exercise. Promoting exercise equity should be a priority, ensuring that all individuals have equal access to resources and opportunities for physical activity. Enhancing social support systems, such as community programs and support networks, can facilitate exercise engagement. In addition, incorporating sociological perspectives in health policies can help address the social determinants of exercise behavior and promote holistic approaches to public health.

FUTURE DIRECTIONS AND RESEARCH GAPS

This section highlights areas for future research to expand our knowledge of exercise and sociology. Research gaps include further exploring the intersectionality of social factors, investigating the role of technology and social media in shaping exercise behavior and examining the long-term societal impacts of exercise interventions.

CONCLUSION

Exercise is not solely an individual pursuit but a complex social phenomenon. By examining the interplay between exercise and sociology, this research paper provides a comprehensive understanding of the sociocultural dimensions of physical activity. Understanding how social factors shape exercise behavior and the sociological consequences of exercise can inform policies, interventions, and advocacy efforts aimed at promoting equitable and inclusive exercise opportunities.

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Research Article

Exploring the psychological effects on identifying talented athletes

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ABSTRACT

Introduction: Talent identification is a process aimed at recognizing individuals with the potential to become elite athletes. It involves assessing various attributes, including physical, physiological, psychological, and sociological factors, as well as technical abilities. Identifying talented individuals in sports typically occurs through mass participation and natural selection, but certain sports, like track and field, may require a more focused approach. Early identification of future elite performers provides a competitive edge and allows for targeted coaching and development. Psychological profiling is an essential component of talent identification, as it helps recognize and analyze personality characteristics that contribute to learning, training, and competition. **Psychological Factors in Learning:** Psychological factors play a crucial role in the learning process of athletes. Factors such as motivation, goal-setting, and task orientation impact an individual's attitude and participation in sports. Motivation can be categorized as either task-oriented or ego-oriented, and understanding an athlete's motivational orientation helps coaches determine their commitment, work ethic, and potential for success. Psychological aspects, including self-control strategies, arousal management, stress management, attention control, and self-confidence, significantly influence an athlete's performance. **Personality Testing and Psychological Differences:** Personality testing is employed to identify psychological differences between sports and non-sports participants, elite and non-elite athletes, individual and team sports, men and women, and body contact and non-body contact sports. Research consistently shows that psychological factors often distinguish successful athletes from their less successful counterparts. Investigating the psychological characteristics of elite adult performers has been the primary approach, assuming that these characteristics can also be used to identify adolescents for early selection. However, the stability and predictive value of psychological characteristics in determining performance potential remains debatable. **Psychomotor Skills and Performance Assessment:** Psychomotor skills, which encompass coordination and perceptual abilities, are essential in sports. Decision-making, anticipation, and perceptual skills are crucial for assessing individual technique and performance accuracy under pressure. The ability to read and anticipate opponents' moves is particularly important in team sports. **Conclusion:** Psychological factors have a significant impact on sports performance and are considered equally important as physical components. Evaluating the psychological aspects of athletes is a complex task compared to assessing their physical attributes. Developing valid tools and field-based methods is essential for studying the psychological structure of sports participants and identifying psychological talents that serve as predictors of the future success.

Keywords: Psychological effects, Talented athletes and psychomotor skills

INTRODUCTION

Talent identification is critical in sports as it impacts the success of organizations by recognizing individuals with the potential to become elite athletes. While traditionally focused on physical attributes and technical skills, the significance of psychological factors in an athlete's performance is now acknowledged. This paper explores the psychological effects on talent identification, emphasizing the role of psychological profiling. Understanding traits like motivation, goal-setting, self-confidence, and stress management is crucial for athlete development and coaching strategies. Psychological factors not only influence individual athletes but also team dynamics and leadership qualities. Early identification of talent allows targeted coaching and improves an athlete's trajectory. The paper delves into various psychological factors, including motivational orientation and personality testing, while addressing ethical considerations. In addition, the evaluation of psychomotor skills and decision-

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making's impact on performance is explored in highly competitive sports environments.

PURPOSE OF THE STUDY

The purpose of the study was to find out the psychological effects on identifying talented athletes.

METHODOLOGY

The primary objective of this study was to investigate the psychological effects on the process of identifying talented athletes. To gather relevant evidence, a comprehensive search procedure was conducted both online and offline. A critical analysis of the literature was systematically performed using reputable online databases such as PubMed, Google Scholar, and Google Advanced Search.

TALENT IDENTIFICATION

Talent identification in sports involves recognizing individuals with exceptional potential for excelling in a specific sport. It is crucial for sports development programs, maximizing the chances of finding and nurturing elite athletes. Key elements include physical assessments, evaluating attributes such as speed, strength, and coordination. Skill assessments, analyzing technical proficiency and tactical awareness, are also vital. Performance analysis, utilizing sports analytics and wearable devices, provides valuable insights. Psychological traits, such as motivation and resilience, play a significant role and are assessed through interviews and evaluations. Talent identification should prioritize long-term athlete development. Talent identification programs, like scouting networks and talent camps, actively seek promising athletes at a young age. A multidisciplinary approach involving coaches, sports scientists, and psychologists enhances accuracy. Inclusivity and diversity ensure opportunities for individuals from different backgrounds. Ethical considerations protect athletes from burnout and ensure fair selection processes. Continuous evaluation and support throughout the development journey are essential. Effective talent identification leads to better athlete development, team performance, and success in competitions.

PSYCHOLOGICAL FACTORS IN LEARNING

In sports, psychological factors significantly impact an athlete's performance and learning. Motivation, a fundamental aspect, drives athletes to set goals and strive for excellence. Two main types of motivation are observed: Task-oriented motivation, focused on personal improvement and learning, and ego-oriented motivation, driven by the desire to outperform others and seek recognition.

Goal-setting is a powerful sports psychology technique that enhances learning and performance. Athletes setting specific, challenging, and attainable goals stay motivated and committed to training. Task-oriented athletes aim for individual improvement, while ego-oriented athletes focus on winning and comparison.

Several psychological elements influence an athlete's performance.

Self-control Strategies

Effective strategies to manage behavior, emotions, and impulses under pressure, such as cognitive restructuring and visualization.

Managing Arousal and Stress

Balancing physiological and psychological activation levels through relaxation training and pre-performance routines for optimal performance.

Maintaining Attention

Staying focused and engaged during practice and competitions using selective attention and mindfulness techniques.

Fostering Self-confidence

High self-confidence influences an athlete's belief in their abilities, encouraging them to face challenges and perform at their best. Coaches can support this through positive reinforcement and a supportive learning environment.

Addressing these psychological elements enables athletes to develop mental fortitude alongside physical skills, enhancing their overall performance and success in sports.

PERSONALITY TESTING AND PSYCHOLOGICAL VARIATIONS

It plays a crucial role in understanding individuals' unique traits, behaviors, and tendencies. Personality tests are tools used to assess an individual's psychological characteristics, helping to identify patterns that influence their thoughts, emotions, and actions. These assessments aid in sports, career guidance, and personal development.

Various types of personality tests, such as the Myers-Briggs type indicator (MBTI) and the Big Five personality traits, measure different aspects of an individual's personality. The MBTI categorizes individuals into personality types based on preferences for extraversion/introversion, sensing/intuition, thinking/feeling, and judging/perceiving. On the other hand, the Big Five assesses five broad dimensions:

Openness, conscientiousness, extraversion, agreeableness, and emotional stability.

Psychological variations among individuals are evident through these personality assessments. Some athletes may exhibit extraversion, seeking social interactions and drawing energy from others, while others may show introversion, preferring solitary and reflective activities. In sports, personality variations influence an athlete's communication, motivation, and response to stress.

Understanding these psychological variations is essential for coaches, trainers, and team dynamics. Tailoring coaching styles and strategies to match individual personality traits can optimize athletes' learning and performance. In addition, psychological variations can impact an athlete's response to pressure, stress management techniques, and communication within a team.

PSYCHOMOTOR SKILLS AND EVALUATING PERFORMANCE

Psychomotor skills refer to the integration of physical movements and cognitive processes to perform specific tasks with precision and efficiency. These skills are essential in sports and other activities that require coordinated movements. Evaluating performance in psychomotor skills is crucial to assess an individual's competence and progress.

In sports, psychomotor skills encompass a wide range of activities, such as throwing, catching, dribbling, shooting, and complex movements like gymnastics routines or dance sequences. Coaches and instructors use various methods to evaluate an athlete's performance in these skills.

1. Observation: Coaches observe athletes during practice sessions and competitions to assess their execution of psychomotor skills. They look for proper technique, body alignment, balance, and coordination.
2. Video analysis: Recording an athlete's performance on video allows for a more detailed review of their movements. Coaches can pinpoint strengths and areas needing improvement, aiding in targeted feedback.
3. Skill-specific tests: Specific tests or drills may be designed to evaluate particular psychomotor skills. For example, measuring an athlete's accuracy in shooting basketball free throws or their speed in completing an agility course.
4. Performance metrics: Sports technology, such as motion sensors or wearable devices, can provide objective data on an athlete's performance metrics, such as speed, acceleration, or jump height.
5. Expert judgment: In some cases, coaches rely on their expertise and experience to evaluate an athlete's psychomotor skills. This subjective evaluation considers the overall performance and potential for improvement.

Evaluating psychomotor skills enables coaches and athletes to identify strengths, weaknesses, and areas for growth. Constructive feedback and targeted training plans can then be implemented to enhance performance. Continuous evaluation and monitoring of progress are essential to track improvements over time.

Overall, accurate assessment of psychomotor skills facilitates effective skill development, optimal performance, and success in sports and other activities that rely on precise and coordinated physical movements.

CONCLUSION

This seminar paper provides a comprehensive exploration of the impact of psychological factors on talent identification in sports. Understanding the influence of psychological elements, such as learning, personality, and psychomotor skills, allows sports organizations and coaches to make well-informed decisions when identifying and nurturing talented athletes. However, assessing these psychological aspects poses challenges, requiring reliable tools and methodologies for accurate evaluations. Recognizing the significance of psychological factors empowers the sports community to unleash the potential of aspiring athletes, ultimately improving the success rate in talent identification and athlete development.

Psychological influences in sports performance are widely acknowledged, holding equal importance alongside physical components. Evaluating a player's psychological aspects is a challenging task compared to assessing their physical attributes. Developing valid tools and conducting field-based studies are essential to understand the psychological structure of sports participants and identify psychological talents, which can serve as predictors of the future success.

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Research Article

Comparative study on cardiovascular efficiency between kho-kho and kabaddi players of Telangana state

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ABSTRACT

The main purpose of the present study was to determine the cardiovascular endurance, agility, and strength among players of kabaddi and kho-kho. To achieve the purpose of the present study, 30 players of kabaddi and kho-kho were selected as subjects from Telangana state and their age ranged from 18 to 27 years. The subjects were divided into two groups, namely, Group-I kabaddi players and Group-II kho-kho players. The following variables were selected, namely, cardiovascular endurance, agility, and leg strength. The data were collected on selected criterion variables, and they were statistically analyzed using T-ratio. All subjects were participated in 12 min cooper run and walk test to measure the cardiovascular endurance, agility was measured by shuttle run, and leg strength was measured by 1 Rm leg press. The selected criterion variables were statistically analyzed using T-ratio, which were used to find out the percentage of cardiovascular endurance.

INTRODUCTION

Cardiorespiratory endurance is a basic component of physical fitness. Cardiovascular endurance can be accomplished through consistent exercise performed for prolonged periods of time. Cardiovascular exercise improves your body's ability to bring oxygen from the environment, into the lungs, and diffused into the bloodstream. With an increase, flow of oxygen to cells in the body will help them work to their capacity. In sports, agility is often defined in terms of an individual sport, due to it being an integration of many components each used differently (specific to all of sorts of different sports).

PURPOSE OF THE STUDY

The main purpose of the present study was to determine the cardiovascular endurance, agility, and strength among players of kabaddi and kho-kho.

METHODOLOGY

In the present study, an attempt has been made to compare cardiovascular efficiency of variables between kabaddi and kho-kho players. To achieve this purpose, we have elected 30 players from each stream kho-kho and kabaddi, and the motor qualities of the players alike strength, endurance, speed, agility, blood pressure and basal pulse rate, physical fitness, and efficiency through cardiovascular test and Harvard Step. Physiological parameters of blood pressure and basal pulse rate, hemoglobin, vital capacity, expiratory flow rate, and Forced Expiratory Volume in 1 s were measured through different apparatus and all scores were recorded.

Thirty kho-kho players boys from high school and thirty kabaddi players boys from High Schools in Narayanpet, Telangana, were selected at random.

The subjects of both groups were normal healthy students without any physical disability, particularly heart and lungs, during selection. The subjects were asked to stand in front of a bench and to step up and down on an 18 inches bench for as long a period as possible up to 4 min. The cadence was step up exercise per 4 min. For getting the correct rhythm and cadence, metronome ceased. The subject was instructed to do the steps in coordination with the metronome. For the first tick of the metronome, the subject put his first foot on the stepping bench. For the three ticks, the subject brought down the first foot placed on the bench and for the fourth tick he brought the second foot back to the floor. This step was maintained for 4 min. Duration of exercise -4 min using an 18 inches

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bench during exercise. If a subject was not able to continue the exercise for the prescribed period, the duration for the exercise was recorded independently for the subjects. The subject was asked to sit down on the bench immediately following the termination of the exercise. Then, the pulse was counted from 1 min rest after exercise. The first pulse count is 3–31/2 min. 39 The sum of the scores obtained from the pulse counts and the duration of time of the exercise were used to calculate the physical efficiency index according to the following formula. Physical Efficiency Index = Duration of exercise in seconds ×100 ×2 (sum of pulse counts to recovery).

APPARATUS

The following apparatus was used for the conduct of this event

1. A stopwatch
2. A bench of 18 inches high
3. Metronome.

After collecting the data selected for statistical analysis to know whether there is any difference between kabaddi and kho-kho players in respect of cardiovascular efficiency. To compare the cardiovascular efficiency of the kabaddi players and kho-kho players, standard deviation, differences between the mean standard error of the mean, and t-ratio were computed. The required t-ratio is compared from the table given by Clarke and Clarke. The computation of mean, standard deviation, and T-ratio of cardiovascular efficiency of the kabaddi and kho-kho players are presented.

RESULTS

The difference was between mean and standard deviation T-ratio of the kho-kho and kabaddi players in Narayanpet District, Telangana.

Table showing the results of T-ratio of cardiovascular efficiency of the players.

Group	Mean	Difference between mean	Standard Deviation	Standard error of the mean	Standard error of difference between mean	T-ratio
Kabaddi	96.9	16	12.23	2.45	3.13	0.51
Kho-Kho	95.3		98.69	1.95		

DISCUSSION

The controlled data from the total scores of kabaddi and kho-kho players of High School boys in Narayanpet District were analyzed and interpreted. The "t"-ratio was calculated to find out whether there were any significant differences between mean obtained from the two groups. The mean, the difference between means, and standard deviation of the kabaddi and kho-kho players and "t" ratio were shown in the above table. Cardiovascular efficiency of kho-kho players is = 68.11 and kabaddi players, which is = 63.52.

CONCLUSION

The study showed that the cardiovascular efficiency of kho-kho players is better than kabaddi players after testing at 0.05 level of significance that it was prude. Our null hypothesis "there is no significance difference between cardiovascular efficiency of kabaddi and kho-kho players" was rejected.

The results collected after statistical analysis proved that there was a slight difference in the cardiovascular efficiency between kho-kho and kabaddi players in Narayanpet District, Telangana state. The results were obtained in favor of the kho-kho players. Even though the null hypothesis was rejected at 0.05 level of confidence. The difference was meager. This may be since both group boys' players are involved in similar type of training and conditioning programs. The slight difference may also be due to the fact that the research scholar conducted the study only on a number of subjects. If the study might have been conducted as a large sample, the results would have been better and more accurate.

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Research Article

Injuries and rehabilitation at national competitions

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ABSTRACT

The purpose of this work is to present and analyze handball literature regarding injury causes, injury types, and injury locations anatomically, as well as prevention measures. According to the findings of the reviewed research, elite handball players sustain a substantial number of injuries, affecting various body areas and varying in severity. The most common types of injuries are overuse ones (to specific body regions, such as the ankle and knee, which are more dominant). The usage of a mouth guard is advised to avoid injury to the mouth and teeth. Research findings have demonstrated the beneficial effects that training aimed at increasing glen humeral inner rotation, outer rotation, and scapular muscle strength, along with exercises for enhancing the kinetic chain and chest flexibility, has on the prevention and rehabilitation of shoulder injuries.

Keywords: Etiology, Handball, Injuries, Prevention

INTRODUCTION

Handball is an attractive and dynamic sports game with a ball. The movements predominant in handball are sprints with sudden changes in direction, numerous jumps, various throws, and shots, the contact between the players as well as specific goalkeepers' activities. Direct contact with the opponent is allowed but strictly regulated by the official rules of the game. Periodic updates to the official rules and regulations just prove the point that handball is constantly being developed and improved, which can be seen in the constancy of periodic updates to the official rules and regulations. The most recent modifications made in 2016 place a special emphasis on tightening up the rules to prevent injuries caused by unsportsmanlike behavior (introducing the blue penalty card after the red one has been shown), as well as to improve the game's appeal and standard. Aggressive contact, however, is an unavoidable aspect of this sport and is most likely to be the reason why players sustain injuries. According to other studies (Fagerli *et al*., 1990; Nielsen and Yde, 1988), between 40% and 84% of all injuries that were recorded were brought on by players directly contacting each other. Top players take part in between 70 and 100 games per season, both in club leagues and with their national teams.

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METHODOLOGY

Depending on the quantity and intensity of competitors, the amount of physical pressure that each member of the team is subjected to varies but is nonetheless significant due to the Breaks are brief during significant competitions, the European Championship, for instance, saw top teams play eight games in 13 days (Laver and Myklebust, 2015). Without a doubt, the high levels of frequency and load experienced during such activities lead to weariness and overload, therefore if there is not a balance between participating in games and recovering between training and different sorts of injuries could happen during competition times (Anderson *et al*., 2018). Sadly, despite the players' propensity to attempt to avoid getting hurt, this is a highly common and inescapable occurrence unique to handball (Laver and Myklebust, 2015; Bere *et al*., 2015). Injury prevention in handball is a pressing concern for players, coaches, and other professionals who work to modify the training regimen in an effort to lessen or eliminate the most common injury causes (Nasiri, 1994; Langevoort *et al*., 2007).

According to the data, injuries among young athletes are on the rise, making injury prevention the most crucial task to do.

Muscle strength and coordination differ in younger players, particularly those between the ages of 15 and 18. Reckling *et al*. (2003) propose proprioception training for this reason, along with exercises to enhance leaping technique and training to increase specific finger muscle strength, both of which have the goal of reducing accidents. The importance of fair play among young players may also have an impact on the decline in the amount of contact-induced injuries.

The purpose of this study is to examine handball literature for the reasons why injuries occur, their types and anatomical sites, as well as the methods of preventing injuries before they happen.

THEORETIC VIEWS OF THE PROBLEM

In the past few decades, numerous authors' research has focused on the etiology (the causes and effects) of handball injuries (Rasuli *et al*., 2012; Zebis *et al*., 2011; Langevoort *et al*., 2007; Reckling *et al*., 2003). When comparing the frequency of injuries among female handball players during games versus training sessions, the authors found that injuries to the lower extremities (63.44%) and the body (13.11%) occurred more frequently during games. In contrast, injuries to the upper extremities (42.52%) and the head and neck (4.62%) occurred more frequently during training sessions. Both during practice and during sports, injuries to the muscles were more common than those to the bones (Rasuli *et al*.).

The likelihood of an injury increases the more actively involved specific extremities and body parts are in carrying out technical activities in the game (such as the shooting shoulder, the jumping leg, and the lower back).

Overuse injuries can result in damage to the wrists, ankles, ligaments, and the muscle-tendon junction. In their 3-month-long study, Clarsen *et al*. (2012) used novel procedures, including a questionnaire that 313 athletes from five different sports, including handball, completed on a weekly basis to record the aforementioned injuries. The 426 injuries to the shoulders lower back, knees, and injuries resulting in time loss were all included in the questionnaire. It revealed 419 overuse issues with those body parts, of which 31% were deemed significant, resulting in a moderate to serious decline in performance or participation, or even a full stop to training. It should be noted that it frequently occurs for players to continue training or competing while experiencing pain in the aforementioned body parts, which is another factor that can cause or prolong an injury and necessitates more time off the field (Jost *et al*., 2005).

It is advised to wear a mouthguard since contact sports between players frequently result in mouth and tooth injuries. This can cut the frequency of such injuries by up to 5.5% (Petrovi *et al*., 2016). However, only a tiny percentage of players (28%) who frequently make harsh contact with their opponents (pivots and offense players, as well as those who have already sustained a serious injury) wear mouthguards (Bergman *et al*., 2017).

The elite handball teams in Iceland's coaches' and physiotherapists' questionnaires revealed that knee injuries (26%) and elbow injuries (17%) were the most common among the players' injuries.

Overuse injuries showed up in the knees (21%), the dominant shoulder (21%), the ankles (19%), feet/toes (17%), and lower back/pelvic (39%). According to Rafnsson *et al*. (2019), the old injuries were mostly to blame for the new ones.

INJURY TO LOWER EXTREMITIES AND REHABILITATION

The ankle and knee are the body regions most prone to injury in handballs, according to numerous studies (Seil *et al*., 1997). According to statistics, ankle and knee injuries account for 19–44% of all injuries, and younger players and those who have already experienced such injuries are more likely to sustain them (Laver *et al*., 2018; Laver and Myklebust, 2015; Bere *et al*., 2015; Clarsen *et al*., 2012; and Rasuli *et al*., 2012). According to the writers, landing on an opponent's foot and overuse are the two main causes of these injuries. This is why modern training theory and practice work to develop new, more effective workouts and techniques to avoid all kinds.

An ankle injury rehabilitation program uses balance training, one of the more conventional techniques. Proprioception training is being utilized to avoid sports injuries. Eils *et al*. (2010) and Söderman *et al*. (2000) both discuss injuries. According to research, there is a strong correlation between poor balance and an increased risk of ankle injuries during a variety of activities (Hrysomallis, 2007). It should be noted, nevertheless, that the combination of balance training and workouts requiring jumps, landings, and agility led to a considerable reduction in the balancing ankle and knee injuries in handball players is one of the most conventional treatments (Mascarin *et al*., 2017).

The number of moderate and complex ankle injuries in female handball players is significantly reduced by the use of proprioception exercises on a variety of balancers, including an ankle disk, a balance cushion, a Bossa and fitness ball, and a "wobble board" in combination with functional strength training and neuromuscular training (2003) Wedderkopp *et al*.). To avoid injuries, some writers have demonstrated the significance of the strength relationship between opposing muscle groups when performing specific actions (Degaard and Risberg, 2005). There are additional, more typical practices

that players go through to prepare for practices and games, such as stretching and warm-up activities. Moreover, those procedures are also very useful in preventing injuries. In addition, isokinetic machines can also be used for the purpose of prevention and rehabilitation.

INJURY TO UPPER EXTREMITIES AND REHABILITATION

Statistical information from the 2000s indicates that during the competition season, top-level athletes made 20 circular arm throws with their more dominant arm, totaling about 48000 tosses. Maximum ball speed of 150–170 km/h, with movements per minute (Fiesler *et al*., 2015; it is apparent that the number of throws per year has increased given the fact that the game has undergone considerable pace and speed changes over the previous 20 years. Handball players use a variety of throws with their upper arms above and below the shoulder line, exposing their shoulders to blocks and contacts when the arm is raised. The forces that are applied to the dominant shoulder's anatomical structures during the throw maybe 1.5 times greater than the player's body weight (Lubiatowski *et al*., 2017; Clarsen *et al*., 2014; and Myklebust *et al*., 2011). As a result, shoulder injuries are extremely prevalent among handball players and are brought on by the repetitive throwing motions and continuous forces placed on the shoulders. According to Laver *et al*. (2018), the handball shoulder is a typical model of the injury that develops due to overuse, that is, due to a lot of repetitive throwing actions utilizing the dominant arm. The stability-mobility condition can be altered by repeated quick throws, which is the primary cause of shoulder injury.

ANTERIOR CRUCIATE LIGAMENT (ACL) INJURIES AND PREVENTION

The increased likelihood of ACL injuries in sports, such as handball, is closely correlated with fatigue. Both static (isometric) and dynamic circumstances allow for the evaluation of the impact of muscle exhaustion. According to Zebis *et al*. (2011), the frequency of ACL injuries is correlated with the effect of muscular exhaustion brought on by neuromuscular activity increased by quick side-cutting motions during a handball game. To measure the neuromuscular activity of female handball players on the force platform before and after a simulated game of handball, Zebis *et al*. (2011) used electromyography (EMG). The participants quickly sidecutted on the platform, and the EMG data revealed that the quadriceps and hamstring muscles, as well as other muscles, had lost some of their strength. Therefore, it is thought that the significance of balance is crucial for neuromuscular control, and proprioceptive training with a variety of balancers helps prevent falls.

Injuries to the lower extremities have been reported (Achenbach *et al*., 2018; Steffen *et al*., 2012; Waldén *et al*., 2012; Mandelbaum *et al*., 2005; and Olsen *et al*., 2005). However, according to experts, it is essential to continue studying the outcomes of preventive training programs as well as the significance of identifying the causes of injuries (gender and age, technique, prior injuries, experience in sports) to prevent ACL injuries (Setuain *et al*., 2015; Shultz *et al*., 2012).

Researchers who looked at measurements for preventing knee injuries came to the conclusion that squatting after planting to prolong the buffering during landing would result in a higher circular momentum in the knee joint, a smaller impact from the force of contact with the surface, and a higher circular momentum in the ankle during plantar flexion. It effectively means that a protective mechanism is generated with the decrease in knee bending angle during the phase of planting, shielding the ACL from a significant strain and injury (Ameer and Muaidi, 2017). One of the training methods that helps knee injury reduction and prevention according to certain authors is the application of strength exercises and neuromuscular exercises, that is, proprioceptive training which should also be more often included in practice handball coach education (Achenbach *et al*., 2018).

CONCLUSION

The purpose of this work is to present and analyze handball literature regarding injury causes, injury types, and injury locations anatomically, as well as prevention measures. Considering the findings of the analysis. According to studies, professional handball players sustain a substantial number of injuries to various body regions and at varying degrees of severity.

While injuries to the upper extremities, the head, and the neck are more common during practice sessions, injuries to the lower extremities and the body are more common among female players during games. The most common types of overuse injuries are thought to affect specific body parts, such as the more dominant shoulder, the ankle, and the knee. The majority of them (2/3) happen during defensive operations and the remaining (1/3) happen during female players' counterattacks. Injuries to female handball players typically result from planting, running, and direct hostile contact between players. The use of mouth guards is advised to prevent injuries to the mouth and teeth, especially for female players in crucial and goalkeeping positions because they are more likely to sustain such injuries. When it comes to the prevention and treatment of shoulder injuries, research has demonstrated the beneficial effects that training aimed at increasing glen humeral inner rotation strength, scapular muscle strength, and outer rotation strength, along with exercises for enhancing the kinetic chain and chest flexibility, has. Elastic bands and a medicine ball have

been found to be effective in boosting shoulder strength and the entire swing and throw motion. The most often damaged joints among female handball players are the ankle and the knee.

The findings of combining some specific player activities (running, jumping, and planting) with neuromuscular training, proprioception exercises, and balancing workouts (on different balancers) demonstrate to show that various types of training are effective in preventing injuries to these lower extremity regions; hence, most writers advise them as an essential component of handball players' warm-up exercises during practice sessions, especially during competition and preparation seasons.

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Research Article

Effects of plyometric training on sprint running performance in boys aged 18–22 years

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INTRODUCTION

Sprint training is a pedagogical process, based on scientific principles, aiming at preparing sportsmen for higher performances in sprint competition. Therefore, there has been high interest in improving fundamental skills; successful athletes and the physical fitness of athletes require the acquisition of a higher sprinting performance. Plyometric training involves quick, powerful, jumping, and bounding movements, this purpose is to increase muscular power and dynamic strength.

The benefits of plyometric training increases power outputs in the muscles, increases in muscles contraction with less energy consumption. Faster speed of muscle contraction a speed in general. It improves agility to change direction quickly which fitness professionals may refer to as agility.

Definition of Plyometric

The term plyometric derived from the Greek word plythein or plyo, which means to increase and metric, which means to measure. However, former Purdue University women's track coach Fred Wilt first coined the actual term plyometric in 1975. Typically, the measurement is sports performance outcomes demonstrated in testing or competition such as throwing, serving velocity, jump height, or sprint speed.

Plyometrics may be incorporated as an integral component of an exercise program that can produce all the aforementioned outcomes. As tremendous forces are imposed on the extremities during sports and athletics, there is a huge demand to develop power during the performance phase of rehabilitation. Plyometrics assist in the development power, a foundation from which the athlete can refine the skills of their sport.

Sprint velocity, which is a major variable in sprint performance, is calculated as a product of stride length and stride frequency, also known as spatiotemporal variables. Along with other aspects of physical maturation, previous studies found that development of sprint velocity is associated with an increase in stride length. Therefore, research needed to investigate the training methods to maintain or improve this stride frequency in athletes.

Plyometric training is performed by exerting maximal muscular power in a short duration, and includes activities such as jumping hopping, skipping, and bounding.

Purpose of the Study

To increase the power of subsequent movements using both the natural elastic components of muscle and tendon and the stretch reflex. This training is a popular exercise for improving the performance of various athletic activities, including those uses sprinting.

Faster speed of muscle contractions or speed in general, improved ability to change directions quickly, which fitness professionals may refer to as agility, overall better control when stopping and starting movements, increased jumping height, and decreased risk of injury to the joints and muscles.

METHODOLOGY

Research Design, Participants, Test Protocol, and Plyometric Training

In this research, we aim to influence the effect of 12-week plyometric training on speed. The procedure for the selection of

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the subjects, criterion measure, reliability of data, design of the study, procedure for administering the test, administration of training program, and statistical techniques used for analyzing of data has been discussed.

Selection of Subjects

The participant includes 18–22 years who followed the plyometric program model. The study sample consisted of 20 male participants, who were divided into two groups, first group as plyometric group (PG) and another one control group (CG). Twenty male students from different colleges of Kurnool District Athletes were selected as subjects for the study, on the basis of best performance in 100-m sprint.

The research went through available literatures pertaining training of the sprinters using plyometric training. The following exercises were chosen (a) standing long jump, (b) standing triple jump (STJ), (c) vertical jumps (VIT), (d) single leg hop jumps, (e) double leg hop jumps, (f) depth jumps, and (g) box jumps. The measurements were performed in the morning when all the above athletes had physical education lessons, and they were also performed under the same conditions and at the same time for 3 days. For each test, an evaluation protocol was applied. Each test was evaluated 3 times, and the highest evaluation was taken as the basis, and the other two results were cancelled during the testing of the above ages. During the performance of the jumping tests, three jumps were tried, but the highest jumping result was recorded in the register. We chose three tests for the assessment of explosive speed; they were standing long jump (SBJ), STJ, and VIT, following the described protocols. These three tests evaluate the explosive strength of the lower limbs. The measurement of the standing long jump (SBJ) is that from a starting line, feet shoulder-width apart, the child is asked to jump over a metric tape as far as possible from the starting line, then must place both feet without falling back (it is not allowed to put hands on the floor). In this case, the best result measured in centimeters is noted, and it is recorded in the athlete's registration sheet in centimeters. In the three-step measurement from the seat, the test starts the jump with feet together, the first jumping step starts with one foot, then with the other foot, always on the rubber mat, and finally, jumps with feet together on the mat. Three jumps are performed jumps that are performed incorrectly are repeated. The length of the jump is measured perpendicular to the vertical line. The measurement accuracy is shown in cm. The longest jump out of three attempts is scored. No double steps allowed. The test taker must smear the soles of the feet with magnesium. He jumps barefoot or with sneakers. Measuring the VJT from the place is to put metric tape on the wall or a table. First, the child should raise his hand up and then make a VIT with both feet with a touch of the metric tape. The result is recorded between the touch and the touched site in centimeters and recorded on the athlete's record sheet in centimeters. The measuring instruments were implemented based on several studies carried out by the authors.

Plyometric Training

The investigation of the effect of 12 weeks of plyometric training on the efficiency of the results in the measurements of speed and in athletes aged 18–22 years was carried out in two groups of participants, the CG and the PG. The 12-week program of plyometric training was carried out only in the experimental group, who, in addition to the regular 2-h weekly exercises in the subject of physical education (Tuesday and Thursday), organized a training system with three additional hours per week (Monday, Wednesday, and Friday), a total of 36 h (3 additional hours for 1 week, 3 × 12 weeks = 36 h) training in 12 weeks. The participants of the CG did not attend any special training apart from regular physical education classes. In both groups of participants, in the same period, the measurements before the experiment (before the start of the plyometric program), and the measurements after the experiment (after the end of the plyometric program), were performed in the researched segments the measurements in the speed. We have divided each hour of the experimental program into four parts, as well: The introductory part (5–10 min) to prepare the organism for further work, the preparatory part (10–15 min) to warm up the locomotor system, mainly the muscles, tendons and ligaments of the lower extremities, the main part (25–30 min) the implementation of the experimental program plan which contains various plyometric exercises, such as: Jumps with one leg, jumps with two legs, depth jumps. The number of sets of each exercise was a minimum of 3 sets, with a maximum of 10 repetitions, with a pause between exercises of 45–90 s, and with a load intensity of 60–75%. Each participant in all testing and plyometric training was closely monitored by physical education teachers and experts in the implementation of this scientific research. The plyometric program applied in this research is composed of different movements, such as: Running, sprinting, one and two-legged jumps, extensions, and depthjumps.

Analysis of Data

Descriptive data were calculated for all tests and presented as the mean (Mean) and standard deviation of the CG and PG. In an analysis applied to the differences between the groups in the measurements pre and post-experiment, analysis of variance (ANOVA) was used to detect the differences between the study groups in all the basic variables practiced in this study in the initial measurements, while to determine the differences between the groups in the finale measurements with the division of the differences to test the main effects between the pre- and post-experiment testing, between the groups (CG and PG).

We have shown the results achieved for the tests of sprinting and jumping. In this reflection of the results, the speed of 30 m

showed an improvement in time in the group that followed the plyometric program (PG). The test result pre-experiment in the pre-measurements was while the test result post-experiment in the post-measurements was which means that we have a value difference also the speed 80 m showed time improvement in the PG, the test result pre-experiment in the was while the test result post-experiment in the post-measurements pre-measurements was which means that we have a significant difference. Even the speed 100-m test showed an improvement in time in the group that followed the CG, the test result before the experiment in the pre-measurements was, while the test result, post the experiment, in the post-measurements was which means that we have a significant difference. However, it should be noted that in the standing long jump test, there was a marked difference between the CG group and the PG group, but the greatest effect was in the PG group, with the result in the pre-experiment test and in the test post-experiment with a significant statistical difference the triple jump test from the place showed learning in the jump distance in particular in the PG group in the test pre-experiment and post-experiment testing with a significant statistical difference. If we take for comparison the indicator of the height jump from the place, the difference between the CG and PG groups shows that the PG group has the highest performance with the result in the test pre-experiment and the test post-experiment with a significant statistical difference.

RESULTS

According to the data, we see a difference between the two groups and between the pre- and post-measurement. In the present, it can be seen that the post-measurement in (PG) showed the best results in relation to the pre-measurement and also showed significant differences in value ($P < 0.05$), while in (CG), we have a decrease in the result of speed 30 m, we also have no significant differences between the pre- and post-measurement.

At the speed of 80 m, PG showed the best performance in favor of the post-measurement, significant differences between the value measurements were presented ($P < 0.05$). While the CG has shown a drop in the result in the post-measurement in relation to the pre-measurement, in this case, we have no significant differences between the measurements in the CG.

In the speed 100-m test, we also have the highlighted results between PG and CG, especially in the post-measurement. PG scored a better result in the post-measurement, but the differences between the pre- and post-measurements were not presented. Whereas CG, we have a significant differences between the pre- and post-measurement ($P < 0.05$).

We present the standing long jump test. Post-measurement in PG has a significant result in relation to prey and also in relation to CG in both measurements. If we look at the significant differences, CG has shown significant differences between the pre- and post-measurement with a value ($P < 0.05$), while PG with value ($P < 0.05$).

We have presented the STJ test. In this case, we see that PG has better results in the post-measurement in relation to the pre-measurement. Likewise, CG has a better result in the post in relation to the pre-measurement, and if we take it as a whole, we see that the PG has shown more favorable results in both measurements, both in the pre and the post. In CG, significant differences were presented between pre- and post-measurement ($P < 0.05$), while in PG, no significant differences were shown between pre and post.

We have presented the VIT test in this case, we see that PG has better results in the post-measurement in relation to the pre-measurement. If we take the ratio between the PG and CG group, we see that the post-measurement has a significant difference between the measurements in the two groups. In CG, significant differences were presented between pre-and post with a value ($P < 0.05$), and differences were also presented in the pre- and post-measurement in PG.

The correlation analysis between the speed and the subjects studied. It should be emphasized that in the entire system of the correlation table, statistically significant positive and negative correlations between the tests have been presented. The results obtained in this way show a statistically significant positive correlation between speeds.

Effects of the Plyometric Program on Speed Ability

The 12-week training program model significantly improved speed performance learning to run 30 m was mainly shown in the group that followed the plyometric program (PG) after the test, and significant differences were also confirmed between the groups. The same model of the program followed, which improved the results after the final test, significant differences between the initial and final measurements were also presented in this study that we took for comparison after 12 weeks of the plyometric training model Furthermore, in the 80 m running the test, we also have statistically significant differences in favor of the PG in the final measurements, in this case, these results show that different plyometric training programs affect speed runs, also according to in the measurement tests before and after the experiment, significant differences between the groups are presented at the $P < 0.05$ level. It should be noted that the 100-m run had a noticeable improvement in speed between the measurement before and after the experiment in the PG, it was evident that the result in favor of the PG group came as a result of following the plyometric training program, it should be noted that the CG in the post-measurements have shown weaker results with the pre-measurement, some authors have also found the same improvements in their results in their published studies.

Likewise, in these 100-m running tests, differences between the measurements before and after the experiment between the groups at the $P < 0.05$ level has been proven. If we take the PG for comparison, those who ran 100 m turned out to have better performance results than those who ran 80 m and then those who ran 30 m between the pre- and post-measurements. In the experiment, if we compare the CG, we see that those who ran 80 m performed better than those who ran 100 m and, finally, 30 m. Therefore, the plyometric training program carried out in this study consists mainly of repetitive jumps, sprints at short distances, then combined sprints and jumps. Our results align with the most relevant results identified by previous studies that highlighted the impact of plyometric training on the development of speed parameters.

DISCUSSION

In this study, the main goal is to identify the effectiveness of the plyometric program for the development of speed in 18–22 years. From the examination of the results in the initial measurements in both research subjects, the control (CG) and plyometric (PG), it was shown that in the speed abilities of the athletes, significant statistical differences were identified while through the univariant ANOVA. After the implementation of the plyometric program (PG) for the development of speed, which training model lasted for 12 weeks and only the PG underwent, from the examination of the post measurements.

CONCLUSION

The 12-week plyometric training program for learning the performance of speed has positively influenced the improvement of the results in all the tests presented in this study among athletes, more concretely it has improved the results of the PG in all the tests in the measurements post. More specifically, if we look at our findings first, the CG group in speed performance showed a decrease in the results during the initial measurement compared to the post-measurements, while the jump indicators showed a normal increase in the result. Second, the PG showed a significant increase in the result of running speed, while the results of the jump showed a marked increase in relation to pre- and post-testing. Moreover, as another conclusion, it has been seen that the tests between PG and CG have shown distinct values among themselves. Significant differences were of significant value in both groups at the level of significance ($P < 0.05$). If we look separately at PG, we have the data in favor of this group in the 30 m running segment with significant differences of 0.000, then comes 80 m run with significant differences of <0.028, while in the 100 m run, we have no significant differences between the pre- and post-measurements. In the standing long jump test, we have a difference between the pre- and post-measurements with a value of 0.020. Moreover, in the STJ test, we have the same value of differences with a result of 0.035, but it should be noted that in the VIT test, we have a difference, that is, worth 0.000. These findings show us that the plyometric training model of 12-week affects improving indicators of speed and explosive strength in athletes. The effectiveness of a program of plyometric exercises model is conditioned by the way in which the content of the exercises, their dosage and organization are adapted to the particularities of age and the level of physical fitness.

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Review Article

Importance of mental health

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INTRODUCTION

Everyone has their own way to "recharge" their sense of well-being – something that makes them feel good physically, emotionally, and spiritually even if they are not consciously aware of it. Personally, I know that few things can improve my day as quickly as a walk around the block or even just getting up from my desk it and doing some push-ups. A hike through the woods is ideal when I can make it happen. But that's me. It is not simply that enjoy these activities but also that they literally make me feel better and clear my mind. Mental health and physical health are closely connected. No kidding – what's good for the body is often good for the mind. Knowing what you can do physically that has this effect for you will change your day and your life. Learning how to routinely manage stress. Moreover, getting screened for depression is simply good preventions practices. Awareness is especially critical at this time of year when disruptions to healthy habits and choices can be more jarring. Shorter days and colder temperatures have a way of interrupting routines-as do the holidays, with both their joys and their stresses. When the plentiful sunshine and clear skies of temperate month give way to unpredictable weather, less daylight, and festive gatherings, it may happen unconsciously or seem natural to be distracted from being as physically active. However, that tendency is precisely why it is so importance that we are ever more mindful of our physical and emotional health – and how we can maintain both- during this time of year. Roughly 1/4th of all people in the world will be diagnosed with a mental health disorder at some point in their lifetime, with anxiety disorders being the most common. Major depression, another of the most common mental health disorders, is also a leading cause of disability for middle-ages adults. Compounding all of this, mental health disorders such as depression and anxiety can affect people's ability to take part in health-promoting behaviors, including physical activity. In addition, physical health problems can contribute to mental health problems and make it harder for people to get treatment for mental health disorders.

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The COVID-19 pandemic has brought the need to take care of our physical and emotional health to light even more so these past 2 years. The good news is that even small amounts of physical activity can immediately reduce symptoms of anxiety in adults and older adult. Depression has also shown to be responsive to physical activity. Research suggests that increased physical activity, of any kind, can improve depression symptoms experiences by people across the lifespan. Engaging in regular physical activity has also been shown to reduce the risk of developing depression in children and adults. Although the seasons and our life circumstances may change, our basic needs do not. Just as we shift from shorts to coats or fresh summer fruits and vegetables to heartier fall food choices, so too must we shift our seasonal approach to how we stay physically active. Some of that is simply adapting to conditions: Bundling up for a walk, wearing the appropriate shoes, or playing in the snow with the kids instead of playing soccer in the grass. Although the seasons and our life circumstances may change, our basic needs do not. Just as we shift from shorts to coats or fresh summer fruits and vegetables to heartier fall food choices, so too must we shift our seasonal approach to how we stay physically active. Some of that is simply adapting to conditions: bundling up for a walk, wearing the appropriate shoes, or playing in the snow with the kids instead of playing soccer in the grass. Sometimes there is a bit more creativity involved. Often this means finding ways to simplify activity or make it more accessible. For example, it may not be possible to get to the gym or even take a walk due to weather or any number of reasons. In those instances, other options include adding new types of movements. Such as impromptu dance parties at home or doing a few household chores. During the COVID-19 pandemic, one built a makeshift gym in my garage as an alternative to driving back and forth to the gym several miles from home. That has not only saved me time and money but also afforded me the opportunity to get 15–45 min of muscle-strengthening physical activity in at odd times of the day. The point to remember is that no matter the approach, the

Physical Activity Guidelines recommend that adults get at least 150 min of moderate-intensity aerobic activity (anything that gets your heart beating faster) each week and at least 2 days per week of muscle-strengthening activity (anything that makes your muscles work harder than usual). Youth needs 60 min or more of physical activity each day. Preschool-aged children ages 3–5 years need to be active throughout the day- with adult caregivers encouraging active play – to enhance growth and development striving toward these goals and then continuing to get physical activity, in some shape or form, contributes to better health outcomes both immediately and over the long-term.

For youth, sports offer additional avenues to more physical activities and improved mental health. Youth who participate in sports may enjoy psychosocial health benefits beyond the benefits they gain from other forms of leisure-time physical activity. Psychological health benefits include higher levels of perceived competence, confidence, and self-esteem-not to mention the benefits of team building, leadership, and resilience, which are importance skills to apply on the field and throughout life. Research has also shown that youth sports participants have a reduced risk of suicide and suicidal thoughts and tendencies. In addition, team sports participation during adolescence may lead to better mental health outcomes in adulthood (e.g., less anxiety and depression) for people exposed to adverse childhood experiences. In addition to the physical and mental health benefits, sports can be just plain fun. Physical activity's implications for significant positive effects of mental health and social well-being are enormous, impacting ever faced of life. In fact, because of this national imperative, the presidential executive order that re-established the president's Council on Sports, Fitness, and Nutrition explicit seeks to "expand national awareness of the importance of mental health as it pertains to physical fitness and nutrition." While physical activity is not a substitute for mental health treatment when needed and it is not the answer to certain mental health challenges, it does play a significant role in our emotional and cognitive well-being. No matter how we choose to be active during the holiday season-or season-every effort to move counts toward achieving recommended physical activity goals and will have positive impacts on both the mind and the body. Along with preventing diabetes, high bold pressure, obesity, and the additional risks associated with these comorbidities, physical activity's positive effect on mental health is yet another importance reason to be active and Move Your Way. As for me … I think it's time for a walk. Happy and health holidays, everyone.

WHAT ARE THE MENTAL HEALTH BENEFITS OF EXERCISE?

Exercise is not just about aerobic capacity and muscle size. Sure, exercise can improve your physical health and your physique, trim your waistline, improve your sex life, and even add years to your life. But that's not what motivates most people to stay active. People who exercise regularly tend to do so because it gives them an enormous sense of well-being. They feel more energetic throughout the day, sleep better at night, have sharper memories, and feel more relaxed and positive about themselves and their lives. Moreover, it is also a powerful medicine for many common mental health challenges. Regular exercise can have a profoundly positive impact on depression, anxiety, and ADHD. It also relieves stress, improves memory, helps you sleep better, and boosts your overall mood. Moreover, you do not have to be a fitness fanatic to reap the benefits. Research indicates that modest amounts of exercise can make a real difference. No matter your age or fitness level, you can learn to use exercise as a powerful tool to deal with mental health problems, improve your energy and outlook, and get more out of life.

EXERCISE AND DEPRESSION

Studies show that exercise can treat mild to moderate depression as effectively as antidepressant medication – but without the side-effects, of course. As one example, a recent study done by the Harvard T.H. Chan School of Public Health found that running for 15 min a day or walking for an hour reduces the risk of major depression by 26%. In addition to relieving depression symptoms, research also shows that maintaining an exercise schedule can prevent you from relapsing. Exercise is a powerful depression fighter for several reasons. Most importantly, it promotes all kinds of changes in the brain, including neural growth, reduced inflammation, and new activity patterns that promote feelings of calm and well-being. It also releases endorphins, powerful chemicals in your brain that energize your spirits and make you feel good. Finally, exercise can also serve as a distraction, allowing you to find some quiet time to break out of the cycle of negative thoughts that feed depression.

EXERCISE AND ANXIETY

Exercise is a natural and effective anti-anxiety treatment. It relieves tension and stress, boosts physical and mental energy, and enhances well-being through the release of endorphins. Anything that gets you moving can help, but you will get a bigger benefit if you pay attention instead of zoning out. Try to notice the sensation of your feet hitting the ground, for example, or the rhythm of your breathing, or the feeling of the wind on your skin. By adding this mindfulness element really focusing on your body and how it feels as you exercise—you will not only improve your physical condition faster, but you may also be able to interrupt the flow of constant worries running through your head.

EXERCISE AND STRESS

Ever noticed how your body feels when you're under stress? Your muscles may be tense, especially in your face, neck, and shoulders, leaving you with back or neck pain, or painful headaches. You may feel tightness in your chest, a pounding pulse, or muscle cramps. You may also experience problems such as insomnia, heartburn, stomachache, diarrhea, or frequent urination. The worry and discomfort of all these physical symptoms can in turn lead to even more stress, creating a vicious cycle between your mind and body. Exercising is an effective way to break this cycle. As well as releasing endorphins in the brain, physical activity helps to relax the muscles and relieve tension in the body. Since the body and mind are so closely linked, when your body feels better so, too, will your mind.

EXERCISE AND ADHD

Exercising regularly is one of the easiest and most effective ways to reduce the symptoms of ADHD and improve concentration, motivation, memory, and mood. Physical activity immediately boosts the brain's dopamine, norepinephrine, and serotonin levels—all of which affect focus and attention. In this way, exercise works in much the same way as ADHD medications such as Ritalin and Adderall.

EXERCISE AND PTSD AND TRAUMA

Evidence suggests that by really focusing on your body and how it feels as you exercise, you can actually help your nervous system become "unstuck" and begin to move out of the immobilization stress response that characterizes PTSD or trauma. Instead of allowing your mind to wander, pay close attention to the physical sensations in your joints and muscles, even your insides as your body moves. Exercises that involve cross movement and that engage both arms and legs—such as walking (especially in sand), running, swimming, weight training, or dancing—are some of your best choices. Outdoor activities such as hiking, sailing, mountain biking, rock climbing, whitewater rafting, and skiing (downhill and cross-country) have also been shown to reduce the symptoms of PTSD.

OTHER MENTAL HEALTH BENEFITS OF EXERCISE

Even if you are not suffering from a mental health problem, regular physical activity can still offer a welcome boost to your mood, outlook, and mental well-being. Exercise can help provide: Sharper memory and thinking. The same endorphins that make you feel better also help you concentrate and feel mentally sharp for tasks at hand. Exercise also stimulates the growth of new brain cells and helps prevent *age-related decline*. Higher self-esteem. Regular activity is an investment in your mind, body, and soul. When it becomes habit, it can foster your sense of self-worth and make you feel strong and powerful. You will feel better about your appearance and, by meeting even small exercise goals, you will feel a sense of achievement. better sleep. Even short bursts of exercise in the morning or afternoon can help *regulate your sleep patterns*. If you prefer to exercise at night, relaxing exercises such as yoga or gentle stretching can help promote sleep. More energy. Increasing your heart rate several times a week will give you more get-up-and-go. Start off with just a few minutes of exercise per day, and increase your workout as you feel more energized. Stronger resilience. When faced with mental or emotional challenges in life, exercise can help you build resilience and cope in a healthy way, instead of resorting to alcohol, drugs, or other negative behaviors that ultimately only make your symptoms worse. Regular exercise can also help boost your immune system and reduce the impact of stress.

REAPING THE MENTAL HEALTH BENEFITS OF EXERCISE IS EASIER THAN YOU THINK

You do not need to devote hours out of your busy day to train at the gym, sweat buckets, or run mile after monotonous mile to reap all the physical and mental health benefits of exercise. Just 30-min of moderate exercise five times a week is enough. Moreover, even that can be broken down into two 15-min or even three 10-min exercise sessions if that is easier.

EVEN A LITTLE BIT OF ACTIVITY IS BETTER THAN NOTHING

If you do not have time for 15 or 30 min of exercise, or if your body tells you to take a break after 5 or 10 min, for example, that's okay, too. Start with 5- or 10-min sessions and slowly increase your time. The more you exercise, the more energy you will have, so eventually you will feel ready for a little more. The key is to commit to some moderate physical activity — however little — on most days. As exercising becomes a habit, you can slowly add extra minutes or try different types of activities. If you keep at it, the benefits of exercise will begin to pay off.

YOU DO NOT HAVE TO SUFFER TO GET RESULTS

Research shows that moderate levels of exercise are best for most people. Moderate means:

1. That you breathe a little heavier than normal, but are not out of breath. For example, you should be able to chat with your walking partner, but not easily sing a song.
2. That your body feels warmer as you move, but not overheated or very sweaty.

CANNOT FIND TIME TO EXERCISE DURING THE WEEK? BE A WEEKEND WARRIOR

A recent study found that people who squeeze their exercise routines into one or two sessions during the weekend experience almost as many health benefits as those who work out more often. So do not let a busy schedule at work, home, or school be an excuse to avoid activity. Get moving whenever you can find the time — your mind and body will thank you!

OVERCOMING OBSTACLES TO EXERCISE

Even when you know that exercise will help you feel better; taking that first step is still easier said than done. Obstacles to exercising are very real — particularly when you are also struggling with a mental health issue. Here are some common barriers and how you can get past them.

FEELING EXHAUSTED

When you are tired, depressed, or stressed, it seems that working out will just make you feel worse. However, the truth is that physical activity is a powerful energizer. Studies show that regular exercise can dramatically reduce fatigue and increase your energy levels. If you are really feeling tired, promise yourself a quick, 5-min walk. Chances are, once you get moving you will have more energy and be able to walk for longer.

FEELING OVERWHELMED

When you are stressed or depressed, the thought of adding another obligation to your busy daily schedule can seem overwhelming. Working out just does not seem practical. If you have children, finding childcare while you exercise can also be a big hurdle. However, if you begin thinking of physical activity as a priority (a necessity for your mental well-being), you will soon find ways to fit small amounts of exercise into even the busiest schedule.

FEELING HOPELESS

Even if you have never exercised before, you can still find ways to comfortably get active. Start slow with easy, low-impact activities a few minutes each day, such as walking or dancing.

FEELING BAD ABOUT YOURSELF

Are you your own worst critic? It is time to try a new way of thinking about your body. No matter your weight, age, or fitness level, there are plenty of others in the same boat. Ask a friend to exercise with you. Accomplishing even the smallest fitness goals will help you gain body confidence and improve how you think about yourself.

FEELING PAIN

If you have a disability, severe weight problem, arthritis, or any injury or illness that limits your mobility, talk to your doctor about ways to safely exercise. You should not ignore pain, but rather do what you can, when you can. Divide your exercise into shorter, more frequent chunks of time if that helps, or try exercising in water to reduce joint or muscle discomfort.

GETTING STARTED WITH EXERCISE WHEN YOU HAVE A MENTAL HEALTH ISSUE

Many of us find it hard enough to motivate ourselves to exercise at the best of times. However, when you feel depressed, anxious, stressed, or have another mental health problem, it can seem doubly difficult. This is especially true of depression and anxiety, which can leave you feeling trapped in a catch-22 situation. You know exercise will make you feel better, but depression has robbed you of the energy and motivation you need to work out, or your social anxiety means you cannot bear the thought of being seen at an exercise class or running through the park.

START SMALL

When you are under the cloud of anxiety or depression and have not exercised for a long time, setting extravagant goals like completing a marathon or working out for an hour every morning will only leave you more despondent if you fall short. Better to set achievable goals and build up from there.

SCHEDULE WORKOUTS WHEN YOUR ENERGY IS HIGHEST

Perhaps you have most energy first thing in the morning before work or school or at lunchtime before the mid-afternoon lull hits? Or maybe you do better exercising for longer at the weekends. If depression or anxiety has you feeling tired and unmotivated all day long, try dancing to some music or simply going for a walk. Even a short, 15-min walk can help clear your mind, improve your mood, and boost your energy

level. As you move and start to feel a little better, you will often boost your energy enough to exercise more vigorously — by walking further, breaking into a run, or adding a bike ride, for example.

FOCUS ON ACTIVITIES YOU ENJOY

Any activity that gets you moving counts. That could include throwing a Frisbee with a dog or friend, walking laps of a mall window shopping, or cycling to the grocery store. If you have never exercised before or do not know what you might enjoy, try a few different things. Activities such as gardening or tackling a home improvement project can be great ways to start moving more when you have a mood disorder — as well as helping you become more active, they can also leave you with a sense of purpose and accomplishment.

BE COMFORTABLE

Wear clothing that is comfortable and choose a setting that you find calming or energizing. That may be a quiet corner of your home, a scenic path, or your favorite city park.

REWARD YOURSELF

Part of the reward of completing an activity is how much better you will feel afterward, but it always helps your motivation to promise yourself an extra treat for exercising. Reward yourself with a hot bubble bath after a workout, a delicious smoothie, or with an extra episode of your favorite TV show, for example.

MAKE EXERCISE A SOCIAL ACTIVITY

Exercising with a friend or loved one, or even your kids, will not only make exercising more fun and enjoyable, it can also help motivate you to stick to a workout routine. You will also feel better than if you were exercising alone. In fact, when you are suffering from a mood disorder such as depression, the companionship can be just as important as the exercise.

EASY WAYS TO MOVE MORE THAT DO NOT INVOLVE THE GYM

Don't have a 30-min block of time to dedicate to yoga or a bike ride? Don't worry. Think about physical activity as a lifestyle rather than just a single task to check off your to-do list. Look at your daily routine and consider ways to sneak in activity here, there, and everywhere.

MOVE IN AND AROUND YOUR HOME

Clean the house, wash the car, tend to the yard and garden, mow the lawn with a push mower, and sweep the sidewalk or patio with a broom.

SNEAK ACTIVITY IN AT WORK OR ON THE GO

Bike or walk to an appointment rather than drive, use stairs instead of elevators, briskly walk to the bus stop then get off one stop early, park at the back of the lot and walk into the store or office, or take a vigorous walk during your coffee break.

GET ACTIVE WITH THE FAMILY

Jog around the soccer field during your kid's practice, make a neighborhood bike ride part of your weekend routine, play tag with your children in the yard, go canoeing at a lake, and walk the dog in a new place.

GET CREATIVE WITH EXERCISE IDEAS

Pick fruit at an orchard, boogie to music, go to the beach or take a hike, gently stretch while watching television, organize an office bowling team, take a class in martial arts, dance, or yoga.

MAKE EXERCISE A FUN PART OF YOUR EVERYDAY LIFE

You do not have to spend hours in a gym or force yourself into long, monotonous workouts to experience the many benefits of exercise. These tips can help you find activities you enjoy and start to feel better, look better, and get more out of life.

CONCLUSION MENTAL HEALTH BENEFITS OF EXERCISE AND PHYSICAL ACTIVITIES

a. Reduce feelings of depression and stress.
b. Enhances your mood and overall emotional well-being.
c. Increase your energy level.
d. Improves sleep.
e. Sleep better.
f. Maintain a healthy weight.
g. Control blood pressure.
h. Improve/maintain some aspects of cognitive function.

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Research Article

Effect of yoga practices and aerobic exercises on selected bio-motor and physiological variables among middle aged women

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ABSTRACT

The aim of this study was to investigate the effects of yogic practices and aerobic exercises on selected bio-motor and physiological variables among middle-aged women. A total of 100 middle-aged women (aged 40–60 years) participated in the study and were randomly assigned to three groups: Yogic practices group (n = 20), aerobic exercises group (n = 20), and control group (n = 20). The yogic practices group engaged in regular yoga sessions consisting of asanas (postures), pranayama (breathing exercises), and meditation. The aerobic exercises group participated in supervised aerobic activities such as jogging, cycling, and aerobic dance. The control group did not engage in any specific exercise program. The intervention period lasted for 6 weeks. Pre- and post-intervention assessments were conducted to evaluate the selected bio-motor and physiological variables, including flexibility, strength, resting pulse rate, and vital capacity. Significant improvements were observed in all measured variables in both the yogic practices and aerobic exercises groups compared to the control group. The yogic practices group demonstrated significant improvements in flexibility, strength, and vital capacity. Similarly, the aerobic exercises group showed significant enhancements in flexibility, strength, and vital capacity. The findings of this study indicate that both yoga practices and aerobic exercises have a positive impact on selected bio-motor physiological variables among middle-aged women. Regular engagement in yoga and aerobic activities can lead to improvements in flexibility, strength, and vital capacity. These results suggest that incorporating both forms of exercise into a comprehensive fitness routine can be beneficial for the overall health and well-being of middle-aged women.

Keywords: Aerobic exercises, Bio-motor physiological variables, Flexibility, Middle-aged women, Strength, Vital capacity, Yogic practices

INTRODUCTION

Middle age, spanning from 40 to 60 years, marks a critical phase in a woman's life, characterized by unique physiological changes and potential health challenges. During this period, maintaining optimal physical fitness becomes increasingly important for supporting overall well-being and mitigating the risk of chronic diseases. In recent years, there has been a growing interest in exploring the impact of different exercise modalities on the health and quality of life of middle-aged women (Surendran, and Lukose, 2022).

Among the various exercise practices, both yoga and aerobic exercises have gained significant attention due to their potential positive effects on physical and mental well-being. Yoga, rooted in ancient Indian traditions, incorporates a combination of postures (asanas), controlled breathing exercises (pranayama), and meditation techniques. This holistic approach to fitness is believed to promote not only physical strength and flexibility but also mental clarity and emotional balance (Connor and Warburton, 2018).

In contrast, aerobic exercises involve rhythmic and sustained physical activities that elevate heart rate and enhance cardiovascular endurance. Activities such as jogging, cycling, and aerobic dance have been associated with improved cardiorespiratory fitness and overall stamina.

Despite the individual merits of yoga and aerobic exercises, limited research has directly compared their effects on selected bio-motor and physiological variables among middle-aged women. Therefore, the present study aimed to investigate and

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Table 1: Computation of analysis of covariance of pre-test post-test and adjusted post-test on flexibility investigation groups and non-investigation group (scores in centimetres)

Test	IVG-I YPWSD	IVG-2 YDWOSD	NIVG	Source of variance	Sum of square	df	Mean square	"F"
Pre	12.90	13.00	13.10	BG	0.40	2	0.20	0.15
				WG	77.60	57	1.36	
Post	17.80	16.60	13.25	BG	222.43	2	111.22	58.83*
				WG	107.75	57	1.89	
Adjusted	17.87	16.60	13.17	BG	234.67	2	117.34	97.79*
				WG	67.19	56	1.20	

*Significant at 0.05 level of confidence. (Table value required for significant at 0.05 level of confidence with df (2, 57) and df (2, 56) was 3.16 correspondingly).
BG: Between groups, WG: Within groups, df: Degrees of freedom, NIVG: Non-investigation group

Table 2: Scheffe's confidence interval test scores-flexibility (scores in centimeters)

IVG-1 YPWSD	IVG-2 YPWOSD	NIVG	MD	CI
17.87	16.60	-	1.27*	**0.87**
17.87	-	13.17	4.7*	
-	16.60	13.17	3.43*	

*Significant at 0.05 level of confidence. NIVG: Non-investigation group

compare the impact of these two exercise modalities on specific aspects of physical health in this population.

Understanding the effects of yoga and aerobic exercises on middle-aged women's health can provide valuable insights for health professionals and individuals seeking evidence-based exercise recommendations. By contributing to the knowledge on the potential benefits of these exercise forms, this study aims to encourage the incorporation of both yoga and aerobic activities into a comprehensive fitness routine tailored to the unique needs of middle-aged women. Through this endeavor, we can empower women to take proactive steps towards improving their overall health and well-being during this significant phase of life (Surendran, and Lukose, 2022).

METHODOLOGY

A total of 100 middle-aged women (aged 40–60 years) participated in the study and were randomly assigned to three groups: Yogic practices group (n = 20), aerobic exercises group (n = 20), and control group (n = 20). The yogic practices group engaged in regular yoga sessions consisting of asanas (postures), pranayama (breathing exercises), and meditation. The aerobic exercises group participated in supervised aerobic activities such as jogging, cycling, and aerobic dance. The control group did not engage in any specific exercise program. The intervention period lasted for 6 weeks. Pre- and post-intervention assessments were conducted to evaluate the selected bio-motor and physiological variables, including flexibility, strength, resting pulse rate, and vital capacity.

RESULTS

Table 1 displays the pre-test flexibility means: 12.90 (IVG-1), 13.00 (IVG-2), and 13.10 (non-investigation group [NIVG]). The pre-test F-value of 0.15 indicates no significant difference in starting scores.

The post-test means were 17.80 (IVG-1), 16.60 (IVG-2), and 13.25 (NIVG). The post-test F-value of 58.83 reveals a substantial difference in scores.

Adjusting for pre-test and post-test means, the analysis of covariance resulted in an F-value of 97.79, confirming significant differences among the treated groups. *Post hoc* analysis using Scheffe's Confidence Interval Test was performed [Table 2].

The *post hoc* analysis of ordered adjusted means revealed significant differences between IVG-1 and IVG-2 (MD: 1.27), IVG-I and NIVG (MD: 4.7), and IVG-2 and NIVG (MD: 3.43), with a confidence interval value of 0.87.

Figure 1 presents a line diagram illustrating the ordered adjusted means, providing a clearer representation of the study results mentioned in Table 1.

Table 3 displays the pre-test strength means: 51.45 (IVG-1), 51.35 (IVG-2), and 51.40 (NIVG). The pre-test F-value of 0.01 indicates no significant difference in starting scores.

The post-test means were 57.30 (IVG-1), 55.36 (IVG-2), and 51.45 (NIVG). The post-test F-value of 11.29 reveals a substantial difference in scores.

Adjusting for pre-test and post-test means, the analysis of covariance resulted in an F-value of 55.72, confirming significant differences among the treated groups. *Post hoc* analysis using Scheffe's Confidence Interval Test was performed [Table 4].

The *post hoc* analysis of ordered adjusted means revealed significant differences between IVG-1 and IVG-2 (MD: 1.86),

Table 3: Computation of analysis of covariance of pre-test post-test and adjusted post-test on strength investigation groups and non-investigation group (Scores in Seconds)

Test	IVG-I YPWSD	IVG-2 YPWOSD	NIVG	Source of variance	Sum of square	df	Mean square	"F"
Pre	51.45	51.35	51.40	BG	0.100	2	0.05	0.01
				WG	774.30	57	13.58	
Post	57.30	55.36	51.45	BG	354.90	2	177.45	11.29*
				WG	895.70	57	15.71	
Adjusted	57.25	55.39	51.45	BG	351.23	2	175.62	55.72*
				WG	176.48	56	3.15	

*Significant at 0.05 level of confidence. (Table value required for significant at 0.05 level of confidence with df (2, 57) and df (2, 56) was 3.16 correspondingly). BG: Between groups, WG: Within groups, df: Degrees of freedom, NIVG: Non-investigation group

Table 4: Scheffe's confidence interval test scores-strength (Scores in Seconds)

IVG-1 YPWSD	IVG-2 YPWOSD	NIVG	MD	CI
57.25	55.39	-	1.86*	1.41
57.25	-	51.45	5.80*	
-	55.39	51.45	3.94*	

*Significant at 0.05 level of confidence. NIVG: Non-investigation group

IVG-I and NIVG (MD: 5.80), and IVG-2 and NIVG (MD: 3.94), with a confidence interval value of 1.41.

Figure 2 presents a line diagram illustrating the ordered adjusted means, providing a clearer representation of the study results mentioned in Table 3.

Table 5 displays the pre-test vital capacity means: 2670.00 (IVG-1), 2645.00 (IVG-2), and 26.05.00 (NIVG). The pre-test F-value of 0.83 indicates no significant difference in starting scores.

The post-test means were 3452.50 (IVG-1), 3112.50 (IVG-2), and 2665.87 (NIVG). The post-test F-value of 77.59 reveals a substantial difference in scores.

Adjusting for pre-test and post-test means, the analysis of covariance resulted in an F-value of 77.59, confirming significant differences among the treated groups. *Post hoc* analysis using Scheffe's Confidence Interval Test was performed [Table 6].

The *post hoc* analysis of ordered adjusted means revealed significant differences between IVG-1 and IVG-2 (MD: 327.48), IVG-2 and NIVG (MD: 780.47), and IVG-2 and NIVG (MD: 452.99), with a confidence interval value of 152.76.

Figure 3 presents a line diagram illustrating the ordered adjusted means, providing a clearer representation of the study results mentioned in Table 5.

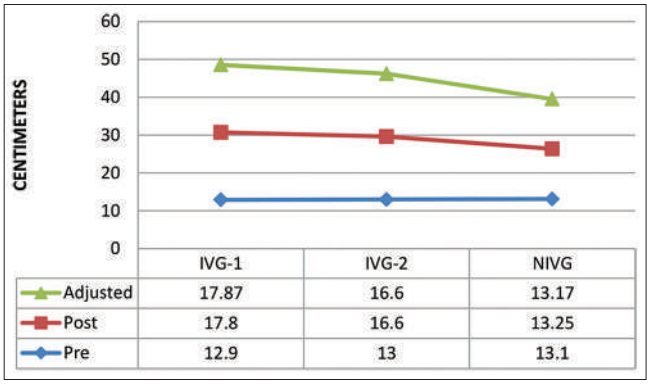

Figure 1: Bar diagram showing pre-test post-test and adjusted post-test means on flexibility

Figure 2: Bar diagram showing pre-test post-test and adjusted post-test means on strength

DISCUSSION ON FINDINGS

The results presented in Tables 1, 3 and 5 reveal significant differences in flexibility, strength, and vital capacity between the investigation groups (IVG-1 and IVG-2) and the NIVG after undergoing specific treatments or interventions. These findings support the effectiveness of the applied treatments in improving the physical attributes of interest. The significant increase in post-test flexibility scores for both IVG-1 and

Table 5: Computation of analysis of covariance of pre-test post-test and adjusted post-test on vital capacity investigation groups and non-investigation group

Test	IVG-I YPWSD	IVG-2 YPWOSD	NIVG	Source of variance	Sum of square	df	Mean square	"F"
Pre	2670.00	2645.00	2605.00	BG	116500.0	2	38833.33	0.83
				WG	3579000.0	57	47092.11	
Post	3452.50	3112.50	2640.00	BG	7554343.7	2	2518114.5	63.49*
				WG	3014125.0	57	39659.539	
Adjusted	3446.34	3118.86	2665.87	BG	6657222.3	2	2219074.1	77.59*
				WG	2144939.7	56	28599.19	

*Significant at 0.05 level of confidence. (Table value required for significant at 0.05 level of confidence with df (2, 57) and df (2, 56) was 3.16 correspondingly). BG: Between groups, WG: Within groups, df: Degrees of freedom. NIVG: Non-investigation group

Table 6: Scheffe's confidence interval test scores-vital capacity

IVG-1 YPWSD	IVG-2 YPWOSD	NIVG	MD	CI
3446.34	3118.86	-	327.48*	152.76
3446.34	-	2665.87	780.47*	
-	3118.86	2665.87	452.99*	

*Significant at 0.05 level of confidence. NIVG: Non-investigation group

IVG-2 compared to NIVG indicates that the treatments employed in the investigation groups were successful in enhancing flexibility. This aligns with prior research that emphasizes the positive impact of targeted interventions on flexibility outcomes (Tsuji *et al*., 2022). The *post hoc* analysis using Scheffe's Confidence Interval Test further confirmed the superiority of both IVG-1 and IVG-2 compared to NIVG, highlighting the benefits of the interventions applied to the investigation groups. Similar to flexibility, the post-test analysis demonstrated significant improvements in strength for both IVG-1 and IVG-2 when compared to NIVG. These results are consistent with previous studies that have reported the positive effects of strength training interventions on increasing muscular strength (Smith *et al*., 2019). The *post hoc* analysis provided additional evidence of the effectiveness of the treatments, showing that both investigation groups significantly outperformed the NIVG in terms of strength gains.

The post-test analysis showed a notable increase in vital capacity scores for IVG-1 and IVG-2 relative to NIVG, indicating that the interventions were successful in improving respiratory function. This finding is in line with existing literature suggesting that targeted exercises and interventions can positively impact lung capacity and vital capacity (Ramanujam, and Kumaran, 2019). The Scheffe's Confidence Interval Test reaffirmed the significance of the results, with both investigation groups exhibiting significantly higher vital capacity compared to the NIVG.

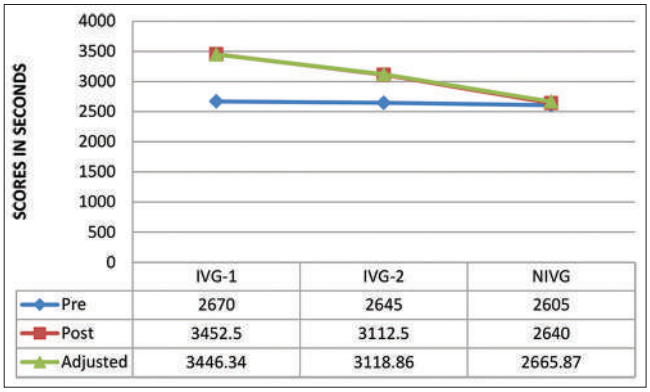

Figure 3: Bar diagram showing pre-test post-test and adjusted post-test means on vital capacity

The observed differences in all three physical attributes (flexibility, strength, and vital capacity) between the investigation groups and the NIVG demonstrate the importance of employing specific interventions to enhance these aspects of physical performance. These findings have practical implications for fitness trainers, coaches, and healthcare professionals, as they emphasize the need for tailored training programs to address individual goals and areas of improvement.

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Research Article

Selected coordinative parameters association with basketball female players playing performance

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ABSTRACT

The aim of the study was to decide the relationship of coordinative variables with basketball playing performance. To achieve the objectives of the study, selected coordinative variables were involved as independent variables and playing ability as dependent variable, which was assessed through subjective rating, by three experts, during the tournaments and the average was taken as criterion score. Seventy-five female basketball players, who had represented the State of Andhra Pradesh, Basketball tournament in 2016–2023 seasons, were selected as subjects. Pearson's product moment correlation (zero order) was used as a statistical tool to find out the result and it revealed that the coordinative variables of orientation ability (0.585*), differentiation ability (0.259*), dynamic balance ability (0.364*), rhythm ability (0.239*), simple reaction ability (0.462*) adaptation ability (0.299*), coupling ability (0.379*), and coordination (0.237*) were having significant relationship with basketball playing performance and remaining variables were not having significant relationship with basketball playing performance.

Keywords: Performance, Coordinative abilities, Training Components, Basketball

INTRODUCTION

The game of basketball is very complicated in terms of skills and team work. Basketball is an aerobic-based anaerobic sport (Delextrat and Cohen, 2009 and Meckell *et al.*, 2009) which requires high intensity activities such as jumping turns, dribbles, sprints, screens, and low intensity activities such as walking, stopping, and jogging. Frequent stoppages in games allow players to recover between bouts of activity, thus, allowing repeated high-intensity spells of play (Drinkwater *et al.*, 2008). In this game, everyone should mastery over fundamental skills such as Dribbling, passing, shooting, rebounding, and defense. When one has mastered the fundamental skills of the games, he gets a feeling of well-being. High level of performance otherwise known as playing ability in basketball depends on proficiency over the fundamental skills. High level of performance of a basketball player depends on fundamental skills. It is recognized that among the fundamentals, ability to dribble the ball, ability to shoot, ability to passing, ability to rebounding, ability to shoot are of primary importance for high level of performance.

Basketball is a fast-moving game and most popular sports in the world and one of the most widely viewed (Scott, 2013). Basketball is played by both men and women of all ages and fitness level. Successful game of basketball needs ability of the players to generate good footwork, agility, and tremendous power during the play of game. Skills such as dribbling, shooting, and passing are of utmost importance for a player at any level of play (Thani, 1997).

Fitness is the ability to meet the demands of a physical task. Basic fitness can be classified in four main components: Strength, Speed, Stamina, and Flexibility. However, exercise scientists have identified nine components that comprise the definition of fitness: Strength, power, agility, balance, flexibility, local muscle endurance, strength endurance, and coordination. All the nine elements of fitness cardiac respiratory qualities are the most important to develop as they enhance all the other components of the conditioning equation. Basketball is a game of applied athletics and it

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Table 1:

S. No.	Coordinative Abilities	Test	Coefficient of Correlation 'r'
1	Orientation Ability	Field goal speed test (in seconds) Basketball throw for accuracy (in points) Basketball dribble test (in seconds)	0.585*
2	Differentiation Ability	Field goal speed test (in seconds) Basketball throw for accuracy (in points) Basketball dribble test (in seconds)	0.259*
3	Dynamic Balance Ability	Field goal speed test (in seconds) Basketball throw for accuracy (in points) Basketball dribble test (in seconds)	0.364*
4	Rhythm Ability	Field goal speed test (in seconds) Basketball throw for accuracy (in points) Basketball dribble test (in seconds)	0.239*
5	Coordination	Baseball Throw	0.237*
6	Simple Reaction Ability	Field goal speed test (in seconds) Basketball throw for accuracy (in points) Basketball dribble test (in seconds)	0.462*
7	Adaptation Ability	Field goal speed test (in seconds) Basketball throw for accuracy (in points) Basketball dribble test (in seconds)	0.299*
8	Coupling Ability	Field goal speed test (in seconds) Basketball throw for accuracy (in points) Basketball dribble test (in seconds)	0.379*
9	Static Balance Ability	Field goal speed test (in seconds) Basketball throw for accuracy (in points) Basketball dribble test (in seconds)	0.111
10	Complex Reaction Ability	Field goal speed test (in seconds) Basketball throw for accuracy (in points) Basketball dribble test (in seconds)	0.109

N=75, r. 05 (75)=0.217, *Significant at 0.05 level

requires well proportionate physique and great amount of physical fitness level.

The number of studies has investigated the relationship between physical fitness, anthropometric and coordinative abilities, and basketball playing performance. In Indian context, there are less studies that have been conducted in this aspect of coordinative abilities and basketball performance; hence, the present study to find out the significant relationship of coordinative ability with basketball playing performance has been taken up.

METHODOLOGY

Purpose of the Study

This study would be deciding to the relationship of coordinative variables with basketball playing performance.

Selection of the Subjects

Seventy-five female basketball players have been selected from national level representation of Andhra Pradesh on non-randomly by purposive sample has been used.

Performance of Basketball

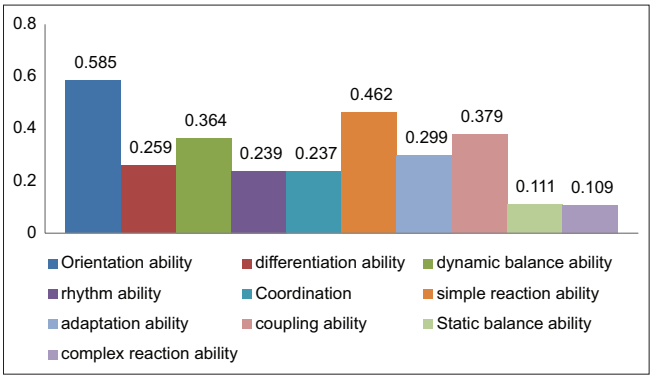
Playing ability is considered as the performance of the basketball players.

STATISTICAL ANALYSIS AND DISCUSSIONS

The dependent variable was playing ability, which was assessed through subjective rating, by three experts. The average of three experts was the individual criterion score. Pearson's products moments correlation (zero order) was used to find out the relationship of selected coordinative variable with basketball

playing performance. The level of significance was set at 0.05. SPSS package was used for statistical analysis.

Selected Coordinative Abilities



Graphical Representation

An analysis of the above table indicates that performance of basketball playing ability is significantly related to orientation ability (0.585*), differentiation ability (0.259*), dynamic balance ability (0.364*), rhythm ability (0.239*), simple reaction ability (0.462*), adaptation ability (0.299*), coupling ability (0.379*), and coordination (0.237*) as obtained values of correlation were greater than the value of r=0.217 the correlation to be significant at 0.05 level of confidence. The remaining coordinative abilities static balance ability and complex reaction ability as their correlation values are less than the value of r=0.217 need for significance at 0.05 level of confidence.

CONCLUSIONS

As per the analysis, my suggestion to the coaches, physical directors, physical education teachers, physical instructors to concentrate effectively on coordinative variables to our training schedule. It may be given effective and good performance in a specific competition. It is concluded, from the present study, that the performance of basketball players influenced by coordinative abilities and higher level of performance of training coordinative abilities standard. Further, the results of the study are of great value in designing the training program of players.

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Review Article

Role of artificial intelligence in sports

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ABSTRACT

The analysis of this literature review and the interviews shows that the most activity is carried out in the methodical categories of signal and image processing. However, projects in the physical education and sports field of modeling and planning have become increasingly popular within the so many years. The application of artificial intelligence (AI) in sports has become a common sight, although not many experts are talking about it. Thanks to predictive analytics, many types of sporting events such as sports training, sports competitions, muscle biopsy, sports kit, and sports equipments can generate more accurate performance, results, and decisions. A major goal of AI in sports is to make extraordinary result, to avoid injury, proper nutrients diet, advertisement, and the game tougher on and off the field. Therefore, it is important for sports businesses to always stay up dated. During the analysis of this paper, we aim to understand and study new and innovative approaches to use in AI in the field of physical education and sports. This white paper introduces the concepts of data mining, statistics, and networks. These concepts help you predict out comes and performance more accurately and we can say that we cannot achieve top performance without AI.

Keywords: Artificial intelligence, Sports

INTRODUCTION

Artificial intelligence (AI) is regularly used for improve individual's sports and games performance and also improve their health and wellness with the help of different technology. Athlete can give their optimal performance as well as they can avoid serious injuries and maximize their strength level. This is also helpful for making strong team members, proper tactics, techniques, and strategies. AI is using for the improvement of current sports performance by understanding and using different sports equipments and biomechanical principal in each and every movement like: If we are throwing shot put, then we have to use proper angle, even the position and motion of the player. In this reason, AI is guiding coaches to improve their decision making capacity. AI impacting in the field of physical education and sports in every aspects such as sports performance, sports training, and sports result. The idea of AI, machine behavior that would be considered intelligent if exhibited by humans, is as old as human built machines. More recently, the field of AI emerged as a subfield of computer science in the 1950's. Nowadays, so many types of technologies adopted by the athletes for their improvement of optimal performance. As we know, AI is leading in each and every field for advancement of performance. As we know that muscle biopsy is a pre-test of an individual to adopt sprint or long distance run for good result and it is not possible without AI. AI concept is altering sports positively and hoisting it to an unheard of level of success. While the facts confirm that measurements and quantitative investigation have assumed a focal job in sports for quite a while, AI is essentially affecting how games are planned, played, and drawing in the crowd. AI mostly gives benefits for team events or technical events such as gymnastic or diving. An athlete has to follow complete biomechanical benefits during the performance and it includes gymnastic kit, action, and proper execution. Athletics: Proper arm action and leg action is needed. Swimming: Proper biomechanical training should be needed. AI and machine learning methods are playing a very important role in this field. The athletes are benefited of all the process as decision-making through fast and automatic gather of all the information easily and immediately. AI is also most promising area for the improvement of their health. It is easy to diagnose any types of disease very fast even we can check athletes body deformities such as kyphosis, scoliosis, lordosis, knock knee, and flat foot, and also, we can correct through AI.

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AI in Sports

Our sports pastimes are quickly changing their faces through the application of AI. Technology has unlocked secrets of sporting success and transforming athlete performances through prevention of sports injuries which play a major role in the performance of the athlete. From an era of stopwatches and chalkboards, we have transformed and developed to predictive algorithms and machine learning and, thus, introduced sports into the computing generation. AI is reshaping the understanding of sports and proving the coaches as well the athletes to take advantage of the next age of information to transform the sports industry globally. Injection of these transformations brings exciting results in the performances.

Benefits of AI in Sports

The introduction of AI into the wearing area represents a massive jump ahead in how we measure and recognize the big quantities of information available to us. The potential of AI to manner and interpret sporting data at terrific speeds and with incredible accuracy method that we are in the end able to dig into minute element and use it to optimize and ideal our performances. The benefits of AI in sports activities are both unmistakable and far-attaining. Except the more apparent advantages that athletes can gain from gaining knowledge of extra about their capabilities and boundaries than ever before, coaches can now make facts-informed choices about schooling and performances, while lovers can eventually be a part of the at the back of-the-scenes motion too.

FOR ATHLETES AND COACHES

Advanced Personalized Training

Thai-powered athlete monitoring structures can do extra than honestly measure on area overall performance. They are able to hold music of the whole thing occurring off it too. Wearables and different tech can measure everything from stress hundreds to distances blanketed, even as a supplements off-season education schedules and recuperation performance. This allows doctors, physio's, coaches, and the athletes themselves to manipulate their workloads higher. As a end result, they are capable of increase custom designed schooling packages that optimize exercise returns and decrease the chance of or maybe save you damage altogether.

Improved Team Analytics

Coaches can now use AI to make records-pushed, unclouded decisions about individuals, crew performances, or even talent degrees. AI is able to spot things maximum coaches could forget at the same time as making accurate, real-time facts clear to them.

Real-time and Retrospective Analytics-including those of Competing Athletes

Coaches and athletes through induction of AI will now be able to track their performances in real-time, taking decisions on the shift without having to linger for results after the game was over. This means that strategies and plays can be tweaked live, and also, the opponent's techniques can also be tracked and given response within no time.

Player performance

In the case of football, a model must require a copious amount of critical metrics such as the apex of the ball, hang time, time to throw, aggressiveness, and snap to kick rate to train itself. The model's ability to track players and learn player actions. All the sports events are totally depends on biomechanics during the game or during the practice session even tactics and techniques are complete relates with AI.

Training and coaching

Any types of training and coaching based on individuals performance and it is done by the help of AI. Coaches always find out athletes strength, speed, flexibility, agility, and endurance with the help of AI for their optimal result.

Proper health and safety measures

If athletes go with proper nutrients diet as we know it's different for individuals can maintain their health for sports, and also, it is very necessary to follow biomechanical measures to avoid injury during practice session or competitions.

Recruitment

Using fresh and constantly updated data sourced from websites like Transfer Market can provide hint at injured players, or rumors through social media sites that detail likely line-ups in upcoming matches.

Sports prediction

Bettors have for years been trying to process a heap of data in a bid to predict the outcome of future matches and win lots of money. They studied the ratio of first and second serves in tennis, the number of aces, backhand winners, etc., to predict athletic outcomes. However, ultimately, humans cannot process as much data as AI-driven soccer algorithms can predict. Although, AI cannot accurately predict the outcome of every single match either; it can get much closer than a human can with a predicting algorithm.

Physical education

In an era when so much of a child's time is monopolized by sitting in front of digital screens, some parents and educators are urging kids to get up and move. The physical activity industry is growing at a rapid rate of 10% each year. Furthermore, an absolute evaluation is needed to enable learners to experience success in their learning, rather than encouraging competition to determine the pecking order. Absolute assessment should be reviewed and managed by setting standards and levels of proficiency that learners want to achieve. A change in the role of physical education teachers is also required. Their role needs

to shift from that of a "knowledge communicator" who delivers what is set out in a standardized curriculum, to that of learning mentors, coaches, and advisors who help students achieve their learning goals. I have implementing such a learner-centered customized education system propels us toward achieving the ultimate goal of education enabling each learner to succeed.

Result prediction

The artificial neural networks at the core of AI applications, having received the success of deep learning have generated great promise and the sports environment is attractive as an opportunity for model learning. There are a few techniques which can assist more accurate and reliable prediction of results.

Logistic regression

Which helps in predicting results about a team or a particular player. Created in 18th century by Thomas Bayes is a probabilistic prediction model that assumes all features to be conditionally independent from the target variable. This rating system, which is actually based on the pi-rating system, generates a rating score which captures the ability of a team that is relative to the residual teams within a particular league.

Fuzzy logic

Fuzzy logic, among the various available AI techniques, emerges as an approach to computer relates on truth, it can be either true or false.

Expert interviews

The other six were employed at a sports science faculty at a university and thus have their focus in research. Nevertheless, they are still close to sports practice, since they often work directly with national teams in different sports and support them comprehensively. Each interviewed expert can be assigned to the intermediate area between sport and computer science. Appropriate written consent from participants to take part in the interviews and to publish the data has been obtained. The interviews were standardized using a guideline that was to be followed as much as possible in the interview. This section was used to obtain an impression of the advancement of AI in sports. To this end, we asked for technologies used in the four identified methodical categories in sports specifically, which were mentioned in Section Literature Review. The second block was about conditions, which favor or hinder a successful project. The interviewers were asked about their experience in concluded projects, what to take into consideration to carry out a successful project, and what to avoid. We specifically asked what special considerations should be made in the different stakeholders of an AI project – the athlete/coach, the federation's officials, and the developer. In the third block, we asked the interviews' opinion about the meaning of AI for theory building in sports science.

Limitations

In particular, it is not possible to observe other pre-conditions like, the correct sitting position or placement of the feet, which would be important parameters for the application of the implemented models in conjunction with the sensor-equipped leg press machine. Furthermore, the developed routines are not able to directly monitor the posture of the body throughout the movement including, for instance, the knee or upper body and particularly the lower back motions.

CONCLUSION

The use of AI in the field physical education and sports is revolutionizing for optimal performance as well as training purpose. AI has also enhanced the accuracy in sports scores and individual player movements. Moreover, fan habits can be easily predictable through AI. For example, there have been instances where computers and AI even cautions the player if there should be an occurrence of a potential decrease in execution or injury. Thus, human-made reasoning in sport won't be very different than its applications in media and programming for the most part. Wearable tech is another development in AI. in sports that is an incredible prospect for future development. These items can engage wellness lovers just as expert competitors, offering broad market reach.

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Research Article

Skill performance response to the influence of ladder training with small side games of football players

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ABSTRACT

Ladder training is the latest method of multi-directional training program, because the elements of motor components that are strength, power, balance, agility, coordination, joints ability, foot speed, hand eye coordination, and reaction time are increasing. Small sided games develop the motivation to play better and refine their skills in the minds of the children Football is a very fascinating and enjoyable game and every child wants to play it. The purpose of this study was to find out the effects of ladder training with small side games (SSG) on skill performance variables of school level football players. The research was carried out on a sample of 40 sub junior school students. The pretests were conducted for all subjects on all selected variables to collect data. All subjects were divided randomly into two groups as experimental group (20). The training program was performed 60 min/day, 5 days/week for a period of 8 weeks. All selected physical and functional variables were assessed by standard tests; dribbling by Ronaldo speed dribbling test, kicking through McDonald soccer skill test. The 8-week ladder training with SSG was conducted followed by post-test for all selected variables. The result from "t" test and inferred that 8 weeks ladder training with SSG treatment produced identical changes over skill performance variables of school level football players. Hence, the ladder training with SSG program appears to be an effective way of improving skill performance variables of school level football players. Soccer coaches and physical education teachers as well as others involved in coaching one or other game can make use of this information in the process of planning their training program.

Keywords: Dribbling, Kicking and football players, Ladder with small side games

INTRODUCTION

Football is a game which calls for strenuous, continuous thrilling action and therefore appeals to the youth the world over. The skills involved in the game are simple, natural, and yet are highly stimulating and satisfying to anyone who participates in the game." Football as it is popularly called in India is a game where the foot is used much more than any part of the body. Bernard Shaw's comment underlines this reality that "Footballers think with their feet." All players should be aware of both the attacking and defensive principles of play. A player must learn from his own observations and mistakes. The skills acquired will be of little use without fitness necessary to carry them out in a game. Football requires a fairly high standard of fitness along with skill. Kicking is a fundamental and versatile technique used for passing, shooting and clearing. True footballers refer to it as striking the ball because it sounds more controlled. Even though dribbling is one of the most valuable fundamental skills in soccer, when it is done too often and for too long a time, it can completely distort a team's offense or defense pattern. Therefore, it is very important to remember that dribbling is never justified if there is an unguarded teammate waiting for a pass. A safe pass is always better than unnecessary dribble. An important skill in the game of soccer is the ability to kick the ball forcefully and accurately. The kick with run-up produces longer and more powerful kicks than the standing kick. An important aspect of the soccer kick is the interplay between the various muscle groups active in the skill (Yaxley, 1982).

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LADDER TRAINING

Ladder training is the latest method of multidirectional training program, because the elements of motor components that is

strength, power, balance, agility, coordination, joints ability, foot speed, hand eye coordination, and reaction time are increasing. By training, the mind and body to understand a variety of foot combinations. There are mostly four type of basic skill are used while training with ladder. These are runs through ladder, skips, shuffles and jump/hops. Although linear and lateral moments are there. It can be learned in a slow controlled phase.

SMALL SIDE GAMES (SSG)

Small-sided games are games with a small number of players on each side, for example, 3 v 3 or 5 v 5. The key point is that because there are fewer players, each player gets more touches of the ball, and there are many additional benefits. The games in the section below will help players to improve on individual and team skills. They are simple to set up, guarantee more player participation, with more passes attempted, and more goals scored. The typical smaller versions of the game (SSGs) are often used for tens development and used as an alternative to the traditional running-based activities (Dellal *et al.* 2008).

HYPOTHESES

It was hypothesized that the ladder training with SSG would produce similar changes over skill performance variables of school level football players.

METHODS

Forty physically active and interested school level football players were randomly selected as subjects and their age ranged between 14 and 17 years. The subjects are categorized into three groups, namely, ladder with SSG (LWSG) group, and control group (CG) each group had 20 subjects. The selected criterion variables dribbling was assessed by Ronaldo speed dribbling test and kicking was assessed by McDonald soccer skill test. The LWSSG group underwent the experimental treatment for 8 weeks, 5 days/week, and a session on each day with 60 min duration.

LWSSG TRAINING PROGRAMME

The training program was lasted for 60 min for a session in a day, 5 days in a week for a period of 8 weeks duration. These 60 min included LWSSG for 40–50 min and 10 min warm-up, and 10 min warm down. Every 4 weeks of training 5% of intensity of load were increased from 65% to 80% of work load. The volume of LWSSG given based on the number of sets and repetitions. Eight weeks of LWSSG were given to the selected subjects. Their training days and hours every week were from Monday to Friday from 6.00 to 7.30 am.

STATISTICAL ANALYSIS

The means and standard deviations of LWSSG groups were calculated for dribbling and kicking for the pre- as well as post-tests. Statistical significance was set to a priority at $P < 0.05$. All statistical tests were calculated using the Statistical Package for the Social Science.

Table 1 reveals the computation of mean, standard deviation, and "t" ratio on selected variables, namely, dribbling and kicking of LWSSG group. The obtained "t" ratio on dribbling and kicking were 10.28 and 14.69, respectively. The required Table 2 value was 2.09 for the degrees of freedom 1 and 19 at the 0.05 level of significance. Since the obtained "t" values were greater than the table value, it was found to be statistically significant.

From the computation of mean, standard deviation and "t" ratio on selected variables, namely, dribbling and kicking of CG. The obtained "t" ratio on dribbling and passing was 10.28 and 14.69, respectively. The required table value was 2.09 for the degrees of freedom 1 and 19 at the 0.05 level of significance. Since the obtained "t" values were greater than the table value, it was found to be statistically significant [Figures 1 and 2].

DISCUSSION ON FINDINGS

Elite footballers need a blend of science and the art of coaching to plan suitable team and individual drills. The conditioning coach not only prepares players for the demands necessary for training but also familiarizes them with ball striking, discrete

Table 1: Characteristics of training groups (*n*=20) at pre-training mean

Variable	LWSG	CG
Age (Y)	14–16	14–16
Height (cm)	148.30	154.20
Weight (kg)	50	49

Table 2: Computation of "t" ratio on dribbling and kicking of school level football players on ladder with small side games group (Scores in numbers)

Group	Test		Mean	SD	T ratio
Ladder with small side games group	Dribbling	Pre-test	27.85	1.03	10.28*
		Post-test	25.35	1.08	
	Kicking	Pre-test	22.05	1.32	14.69*
		Post-test	26.50	1.48	
Control Group	Dribbling	Pre-test	27.57	0.99	0.99
		Post-test	27.02	0.87	
	Kicking	Pre-test	21.95	1.01	0.76
		Post-test	21.20	0.87	

*Significant level 0.05 level (degree of freedom 2.09, 1 and 19)

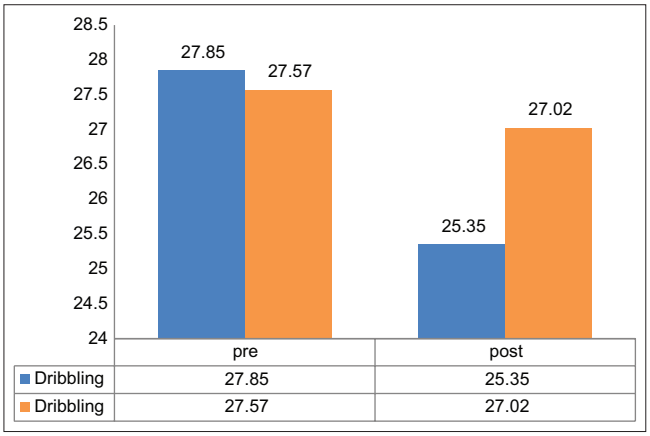

Figure 1: Bar diagram shows the mean values of pre- and post-test on dribbling of experimental and control groups (Scores in Seconds)

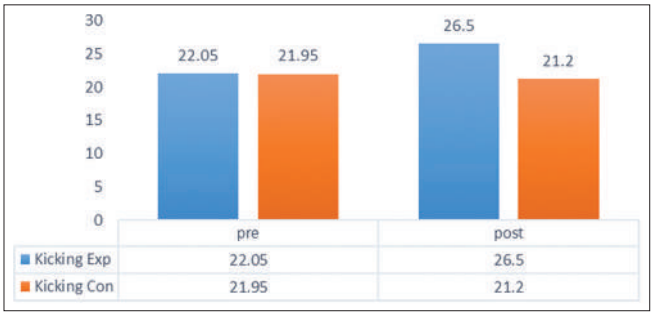

Figure 2: Bar diagram shows the mean values of pre- and post-test on kicking of experimental and control groups (Scores in numbers)

positional movements, orientation of space on the pitch, while providing a reactive stimulus so players are exposed to unrestrained movements when training with additional players. The contemporary study considered the influence of 8 weeks of LWSSG training on skill performance variables of footballers. The results of this study selected that LWSSG training is more efficient to bring out desirable changes over the skill performance variables of the footballers. Investigators have extended their interest to consider the dribbling and passing commencement from the way a footballers approaches the LWSSG training.

The LWSG groups skill performances (dribbling and passing) improved substantially by 8.97% and 15.51%, respectively, and there was a significant difference in the groups. The football requires such as running, jumping, sliding, lunchin and quick changes in direction. It strengthens and tones muscles the resistance of the water means that opposing muscle groups are worked in each movement as you push and pull against it. Like LWSSG training is probably the new found chic workout among the youths. Although initially chose LWSSG training simply as a hobby to developing liking to it. Furthermore, the LWSSG training helps to maintain health and fitness part from making feel bold and equipped. Skill performance variables likes to dribbling and kicking developing the LWSSG training for ladder exercises, sprint movements, scoring results, and running especially for the beginner of footballers. Dribbling can be developed for the LWSSG training likely going to move along the side of the ladder, touching each box with your inside foot, while your outside foot keeps pace. Keep your hips square for the entire drill and with quick, light steps, reach in and out of every box with just your inside foot, improves your movement because you will always be moving to try to get open, or moving to help your team defend well.

Kicking can be developed for the LWSSG training improvement with kick with run-up produces longer and more powerful kicks than the standing kick. An important aspect of the soccer kick is the interplay between the various muscle groups active in the skill. The agonists contract to initiate the movement at each of the joints, but these muscles become the antagonists to slow the rapid angular movements at the joints just before or following release of the ball.

Pre- and post-test dribbling and kicking scores between the experimental and CGs were examined; there was a significant difference in posteromedial and posterior directions.

Cabo *et al*., (2019) study suggests that coordination training with an agility ladder does not seem to be effective to improve physical fitness and dribbling. Therefore, this information could be beneficial to players and coaches for programming tasks during soccer training sessions.

Hammami *et al*., (2018) effective strategy of multicomponent training that can induce greater positive effects on specific skills tasks when compared with interval or agility training and moderate to large improvements in team sport-related physical fitness.

Katis and Kellis three-a-side games provide higher stimulus for physical conditioning and technical improvement than six-a-side games and their use for training young soccer players is recommended.

Ricardo *et al*., (2009) number of players and exercise duration resulted in intensity increases and more frequent individual tactical actions.

Halouani *et al*., examine the optimal periodization strategies of SSG training for the long-term development of physiological capacity, technical skill, and tactical proficiency, while also minimizing the associated risk of injuries.

Musafata (2020) suggest that SBT at maximum intensity may be more effective than SSG in improving the physical performance characteristics of young soccer players in the pre-competitive season.

According to these results, it can be said that regular, structured, and planned aqua aerobic exercises for 8 weeks of footballers who have a positive effect on improving their skill performance changes.

CONCLUSION

From the results of the study and discussion, the following conclusions were drawn.

From the findings, it was concluded that the footballers doing the LWSSG for the more strengthening particularly lower body. Within the limitation and on the basis of the findings, it was very clear that 8 weeks of LWSSG produced significantly changes in the dribbling of footballers. It was clear that 8 weeks of LWSSG produced significant changes in the kicking of footballers. In summary, the results of this study demonstrated that the football coaches should be more on skill performance developing in the training schedule, particularly for footballers.

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Research Article

Effect of yoga on healthy lifestyle

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ABSTRACT

Health and its care have become a global concern. The fast pace of life, sedentary lifestyle, and immoderation in diet, activities, recreation, and sleep are the factors responsible for stressful living and ultimately manifest in diseases. Each time we move into a yoga pose or practice some pranayama, we deepen our ability to control our body, breath, and focus. Likewise, when we dig deeper into the philosophy of yoga, we naturally begin to eat, sleep, love, and think more like yogis. Yoga, an ancient Indian lifestyle-related discipline has been scientifically proven and shown to improve physical, mental, and emotional well-being. Yoga is one of the six foundations of Indian philosophy and has been used for millennia to study, explain, and experience the complexities of the mind and human existence. Stress tends to be either ignored or dismissed by the very people who are best placed to do something about it-managing and senior directors, personnel and training managers, occupational health workers, and departmental managers and supervisors. The opportunity exists for employers and employees to get together and make way for changes that will reduce stress related illness. The Yoga way of life encompasses the philosophy of Karma Yoga (path of detached action), Jnana Yoga (knowledge of self), Bhakti Yoga (trust in the supreme order), and Raja Yoga (asana, pranayama, meditation, etc.). The various meditation techniques work at the mental level; all these practices are intended to develop a certain type of awareness within oneself which in turn brings about a change in their emotional functions.

Keywords: Health, Lifestyle, Yoga

INTRODUCTION

We all know about the importance of exercise in our daily life. Yoga is also simply, a seated 11 training which is very beneficial for health and athletic ability. Regular yoga practice makes our body strong and flexible. Asana improves the stretching and relaxing ability of muscles and is very helpful for skeletal system of human body. This reduces the risk of injuring ligaments and tendon.

Yoga is also helpful for gently stretching of joints and ensures the optimum blood supply to every cell of body. Yoga improves the power of synchronization of the body and mind by systematically contracting and slaying muscle in the coordinate manners. Continuing yoga exercise is the ideal complement to other type of systems of exercises such as running; cycling; and weight training. In yoga practice; the body works systematically. The entire major muscle groups are used. Yoga Asana improves the strength of different body parts such as back, neck, shoulders, deep abdominal, and buttocks muscles. It is a fantastic strengthening practice. It is help for building core strength of body.

Yoga enhances your functionality in everyday life. It also brings nourishment to internal organs of body. “Yoga asana is the physical postures and exercises which tone up and make strong the internal and outer organs of the body.” Yoga exercises helps to improve balance, focus, and coordination of body. There are plenty of yoga asanas which are beneficial for improving balance. Regular practice of yoga improves your concentration that will serve you in everyday life.

Yoga asana helps to comfort of body function and also regulate the hormonal regulation and neural regulation. It also enhances muscular activity. Yoga is very useful for biochemical variable of our body. It is very helpful for maintaining the quantity of glucose, sodium, cholesterol, triglycerides, catecholamines, total white blood cell, and also increases the level of cholinesterase, A.T.P., hemoglobin, lymphocyte, vitamin, total protein, etc.

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Yoga is a way to achieve perfect balance and harmonizing the body emotion. Yogasana, breathing exercises, bandha practices, and shatkarma are the parts of yoga. We realize the higher perception of life with systematic practice of them. Yoga facilitates to make one's life focused, useful, and noble. Thus, yoga is a discipline which influences the progress of our day to day harmony to the human beings by physical practices with or without a toner on spiritualism. Hatha yoga emphasizes our physical health more than other yoga civilization.

The Yogic lifestyle is highly beneficial for ourselves as well as for the world around us. In these times of environmental crisis, if we all take the oath to make a few changes to adopt the yoga lifestyle, we can make the world a better place." I will try to show that this popularly adopted Yogic lifestyle in contemporary times is the revival of an ancient culture. Yoga is an early practice having its origin in the pre-Vedic period and an expansion in the Vedic period. Many ancient scriptures provide ample proof to my claim and substantiate the scope of my research. I shall elaborately discuss and compare the contemporary Yogic lifestyle practices with the instances and principles mentioned and conferred in the scriptures popularly known as Śāstras.

The ancient Indian approach to yoga is a very scientific and practical way of dealing with life. For the ancient yogis, Yoga was not only a part of life; it was a way of life. A deep and profound science of living was explored by the ancient seekers to create the magic of protecting and nurturing of life along with soteriological goals. This particular way of life included a deep investigation and comprehension of the Yogic philosophies, earning of good responses, aligning of the body and mind inside out, exhibiting of kindness toward others, growing of awareness of our environment, and having gratitude for all things that we have around us. This lifestyle is highly beneficial for our own well-being, physical, mental, emotional, and spiritual, as it helps us to be better humans. This revolutionary lifestyle, if we may call so, leads humanity to feel for the planet and the entire cosmos as well.

YOGA

Yoga is the best method in the present days for healthy life. The word yoga comes from the Sanskrit word "yuj" which means join, unite, harness, and "yoke." In ancient India, yoga implied joining or integrating all aspects of life of an individual such as physical, mental, and spiritual. The roots of yoga originated in ancient India. In oral traditions of yogis, the knowledge of yoga was first passed by Lord Shiva to the lives of men. 3 Yoga is also referred in pre-Vedic Indian tradition and also mentioned in Rig-Veda. Yoga is also referred broadly in Hindu Upanishads but the origin of yoga to be much older than that. The chronology of earliest text describing yoga-practices is unclear, varyingly credited to the Upanishads (Singleton, 2010). There are six famous branches of yoga:

Bhakti Yoga

This branch of yoga mostly used in India as a path of heart and devotion.

Raj Yoga

This branch of yoga is related to self-control. Yogis considered it as the king of yoga. Raj yoga practitioners achieve self-respect by learning to be masters.

Jnana Yoga

This branch is related to mind. Yogis who practice this branch focus on mind, intelligence, wisdom, and knowledge.

Karma Yoga

Karma yoga is related to service. Yogis related to this branch believed that one's present situation was based on his past action. If we are doing selfless service in present, our future will be free from negativity and selfishness.

Tantra Yoga

This branch of yoga is mostly misunderstood of all the paths. Tantra yoga is related to using rituals to experience what is scared.

Hatha Yoga

It is the most popular branch of yoga. This branch of yoga includes physical poses or asanas and pranayama.

IN YOGA SUTRA PATANJALI EXPOUNDED THE PRACTICE OF YOGA INTO EIGHT PATH OF SELF SUPERIORITY

1. Yam – Self-restraint – It is related to behavioral commitments. These commitments are Ahinsa (nonviolence), Satya (honesty), Asteya (non-stealing), Brahmacharya (celibacy), and Apaertigraha (non-hoarding)
2. Niyama – Observance of ethical code – Sauch (purity, cleanliness), Santosh (contentment), Tapas (persistent meditation), Svadhyaya (study of self), and IshvaraPranidhana (true self) (Tummers, 2009)
3. Asana – Physical posture – A position used for meditation. (Patanjali`s sutras)
4. Pranayama – Breath control
5. Pratyahara – Abbreviation of senses
6. Dharana – Concentration or focus
7. Dhayana – Meditation (control over sense organs)
8. Samadhi – Blissful awareness if these eight stages of yoga are followed and practiced by man there would be an all round development in life – physically, intellectually and spiritually and man would attain physical and mental equanimity.

- Yoga is the restraint of mental operation (process)
- Yoga is the disconnection of connection with suffering
- Yoga is balance (equanimity)
- Yoga is said to be the unification of the web of dualities.

Yoga can be described in different forms as below

- Bhakti yoga (through devotion)
- Karma yoga (through self-less action)
- Jnana yoga (through self-enquiry and knowing)
- Mantra yoga (through mantra)
- Naada yoga (through transcendental sacred vibrations)
- Raja yoga or Ashtanga yoga (through eight-limb approach), etc.

YOGIC LIFESTYLE

By the term Yogic lifestyle, we can easily understand that it is something different from a normal lifestyle. Normally, the word lifestyle means, a way of living for individuals, families, and societies, which they manifest for coping with their physical, psychological, social, and economic environments on a day-to-day basis. Lifestyle is expressed in both work and leisure behavioral patterns and (on an individual basis) in activities, attitudes, interests, opinions, values, and allocation of expenditures. It also reflects people's self-image or self-concept; the way they see themselves and believe they are seen by the others. Lifestyle is a composite of motivations, needs, and wants and is influenced by factors such as religion, culture, family, reference groups, and social class.

"Lifestyle" generally involves the attitudes, opinions, interests, and behaviors of an individual, a group and a culture. The "lifestyle" shows variations according to gender, age, education, income, place of living (rural or urban), caste, race, religion, and ethnicity. The people belonging to different age groups, gender, income and education groups, caste, religion, rural, and urban settings differ in their attitudes, thinking, behaviors, areas of interests, opinions, eating habits, dressing style, living style, etc. In social interaction, lifestyle becomes a medium by which a person projects one's place in "status hierarchy." In nutshell, we can say that the people belonging to different groups have different "way of living."

Yoga is not only meant for physical or mental exercises. As stated earlier, it is a philosophy – a way of living life. According to Patanjali, the main cause of all our pain and sorrow is Avidya (Ignorance) – lack of awareness. This is the ignorance for awareness and importance of living the life in an ideal manner. Knowingly or unknowingly our lifestyle has become bad and we are facing various kinds of health issues. Moreover, these issues are not restricted to physical (high blood pressure, diabetes, arthritis, obesity, etc.) only. Rather, these consist of mental issues (such as anxiety, stress, depression, lack of confidence, etc.) and social issues (such as crime, homicide, rape, etc.) as well. Health of individuals has a direct relation with the health of a society and ultimately the health of the nation. However, our health is directly related to our way of living, so the root cause of the entire problem is our lifestyle, our beliefs, our values, and these can be termed as our life philosophy. Yoga keeps the body healthy and removes many kinds of physical and mental problems. Yoga makes breathing movements smooth. By taking deep breath during yoga, the body gets stress free. With yoga, blood circulation is smooth and harmful toxins come out from the body, we are giving information about 10 benefits of Yoga practice,

- Whole health
- Weight loss
- Relief from anxiety
- Peace of the heart
- Improve immunity
- Live with more awareness
- Improve relations
- Increase in energy
- Better physical flexibility and seating
- Better Intuition.

The Yoga sadhanas is highly respected by: Yama, Niyama, Asana, Pranayama, Pranahara, Dharana, Dhyana, Samadhi, Bandhas, Mudras, Shatkarmas, Yuktahara, Mantra-Japa, Yukta-karma, and so on. Yamas are constrainments and Niyamas festivals. These are accepted as the pre-supporting requirements of Yogic. Asanas designed to detect body glands and cerebrum, "kuryat-tadasanam-sthairyam," combine to hold securities on physical bodies and provide physical strength (deep acquaintances and human relationships) for a long time.

Pranayama involves influencing the breathing caused by breathing as an important or important factor in displaying a person's behavior. It contributes to the development of human brain acne and creates control over cerebrum. In key areas, this is done by sharing the features shared by "swelling breathing" (svasa-prasvasa) with spices, mouths and other body bags, internal and external processes, and goals. The minimum time for the next time, this is considered to be modified, controlled, controlled, and viewed within the air (svasa) conducting the body space feature (slot), space (s) in full position (in the back), and receiving washing during the control, control and check out (prasvasa). Prahara shows the difference between personal care (withdrawal) from the body's mind associated with the external subjects. Dharana displays a broader field of thinking (inside the body and brain) which is usually obtained by a correction handle. Dhyana (imagination) is a test (mentallyminded) and Samadhi (joining) Bandhas and Mudras are embarrassed with Parana. They look like high yogic tons that have a large portion of the handle found in some near development respiratory controls. This stimulates control over

the brain and draws the highway of Yogic access. In any case, a system related to a sedan, which impels a person to commit himself and leads to the conclusion of a remarkable quality, is regarded as the quintessence of the Yoga Sadhana. Saṭkarmas are expulsion measures that can be found in the environment and help eliminate poisonous substances collected in the body. Yuktahara promotes ready preparation for food and support for a healthy lifestyle.

YOGA BENEFITS IN LIFE

Weight reduction a strong and flexible body, beautiful flashing skin, peaceful mind, good health-whatever you want, yoga gives you. The yoga is only consider partially by some asa but its benefit is calculated only by body level but we are unable to know that yoga gives us the benefit of physical, mental, and respiration. When you are with beautiful thoughts, then life travels peace, happiness, and is more energy filled. It is a certified fact that the special actions of respiration in yoga, meditation, and yoga get relief from stress, eliminating the yoga mind from various disciplines, provides stability, and helps in stabilizing the mind in a particular task. Humans are attracted to something only when they benefit from them. The way we are attracted to yoga is an indication of the fact that yoga has many advantages. Yoga not only strengthens our body, but also strengthens and satisfies the mind and the spiritual force. Yoga also has many benefits in daily life, come Introduce them. Yoga is beneficial and beneficial for all the men and women, children, young, and old. According to body capabilities and elasticity, any change and change can made in yoga. In any case, yoga is beneficial.

A Yogic lifestyle helps to change our attitudes, habits, and general ways of living. The Yogic lifestyle is prescribed by MaharṣiPatanjali in the Yoga Sūtras. Also acclaimed as AṣṭāngaYoga lays focus on different aspects such as behavior, attitude, food, physical, mental, and spiritual well-being. These limbs bring changes in morality and ethics. A healthy diet is necessary for a healthy body. Āsanas, Prāṇāyama, etc., are recommended for the same. Different diseases such as heart disease, diabetes, obesity, arthritis, piles, gastric, and hypertension occur due to lack of physical work. If a person practices, physical movements, and exercise every day, he will not suffer from any disease.

CONCLUSION

Yoga is also helpful for gently stretching of joints and ensures the optimum blood supply to every cell of body. Yoga improves the power of synchronization of the body and mind by systematically contracting and slaying muscle in the coordinate manners. Continuing yoga exercise is the ideal complement to other type of systems of exercises such as running, cycling, and weight training. In yoga practice, the body works systematically. The entire major muscle groups are used. Yoga Asana improves the strength of different body parts such as back, neck, shoulders, deep abdominal, and buttocks muscles. It is a fantastic strengthening practice. It is help for building core strength of body. Yoga enhances your functionality in everyday life. It also brings nourishment to internal organs of body. “Yoga asana are the physical postures and exercises which tone up and make strong the internal and outer organs of the body.” Yoga exercises helps to improve balance, focus, and coordination of body. There are plenty of yoga asanas which are beneficial for improving balance. Regular practice of yoga improves your concentration that will serve you in everyday life. Asana is the third limbs of Astang yoga. It is also called posture. A steady and good posture is very helpful to produces mental and physical equilibrium. With the help of postures, we exercise every muscle, nerve, and glands of body. We discipline our mind, reduce fatigue, and relax the nerves with regular exercises of yoga Asana. Therefore, yoga is very important for living a healthy lifestyle.

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Research Article

Comparative study on anxiety and aggression in between football players of professional colleges and degree colleges in Telangana

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ABSTRACT

The promotion of sport is no longer a matter of dispute. The importance has been recognized by all countries of the world. Performance in sports and games is purely based on one's physical as well as mental capacity. Over the last two decades, psychology has become increasingly involved in athletics and sports. It focuses both on the individual athlete on the team. Psychology involved with athletes' coaches and trainees to enhance athletic performance through improved physical and mental training. Knowledge of psychology helps in understanding each individual anxiety and aggression. Anxiety and aggression play paramount role in sports and two states of mind. The over anxiety individual has a high level of careful and emotional activity with neuromuscular tension that may eventually lead to the individual to the exhausted stage and perhaps to psychosomatic disorder. Aggression is one of those unfortunate terms in the behavioral sciences that have been taken over from everyday language and have variety of meanings.

Keywords: Aggression and football players, Anxiety, Athletes, Coaches, Psychology, Trainees

INTRODUCTION

Anxiety refers to the emotional state of mind where a fear of danger or loss or suffering is a prominent feature and is one of the greatest problems of modern trends in scientific knowledge. The intense anxiety which appears and disappears occasionally in football players is called has free floating anxiety. Aggression is behavior and action that usually seeks to inflect psychological or physical harm either on another person or on some individual possessions or dear one. Aggression is the attitude to dominant the college or opponent by virtue of stronger body and greater ambition.

Some aggression directly inward and in its extreme form may culminate in self destructive behavior including suicide other aggressive behavior is directly outward toward others.

Hypothesis

It was hypothesized that there might not be any significance difference in anxiety and aggression among football players of professional and degree colleges in Telangana.

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METHODOLOGY

The main purpose of the study was to compare the anxiety and aggression among football players of professional and degree colleges for the purpose of the study nearly 130 university, football players from different professional colleges and degree colleges of various universities were selected as subjects. The age group of the subjects was below 25 years.

Anxiety and aggression or the two psychological variables selected to compare the anxiety and aggression of professional and degree college's football players. The players are watched individually without their knowledge when they are performing in the game at the end of the game the layers involved or orally asked the questions which are in the questionnaire and also the questionnaire was served to bring out their responses related to the psychological variable selected. The rate of responses both oral as well as questionnaire are recorded twice and as same responses were all the times the data recognized as reliable.

Analysis of the Data

The psychological variables, namely, anxiety and aggression, were assessed by using analysis of variance. The data were analyzed and dealt whether hypothesis formulated was accepted or rejected.

Table 1: The analysis of data on anxiety between the professional and degree college football players

Source of variance	DF	SS	MS	F ratio
Within the group	148	1819.5	12.29	--
Between the group	1	6.82	6.82	0.55

Table 2: The analysis of data on aggression among professional and degree college football players

Source of variance	DF	SS	MS	OF	TF
Within the group	148	1063.26	7.18	--	--
Between the group	1	2.93	2.93	0.41	3.90

Table 1 shows the analysis of data on anxiety between the professional and degree college football players shows that the calculate value of F ratios is 0.55 which is significant at 0.05 level of confidence.

Hence, it shows that there is no difference in anxiety level between the professional and degree college football players.

Table 2 shows the analysis of data on aggression among professional and degree college football players.

The obtained values of F ratio is 0.41 is significant at 0.05 level. Hence, there is no difference in aggression aware of the professional and degree college football players.

DISCUSSION ON HYPOTHESIS

It was hypothesized that there might not be any significant difference in anxiety and aggression among football players of professional and degree college in Telangana. As the obtained "F" ratio of 0.55 and 0.41 was insignificant at 0.05 level of confidence, the null hypothesis is accepted.

The difference in level of anxiety among professional and degree college players was comparatively insignificant at 0.05 levels. It was also concluded that the difference in level of aggression among professional and degree college players was insignificant at 0.05 levels.

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Research Article

Building, developing, and maintaining a healthy lifestyle for students through the practice of sports activities

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ABSTRACT

A sport occupies a vital role in our lives. It keeps us fit and healthy and makes us active. The secret to having a healthy and positive lifestyle is to have a positive mind and body. Sports is such an activity that it can be taken up by anyone, at any age and at any point in life. Adults, children, and elders - Everyone alike can take part in sports. Nowaday's sports are curricular, cocurricular, and extracurricular activities in schools, universities, and clubs etc. However, in reality, sports play an equally important role as doe's education in a person's life. To achieve overall and all-round development in life, one should be well-versed in both sports and culture. While training sharpens the mind, a sport sharpens the body and fitness. Thus, both are essential. Sports are one such activity which helps us in maintaining a proper physique and a positive mentality. Sports activities and disease prevention is a nowadays worldwide discussed about the problem, many specialists, and researchers embraced the idea that physical activities can develop and maintain the health of the human body. Our study was focused on finding the habits of a group of students from the "Andhra University" at Visakhapatnam regarding physical activities, types of sports activities practiced in leisure time, student's concepts about the values and importance of practicing sports activities, etc. The main method of research was the lifestyle health questionnaire through which we research and investigate some aspects regarding sports activities influence on the level of health and lifestyle. We take a sample of 600 students from all 3 years of study from various departments of our university. The results of the research proved that students are aware of the positive influence of sports activities on the human body.

Keywords: Benefits of sport practice, Healthy lifestyle, Sports activities

INTRODUCTION

"Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." According to the World Health Organization (WHO, 1948).

"It is health that is real wealth and not pieces of gold and silver." According to Mahatma Gandhi (Mahatma Gandhi, 1948).

"The condition of being well or free from disease." According to Merriam Webster online dictionary (Webster online dictionary, 2016).

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Health is a state of physical, mental, and emotional well-being felt by persons of any age in their personal and social life. According to Neacşu, *"the right to health, just as the right to good education, is one of the fundamental rights of any human being"* (Neacşu, 2010).

Promotion of healthy lifestyles has been gaining popularity as a tool for developing public health. Studies indicated that healthy lifestyles enhance lifelong health, increase quality of life, and decrease morbidity and mortality (Ebem, 2007).

Lifestyle choices and individuals' behaviors have the potential to influence health and improve the quality of life (Lyons and Langille, 2000). During the transition from childhood to adulthood, adolescents establish patterns of behavior and make lifestyle choices that affect both their current and future health (Nader *et al*., 2008; Telama, 2009).

Active and health-enhancing leisure time through outdoor physical activities can significantly increase the benefits of physical activities and facilitate adoption of a healthy lifestyle in children and adolescents and can also be combined with the school environment (Fromel, 2017).

There is also evidence that regular physical education may reduce or prevent mild or moderate depression (Yildirim, 2010).

Specialists consider that health is not strictly a medical issue, but also a bio-psycho-social state. In brief, we can state that human health is a combination of several factors: biological, psychological, and social (Zlate, 2010).

Purpose of the Study

The aim of this study is to identify the lifestyle habits of students from "Andhra University" in Visakhapatnam and how sports activities influence their health, lifestyle, and motor development.

METHODOLOGY

The Place of the Research

The research work took place in the university 2022–2023 at the "Andhra University" at Visakhapatnam with students from four departments, i.e., arts, law, engineering, and science.

Sample of the Research

At the experiment attended 600 students from the four departments mentioned above, and answered to the lifestyle habit questionnaire. Approximately, 356 from the total number of those questioned, representing 59% from the total number of students, were female, and 244 students, representing 41% from the total, were male. Department wise participated in our experiment the structure of the sample was: 150 students from the arts represented 25% from the total number of participants, 114 students from the law represented 19%, 138 students from the engineering represented 23% from the total number of participants, 198 students from the science representing 33% from the total sample.

Methods of Research

The method of research used in our experiment was the questionnaire on lifestyle habits with five levels of answers on Likert scale. For the questionnaire of opinions, we used the following references Dragnea (2006), Cârstea (2000), and Ionescu (2012).

We used the following types of scales in building the questionnaire: nominal scale used for the quantitative variables, interval scale used for measuring the level of knowledge and attitudes regarding the items of the questionnaire, and Likert scale with five levels 5 - strongly agree, 4 - agree, 3 - neither agree nor disagree, 2 - disagree, 1 - strongly disagree.

The questionnaire for students had 8 items that followed our research theme and had as aim to discover the lifestyle habits of students regarding sports practice.

ANALYSISIS OF DATA AND RESULT OF THE STUDY

The first step in the research was to administrate a set of questions and to find out the opinions of students regarding the effects of sports activities on their body and mind.

Question 1: Does a sports activity help in improving or maintaining health parameters?

Question 2: Are sports activities important in developing communication, socialization, and making friendships?

Question 3: Does sports activities promote moral values such as self-respect, respect for the others, respect for laws and rules, loyalty, correctitude, dignity, and discipline?

Question 4: Has sports activities real impact on social values such as communication capacity, socialization, respect for the others, respect for the social rules, raised capacity for collaboration, and respect for the colleagues activity?

Question 5: Does the sports activities improve motivation level?

Table 1: Students sample divided on gender and students sample divided on departments

Item	Arts department	Law department	Engineering department	Science department	Grand total
Male	61	57	60	66	244 (40.66%)
Female	89	57	78	132	356 (59.33%)
Total	150 (25%)	114 (19%)	138 (23%)	198 (33%)	600

Table 2: The influence of sports activities on maintaining health parameters

Item	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Male	10 (1.66%)	20 (3.33%)	44 (7.33%)	92 (15.33%)	78 (13%)
Female	06 (01%)	28 (4.66%)	38 (6.33%)	110 (18.33%)	174 (29%)
Total	16 (2.66%)	48 (08%)	82 (13.67%)	202 (33.66%)	252 (42%)

Question 6: Does the sports activities improve the need for constant practice of sports, the desire for self-improvement, and the need for knowing your physical limits?
Question 7: Does the sports activities influence on mental and physical relaxation?
Question 8: Does the sports activities impact on the level of physical fitness?

DISCUSSION

The questionnaire aimed to identify the lifestyle habits of students from "Andhra University," and how sports activities influence their health and motor development. Hence, after questioned the students' sample of the research find out the following:

Table 3: The importance of sports activities on communication, socialization, and making friendships

Item	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Male	24 (04%)	36 (06%)	32 (5.33%)	66 (11%)	86 (14.33%)
Female	30 (05%)	28 (4.66%)	36 (06%)	88 (14.66%)	174 (29%)
Total	54 (09%)	64 (10.66%)	68 (11.33%)	154 (25.66%)	260 (43.33%)

Table 4: The importance of sports activities on moral values

Item	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Male	10 (1.66%)	20 (3.33%)	44 (7.33%)	92 (15.33%)	78 (13%)
Female	06 (01%)	28 (4.66%)	38 (6.33%)	110 (18.33%)	174 (29%)
Total	16 (2.66%)	48 (08%)	82 (13.67%)	202 (33.66%)	252 (42%)

Table 5: The influence of sports activities on social values

Item	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Male	04 (0.66%)	14 (2.33%)	52 (8.66%)	72 (12%)	102 (17%)
Female	14 (2.33%)	22 (3.66%)	44 (7.33%)	78 (13%)	198 (33%)
Total	18 (03%)	36 (06%)	96 (16%)	150 (25%)	300 (50%)

Table 6: The impact of sports activities on motivational level

Item	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Male	10 (1.66%)	20 (3.33%)	40 (6.66%)	70 (11.66%)	104 (17.33%)
Female	18 (03%)	24 (04%)	52 (8.66%)	94 (15.66%)	168 (28%)
Total	28 (4.66%)	44 (7.33%)	92 (15.33%)	164 (27.33%)	272 (45.33%)

Table 7: The impact of sports activities on the level of self-improvement

Item	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Male	6 (01%)	24 (04%)	40 (6.66%)	70 (11.66%)	104 (17.33%)
Female	6 (01%)	40 (6.66%)	66 (11%)	90 (15%)	154 (25.66%)
Total	12 (02%)	64 (10.66%)	106 (17.66%)	160 (26.66%)	258 (43%)

Table 8: The influence of sports activities on mental and physical relaxation

Item	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Male	08 (1.33%)	30 (05%)	60 (10%)	50 (8.33%)	96 (16%)
Female	16 (2.66%)	40 (6.66%)	70 (11.66%)	84 (14%)	146 (24.33%)
Total	24 (04%)	70 (11.66%)	130 (21.66%)	134 (22.33%)	242 (40.33%)

Table 9: The influence of sports activities on mental and physical relaxation

Item	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Male	10 (1.66%)	40 (6.66%)	36 (06%)	64 (10.66%)	94 (15.66%)
Female	20 (3.33%)	44 (7.33%)	66 (11%)	90 (15%)	136 (22.66%)
Total	30 (05%)	84 (14%)	102 (17%)	154 (25.66%)	230 (38.33%)

For the first question regarding the influence of sports activities in improving or maintaining health parameters, the sample of students answered as follows: 16 students, representing 2.66% from the total answered strongly disagree; 48 students, representing 8% from the total answered disagree; 82 students, representing 13.66% from the total answered neither agree nor disagree, 202 students, representing 33.66% from the total answered agree; and 252 students, representing 42% from the total answered strongly agree that the sports activities in maintaining health parameters.

Regarding the second question of the questionnaire that outlined sports activities as an important factor in developing communication, socialization, and making friendships the students answered as follows: 54 students, representing 9%, answered strongly disagree; 64 students, representing 10.66% from the total answered disagree; 68 students, representing 11.33% from the total answered neither agree nor disagree; 154 students, representing 25.66% from the total answered agree; and 260 students, representing 43.33% from the total answered strongly agree that sports activities as an important factor in developing communication, socialization, and making friendships.

Regarding the third question of the questionnaire importance of sports activities on moral values the students answered as follows: 16 students, representing 2.66%, answered strongly disagree; 48 students, representing 8% from the total answered disagree; 82 students, representing 13.67% from the total answered neither agree nor disagree; 202 students, representing 33.66% from the total answered agree; and 252 students, representing 42% from the total amount of students answered strongly agree that the importance of sports activities on moral values.

Regarding the fourth question of the questionnaire influence of sports activities on social values the results were: 18 students, representing 3% from the total answered strongly disagree; 36 students, representing 6% from the total answered disagree; 96 students, representing 16% from the total answered neither agree nor disagree; 150 students, representing 25% from the total answered agree; and 300 students, representing 50% from the total amount of students answered strongly agree, that the influence of sports activities on social values.

Regarding the fifth question of the questionnaire sports activities and their involvement in improving the motivational level students answered as follows: 28 students, representing 4.66% from the total answered strongly disagree; 44 students, representing 7.33% from the total answered disagree; 92 students, representing 15.33% from the total answered neither agree nor disagree; 164 students, representing 27.33% from the total answered agree, and 272 students, representing 45.33% from the total answered strongly agree that sports activities as an very important factor in developing the motivational level.

Regarding the sixth question of the questionnaire sports activities improve the need for constant practice of sport, the desire for self-improvement and the need for knowing your physical limits the students answered as follows: 12 students, representing 2% from the total answered strongly disagree; 64 students, representing 10.66% from the total answered disagree; 106 students, representing 17.66% from the total answered neither agree nor disagree; 160 students, representing 26.66% from the total answered agree; and 258 students, representing 43% from the total answered strongly agree that sports activities very important in self-improvement and the need for knowing the physical limits.

Regarding the seventh question of the questionnaire influence of sports activities on mental and physical relaxation the students answered as follows: 24 students, representing 4% from the total answered strongly disagree; 70 students, representing 11.66% from the total answered disagree; 130 students, representing 21.66% from the total answered neither agree nor disagree; 134 students, representing 22.33% from the total answered agree; and 242 students, representing 40.33% from the total answered strongly agree that sports activities have a very important role in physical and mental relaxation.

Regarding the last question of the questionnaire the impact of sports activities on the level of physical fitness, the students answered as follows: 30 students, representing 5% from the total answered strongly disagree; 84 students, representing 14% from the total answered disagree; 102 students, representing 17% from the total answered neither agree nor disagree; 154 students, representing 25.66% from the total answered agree; and 230 students, representing 38.33% from the total answered strongly agree that sports activities are very important in developing the level of physical fitness.

CONCLUSION

The study focused on finding out the basic habits of students from Andhra University regarding sports activity and students perception about the effects of sports activity on health and other social and moral values.

From the research results we can conclude that the majority of the students know the benefits of practicing sports activities and appreciate their effects.

Besides of the main motive for a practice of sports activity that was analyzed in many other research - the benefit of maintain health, we find out that also socialization and communication and making new friendship is what they are looking for. Furthermore, sports activities in students' opinion have an important role in building strong motivation, mental, and physical relaxation.

Furthermore, other studies analyzed sports effects from a psychological perspective, physically active individuals report higher levels of self-esteem, and lower levels of anxiety, which also have both been associated with improved academic achievement (Flook *et al*., 2005).

One of the main motivations for sport, analyzed and discovered by specialists, is to create a healthy lifestyle through practicing physical exercises. According to experts, a healthy lifestyle is an active process that takes place during ontogenesis, especially during maturity, the genetic inheritance being important and environment norms and values in which individuals live (Sopa *et al*., 2016).

Another study indicated that taking time away from traditional educational pursuits during the school day to spend an hour devoted to physical activity will not adversely influence the performance of traditional educational skills (Carlson *et al*., 2008). Another study concluded that students who participate in physical activity programs in school are less likely to experience adverse health complications resulting from degenerative diseases (Rennie *et al*., 2005). Many of the previous researches have already outlined the positive relationship between academic success and physical activity in the literature (e.g., Tomporowski *et al*., 2008; Chomitz *et al*., 2009; Tagoe and Dake, 2011; Turkmen, 2013).

In order to promote a healthier lifestyle for children, several attempts have been made, and many studies argued that education plays a vital role (James *et al*., 2004; Reynolds *et al*., 2000; Pate *et al*., 2005).

Taras also demonstrated that students who are physically active demonstrate greater attention during class than other students (Taras 2005).

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Research Article

Effect of yogic practice on selected psychological variables among central Telangana girls

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ABSTRACT

Aim: The aim of the study was to examine the scientific approach for the effect of yogic practice on selected psychological variables among central Telangana girls. **Methods:** A sample of one hundred (n = 100) subjects in the age categories of 18–22 years were divided equally into two groups: one experimental group and the other control group. The dependent variable tested for this study was delimited to two psychological variables that are stress and anxiety. The criterion variables chosen were tested with reliable testing tools. Stress was measured with perceived stress questionnaire, and scores were recorded based on the responses. Anxiety was measured with sports anxiety test, and scores were recorded based on the responses. The control group was not given any specific training, whereas the experimental group underwent yogic practice 6 days a week for 12 weeks and 60 min per session. The pre- and post-test data collected were statistically analyzed by applying paired t-test initially to compare the means and t-ratio for significant difference separately for each dependent variable. **Results:** The results of the study indicate that stress and anxiety significantly reduced in the experimental group as a result of participating in the yogic practice. **Conclusion:** It is concluded that yogic practice reduces stress and anxiety.

INTRODUCTION

Life is made up of physical movements. Modern science provides us leisure, comforts, and easier material existence, but it does not give us peace of mind. Scientific advancement is eliminating physical exercise from our day-to-day life. The automotive and the television are the two key contributors to our sedentary lifestyle. The sedentary way of life has a negative effect on the human body and it has been associated with many serious health problems.

The word yoga is derived from the Sanskrit root Yuj. It means the disciplining of the mind, intellect, the emotions, and the will, which yoga presupposes, it means a poise of the soul which enables one to look at life in all its aspects evenly (B. K. S. Iyengar).

In the modern era, the origin of yoga is not usually given much importance. While "Yoga" has now become a veritable household word, knowledge of its roots escapes most people, even many of those practicing it with regularity. Historically, yoga was more than a particular teaching. Yoga, a way of life, a culture, and a lifestyle which encompassed not only techniques, practices, or ideas but also eating habits, bathing habits, prayer, social interaction, and work. The emergence of creativity as the core of technology has added esthetics or a new dimension in the field of science. Hence, yoga has brought a breakthrough in unraveling the hidden dimensions of mind. All those seeking to develop greater critical and creative faculties now have yoga as a new tool.

The emergence of creativity as the core of technology has added esthetics or a new dimension in the field of science. Basically, art has been impregnated into science. The creative and critical faculties of mind lie hidden in the higher state of consciousness. The foundation of arts and science is now being found in deeper states of our consciousness. Hence, yoga has brought a breakthrough in unraveling the hidden dimensions of mind. All those seeking to develop greater critical and creative faculties now have yoga as a new tool.

Stress

The modern man suffers more psychological stress than physical stress. Humans are trying to live a successful life

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as per the expectation and norms of the society and are continually challenged with rapidly accumulating stresses. In this fast-moving social setup, with high standard of living and innumerable changes, the individual has no time to look back and think about what is happening to his body and mind. This accumulated stress for a prolonged period leads him to the so-called stress induced disorders, such as heart attacks, high blood pressure, diabetes, asthma, back pain, and other psychological problems.

A change in attitude and lifestyle is necessary to help the individual to come out of these health hazards and to cope with the future. Traditional yoga philosophy regards human beings as an individual entity. The root cause of ailment of a stress, through the various therapeutic techniques of yoga one can pluck out this cause and can provide health and harmony (Davidson and Neal 1990).

Anxiety

While doing any job when one suspects about the proportion of possibility of success is known as anxiety. Anxiety is a psychological factor that differs from arousal. It encompasses some degrees of activation and an unpleasant emotional state. This form of anxiety is used to describe the combination of intensity of behavior and directional effect or emotion. Anxiety plays an important role in the acquisition of motor skills as well as in athletic performance. Anxiety can either enhance or inhibit performance whether its effect is positive or negative depending on how an individual athlete perceives the situation.

People with low trait levels have been known to perform better in selected motor skills than those with high or trait levels. There is also a positive relationship between participants in athletic competition. A moderate level of anxiety seems best for the acquisition and performance of motor skills. Levels of anxiety either too high or too low tend to inhibit learning and performance (Lewellyn and Blucker, 1974).

METHODS

Selection of Subjects

For the present investigation, 100 girl students of Government College of Physical Education, Domalguda, Hyderabad, were selected randomly. Their age ranged between 18 and 22 years. The subjects were assigned to two groups with 50 each, Group I was experimental and Group II a control group. Yogic practices were given to Group I. No training was provided to Group II. The duration of the training period was 12 weeks, and the number of sessions per week was confined to 6 days which was considered adequate enough to cause change in selected dependent variables. Each session lasted for 1 h. Pre-test and post-test were conducted to the control and experimental groups. The instrument used in obtaining data of each player's stress and anxiety was Perceived Stress Questionnaire and Sports Competition Anxiety Test; scores were recorded based on the responses. The data collected from the groups on selected variable were statistically examined to find out whether there was any significant difference between the pre- and post-test for experimental and control groups using statistical technique of t-test and then comparing the mean scores and t-ratio for significant differences. The level of significance was fixed at 0.05 level of confidence.

RESULTS

Table 1 shows the effect of yogic practices on experimental groups than control groups on stress among central Telangana girls.

Table 1 shows that stress of the selected sample in experimental group, pretest mean is 0.534 with 0.113 S. D, and posttest mean is 0.500 with 0.101 S.D. From the t-test calculated value is 7.796 greater than table value 2.011 at 49 D.f. with 0.05 α. Hence, there is a significant improvement of yogic practices on stress pre- to post-test in the experimental group.

Whereas the selected variable, stress of selected women in control group shows that pretest mean is 0.549 with 0.098 S. D and posttest mean is 0.547 with 0.099 S.D. From the t-test calculated value is 1.593 less than table value 2.011 at 49 D.f. with 0.05 α. Hence, there is no significant improvement of yogic practices on stress pre-test and post-test in the control group.

The above table clearly shows that there is a significant effect of yogic practices in relation to stress in the experimental group than control group among central Telangana girls.

Figure 1 shows the effect of yogic practices on experimental groups than control groups on stress among central Telangana girls.

Table 2 shows the effect of yogic practices on experimental groups than control groups on anxiety among central Telangana girls.

Table 2 shows that anxiety of the selected sample in experimental group, pretest mean is 19.46 with 2.509 S. D and posttest mean is 18.16 with 1.993 S.D. From the t-test calculated value is 10.111 greater than table value (2.011) at 49 D.f. with 0.05 α. Hence, there is a significant improvement of yogic practices on anxiety pre- to post-test in the experimental group.

Whereas the selected variable anxiety of selected women in the control group shows that pre-test mean is 20.08 with

Table 1: The effect of yogic practices on experimental groups than control groups on stress

Group	N	Pre test		Post test		Mean diff	t-value	df	Sig. (2-tailed)	Inference
		Mean	SD	Mean	SD					
Experimental group	50	0.534	0.113	0.500	0.101	0.034	7.796	49	0.000	S*
Control group	50	0.549	0.098	0.547	0.099	0.001	1.593	49	0.118	NS

*A table value of 2.011 is needed at 49 df, at a 0.05 level of confidence indicates significance

Table 2: The effect of yogic practices on experimental groups than control groups on anxiety

Group	N	Pre test		Post test		Mean diff	t-value	df	Sig. (2-tailed)	Inference
		Mean	SD	Mean	SD					
Experimental group	50	19.46	2.509	18.16	1.993	1.300	10.111	49	0.000	S*
Control group	50	20.08	2.784	19.84	2.244	0.240	0.966	49	0.339	NS

*A table value of 2.011 is needed at 49 df, at a 0.05 level of confidence indicates significance

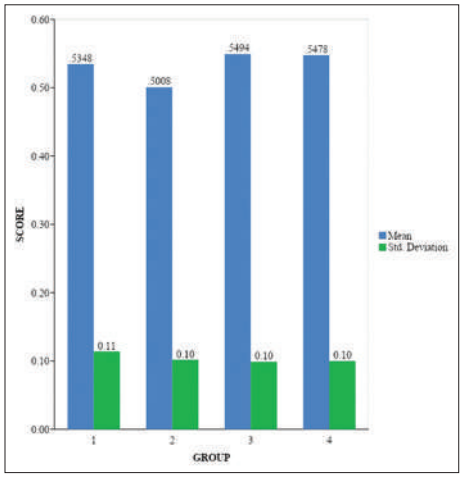

Figure 1: The Effect of Yogic practices on experimental groups than control groups on Stress

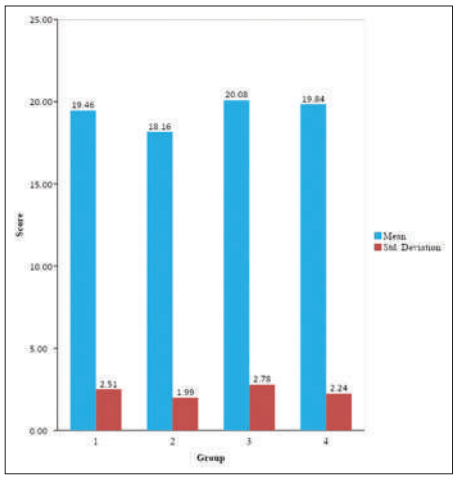

Figure 2: The effect of yogic practices on experimental groups than control groups on anxiety

2.784 S. D and post-test mean is 19.84 with 2.244 S.D. From the t-test calculated value is 0.966 less than table value (2.011) at 49 D.f. with 0.05 α. Hence, there is no significant improvement of yogic practices on anxiety pre-test and post-test in the control group.

The above table clearly shows that there is a significant impact of yogic practices in relation to anxiety in the experimental group than control group among central Telangana girls.

Figure 2 shows the effect of yogic practices on experimental groups than control groups on the anxiety among central Telangana girls.

DISCUSSION

The main aim of the study was to find out the effect of yogic practices on selected psychological variables of the girls. All the subjects took part in their regular Yogic training program. Yogic practice proved that the nature of yoga is controlling the mind and central nervous system, and unlike other sports, it has a moderating effect on the nervous system, the hormonal emissions, physiological factors, and regulation of nerve impulses; therefore, it can be effective in improving depression and mental disorders. Our results indicate yogic training significantly reduces the measures of stress and anxiety. Thus, 12 weeks of practicing yoga reduced the stress and anxiety of experimental group training athletes.

CONCLUSION

Within the limitations of the study and on the basis of the obtained results, it was concluded that the 12 weeks of yogic practice had significantly reduced stress and anxiety among central Telangana girls.

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Review Article

Effect of exercise on human hormones

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ABSTRACT

Our endocrine system consists of glands that release hormones that control physiological functions in our body. Exercise positively boosts the number of hormones circulating in our body and strengthens receptor sites on target organ cells, exercise can improve organs function, physical appearance, and our state of mind, vigorous exercise in particular might improve endocrine function.

Keywords: Exercise, Hormones

INTRODUCTION

Exercise can stimulate our anterior pituitary gland, its release the luteinizing hormone specially this hormone release when we lifting heavy weights and luteinizing hormone triggers testosterone production, intensive exercise also stimulates the thyroid gland to release of thyroxine hormone, exercise can help to control weight and reduce our weight, exercise can increase insulin levels by reducing blood concentrations of insulin, blood insulin levels begin decreasing after 10 min of aerobic exercise, exercise can help releases epinephrine through adrenal gland and epinephrine increases the about of blood that our heart pumps, exercise effects on our endocrine system might positively effect our mental state, while exercising pituitary gland produces endorphin hormone and its block our sensitivity to pain and can reduce tension or anxiety by inducing a sense of euphoria, exercise can more effect in women hormone than men hormones, exercise can influence prolactin hormone, prolactin known as luteotropic hormone or luteotropin hormone is a protein that in human is best known for its role is enabling female mammals to produce milk, high prolactin levels can also contribute mental health issues, prolactin hormone level can rise after exercise, moderate exercise can influence secretion of women hormones specially follicle stimulating hormone, luteinizing hormone, estrogen, and progesterone, regular physical exercise can positively influence the basal level of serum prolactin hormone in the young women.

Now a days, moderation leads to no physical activity or physical movement in every sphere of human population, so many scientific reports indicted that a less in physical activity in adolescent population, the people decrease their activity because of automation and different types of electrical and electronic gadgets, now world is faced with an epidemic of metabolic diseases such as obesity and Type 2 diabetes. This is due to changes in food habits and the less in physical activity. Exercise is usually part of the prescription, the first line of defense, to prevent or treat metabolic disorders. However, we are still learning how and why exercise provides metabolic benefits in human health. This open access volume focuses on the cellular and molecular pathways that link exercise, muscle biology, hormones, and metabolism. This will include novel “myokines” that might act as new therapeutic agents in the future. Exercise can affect hormones in different ways depending on the duration, load, type of intensity, and exercises. Exercise can increase dopamine hormone secretion to decreases stress and depression. Serotonin hormone can improve mood and sleep quality with the effect of exercise. Exercise can influence testosterone hormone to improve muscle mass, muscle strength, sex drive, and sperm count in men. Exercise has numerous effects on hormone balance in both the female and male body. The available research supports a combination of aerobic exercise and strength training for optimal hormone health. It is important to remember that engaging in too much exercise can be detrimental to hormone health and it is vital that one makes

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sure to fuel their body appropriately for the given activities, they are engaging in.

MAINLY EXERCISE MAY INFLUENCE BELLOW MENTIONED HUMAN HORMONES

Insulin

Insulin is a peptide hormone produced by the pancreas gland; insulin regulates carbohydrates and fat metabolism. When blood sugar is elevated, insulin is released to promote the absorption and storage of glycogen and glucose. Insulin helps to decrease levels of glucose in the blood by promoting its absorption from the bloodstream to muscles of skeletal or fat tissues. It is important to know that insulin can cause fat to be stored in adipose tissue instead of being used to fuel muscular activity. When exercise starts, the sympathetic nervous system suppresses the release of insulin consequently, it is most important to avoid food with high levels of sugar before exercise because it can elevate insulin levels and promote glycogen storage instead of allowing it to be used to fuel physical activity.

Epinephrine and Norepinephrine

These amine hormones play a major role in helping the sympathetic nervous system produces energy and in synchronize the body's function during cardiorespiratory exercise. Classified as catecholamines, epinephrine, and norepinephrine are separate but related hormones. Epinephrine often referred to as adrenaline because it is produced by the adrenal gland, elevates cardiac output, increases blood sugar, promotes the breakdown of glycogen for energy, and holds up fat metabolism. Norepinephrine carries out a number of the same functions as epinephrine, while also constricting blood vessels in parts of the body not involved in exercise.

Glucagon

Released in response to short levels of blood sugar, glucagon is produced by the pancreas to stimulate the release of free fatty acids from adipose tissue and increase blood glucose levels, both of which are important for fueling exercise activity. As glycogen levels are exhaust during exercise, glucagon releases additional glycogen stored in the liver.

Testosterone

Testosterone is a steroid hormone produced by the Leydig cells of the testes in males and the ovaries of females, with small amounts produced by the adrenal glands of both genders. Testosterone is responsible for muscle protein resynthesis and the repair of muscle proteins damaged by exercise and plays a significant role in helping to grow skeletal muscle. Testosterone works with specific receptor sights and is produced in response to exercise that damages muscle proteins.

Cortisol

Cortisol is a catabolic steroid hormone produced by the adrenal gland in reciprocation to stress, low blood sugar, and exercise. It assists energy metabolism during long periods of exercise by ease the breakdown of triglyceride and protein to create the glucose necessary to help fuel exercise. Cortisol is released when the body involvement too much physical stress or is not enough recovered from a previous workout. While cortisol helps to upgrade fat metabolism, exercising for too long can elevate levels of cortisol to catabolize muscle protein for fuel instead of conserving it to be used to repair damaged tissues.

Human Growth Hormone

Human growth hormone is an anabolic peptide hormone produced by the anterior pituitary gland that stimulates cellular growth. Like all hormones, HGH works with specific receptor sites and can produce a number of responses, including increasing muscle protein synthesis responsible for muscle growth, increasing bone mineralization, supporting immune system function, and promoting lipolysis or fat metabolism. The body produces HGH during the REM cycles of sleep and is stimulated by high-intensity exercise such as heavy strength training, explosive power training or cardiorespiratory exercise at or above the onset of blood lactate.

CONCLUSION

The present world is a competitive mode and everyone facing physical and mental stress, the changes in the social life, food habits, and in activity may aggregate the whole situation, regular exercise and sports habits may improve their lifestyle and certainly psychological well-being and physiological condition is being improved.

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Research Article

Effect of plyometric training on vertical jumping ability among volleyball players of Adikavi Nannaya University, Rajahmundry Andhra Pradesh

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ABSTRACT

The purpose of the present study is to find out the effect of plyometric training for development of vertical jumping ability among male volleyball players of Adikavi Nannaya University. The subject was chosen at random from a group of boys between the ages of 19 and 21 years old. *n* = 20 Experimental Group I and *n* = 20 Control Group II are included in the study's sample. Vertical jump test was utilized in the study as a pre-test and post-test to determine vertical jumping in both groups. Experiment group I received plyometric training on alternate days for 8 weeks, while control group II received general warm-up training. The experimental group's performance on the vertical jump improved from pre-test to post-test. It is concluded that significant effect in experimental group I t whereas the control group exhibits a reduction in their performance.

Keywords: Plyometric training, Vertical jump, Volleyball

INTRODUCTION

Volleyball is a team sport in which two teams of six players are separated by a net. Each team tries to score points by grounding a ball on the other team's court under organized rules. It has been a part of the official program of the Summer Olympic Games since Tokyo 1964. Beach volleyball was introduced to the program at the Atlanta 1996. The adapted version of volleyball at the Summer Paralympic Games is volleyball. The complete set of rules is extensive, but play essentially proceeds as follows: a player on one of the teams begins a "rally" by serving the ball (tossing or releasing it and then hitting it with a hand or arm), from behind the back boundary line of the court, over the net, and into the receiving team's court.[3] The receiving team must not let the ball be grounded within their court. The team may touch the ball up to 3 times to return the ball to the other side of the court, but individual players may not touch the ball twice consecutively. Typically, the first two touches are used to set up for an attack. An attack is an attempt to direct the ball back over the net in such a way that the team receiving the ball is unable to pass the ball and continue the rally, thus, losing the point. The team that wins the rally is awarded a point and serves the ball to start the next rally.

Plyometrics, also known as jump training or plyos, are exercises in which muscles exert maximum force in short intervals of time, with the goal of increasing power (speed-strength). This training focuses on learning to move from a muscle extension to a contraction in a rapid or "explosive" manner, such as in specialized repeated jumping. Plyometrics are primarily used by athletes, especially martial artists, sprinters, arm wrestlers, and high jumpers, to improve performance, and are used in the fitness field to a much lesser degree. Plyometrics includes explosive exercises to activate the quick response and elastic properties of the major muscles. It was initially adopted by Soviet Olympians in the 1950s, and then by sportspeople worldwide. Sports using plyometrics include basketball, tennis, badminton, squash, and volleyball as well as the various codes of football. The term "plyometrics" was coined by feed wilt after watching Soviet athletes prepare for their events in track and field. He began a collaboration with trainer Michael to promote plyometrics.

Asheervatham *et al*. (2019), the principle of the study was to access to effect of plyometric training and aqua plyometric training on muscular endurance and explosive power among junior long

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jumpers. Forty-five long jumpers from Chennai region at age ranged between 14 and 17 years. The selected subject was assigned into three equal groups with 15 subjects with each group. The experimental group-I plyometric group and experimental group-II aqua plyometric training and control group. The experimental groups were under 12 weeks of training and control group was not under experimentation. Muscular endurance was measured by sit-ups test and explosive power was measured by standing broad jump was taken for both groups. The initial and the final readings derived from the experimental and the control group underwent a procedure of statistical analysis using ANCOVA. The confidence level was 0.05. These finding suggest that the plyometric training and aqua plyometric training program has a statistically significant influence in developing the selected criterion variables.

Objective of the Study

The objective of the study is to find out the effect of plyometric training on the development of vertical jumping ability among volleyball players of Adikavi Nannaya University AP.

Hypothesis

It was hypothesized that there would be a significant difference in plyometric training development vertical jumping ability among volleyball players of Adikavi Nannaya University AP.

METHODS

The purpose of the present study is to find out the effect of plyometric training for development of vertical jumping ability among volleyball players of Adikavi Nannaya University. The subject was chosen at random from a group of boys between the ages of 19 and 21 years old. $n = 20$ Experimental Group I and $n = 20$ Control Group II are included in the study's sample.

Tools

Vertical jump

Purpose of the test: To measure vertical jumping ability.

RESULTS

Paired samples statistics				
Vertical jump	**Mean**	***n***	**SD**	**Standard error mean**
Control group				
Pre-test	53.2500	20	1.12974	0.25262
Post-test	53.1000	20	1.29371	0.28928
Experimental group				
Pre-test	53.2500	20	1.12974	0.25262
Post-test	55.4750	20	0.99307	0.22206

The analysis of the data reveals that the subjects with the plyometric training have shown improvement in the performance of vertical jump test from pre to post-test mean SD experimental group pre-test result shown (53.2500) and controlled group (53.2500) after 8 weeks of specific of plyometric training that there is improvement in the subject's experimental group (55.475) and controlled group (53.1000).

CONCLUSION AND RECOMMENDATION

As for the practicality of this study which may applied when designing, the effective plyometric training programmed for young volleyball players. I clearly mention that the plyometric training has shown excellent effect in the improvement in vertical jumping ability. Coaches will be able to analyzed the results and be able to enhance the future performances. At such feedback is very crucial for the improvement in performance athlete. I concluded the assessment process can be conducted every 3 months and 6 months to update the progress of players performance and to ensure that it is up to date with the players training needs requirements. It is recommended that coaches assess their player's performance on a regular basis to ensure better compliance with the training program. The aim of formulating the effect of plyometric training exercise to betterment and enhance their performance as well as guide line for athlete coaches at various level in preparing and designing quality and effective training program.

Recommendations

The following suggestions are made for the benefit of players, coach's academicians, and sports scientists. The researcher suggests the part of the coach to use the above-said development of the plyometric training program for volleyball players. The study helps the physical educationist and coaches for selecting the athletes.

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Research Article

Values of Family Support to Athletes in Nepal

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ABSTRACT

Family support is supposed to be one of the important encouraging factors for athletes. Nepal's 221 athletes, practicing for the Ninth National Game held in November 2022, were included in a survey to assess the level of support rendered to them by the family. Supports were measured through encouragement, material, and financial assistance as well as feeling of happiness with their involvement in sports. All these variables were arranged in Likert Scaling and later they were merged together for creating combined indices. A follow-up qualitative information suggested that family members support in material terms but the sociopsychological state of the members was reported much encouraging for the athletes involved in individual games. Athletes of team games had low scores of supports obtained from family compared to others. Similarly, Dalits and Tribal (Indigenous or Janajati) groups were much supportive to their athlete members than "Others." There is a need for programs boosting up the morale of the family members that further support the athletes.

Keywords: Nepal, Sports, Supports to athletes

THE BACKGROUND ISSUES

Without family and community support, the sports persons cannot perform to an expected level. There are limitations of each performance; however, a sportsperson is needed to be backed up by the family, peer groups, coaches, and trainers as well as the managers for the best performance they could. A nexus of family organization, power relationships with the family structure, and interplay of sportsperson with decision makers of families have a meaningful relationship for the construction of their psychological and physiological ability to cope the competition that ensues in desired performance. Family is thus a unit that renders resources, pays for sorrows and pains, and enjoys the success of an athlete in the fullest as well.

The decision-making process of family makes a child sportsperson. It includes social and societal interactions in the neighborhood and kith and kinship surroundings. Such a surrounding may be affected by their ethnicity, educational level of members, sex of the persons and athlete member, strength of the determination of sports-seeking, or advocating members. The sibling effect of "mounting unusual expenses to someone" can be a devastating issue that even brings dispute and broken relationships. A sportsperson has to pay the social price of his/her selection for the court/yard or the playground. Medals have smiled in the face-values but they might have stood on the backgrounds of tears behind the curtain.

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Objectives

General objective of this paper is to examine the level of support to athletes from the society that plays a key role in boosting up the psychology of player. However, the following specific objectives are set for this analysis.

1. To evaluate the perception of athletes towards family members for obtaining the support
2. To assess the familial support to athletes by ethnicity and education, and
3. To examine the familial support by types of games of the athletes.

Significance of the Study

Agencies related to society, communities, family, and peer group as well as the trainers and coaches can be benefitted from the findings of this study. Managerial sector can coordinate and set the milieu accordingly and have the best performance in the national and international competitions.

RELATED LITERATURE

Family network for athletes is important for their performance. A study conducted in 20 athletes and 17 mothers in Spain showed that mothers are more worried about the performances of daughter in sports as well as in academic sphere compared to the fathers. This study had a few number of cases but it analyzed extensively the negative and positive psychological stress. It also mentioned the sacrifice of mother and the family in terms of time, economic resources, and emotional discharges (Palomo-Nieto *et al*., 2016). A study conducted in Poland revealed that besides providing instrumental support, parents also play an important role as role models, especially if they have sports-related experience or their interest in sports is seen in action, by which the athletes will have more confidence and high morale to face the competition (Siekańska, 2012:381).

The developmental model of Wylleman and Lavallee (2004) depicted sports career progression based on Bloom's (1985) three stages of talent development. Modifying the earlier one, Wylleman and Lavallee's model presents four different levels of an athlete's development through their athletic careers: Athletic, psychological, psychosocial, and academic and vocational levels (Park and Kim, 2014:118–119). These levels of development have grounds in the milieu of family and community. The intensity of influence is obviously high in the level of the surroundings of parents, siblings, and other relatives within the frame of family. Lundy *et al*. (2019:90–91) found that stable interactions and positive relations are important to determine the desired level of physical activity, sports participation, and obviously the performance of an athlete. Not only in Canada, the source of data of 10 selected varsity students, the stable family context with maintained family values as guiding principles are equally important in the changing family structures in South Asian context. They have concluded that parent and sibling influences may have a more direct impact on athletic progression through the provision of guidance, support, motivation, and competition.

There are several families that have gave up their other interests and motives but fully supported to boost the career of the athlete children. Some of the examples are notable for Indian athletes as for Badminton player Saina Nehwal, whose family moved from Haryana to Hyderabad; the struggle of the family of fencer Josna Jose, and swimmer Anshul Kothari are notable (Banerjee, 2019). Similarly, Deekshya Tamang, a table tennis player in Nepal is unconditionally supported by her taxi-driver father and all family for her success (Dahal, 2019). These are only a few representative cases. The supports of family are the foundations for the success of a player; however, there are no smooth pathways equal to all.

Support from family includes the supports from siblings too. Studies have indicated that there also exists rivalry relationship between two siblings with smaller age gap; however, with higher gap in age, there would be cooperative and supportive role of siblings (Taylor *et al*., 2021:3).

Ultimately, the political commitment of the leaders is important to make families also supportive to their members. Families strengthened by institutional support systems would sustain with capacities to assist their athlete members. For this reason, the commitments of politicians have equal meaning to boost the area of sports worldwide. The Nepalese former prime-minister KPOli is one of the advocates of sports and Yoga in Nepal and has been insisting families to support their members join and achieve best results in sports. A prestigious KPOli Cup tournament is organized to boost football in Nepal (TKP, 2023). The Indian Prime-minister Narendra Modi was reported urging the parents to bring their children in sports in the country (Sarkar, 2016). Similarly, The Bangladeshi prime minister Begum Hasina in 2022 publically urged the parents to send their children to the arena of sports. Although it was intended to make the children refrained from addiction to the mobile-phones, laptop, iPad, or other devices for their mental well-being; however, it was one of the strong messages in South Asian countries by one of the heads of the governments. In the same way, the Bhutanese government offered tax exemption for Cricket players (TB, 2019) and Sri Lankan (CERI, 2018) government brought a program to insist children and other citizens to join sports.

DATA AND METHODS

Research Design

It is a cross-sectional and descriptive study that collects information in one-time survey by administering the structured short questionnaire with some limited variables. Since some personal cases of the athletes are also collected along with a few key informant interviews this work bears the quality of a mixed study blended with both quantitative and qualitative characteristics.

The Sample

All known 19 training centers run by the Nepal Sports Council (4), Nepal Army (NA) (1), Nepal Police (NP) (1), private agencies (12), and community (1) operated were visited to meet the participating athletes. Altogether, in these 19 different centers in Kathmandu and Lalitpur area within a period of the 3rd and 4th weeks (17th Sunday to 31st Sunday) in July 2022 the players associated with Armed Police Force (APF) and other agencies were also met by the researcher. There were shifts of trainings and to avoid similar kind of trainees, only one visit and only one shift in a center were considered. Some others were also included who were in practice but not targeting for the national games. Altogether, 221 respondents were included in the study.

Tools

A quantitative and structured questionnaire was used. The mode was mostly self-administrated and only a few were supported for better understanding and clarity of the issues. There were also some items of qualitative information collected to support to the study based on the major broader themes of the topics covered in the questionnaire.

Ethical Considerations

Respondents were visited to their respective places but they were not asked to visit to the place of researcher. They were not disturbed during their training. They were included only after permission of their coaches. All of them were 18 years of age and above. They were not paid for the information they provided, neither they were given some pressure from their coaches, managers, or other seniors or by the researcher. Confidentiality of the information was ensured. They were requested to mention their nick-names or acronyms instead of the real ones but were urged to provide reality-based answers.

Scheme of Analysis

Quantitative questionnaire included a series of multiple answer questions about *how much supports is obtained* to athletes by the individuals and institutions with answer alternatives crafted in 4-point Likert Scaling as Perfectly Yes, Somewhat Yes, Somewhat No, Extremely No. In the stage of constructing Index of supports, former two were assigned "1" and later two were assigned "0." The "Index of Family Supports" combined the values for Father and Grandfather, Mother and Grandmother, Brothers, Sisters, Spouse, Other Relatives, and Son-Daughters. Thus, a separate index was created that in the form of an interval scale variable that is used to derive mean and dispersion and test for correlations.

BACKGROUND OF THE ATHLETES

Some socioeconomic and participatory background variables of the athletes influence their ability, determinism, and psychological state before they are down to the ground, court, yard, or the ring. Therefore, a glimpse of few background variables is presented in consequent sub-section.

Social Composition - Ethnic and Educational Characteristics

Dalits participants were in a fewer number (8) compared to Others (Brahmin, Kshatriya, and Sanyasis) (91), and Indigenous Tribes (122). Although there is almost 12+ percent share of Dalits in Nepal's population, the low level of their participation in sports needs some intervention [Table 1]. Similarly, 69.7% of respondents had only Plus 2 level of education that indicated low level of education among the athletes in Nepal, which again needs some policy intervention [Table 2].

Professional and Institutional Affiliations

More than half of the sportsperson (51.6%) were collectively affiliated to NA, NP, and APF. Clubs and others were the establishment agencies for 86 athletes and only 21 were directly with the Central, Provincial,or District level units of National Sports Council and their affiliated associations.

A message is if disseminated with this data that a person needs to join security services for grabbing opportunities in sports –

Table 1: Composition of respondents by ethnicity, athletes practicing for national games, Nepal, 2022

Ethnic background	Sex					
	Female		Male		Total	
	Cases	Percent	Cases	Percent	Cases	Percent
Dalits	5	4.1	3	3.0	8	3.6
Indigenous tribes	72	59.0	50	50.5	122	55.2
Others	45	36.9	46	46.5	91	41.2
Total	122	100.0	99	100.0	221	100.0

Source: Field Survey, 2022

Table 2: Educational level of athletes practicing for national games, Nepal, 2022

Educational level	Sex					
	Female		Male		Total	
	Cases	Percent	Cases	Percent	Cases	Percent
Up to SEE	32	26.2	31	31.3	63	28.5
Plus 2	48	39.3	43	43.4	91	41.2
Bachelor plus	42	34.4	25	25.3	67	30.3
Total	122	100.0	99	100.0	221	100.0

Source: Field Survey, 2022

that would be an unjustifiable statement [Table 3]. The reason is that all the talents outside these security services will be discriminated. Moreover, this scenario may be similar to other countries in South Asia.

INSPIRATION AND SUPPORTS TO ATHLETES

Inspiration, motivation, and supports have utmost importance for achievements to the players. Successes are hidden behind these psychological factors that are translated in the physical form as performances. However, half (50.9%) of the sportspersons in Nepal considered themselves as inspirations. Male athletes were even more in numbers (58.3%) considering themselves as source of inspiration compared to their female (44.8%) female counterparts. Coaches or trainers (16.5%), siblings (10.8%), and father (10.4%) were inspirations following the previous ones simultaneously [Table 4]. This scenario has raised issues from both sides. Are the parents shifting towards their busy lives and largely failed to inspire their descendants to participate in the sports? Or is there the ground sufficed to depict a shift of society, mostly the urbanite ones from a coherent family circumstances to individualized and self-centered ones? A sociological interpretation could illustrate it as distorted family and interpersonal relations in the society.

There was the gloomy picture of relationship in family and surroundings that may be attributed to westernization or modernization. A question was cross-checking the psychological state of the athletes by asking them – if in case you win a medal, to whom the medal will be dedicated? Surprisingly, the answer was affirmative toward parents (29.6%), mother (26.7%), family (16.7%), father (9.0%), and none (7.2%). Rest of the other (11%) was distributed to many. The responses were further classified by sex of the respondents and was found that the female athletes were much dissatisfied with family compared to their male counterparts. Only 28.7% of females and 30.3% males desired to dedicate their medals to parents. For mothers, there were slightly more females (27.9%) than males (25.3%), but dedication of expected medals to father was reduced to 8.2% for females and 10.1% to males [Table 5]. As literature also suggested the role of father as supporting agent for sports participation has been reduced over the time in South Asian continent.

Index of Family Support to Athletes

Liberal to girls and youngsters

The composite index constructed for family that combined all relatives together as mentioned in earlier section (3.5 Scheme of Analysis) is observed as slightly more supportive to females (mean = 0.5003) than males (mean = 0.4719). Among the

Table 3: Institutional affiliation by sex and ethnicity of respondent athletes practicing for national games, Nepal, 2022

Affiliation category	Sex					
	Female		Male		Total	
	n	%	*n*	%	*n*	%
Departmental NA-NP-APF	58	47.5	56	56.6	114	51.6
Sports Council Related Pr-Di	10	8.2	11	11.1	21	9.5
Clubs and Others	54	44.3	32	32.3	86	38.9
Total	122	100.0	99	100.0	221	100.0

Source: Field Survey, 2022. NA: Nepal army, NP: Nepal police, APF: Armed police force, Pr: Provincial, Dr: District

Table 4: Inspirations for sportspersonship to athletes practicing for national games, Nepal, 2022

Inspiration	Sex					
	Female		Male		Total	
	n	%	*n*	%	*n*	%
Self	52	44.8	56	58.3	108	50.9
Coach Trainer	20	17.2	15	15.6	35	16.5
Siblings	17	14.7	6	6.3	23	10.8
Father	13	11.2	9	9.4	22	10.4
Mother	8	6.9	7	7.3	15	7.1
Friends	5	4.3	1	1.0	6	2.8
Spouse	0	0.0	1	1.0	1	0.5
Others	1	0.9	1	1.0	2	0.9
Total	116	100.0	96	100.0	212	100.0

Source: Source: Field Survey, 2022. Note: Nine non-reported cases are omitted, n = 221

Table 5: Dedication of medal, in case of winning the competition of athletes practicing for national games, Nepal, 2022

Whom will you dedicate the medal?	Sex					
	Female		Male		Total	
	n	%	*n*	%	*n*	%
Parents	35	28.7	30	30.3	65	29.4
Mother	34	27.9	25	25.3	59	26.7
Family	28	23.0	9	9.1	37	16.7
Father	10	8.2	10	10.1	20	9.0
None	8	6.6	8	8.1	16	7.2
Others, many	7	5.6	17	17.1	24	11.0
Total	122	100.0	99	100.0	221	100.0

Source: Source: Field Survey, 2022

different age categories, under 15 had only three respondents and they were obviously most supported by families with mean index of 0.5833 compared to the mean of 0.4255 for the age group 30–34. Another notable indicator is that the lowest age had smaller standard deviation (0.109) compared to all other groups. The age group 25–29 is odd in this series with mean index of 0.5389; otherwise, the increasing age is retarded from the family supports and it increases when the athletes were supposed to have their own responsibilities in families by the age of 35 and over. It is indicative that either the families were more supportive to either young ones or the female athletes [Table 6].

Ethnic variations – Dalits are more rational

Ethnicity generally indicates the overall status in various socioeconomic settings in Nepal and India. It is equally applicable in other countries in South Asia; however, a few of them would not like to mention ethnic variations in populations. Such attempts hide the realities and they do not support to design and implement specifically focused programs targeting the affected group or population. Many Nepalese studies have attempted to analyze the scenarios in sociodevelopmental affairs by ethnicity and they have implications in national development processes. In this study, there was an attempt to analyze the composite index of family support by ethnicity and the settings of residences of respondents [Table 7].

Although the number of respondents was only eight for Dalits communities, their family support was better (mean = 0.6429) compared to Tribal groups (mean = 0.4827) and others (mean = 0.4804). The others groups constituted of mostly Brahmin, Kshatriya (Rajpoot), and Sanyasis [Table 7]. There are many studies that have illustrated the "Others" group as high-class group and the family supports for the athletes was found poorer in this so called "higher" class of group in society. Therefore, maybe in the terms of economic status and enjoying the state opportunities the higher group was ahead of others, they are in inferior positions in terms of supporting their children in sports activities.

Table 6: Composite index of family supports by sex and age, athletes practicing for national games, Nepal, 2022

Background variables	Composite index of family supports		
	Mean	*n*	SD
Sex			
Female	0.5003	122	0.244
Male	0.4719	99	0.203
Age Category of Respondents			
Under 15	0.5833	3	0.109
15–19	0.4786	45	0.236
20–24	0.4665	81	0.211
25–29	0.5389	56	0.224
30–34	0.4255	23	0.262
35 and Over	0.5165	13	0.237
Total	0.4876	221	0.227

Source: Source: Field Survey, 2022. SD: Standard deviation

Table 7: Composite index of family supports by ethnicity, place of residence and education, athletes practicing for national games, Nepal, 2022

Background variables	IJHPECSS_50(1)_35		
	Mean	*n*	SD
Ethnicity			
Dalits	0.6429	8	0.259
Janajati (Tribes)	0.4827	122	0.222
Others	0.4804	91	0.227
Place of residence			
Rural	0.5041	61	0.211
Urban	0.4812	160	0.232
Educational level			
Up to SEE	0.5431	63	0.244
Plus 2	0.4627	91	0.218
Bachelor plus	0.4691	67	0.215
Total	0.4876	221	0.227

Source: Source: Field Survey, 2022. SD: Standard deviation

Development needs to be supportive

Another thought is proved that the urban families are more negligible (mean = 0.4812) than rural families (mean = 0.5041) in supporting their young members in sports activities. It more or less presents the scenario, which is also discussed above that development and complexities of life of the people has forced them to refrain from supporting to their children to their sports activities. It indicates a need for orienting urban parents for supporting to the sports activities of their children. Such a scenario is equally applicable for the increasing level of education (bachelor plus, mean = 0.4691) that obviously was associated with prosperity of family, had low level of supports index than for the respondents with low education (SEE, or high school level – mean = 0.5431) [Table 7].

Family support is game selective

Female members are much supported by the families that are almost evident with this set of data. Nevertheless, if the females are choosing individual games (mean = 0.5232) and martial arts games the supports index is observed as high (mean = 0.5232) for them. In total, individual games were in priorities for families to support to their members. Even the male members were having higher score (mean = 0.5089) than their other categories. Females in martial arts had the highest score (mean = 0.5325) of the index of family supports [Table 8].

Surprisingly, the number of respondents in martial arts category was equal (44) to each other; however, the score of family supports index had the highest variation between female (mean = 0.5325) and male (mean = 0.4740) compared to other categories. What psychology of family members was perceived by the respondents, who furnished the answer was not clear in this quantitative analysis? There was also another attempt to seek possible answer for this by collection of qualitative information. Altogether, the participants in individual game were the most chosen by families (mean = 0.5149) followed by martial arts games (mean = 0.5032) and lastly by team games (mean = 0.4559). In all categories, females overwhelmed the males with the highest score for all total [Table 8].

Table 8: Composite index of family supports by types of games, athletes practicing for national games, Nepal, 2022

Category of games	Composite index of family supports			
	Sex	Mean	*n*	SD
Individual games	Female	0.5232	20	0.245
	Male	0.5089	28	0.189
	Total	0.5149	48	0.212
Team games	Female	0.4680	58	0.274
	Male	0.4299	27	0.218
	Total	0.4559	85	0.257
Martial arts games	Female	0.5325	44	0.198
	Male	0.4740	44	0.202
	Total	0.5032	88	0.201
Total	Female	0.5003	122	0.244
	Male	0.4719	99	0.203
	Total	0.4876	221	0.227

Source: Source: Field Survey, 2022. SD: Standard deviation

Males in individual games received slightly better support from family than even females in the team games. The males in team games had the lowest score of family support index in the total data.

This information depicted the picture of family support tilted toward female members, who are more from the disadvantageous and rural areas than urban. An equation of living the developed areas with much complexities of life prohibits supporting to the family members, mostly the daughters and sons, for their sports activities is roughly established.

QUALITATIVE INFORMATION: COMPARE AND CONTRAST

A few information rendered by the athletes who were non-respondent of this survey are presented in this section. This section presents a few key informant interviews (KII) and short case studies (CS) and that help to understand and/or contrast the views established by quantitative information in previous sections.

KII-1: Ms. JG, 31, considers her parents as fully non-cooperative to her endeavors in sports. She has all cups, medals hidden behind the curtain at home. Her parents claim that she has been wasting her time by being involved in sports. She attempted to counsel her parents through others, but was not successful. Parents in urban areas desire their children earn much money to compensate expenditures for a luxury life, but sports have no such high income and they are frustrated. They cannot invest all the time on children.

KII-2: Ms. TN, 27, a medalist in national games, thinks that her family is everything for her quality and achievement. Even after the death of her father the other family members have supported her in such a way she does not feel the absence of him. For her, the family is the utmost institution to bring her up in the contemporary position. She described that every athlete must be counseled to accept the guidance of family.

KII-3: Mr. SA, 30, expressed that not all families understand the importance of participation in sports and the type of sports they have chosen. It is the duty of every athlete to convey the benefits of involvement in sports to their families. Parents being in the older generation expect some glamorous position of their sons/daughters and a fixed income generation every

month, which may not happen in sports. The community people and broader circle of relatives have to convince the parents of athlete that they are playing for the nation. He further accepts that if not in the medal winning games, the athlete must give priority to popular games such as football and crickets so that parents and other family members would appreciate them by watching them in media.

KII-4: Mr. RM, 43, a former sportsperson at local level, and father of a young daughter, 14, said that every family of the athletes must be proud of them. In games, not always the same individual wins the medal. When they are defeated by others they easily accept it as a very obvious and natural phenomenon. After losing a game, he shares his own experience that the athlete becomes humble and adjustable in the family. Family also requires to teach their descendants that they should aim for the wins, but must be ready to accept the defeats in life.

The four KIIs above present the multifaceted roles of families in the bringing up of an athlete in contemporary Nepali society. Some of the families may need counseling and some others may counsel to others. Members of the best supportive families can be used as counselors to other families. However, it is important to save the athletes by families in the case of severe depressions after losing the games. Besides these KIIs, two CS were also revealed during the fieldwork that helped to understand the role of families in bringing the sportspersonship up of an individual.

CS-1: Ram (changed name) Gharti, 47, from a distant area is a helper at a community level cooperative office. His daughter, 17, required to join a coaching session for a Martial Arts game that began at 6.00 am in the district headquarter, Parasi bazar, which is 22 km far from his house. He could not afford to rent a room for about 2 months. Furthermore, it was not safe to leave his young daughter alone in the headquarter. It was not also easy to find transportation every day that can make possible to reach the coaching station early in the morning at 6.00. He decided to buy a second-hand bicycle and every day, he peddled it having his daughter on the back carrier from 4.30 am to 6.00 am. He used to come back immediately after dropping the daughter and she used to go back home by bus after training concluded every day at 9.30.

CS-2: Sir, I am a 14-year-old boy of a Tamang family. My father works out of the home-village as a mason worker. I need to carry a bunch of vegetables that weigh about 30 kg in Doko (bamboo basket) every day from 5.30 in the morning. Usually I reach Dhulikhel bazar (headquarter of Kabhre district) in an hour walking. I use to sell them vending on the street in the morning until 9.00 o'clock to meet my education and sports expenditure. I eat at a hotel in morning. I am preparing for badminton singles in interschool level. We have no sufficient land to cultivate vegetable. My mother collects all vegetables from others in earlier evening and sprinkles water to make them afresh until the next day. I submit all money to my mother and she pays to the other families for their vegetables. We earn the margins. My mother insists me to continue badminton and consoles me that there will be a brighter day in the future. I have won once a cup and cash prize too.

This two canvases illustrated in the form of words depicted contribution of parents and the entire family for the upbringing of sports-personality of individuals. The social networking interplays through family and strengthens the psychological state of athletes. Some dispute is there and that are needed to be removed through proper counseling to family and athlete themselves.

CONCLUSIONS AND RECOMMENDATIONS

Families were more supportive to their female members than males who were in the individual games and also in martial arts. There were some complications revealed within families too but overall role of families was supportive. Intrafamily relationships are not always smooth. Urbanization is translated into individualism and less investment of family in sports activities of members is reflected in research. Rural youths are the pillars of sports activities; however, they need sustainable support when they gradually advance to higher level with increasing expenditure. So called elites families by ethnic-default have not been much sports friendly compared to the other groups.

Some recommendations may include – reorientation of family relations specially in favor of sports development is needed in Nepal with media utilization. Poor families with sports talents are to be strengthened with visible and sustainable institutional support. Women's participation in sports has become visible in this decade and girls are to be supported by stipend, scholarships, and institutional contracts and recruitments which may equally apply to boys too. Periodic researches are required to reveal the trends in familial support to sports.

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Review Article

Recreational Activities for Senior Citizens in Nepal

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Master's in Sports Science

ABSTRACT

Physical recreational activities play a crucial role in the well-being of elderly people in enhancing the quality of their life. Among the benefits of recreation for senior citizen is improvement in health, fitness, and opportunities for much socialization and happiness. The main objective of this study is to propose a plan physical/recreational activities for the senior male citizen of the age group of 68–80 years in Bhaktapur Municipality Ward 6 in Nepal. This study utilized the data collected through a structured questionnaire on facts and perceptions related to health as well as the reports from the local health post in the community. The result showed that almost all (97.1%) senior citizens were not happy, only 44.0% were interested in watching TV but 76.3% were interested to watch the games; however, only 9.6% of elderly people had some knowledge regarding the necessity of physical recreational activities. The majority of the senior citizens (90.4%) had no knowledge of physical exercises and recreational activities. They had neither participated in such type of activities during their leisure time. Activities are planned addressing physical, social, psychological, and intellectual needs of the person considering their preferences and interest. The Municipality and health service-providing agencies including social organizations jointly need to conduct recreational programs for the citizens of Nepal to make their elderly life healthy and better.

Keyword: Bhaktapur, Leisure, Nepal, Physical activity, Recreational activity, Senior citizen

INTRODUCTION

Background

The benefits of physical activities on health and well-being of humans are well documented in many fields of study. Aging is a universal phenomenon that every living organism has to go through. As individuals become old, physical and mental abilities begin to decline. Their social role and network gradually decrease and many other age-related changes occur. Since the world is facing an increased proportion of elderly people among various societies, there is also an increasing concern for the prevalence of disability in older ages, which triggers for the need of formal caregiving services the elderly people (Christensen *et al*., 2006).

To effectively manage stress, the health- and fitness-related physical activities such as recreation are important in the community life. For achieving wellness requires that the individual make lifestyle choice which promotes health. A study conducted by Christensen *et al*. (2006) also identified physical activity as one of the most important factors in promoting health and quality of life in the remaining years of life. Sedentary older adults were found with a greater risk of functional decline compared to their counterparts who were physically active. This paper is a synthesis of prominent issues on recreation most importantly health- and fitness-related physical recreational activities. It examines the current trend of the phenomenon and what can be done to promote health including recreational activities among Nepalese citizen particularly older persons and propose the plan of activity.

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Review of the Literature

The active participation in family and community events that are related to physical activities is imperative to ensure that older adults attain and maintain good health and fitness. Braham and Jomlison (2001) had views that improperly utilized leisure can result in various social problems. These problems may range from idleness, violence, and alcoholism to drug abuse and other related vices. Carefully planned and appropriately utilized leisure activities can assist the elderly to regain their life interests and rebuild their self-esteem. In general, older adults' mental health varies according to their age categories as young old (60–69) to older old (80–89). The group of elderly in the older old (80–89) were found at higher risk for isolation and loneliness (Chung, 2020; Den Hounting,

2020; Stanford Center on Longevity, 2018). They were also likely to have lower engagement in physical and recreation activities (Guisado-Clavero *et al*.; 2018).

Nepalese researchers have mentioned the challenges of senior citizens due to the lack of adequate support systems. According to Khanal (2015) and Khadka (2020), many elderly people in Nepal are without caretakers. Their designated caregiver is generally their son or one of the sons, who is frequently either working outside the home for which reason or willingly living separately. This scenario showed a gap in the provision of care and support from the aging population. Tausig and Subedi (2022) expressed that a number of physical, mental, and psychological issues are faced by elderly people. They may even face chronic diseases such as diabetes, high or low blood pressure, amnesia, depression, and physical limitations. Although there are some support from a number of NGOs and INGOs, they are far less than the required amount of services. In a study, Utami and Prapti (2020) further pointed that after recreational activity a vast majority (88.8%) of elderly people felt happy and refreshed.

Recreational activities

Any pursuit engaged in during leisure time other than pursuits in which people are normally highly committed is defined as recreational activity (Roberts, 1974). The recreation may be active or passive, indoor or outdoor, it can be classified into four groups of activities as below:

i. Those taking place indoors and around the house, for example, listening to music, reading, gardening, and watching television
ii. Activities with high social content, for example, entertaining people, eating out, and visiting bars;
iii. Cultural and artistic pursuit, for example, visiting art galleries, exhibitions, museums, theaters; anything that will increase or improve cultural awareness;
iv. Active pursuit of sports jogging, playing tennis, badminton; and informal activities, for example,picnicking, sightseeing, driving for pleasure, and so on. (Lawson and Baud-Bovy, 1977, Obinna *et al*., 2009).

Many of the above-listed recreational activities occur during leisure time and are quite beneficial for healthy aging.

Leisure activity

Leisure activity plays a vital role in promoting well-being of the senior citizens which contributes to quality of life. According to Obinna *et al*., in 2009 and Mcpherson 1983 leisure is a state of mind or attitude. It is not a kind of work with freedom of choice in selecting activities. It is more or less the relaxation and diversion from work and is among the personal maintenance activities. He also described leisure as playfulness or play, voluntary activity, expressive activities, instrumental activities, spontaneity, utilitarian and meaningful activities, a state of being active and passive activities, social and individual activities, expensive and inexpensive pursuits, intellectual (cognitive), social and physical pursuit, intrinsic and extrinsic rewards, creativity, and high culture and mass culture daily routine. Those activities should not be task-oriented and the activities of daily living such as sleeping cleaning and cooking should not be included.

People often engage in reading, swimming, walking or hiking, cycling, meditation, traveling, painting listening to music, and thousands of fun creating activities as leisure activities (TMRPK Tennakon, 2019) around the world. Mostly, leisure activities should be simple, interesting, and enjoyable. A very simple activity can stimulate the physical and mental health of the person. It was proven that participating in leisure activities contributes to reduce the stress level of the people. Moreover, medical researchers explained the fact that people who were engaged in leisure activities are happier than those people who are not. Therefore, free time activity is essential for senior citizens but spending their free time in a meaningful is more important. Regarding the leisure and aging, it has been well established that spending time in leisure activities is positively associated with physical health, life satisfaction, and psychological well-being for the elderly (Gibson and Singleton 2012).

Participation in leisure and recreation activities is conductive to good mental health (Lee and Allen, 2021). Participation by older people in leisure and recreation activities varies across age cohorts. In the survey of the American Time Use Survey of 2009, Novak (2012) stated that on an average day, adults aged 75 and over spent 7.8 h on leisure time spent by 35–45 year-olds. There should be a way to express the emotions of the older person. As most of the time, they were unseen and unheard. That feeling brings them unhappiness caused in low self-esteem.

In fact, activities including going out for walk, listening music, and playing games with group can help elder people to express their emotions relieving the stress and anxiety. Engaging in enjoyable and meaningful leisure activities can help in coping with stress and disabilities, decrease levels of depression and loneliness, reduce insomnia, improve the aging adjustment process, enhance social networking, prevent cognitive decline, and reduce the risk of dementia (Bennett, 2002, Wang *et al*., 2002, Warr *et al*., 2004, Edeshaw and Yoo 2016) cited by Tennakon TMRPK (2019). Thus, it is necessary to choose a leisure and recreational activity for a person, especially for senior citizens, it should be an activity that he/she can enjoy. People need to have aware and knowledge about the benifits of active participation in physical exercise and recreational activities. Abdeta *et al*. (2019) reported that less than one-third of older people respondents in Harar town, eastern Ethiopia had good knowledge of the physical activity and exercise regimens.

This result contradicted a study by Wong *et al*. (2017) who identified that the majority of older people in neighbor country Hong Kong have good knowledge of the physical activity and exercise guidelines.

Aging population in Nepal

According to UNICEF's (2017) report, an "Ageing society is characterized by a population where the percentage of individuals aged 65 years and above, known as old-age dependents" is seven percent or more of the total population. When this percentage doubles, to 14% or more, it is classified as an "aged society." The National Planning Commission, UNICEF, and Population Council (2017) have calculated for this study that Nepal will become an aging society around 2028, in approximately 5 years from 2023, which is roughly 31 years from 2023.

In 2002, population aged 65 years and above for Nepal was 6.1%. Population aged 65 years and above of Nepal increased from 3.3% in 1973 to 6.1 in 2022 growing at an average annual rate of 1.26%. In developing countries such as Nepal, poverty, lack of education, healthcare, and transportation pose significant challenges for the elderly population. The adequate physical and recreational activities help to improve well-being, and physical and mental health, which is one of the ways to build the healthy society.

Senior citizen

The Senior Citizen Acts, 2063 (2006) in Nepal defines senior citizens of Nepal means a individuals having completed the age of 60 years. With an increase in life expectancy rates, the senior citizen population in Nepal is on the rise.

Physical activity

The World Health Organization (2022) defined physical activity as any bodily movement produced by skeletal muscles that requires energy expenditure. Physical activity refers to all movement including during leisure time, for transport to get to and from places, or as part of a person's work. Both moderate- and vigorous-intensity physical activity improve health. Popular ways to be active include walking, cycling, wheeling, sports, and active recreation and play and can be done at any level of skill and for enjoyment by everybody. Regular physical is proven to help prevent and manage non-communicable diseases such as heart disease, stroke, diabetes, and several cancers. It also prevents hypertension, maintain a healthy body weight and can improve mental health, quality of life, and well-being.

Statement of the Problem

Nepal has experienced a notable increase in the size of its population aged 60 and older in the last three decades. Almost nine percent of the population is now 60 or older. It has a population of about 29.1 million people as the results of census 2021. It is situated between China and India and is the home of Mount Everest and Lord Buddha. There are about 125 languages are spoken in Nepal and there are at least 145 different ethnic groups.

Limited researches have been conducted on senior citizens in Nepal regarding contemporary challenges and active involvement in physical and recreational activities for wellbeing of them. Following are some issues related to recreational activities of elderly people in Nepal.

- The practice of culture of physical activities is not developed in the community.
- Inappropriate use of free time that in one or another way affects health and society.
- Lack of recreational activities in daily life.
- Lack of knowledge regarding the health benefit aspect by participating physical and recreational activities.
- The activities that take place in the community in general, are not directed at the elderly.
- A large majority have chronic diseases.

Objective of the Study

The main objective of this study is to propose the plan of physical recreational activities for the senior citizen of age group of 68–80 years old in Bhaktapur Municipality Ward-6, Nepal.

The specific objectives are as follows:

i. To identify the ways of passing the leisure of senior citizens.
ii. To understand the possibility of introducing recreational activities for the senior citizens.

Research Question

On the basis of the above discussion, a research question can be put forward as - how to enhance the active lifestyle to attain the quality of life of the senior citizens of age group 68–80 years old in Bhaktapur Municipality Ward-6 in Nepal?

Conceptual Framework

The variation in interest in recreational behavior and participation is the determining factor for designing the model to set out the analysis to what extent the independent variables (age, gender, education, knowledge regarding physical activity, and active lifestyle) could together and separately explain variation in the dependent variable which will support to prepare set of plan of physical recreational activity for the senior citizens [Figure 1].

RESEARCH METHODOLOGY

Research Design

The study is designed as a descriptive and cross-sectional one that includes primary data using quantitative methods. The

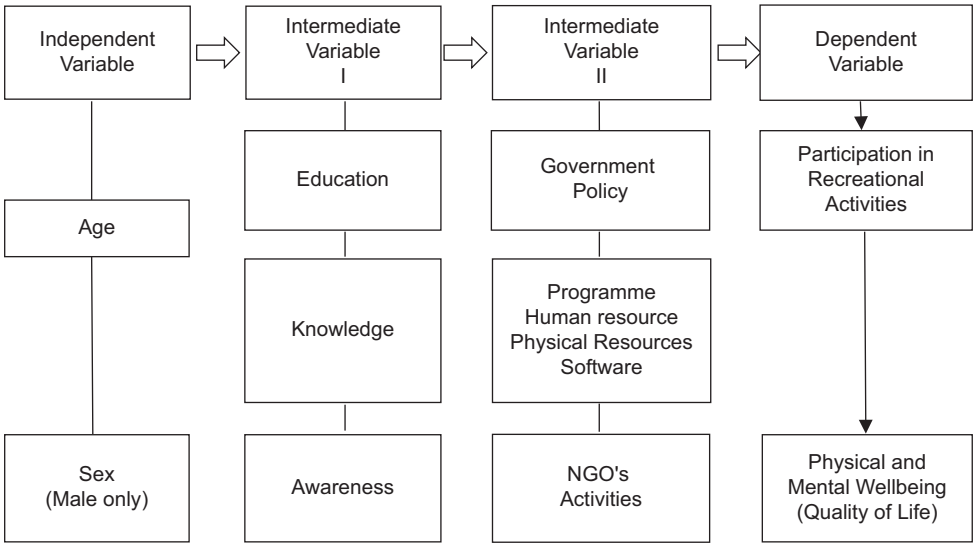

Figure 1: Conceptual Framework

primary data were collected through a survey with a structure questionnaire targeting senior citizens of the age group of 68–80 years old in Bhaktapur municipality settlement-6, Nepal that comprised 73 responses from senior male citizens within 2 weeks. The total male population of senior citizens was 139. The sample size of this study was 73 (53%). The random selection method was applied to select the sample. The completed questionnaire was filled by the author with direct communication and interview with the respondents.

Instrumentation

A formal questionnaire was designed to collect the primary data. The set of questionnaires included general information, family background, passing leisure activities in daily life, and opinions related to recreational activities and their interest. The questionnaire was filled by direct interviewing with the respondents.

Data Processing and Tabulation

The collected data from the survey questionnaire were entered into the Epi-data. SPSS software was used for the tabulation without distorting the information.

Limitation

Nepal is a society of extreme and crosscutting inequalities based on gender, caste, ethnicity, regional identity, and income/wealth (Pradhan and Shrestha, 2005). The inequalities that characterize Nepali society are deeply embedded in its culture and social arrangements. Due to socio-cultural and tradition pattern and beliefs of the people both men and women do not prefer to participate in some activities together. The age groups, it is necessary to plan and organize the physical and recreational activities according to the age group and the condition to participate. Therefore, one of the limitations of this study is, the study did not cover women citizens. Age groups over 80 years were not included in this study.

Table 1: Age group of participants, senior citizens in Bhaktapur 6, Nepal, 2023

Age group	Number	Percentage
Up to 70	27	37.0
71–75	18	24.7
76–80	28	38.4
Total	73	100.0

Source: Field Survey 2023

3. CHARACTERISTICS OF THE RESPONDENTS

Age of the Respondent

The research was conducted in 2023, throughout the year. The respondents were senior citizens who stated in ward 6 in Bhaktapur Municipality. The total participants in this study were 73 senior male citizens of the age group of 68–80 years. The sample was categorized into three groups according to their age. The mean age of participants was 73.51 years old. The majority of the participants (38.4%) were in the age group of up to 70 years old. There were 37% of participants were up to 70 years old, 24.7% of participants were in the age group of 71–75 years [Table 1].

Educational Backgrounds of Respondents

However, the educational background was varied; it was categorized into two groups in this study. The majority of the respondents (54.8%) were literate. Most of the literate group only knows to write their name but they never attended education in school, very few of that group attended education in school. The illiterate portions of the respondents were 45.2% [Table 2].

FINDINGS

Suffering from Different Chronic Diseases

It was identified that almost all the respondents were suffering from various types of illness such as blood pressure, asthma, diabetes, arthritis, and headache issues. More than 50% of senior citizens out of total sample (n = 139) were suffering from high blood pressure, 36% of respondents reported they are victims of diabetes. Among them, 32% had asthma and those who are suffering from headache were 22%. Two senior citizens were suffering from nerve disturb [Table 3].

Leisure Activity

Having leisure

A significant number of senior citizens (n = 67) that is 91.8% stated that they have a large amount of free time to spend on leisure time activities of a daily basis. Only a small portion of respondents (6.8%) stated having a little leisure time. Interestingly, one respondent (1.4%) of the age group up to 70 years old reported no leisure time [Table 4]. It showed that all the respondents were able to participate in physical recreational activities with low intensity.

Table 2: Education backgrounds of the participants, senior citizen in Bhaktapur 6, Nepal 2023

Literacy	Number	Percent
Literate	40	54.8
Illiterate	33	45.2
Total	73	100.0

Source: Field Survey 2023

Passing leisure time

The survey found that leisure time activities were varied. Almost all the respondents (97.1%) passed their leisure time by gossiping with friends outside. More than 60% (n = 48) used their leisure time by roaming activity. Moreover, 37.1% used to do housework and passing the leisure time by gardening were 25.7%. Very few respondents (15.7%) reported that they used to play games during their leisure time. None of the respondents used to participate in physical activities [Table 5]. The result showed that almost all senior citizens were not happy. All respondents were passing leisure passively.

Knowledge about the Activities

The findings of this study revealed that majority of the senior citizens (90.4%) in the ward 6 of Bhaktapur had no knowledge of physical exercises and recreational activities. Only 9.6% senior citizens had some knowledge regarding the importance of physical recreational activities [Table 6]. Those who had having knowledge about the benefits of physical exercise were not engaging in the activity.

Preferences of the Senior Citizens

Preferences to participate in recreational activities

The majority (97.2%) of the senior citizens preferred active participation in recreational activities during their leisure time. All

Table 3: Suffering from different diseases, Senior Citizen in Bhaktapur 6, Nepal 2023

Type of diseases	Age groups of participants							
	Up to 70		71–75		76–80		Total	
	n	%	*n*	%	*n*	%	*n*	%
Asthma	4	22.2	3	23.1	9	47.4	16	32.0
Sugar, Diabetes	4	22.2	4	30.8	10	52.6	18	36.0
Pressure	8	44.4	10	76.9	8	42.1	26	52.0
Headache	4	22.2	2	15.4	5	26.3	11	22.0
Nerve disturbed	2	11.1	0	0.0	0	0.0	2	4.0
Total	18	100.0	13	100.0	19	100.0	50	100.0

Source: Field Survey 2023, N: Number, %: Percentage

Table 4: Availability of leisure time of participants, senior citizen in Bhaktapur 6, Nepal 2023

Availability of leisure time	Age groups of senior male citizens							
	Up to 70		71–75		76–80		Total	
	n	%	*n*	%	*n*	%	*n*	%
Most of the time	24	88.9	16	88.9	27	96.4	67	91.8
A little time	2	7.4	2	11.1	1	3.6	5	6.8
No leisure time	1	3.7	0	0.0	0	0.0	1	1.4
Total	27	100.0	18	100.0	28	100.0	73	100.0

Source: Field Survey 2023, N: Number, %: Percentage

the respondents (100%) reported that they are interested to visit temple. More than 90% of respondents liked traditional dance and having preference to play traditional and small games were 77.8%. Respondents who pointed the interest to watch games and walking were 76.4% and 73.6percentrespectively. A very few respondents (26.4%) reported having preference to participate in Yoga and only 44.4% of the respondents replied that they like to watch TV [Table 7]. The result showed that visit temple, traditional dance and songs, and recreational activities are the most preferable activities.

Desire to have recreational activity in daily life

All most all (97.3%) respondents reported that they like to have recreational activities in their daily life to pass their leisure time actively and for the refreshment and wellbeing [Table 8]. In addition, they wished that these types of activity are needed to be organized by municipality and local government of Nepal for the conformability of senior citizens.

DISCUSSION

The present study was carried out in a relatively under-developed area Bhaktapur city, some idiosyncratic results were obtained. This study was carried out to identify the way of passing the leisure time, knowledge about physical exercise and recreational activity, their health, and preferences of activity of recreational activity. Many senior citizens in this area were in the condition of active participation; however, majority of them were not able to do work and any specific occupation. Most of the time, they were in leisure. Almost all the respondents of the study were passing their leisure time inadequate way. They did not have any physical and recreational activities to participate during their leisure time.

More than 90% respondents did not have knowledge on the benefits of regular participation in physical exercise and recreational activities in the elderly age. The finding of the study has proven that senior citizens were not aware about the benefits and importance of physical exercise and recreational activity. However, only a small portion of them had knowledge on the benefits of such types of activities, they did not participate regularly. Therefore, it is necessary to launch some awareness program for them.

Majority of the respondents (97.1%) had habits of passing their leisure time only by gossiping, it means they passed their time passively and they were unhappy. It showed the necessity to plan and implement the recreational activity for their active lifestyle. However, it is proven that if a senior citizen is not very mobile, there may be exercise that can improve their physical strength and regain the ability to move. No matter whether they are sitting, standing, or walk they can still receive physical and psychological benefits from the exercise also.

According to the preference, majority of the respondents preferred to participate in traditional activities such as paying

Table 5: Involvement in different activities in leisure, Senior Citizen in Bhaktapur 6, Nepal 2023

Activities in leisure time	Age groups of senior citizens							
	Up to 70		71–75		76–80		Total	
	n	%	*n*	%	*n*	%	*n*	%
Watching TV	11	42.3	4	23.5	4	14.8	19	27.1
Gossiping with friends outside	24	92.3	17	100.0	27	100.0	68	97.1
Playing games	5	19.2	3	17.6	3	11.1	11	15.7
Roaming	19	73.1	13	76.5	16	59.3	48	68.6
Housework	14	53.8	3	17.6	9	33.3	26	37.1
Gardening	11	42.3	4	23.5	3	11.1	18	25.7
Play with mobile set	4	15.4	3	17.6	1	3.7	8	11.4
Total	26	100.0	17	100.0	27	100.0	70	100.0

Source: Field Survey 2023, N: Number, %: Percentage

Table 6: Knowledge about physical/recreational activities, senior citizen in Bhaktapur 6, Nepal 2023

Knowledge about physical/ recreational activities	Age category of senior citizens							
	Up to 70		71–75		76–80		Total	
	n	%	*n*	%	*n*	%	*n*	%
Yes	4	14.8	2	11.1	1	3.6	7	9.6
No	23	85.2	16	88.9	27	96.4	66	90.4
Total	27	100.0	18	100.0	28	100.0	73	100.0

Source: Field Survey 2023, N: Number, %: Percentage

traditional music, songs, dance, visit temples, and playing traditional small games. After Analyzing, the expression senior citizens about their desire to have physical and recreational activity in their daily life, focused necessary to plan and implement such activity. In analyzing the responses of the senior citizens taking their age into consideration, it is possible to assume that there is positive tendency shown by the respondents to lead active life by participating in recreational activity.

The researcher identified that there is a great need of further studies in this field to know the real situation of the senior citizens in their daily life and to introduce and start recreational activities during their leisure. There is a lack of physical exercise and recreational activity for senior citizens in Nepal compared to Western countries or Europe. After finding the necessary information, the author proposed a plan of physical recreational activities for the senior citizens in Bhaktapur municipality ward 6, Nepal for the welling being of their life.

PROPOSED PLAN OF RECREATIONAL ACTIVITIES FOR SENIOR CITIZENS

A few previous surveys had revealed some activities such as watching TV or listening radio, traveling, or doing sports, were prevalent among senior citizens. However, there were some gaps between the activities the older adults were actually participating and those which they would like to participate even if they were not doing. Therefore, it is important to understand in what activities senior citizens like to participate. In addition, it is essential to understand which activities can help senior citizens to maintain their quality of life. Therefore, considering these aspects the desire, culture, and tradition of the survey community proposed plan of recreational activities for the senior citizens of the community of Bhaktapur-6 is presented.

Proposed Plan

Outline of Proposed Activities

I. Outdoor games
   i. Traditional small Games

Board games and card games provide great ways to socialize and benefit from the joyful challenges of friendly competition.

Consider options like: Kachhipachha, baaghchaal, Dhucholechaa

   ii. Team movement games: Passing the ball, improving balance, play with balloons, playing with rubber bands.

Table 7: Preferences of participants, Senior Citizen in Bhaktapur 6, Nepal 2023

Preferred to engage during leisure time	Age group of senior citizens							
	Up to 70		71–75		76–80		Total	
	n	%	*n*	%	*n*	%	*n*	%
Watching Games	22	81.5	16	88.9	17	63.0	55	76.4
Walking	24	88.9	13	72.2	16	59.3	53	73.6
Play Traditional and Small Games	18	66.7	17	94.4	21	77.8	56	77.8
Watching TV	17	63.0	7	38.9	8	29.6	32	44.4
Traditional Dance	24	88.9	17	94.4	25	92.6	66	91.7
Visit Temple	27	100.0	18	100.0	27	100.0	72	100.0
Yoga	3	11.1	7	38.9	9	33.3	19	26.4
Recreational Activities	26	96.3	17	94.4	27	100.0	70	97.2
Total	27	100.0	18	100.0	27	100.0	72	100.0

Source: Field Survey 2023, N: Number, %: Percentage

Table 8: Wish of senior citizens to be organized recreational activity by municipality, senior citizen in Bhaktapur 6, Nepal 2023

Wishing to organize activities by municipality	Age group of senior citizens							
	Up to 70		71–75		76–80		Total	
	n	%	*n*	%	*n*	%	*n*	%
1. Yes	27	100.0	17	94.4	27	96.4	71	97.3
2. No	0	0.0	0	0.0	1	3.6	1	1.4
9. Not Stated	0	0.0	1	5.6	0	0.0	1	1.4
Total	27	100.0	18	100.0	28	100.0	73	100.0

Source: Field Survey 2023, N: Number, %: Percentage

Table 9: Monthly plan schedule

S. N.	Recreational activities	Duration	Frequencies	Hours
1.	Walk Through green area	40 min	Three times a Weekly	8: 30 am
2.	Traditional dance and songs	1 h	Weekly	16:30 pm
3.	Educative talk: Literary workshop, religion, Health.	1 h	Weekly	8:30 am
4.	Excursions to tourist centres	4 h	Monthly	8: 00 am
5.	Visit temple (Within the city)	2 h	Weekly	8:00 am
6.	Visit temple (Out of the city)	3 h	Monthly	8: 00am
7.	Fun games and small activities	One and half hours	Two times a Month	16: 00 pm
8.	Exercise and telling jocks	1 h	Weekly	8:00 pm
9.	Traditional small games	2 h	Weekly	16: 00 pm
10.	Fine art related activities	2 h	Weekly	16: 00 pm

Table 10: Weekly plan schedule

Recreational activities	Week 1						
Schedule	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Morning	Exercise	Walking	Educative talk	Exercise	Walks	-	Visit temple
Afternoon	Small games	-	-	-	-	Traditional Dance	
Evening	-	-	Recreational activities	traditional music and songs	-	-	-

II. Art and craft: Drawing art, making traditional craft

Sing and play traditional instruments

Traditional dances: Traditional dance and watch traditional dance

III. Simple Exercises with low intensity: Exercise with music, stretching exercise, Rhythmic exercises, simple body movement exercises.

IV. Outing and excursions: Many great options, especially when one gathers a small group of people to share the experiences. Getting out of the house is an important part of finding potential partners.
- Visit temples: About 1 km.
- Visit touristic areas: about 1 km.
- Visit the traditional museum: about 1 km.

V. Fun activities

Whatever the age, interests, or abilities, it can enjoy pastimes that make a person laugh, and lose track of time. It includes Telling Jocks, Participating in comedy, and kite flying.

VI. Other outdoor pastimes

Long tour program: Visit temples, Natural site visit.

VII. Video play
- Historic and religious story
- Videos of participating adult people in different activities
- Documentaries.

VIII. Educative talk
- Health benefit knowledge
- Health benefit habits
- Motivational talk

IX. Memory games

Exercising memory is very important to maintain lucidity and cognitive abilities. These exercises improve concentration in a short time and keep active.

Some games are cards for memory, guest what it is, guest who is, etc.

Recommended Modes and Methods for Activities

The following modes and methods of recreational activities are recommended.

I. Work area: spacious, clean, and ventilated, if possible without any object that may represent any danger to older adults

II. Activity schedule: The activities will take place in the morning for physical activities at 8:30 am and other recreational activities will take in after and evening.

III. Familiarization: The older adult must be familiarized with all activities.
IV. Constant observation: There must be constant observation of the members of the group and the elements that make up the activities.
V. Interpersonal relationships: The strengthening of interpersonal relationships and the creation of new group relationships should be promoted.

The activities should be simple, easy; the weekly frequencies will depend on the group and the execution time of the experience.

It is necessary to prepare the body and those most committed to physical activity, the rhythm of execution should be slow with low intensity, the pulse and heart rate should be taken before and after exercise

VI. Affective component: It is important to create an affective climate that allows participants to feel confident, respectful and optimistic, that good humor and joy prevail.

Control and Evaluation of Plan of Activities

The evaluation is carried out in a systematic way. Starting from the execution of integrative activities; physical-recreational activities with a feedback and continuous improvement character, taking into account the objective conditions, in the three fundamental aspects that are worked on.

Precautions to be Taken

The following precautions should be taken during the implementation of the program.

- Check the space to avoid accidents, moving obstacles from site before, during and after activities
- Consider the adequate climate and temperature
- Choose a time of a day when the majority senior citizens feel cheerful
- Always have their consent
- Select and adapt select the activities to their psychomotor possibilities
- Manage a health worker for any emergency
- The program leaders and staff should be trained to conduct high-quality recreational program.

CONCLUSIONS AND RECOMMENDATIONS

- In the process of characterizations of the subjects, almost all the senior citizens have a passive lifestyle and their leisure time is passing inappropriately.
- Recreational activities can be one of the best ways for entertain for senior citizens in their daily routines for the wellbeing and to reduce the boredom.
- Recreational activities should be planned considering the culture, tradition, and preferences of the senior citizens to inspire their desire to participate in such activities in a country like Nepal.
- After finding the physical condition of the subjects the plan of the physical recreational activities is designed for the wellbeing of the senior citizens.
- Activities are planned addressing physical, social, psychological, and intellectual needs of the person considering their preferences and interest.
- The municipalities and ward office bearers should be made responsible for undertaking the activities. If they consider it appropriate, some NGOs or private agency can also be assigned to operate the programs.
- There must be an established system of periodic monitoring and suggestive actions for course correction of the implemented activities.
- Following the 8th annexure of the Constitution of Nepal that confers rights and obligations of 22 items to local authorities. Taking care of the elderly population also falls within these 22 points, and hence all local levels must have specific programs in favor of recreational activities of a senior citizen.
- Periodic research to identify their interests and shift in them with the evaluation of implemented operational program must be adopted.

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Research Article

Effect of "on court drills" in the performance of selected motor fitness variables among tennis players

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ABSTRACT

The purpose of the study was to find out the effect of on court drills in the performance of selected motor fitness variables among tennis players. To achieve the purpose of this study, the investigator randomly selected 15 tennis players from Tennis Club, Vijayawadai. The participants' age group was between 12 and 14 years. Selected participants were tested of their agility and balance, which were considered pre-test scores. To measure agility, "shuttle run test" was administered, and to measure balance, "static balance test" was administered. The participants were given 6 weeks "on court drills" training such as, close and drop, protect your turf, forehand only, hi-lo drill, and transition drill. Immediately after the experimental period, the participants were measured of their agility and balance, which formed as post-test scores on selected motor fitness of the tennis players. The difference between the initial and final scores on selected motor fitness variables was considered the effect of one court drills among the tennis players. To test the obtained data, statistically "t"-test was used. The obtained results proved that "on court drills" significantly improved motor fitness variables, agility and balance. It was concluded that on court drills significantly contributed for the improvement of motor fitness variables, agility and balance which in turn would improve overall health of the tennis players.

INTRODUCTION

"The science of sports training is a recent to the field of sports science. The sports science discipline has improved at a very fast pace in the past few decades. The knowledge gained by these disciplines has to be understood by the coaches and trainers to apply it correctly to the training process. However, the majority of the coaches do not have sufficient scientific background and training to make full and effective use of the knowledge acquired by the sports science disciplines. This creates a gap between scientists and coaches. The science of training with its workers having sufficient background of science and sports is able to fill this gap and can become mediator between the scientists and the coaches" (Singh,1994).

"Performance sports aim at high sports performance and for most physical and psychic capacities of sports men are developed to extreme limits. This normally does not happen in other areas of human activities. As a result, performance sports field valuable knowledge about the limits to which human performance and various performance factors can be developed. It also leads to the discovery of means and methods for improving various physical and psychic capacities (performance factors) to exceptionally high levels. This knowledge can be faithful applied to other areas of sports and human activities" (Singh, 1994).

"A tennis match is intended to be continuous. Because stamina is a relevant factor, arbitrary delays are not permitted. In most cases, service is required to occur no more than 20 s after the end of the previous point. This is increased to 90 s when the players change ends (after every odd-numbered games), and a 120 s break is permitted between sets. Other than this, breaks are permitted only when forced by events beyond the players' control, such as rain, damaged footwear, damaged racquet, or the need to retrieve an errant ball. Should a player be determined to be stalling repeatedly, the chair umpire may initially give a warning followed by subsequent penalties of "point," "game," and default of the match for the player who is consistently taking longer than the allowed time limit" (Anna, 2005).

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HEALTH BENEFITS OF TENNIS

Supports Cardiovascular Health

"Aerobic activity of any kind works to strengthen your heart. Jumping for the perfect swing, running down the court, and chasing runaway balls are some of the activities that increase the heart rate as one play tennis. As the heart rate rises, the breathing becomes deeper and faster, increasing oxygen and blood flow throughout the body – all of which contribute to a stronger cardiovascular system" (Pinckard *et al*. (2019). "A 2017 study found that participation in racquet sports was related to a 56% reduction in death from cardiovascular disease (and a 47% reduction of risk of death from any cause)" (Garone, 2021).

Aids Weight Loss

"Engaging in aerobic exercise through tennis not only protects the heart – it may also help lose weight, if that is a personal goal. In a 2012 study, researchers found that obese men and women who added aerobic exercise to their routine 5 days a week lost significant amounts of weight over 10 months, even when they made no changes to their diets" (Oja *et al*., 2017). "Depending on the weight and the intensity of the game, one can burn a few hundred calories per hour playing tennis" (Garone, 2021).

Increases Range of Motion

"The broad movements of tennis, such as swinging and reaching, are an excellent means of increasing the range of motion" (Iwata *et al*. (2019). "These dynamic, stretching motions lubricate the joints and strengthen muscles and tendons. However, if one just starting out on the court, it is smart to work the way up to these movements to prevent injury" (Garone, 2021).

Improves Balance

"Good balance is a must in tennis (at least, if one is not going to topple over every time he/she lean over for a backhand). By using a racquet, one is training the body to maintain its equilibrium while hitting and serving with a two-foot extension of the arm" (Garone, 2021).

Decreases Osteoporosis Risk

"Osteoporosis occurs when the creation of new bone cannot keep up with the deterioration of old bone, causing bones to break more easily. Most commonly, this condition affects women, and risk increases as the age (National Resource Center) "While you might think that exercise would increase the risk of fractures, the opposite is actually true. According to the National Institutes of Health, many types of exercise help prevent osteoporosis, especially weight-bearing exercises" (Garone, 2021).

Promotes Agility

"The fancy footwork of tennis can help one get lighter on the feet. "Tennis is not a straight-line sport," says Barnick. "Players have to cover the court, which requires forward and back, side-to-side, and diagonal movement patterns. Tennis players frequently change direction, stop and start, and accelerate and decelerate. They also need to change their vertical positioning for low balls as well as overhead volleys and serves" (Lauer, 2017). "This constant switching of movement in tennis trains the body and brain to adapt more quickly" (Garone, 2021).

Enhances Motor Control

"Motor control is an awareness and ability to stabilize one body part while another body part is moving," says Barnick. The movements of tennis can uniquely support this area of physical fitness. "In tennis, motor control is necessary as one move the arm to swing the racquet. At the same time, core muscles stabilize hips to avoid falling while swing. It is not just arms and legs that may become more coordinated from racquet sports. The body rotation, stopping and starting, and reaching and balancing tennis requires also may stabilize the core. "Thus, tennis develops the core in more ways than simple postural exercises or abdominal floor routines" (Bashir *et al*. 2019).

Increases Vitamin D Exposure

"Getting adequate vitamin D has been associated with a stronger immune system, improved heart health, and reduced risk of cancer. Still, many people are deficient in this critical nutrient. Playing tennis outdoors lets one soak up Vitamin D from sun exposure" (Harinarayan *et al*., 2013). "Some studies have shown that the body receives the most Vitamin D from sunlight near midday, so consider scheduling match around noon, so long as it is not too hot at that time" (Garone, 2021).

Researches have proved that motor fitness variables, such as agility and balance play a vital role in the improvement of health conditions as well as the tennis performance. The investigator is interested to make a study on the effect of "on court drills" in the performance of tennis players which in turn would contribute for their overall health.

METHODOLOGY

To achieve the purpose of this study, the investigator randomly selected 15 tennis players from Tennis Club, Vijayawadai. The participants' age group was between 12 and 14 years. Selected participants were tested of their agility and balance, which were considered pre-test scores. The participants were given 6 weeks "on court drills" training. Immediately, after the experimental period, the participants were measured of their agility and balance, which formed as post-test scores on selected motor fitness of the tennis players. The difference between the initial and final scores on selected motor fitness variables was considered the effect of one court drills among the tennis players.

ON COURT DRILS

Close and Drop

This drill works on both forward and backward movement. Reinforces closing in while at the net. The investigator kneels at the net facing the participant on the same side service line. Two cones are set up on the other side of the net as targets for the drop shots. The investigator alternates tossing balls to the left and right sides, forcing the participant to sprint up and hit a drop shot. After each shot, the participant backpedals as quickly as possible to the starting position (the center of the service line). After 25 s (a long point), the next participant jumps into position. This gives the first participant a chance to recover.

Protect Your Turf

This drill improves movement skills around the net. Participant stands in the center of one of the service boxes. Investigator stands with basket of balls on the opposite side of the center service line. Investigator feeds balls rapidly from the opposite side service line, moving the participant back and forth and side to side within the service box. If there is more than one participant, the second participant quickly jumps in when the first participant misses.

Forehand Only

This drill improves lateral movement along the baseline. Participant stands in ready position in the center of the baseline. Investigator feeds from the other side of the net. Investigator runs participant from side to side, but participant is only allowed to hit forehands. Investigator could designate inside-out or inside-in targets (down-the-line forehands hit from the backhand corner).

Hi-Lo Drill

This drill teaches participants how much reach they actually have at the net, while taking only one step in each direction. Investigator feeds from opposite side service line to participant at net. Participant alternately hits a high forehand volley followed by a low backhand volley. After a short rest period, the sequence is reversed to a high backhand and a low forehand volley.

Transition Drill

Works on hitting a variety of shots as the participant advances to the net to close out the point. Investigator feeds balls rapidly from the opposite side baseline. Participant shuffles along the baseline, then sprints forward to the center service line, split steps, and hits a forehand volley immediately followed by a backhand volley while closing into the net. The final shot in the sequence is an overhead while backing up.

Data Collection and Statistical Analysis

To measure agility, shuttle run was administered and to measure balance static balance test was administered both for collection of pre- and post-test scores. The obtained data were subjected to statistical treatment using "t"-test to determine how far agility and balance were improved among the tennis players [Table 1].

Table 1: Effects of on court drills on agility and balance of tennis players

Effect of on court drill on agility				
Test	**Mean**	**MD**	**SD**	**t'**
Pre	11.53	−0.39	0.16	−9.65*
Post	11.15			
Effect of on court drill on balance				
Test	**Mean**	**MD**	**SD**	**t'**
Pre	48.53	4.73	1.53	11.95*
Post	53.27			

*Significant at 0.05 level

RESULTS

DISCUSSION

Tennis players have to cover the court, which requires forward and back, side-to-side, and diagonal movement patterns. Tennis players frequently change direction, stop and start, and accelerate and decelerate. Motor fitness is an awareness and ability to stabilize one body part, whereas another body part is moving, In tennis, motor fitness is necessary as one move the arm to swing the racquet, whereas core muscle stabilize hips to avoid falling while swing. Thus, tennis develops the core in more ways than simple postural exercises or abdominal floor routines, Hence, the investigator was interested to find out the effect of "on court drills" for improvement of motor fitness, namely, agility and balance in this study.

The results of the study proved that, due to 6 weeks, "one court drill" training, the school level tennis players significantly improved their agility and balance. Moreover, the results of this study were in agreement with the findings of Lauer, 2017 and Bashir *et al*. 2019).

CONCLUSION

It was concluded that on court drills significantly contributed for the improvement of motor fitness variables, agility and balance which in turn would improve overall health of the tennis players.

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Research Article

Relative effect of mental training on net drop shot and smash performances of male badminton players

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ABSTRACT

Mental and emotional components are often as important as the physical aspects of performance in determining success in today's sports arena. The aim of this study was to find out the relative effect of mental training on net drop shot and smash performances of male badminton players. Intercollegiate level 40 badminton players were randomly selected for this study and divided into two groups, namely, the experimental group and the control group. The experimental group was asked to undergo 8 weeks of mental training whereas the control group did not. Before and after the experimental period, the participants were measured on their performance levels on net drop shot and smash through three experts for a maximum of 40 marks. The initial and final scores on the net drop shot and smash were considered the effect of mental training on male badminton players. The obtained data were analyzed through two-group ANCOVA. The results proved that there was a significant improvement in net drop shot and smash performances of the badminton players. It was concluded that mental training may be provided to the badminton players as part of their psychological preparation, which would improve performances of badminton.

INTRODUCTION

To keep pace with the fast and vast changes that are taking place in the various disciplines, there is a tremendous demand and responsibility cast on the training system to meet the challenges of preparing men and women to achieve tasks with success and excellence. Sports are no exception to this and so emphasis is placed on psychological aspects of a player to attain success (Mohan *et al*. 1986).

Traditional approaches to psychomotor training in sports focus on developing motor (production) skills first with recognition skills added later, often in the form of full-skill practice such as a football scrimmage. Newer theories of training psychomotor performance in sports favor decision training over behavioral training (Vickers, 2007). They advocate incorporating recognition skills earlier in the acquisition and practice of psychomotor skills, for instance having a quarterback practice reading defenses while practicing footwork drills. However, while whole-task practice is generally desirable, it can also be beneficial to separate production and recognition skills for the sake of targeted training activities that may be delivered in approximately the same time frame but that are optimized for either the psycho or the motor part. This approach to training psychomotor performance skills is based on the simple but profound notion that recognition and production components can be de-coupled for targeted training and then recoupled for transfer to performance. The approach to training psychomotor performance skills is based on sports science research showing that experts' performance advantage over skilled but less expert performers often lies in the area of recognition skills rather than production skills and, further, that recognition skills can be targeted for training that then leads to improved performance of the overall skill (Williams and Ward, 2003). The recognition training approach has far-reaching implications for training psychomotor performance skills beyond sports, especially those that are typically associated with simulator-based training such as aviation, surgery, and use of force in law enforcement and the military (Fadde, 2007)

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MENTAL TRAINING

Mental training refers to a systematic and regular practice of psychological skills for the purpose of improving performance and increasing enjoyment of sports and exercise. Mental and emotional components are often as important as the physical aspects of performance in determining success in today's sports arena. Many serious athletes allot up to 20 h a week to physical practice whereas mental practice is often ignored. Like physical skills, mental skills such as goal setting, focusing and concentration, sports hypnosis, emotional intelligence, arousal management, and mental rehearsal also need to be consistently practiced.

"In badminton, all actions are done over the net so the badminton players need sufficient height to achieve peak and top-class performance. The weight is proportional to height increased muscle mass is essential to achieve strength and power. Long limbs: arms and legs with broad palms and long fingers, active wrists strong active muscles, agile legs, broad shoulders, and feet are necessary for a volleyball player. Active eye and strong physique: the physique should be without any postural eel formatives like knock knees, bow legs, flat poor hypnosis, lordosis, and scoliosis, somatic body types: somatic body types are ectomorph, mesomorph, and endomorph, volley ball needs players with a combination of ectomorphy and mesomorph. Jumping ability: jumping ability is not by birth. It can also be developed but not much. A badminton player should have the motor ability in which some are trainable and some are partially trainable." (Adams 1980).

Zhu (2013) "reported that affordances mean opportunities for action. These affordances are important for sports performance and relevant to the abilities developed by skilled athletes. In racquet sports such as badminton and found skilled players successfully perceived the affordance of string tension, but only experts were concerned about saving energy." Couppé *et al*. (2012) profiled shoulder passive range of motion and isometric strength for external and internal rotation as part of a preseason screening in adolescent national badminton players. And found males were generally stronger than females in all strength measurements except for internal rotation on the dominant side ($P < 0.01$).

According to Carr (2006), "the psychological issues that are present in the world of sport and elite performance are numerous; the ever-evolving psychological dynamics of individuals involved in sport and elite performance are intriguing and unique. A specialized knowledge base, training, and experience in providing psychological services are required to treat this unique population. Counseling and clinical issues of the athlete and elite performer require further attention in the realm of psychological interventions, including further exploration of the efficacy of interventions for performance enhancement." In this study, the investigator was interested to find out the relative effect of mental training on badminton skill performances net drop shot and smash of male badminton players.

METHODOLOGY

Badminton players who participated at intercollegiate level were selected for this study. Forty men badminton players in the age group ranging from 18 to 23 years were selected for this study. The participants were randomly divided into two groups and each group consisting of twenty participants. Group 1 acted as experimental group-1 and group-2 acted as control group. Control Group underwent a routine coaching program. The experimental group was given mental training for 8 weeks. Before the experimental treatment both the groups were measured of their skills in badminton, namely, net drop shot and smash which formed initial scores of the participants. The experimental group was imparted mental training for 8 weeks.

MENTAL TRAINING

"Mental training refers to a systematic and regular practice of psychological skills for the purpose of improving performance and increasing enjoyment of sports and exercise. Like physical skills, mental skills such as goal setting, focusing and concentration, sports hypnosis, emotional intelligence, arousal management, and mental rehearsal also need to be consistently practiced."

Part I

Exercise 1: Breath In - Breath Out: The participants felt a sense of calm and quiet.

Exercise #2: Stepping into the circle: Connect to a feeling of being in control, confident, and relaxed.

Part II

Conducted on the field during shooting practice.

Positive Exercise: Shots made in practice.

Experience something positive about that shot.

Process Exercise: Close attention to what participant was doing when he hit the ball well.

Take note of what imagery was most prominent in his mind as he made a correct shot. The participant would pay close attention to the sensation in his body he was aware of during his shot.

Table 1: Relative effect of mental training on net drop shot among badminton players

	Experimental group	Control	Source of variance	Sum of squares	Df	Mean squares	Obtained F
Pre-test mean	31.27	31.80	Between	3.60	1	3.60	
			Within	155.50	38	4.09	0.880
Post-test mean	33.73	31.73	Between	30.63	1	30.63	
			Within	98.35	38	2.59	11.83*
Adjusted post-test mean	34.01	31.94	Between	42.23	1	42.23	
			Within	51.72	37	1.40	30.21*
Mean diff	2.47	−0.07					

Table F-ratio at 0.05 level of confidence for 1 and 38 (df)=4.08, 1 and 38 (df)=4.08

Table 2: Related effect of mental training on smash skill of badminton players

	Experimental group	Control	Source of variance	Sum of squares	Df	Mean squares	Obtained F
Pre-test mean	27.47	27.73	Between	1.60	1	1.60	
			Within	294.30	38	7.74	0.207
Post-test mean	30.93	28.40	Between	65.03	1	65.03	
			Within	232.75	38	6.13	10.62*
Adjusted post-test mean	31.24	28.41	Between	79.97	1	79.97	
			Within	82.83	37	2.24	35.72*
Mean diff	3.47	0.67					

Table F-ratio at 0.05 level of confidence for 1 and 38 (df)=4.08, 1 and 37(df)=4.08

Data Collection and Statistical Procedure

Net drop shot was assessed by three experts in actual play situations considering start base position, footwork, racket position and hitting action, and effect and scored for a maximum of 40 marks. The score was the average of the observational marks given by the experts.

Smash was assessed by three experts in actual play situations taking into consideration moving into position, preparing the ready position, hitting the smash, and effect. The experts were requested to score the smash of each participant for a maximum of 40 marks. The score was the average of the observational marks given by the experts.

After the experimental treatment both the groups were measured of their skill variables. The differences between the initial and final means on selected variables were the effect of badminton drills among the school badminton players. To test the statistical two-group ANCOVA was employed.

RESULTS

Results presented in Table 1 proved that the initial net drop shot mean values of the experimental group were 31.27, and the control group was 31.80. Due to 8 weeks of mental training, the badminton net drop shot skill improved to a mean value of 33.7 in the experimental group with a mean difference of 287 whereas the control group changed −0.07. The statistical analysis proved that post-test means of the experimental group were significant at 0.05 level and the adjusted mean F values also proved to be significant at 30.21.

Results presented in Table 2 proved that the initial smash skill mean values of the experimental group were 27.47, and the control group was 27.73. Due to 8 weeks of mental training practice, smash skill was improved to a mean value of 30.93 with a mean difference of 3.47 whereas the control group changed 0.37. The statistical analysis proved that post-test means of experimental groups was significant at 0.05 level and the adjusted mean F values also proved to be significant at 35.72.

DISCUSSION

"While an elite athlete can spend countless hours training his or her body, too often, little time or attention is devoted to preparing the mind for the challenges and demands of the sport. Because an athlete's state of mind can significantly affect his or her performance or the eventual outcome of competition, developing strong mental skills can help athletes of all levels searching for a competitive advantage." Wiggins *et al.* (2014) examined the "role of cue utilization in the initial acquisition of psychomotor skills. Examined the relationship between cue utilization typologies and levels of accuracy following four simulated, power-off landing trials in a light aircraft simulator. The results indicated that higher levels of cue utilization were

associated with a greater level of landing accuracy following training exposure." The acquisition of psychomotor skills through 8 weeks of mental training contributed to enhanced skill performances. The findings of this study proved that the experimental treatment of mental training contributed to improved net drop shot and smash skills in badminton and the findings of this study agreed with the previous studies.

CONCLUSION

It was concluded that 8 weeks of mental training significantly improved net drop shot and smash skills in ball badminton.

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Research Article

Impact of badminton drill practice on service accuracy and speed of high school badminton players

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ABSTRACT

The aim of this study was to find out the impact of badminton drill practice on service accuracy and speed of high school badminton players. Thirty men badminton players in the age group ranging from 14 to 17 years were selected for this study. The subjects were randomly divided into two groups and each group consisting of 15 subjects. Group 1 acted as experimental Groups 1 and 2 acted as acted as control group. Control Group underwent routine coaching program. Experimental group was given drills training in badminton for a period of 6 weeks. Before the experimental treatment, both the groups were measured of their skill in badminton, namely, serviced accuracy and physical fitness variable, speed which formed initial scores of the subjects. The experimental group was imparted with 6 weeks of badminton drills. The skill practices consisted of general skill practices, such as clearing, clearing corner to corner, clearing corner to corner no rest, hover drills, food work drills, and specific drills. The data were serve accuracy was collected using "Zonal Method," and speed was measured through 50 M dash. The two group analysis of covariance results proved that the initial serve accuracy mean values of experimental groups were 11.33 and control group was 11.07. Due to 6 weeks, badminton skill drills practice, the badminton serve for accuracy skill improved to mean value of 14.20 on experimental group with mean difference of 2.87, whereas control group changed 0.20. The statistical analysis proved that post-test means of experimental groups were significant at 0.05 level and the adjusted mean F values also proved to be significant at 67.81. And as for speed initial speed mean values of experimental groups were 8.27 and control group were 8.24 s. Due to 6 weeks, badminton skill drills practice, speed was improved to a mean value of 7.73 s with mean difference of 0.54, whereas control group changed 0.01. The statistical analysis proved that post-test means of experimental groups were significant at 0.05 level and the adjusted mean F values also proved to be significant at 7.10. It was concluded that badminton skill practice training may be beneficial to improve skills in badminton and physical fitness levels of the badminton players.

INTRODUCTION

"The game of Badminton requires a lot of stamina and exceptional fitness. It is a fast-paced sport which requires more aerobic stamina than other racket sports such as Tennis and Squash. The reaction time for a Badminton player is also faster than the abovementioned racket sports. It is a sport dominated by players from Asia and a few European countries such as Denmark. All England Badminton Championship is the most prestigious Badminton Tournament in the world. Besides this, there are team championships for men as well as women. Badminton is also an Olympic discipline having both individual and team medals at stake. Badminton is also popular among fitness enthusiasts as it provides a good cardiovascular workout" (http:/www.badinton).

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"In badminton all actions are done over the net, so the badminton players need sufficient height to achieve peak and top class performance. Weight is proportional to height increased muscle mass is essential to achieve strength and power. Long Limbs; arms and legs with broad palm and long fingers, active wrist strong active muscle and agile legs, broad shoulder and foot are necessary for a volleyball player. Active eye and strong physique; the physique should be without any postural eel formatives such as knock knees, bow legs, flat poor hypnosis, lordosis and scoliosis, somatic body types; somatic body types are ectomorph, mesomorph, and endomorph, and volley ball needs players with a combination of ectomarph and mesomarph. Jumping ability; jumping ability is not by birth. It can also be developed but not much. A badminton player should have the motor ability, in which some are trainable and some are partially trainable" (Swat, 1975).

"As an instructional strategy, drill and practice is familiar to all educators. It "promotes the acquisition of knowledge or

skill through repetitive practice." It refers to small tasks such as the memorization of spelling or vocabulary words, or the practicing of arithmetic facts and may also be found in more sophisticated learning tasks or physical education games and sports. Drill-and-practice, like memorization, involves repetition of specific skills, such as addition and subtraction, or spelling. To be meaningful to learners, the skills built through drill-and-practice should become the building blocks for more meaningful learning" (Kumekawa, Eugene (2014).

"Specific Drill and Practice activities help learners' master materials at their own pace. Drills are usually repetitive and are used as a reinforcement tool. Effective use of drill and practice depends on the recognition of the type of skill being developed, and the use of appropriate strategies to develop these competencies. There is a place for drill and practice mainly for the beginning learner or for students who are experiencing learning problems. Its use, however, should be kept to situations where the teacher is certain that it is the most appropriate form of instruction" (Kumekawa, Eugene (2014).

Zhu Q. (2013) "reported that affordances mean opportunities for action. These affordances are important for sports performance and relevant to the abilities developed by skilled athletes. In racquet sports such as badminton and found skilled players successfully perceived the affordance of string tension, but only experts were concerned about saving energy." Akpinar *et al*. (2012) "compared the coincidence-anticipation timing accuracy of athletes of different racket sports with various stimulus velocity requirements. Three different stimulus velocities, low, moderate, and high, were used to simulate the velocity requirements of these racket sports. Badminton players performed better under the moderate speed comparing to tennis and table tennis players." Goh *et al*. (2013) "examined sports injury pattern and establish cost of injuries in relation to training of 58 competitive badminton players in a Malaysian National Sports School and concluded badminton injuries mostly involved the lower limb and almost all overuse injuries occurred in the lower limb. However, badminton injuries as a whole were predominantly sprains and strains and not overuse in nature as widely believed."

Skill drills have been used in physical education and in sport to improve the performance in any game and specific skills of players. These assessments served the teacher and coach to determine a players' level of ability or their progress, weaknesses, and strengths. How far such skill drills influences the selected physical and performance skills of badminton players were the research interest of the investigator in this study? For this purpose, the investigator selected skill variable service accuracy and physical fitness variable speed of high school badminton players.

METHODOLOGY

Thirty men badminton players in the age group ranging from 14 to 17 years were selected for this study. The subjects were randomly divided into two groups and each group consisting of 15 subjects. Group 1 acted as experimental Group 1 and Group 2 acted as a control group. Control Group underwent routine coaching program. Experimental group was given drills training in badminton for a period of 6 weeks. Before the experimental treatment, both the groups were measured of their skill in badminton, namely, serviced accuracy and physical fitness variable, speed which formed initial scores of the subjects. The experimental group was imparted with 6 weeks of badminton drills.

SKILLS TRAINING

The skill training imparted to the badminton players consisting of the following:

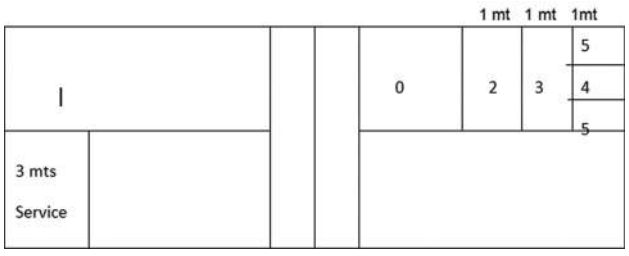
- Clearing drills
- Clearing corner to corner
- Clearing corner to corner - no rest
- Hover drill
- Up and back with hover
- Lift-drop-drop
- Net drives
- Net drives
- Net drives with 3
- Footwork drills
- Specific drills
- Wall rally drill
- Multiple shuttles and overhead strokes
- Multiple shuttle net play
- Half court singles
- King of the court.

Data Collection and Statistical Procedure

- Physical fitness variable, speed, was measured through 50 M sprint test, and the scores were recorded in seconds
- The serve accuracy in badminton was determined through "Zonal Method" as detailed below.

Field Marking

The full ball badminton court was marked as detailed in below Figure.



Subjects were asked to stand behind the service area. One by one each subject was asked to serve from the service area and five chances were given for each subjects, with the respective rackets they were given practice for a period of 6 weeks. Based on the ball landing on the opposite side in the marked area, scoring was accorded either 0 or 1 or 2 or 3 or 4 or 5 for each chance. The scores for all the five chances were added up to mark the score of the subject.

After the experimental treatment, both the groups were measured of their skill variable, service accuracy, and speed. The differences between the initial and final means on selected variables were the effect of badminton drills among the school badminton players. To test the statistical, two group analysis of covariance was employed.

RESULTS

Results presented in Table 1 proved that the initial serve accuracy mean values of experimental groups were 11.33 and control group was 11.07. Due to 6-week badminton skill drills practice, the badminton serve for accuracy skill improved to mean value of 14.20 on the experimental group with a mean difference of 2.87, whereas control group changed 0.20. The statistical analysis proved that post-test means of experimental groups were significant at 0.05 level and the adjusted mean F values also proved to be significant at 67.81.

Results presented in Table 2 proved that the initial speed mean values of experimental groups were 8.27 and control group were 8.24 s. Due to 6-week badminton skill drills practice, speed was improved to mean value of 7.73 s with a mean difference of 0.54, whereas control group changed 0.01. The statistical analysis proved that post-test means of experimental groups was significant at 0.05 level and the adjusted mean F values also proved to be significant at 7.10.

DISCUSSION

Di *et al*. (2012) documented that neuroimaging studies of professional athletic or musical training have demonstrated considerable practice-dependent plasticity in various brain structures, which may reflect distinct training demands. And studied structural and functional brain alterations were examined in professional badminton players and compared with healthy controls. It was indicated that badminton expertise is associated with not only plastic structural changes in terms of enlarged gray matter density in the cerebellum but also functional alterations in frontoparietal connectivity. Such structural and functional alterations may reflect specific experiences of badminton training and practice, including high-capacity visuospatial processing and hand–eye coordination in addition to refined motor skills.

The findings of this study proved that 6-week badminton skill practices significantly contributed for the improvement of

Table 1: Impact of badminton skill practice on serve accuracy among badminton players

	Experimental group	Control	Source of variance	Sum of squares	Df	Mean squares	Obtained F
Pre-test mean	11.33	11.07	Between	0.5	1	0.53	0.143
			Within	104.3	28	3.72	
Post-test mean	14.20	11.27	Between	64.5	1	64.53	39.86*
			Within	45.3	28	1.62	
Adjusted post-test mean	14.14	11.33	Between	59.0	1	58.97	67.81*
			Within	23.5	27	0.87	
Mean diff	2.87	0.20					

Table F-ratio at 0.05 level of confidence for 1 and 28 (df)=4.10, 1 and 27(df)=4.11

Table 2: Impact of badminton skill practice on speed of the badminton players

	Experimental group	Control	Source of variance	Sum of squares	Df	Mean squares	Obtained F
Pre-test mean	8.27	8.24	Between	0.01	1	0.01	0.052
			Within	3.00	28	0.11	
Post-test mean	7.73	8.25	Between	2.06	1	2.06	6.43
			Within	8.97	28	0.32	
Adjusted post-test mean	7.72	8.26	Between	2.16	1	2.16	7.10
			Within	8.23	27	0.30	
Mean Diff	−0.54	0.01					

Table F-ratio at 0.05 level of confidence for 1 and 28 (df)=4.10, 1 and 27(df)=4.11

service for accuracy of school level badminton players and also improved physical fitness variable speed.

The reason may be as found by Di *et al*. (2012) structural and functional alterations due to badminton skill practice reflected specific experiences of badminton training and practice, including high-capacity visuospatial processing and hand–eye coordination in addition to refined motor skills. Moreover, the findings were found to be in agreement with the findings of Di *et al*. (2012).

CONCLUSION

It was concluded that badminton skill practice training may be beneficial to improve skills in badminton and physical fitness levels of the badminton players.

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Research Article

Effect of yoga therapy on selected physical fitness variables among adolescent school boys

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ABSTRACT

The aim of this study was to find out the effect of yoga therapy on selected physical fitness variables among adolescent school boys. To facilitate the study 30 adolescent school boys were randomly selected from different schools in Andhra Pradesh and divided into two groups of 15 in each. Their age was between 14 and 16 years. One group was considered a control group and the other an experimental group. Pre-tests were conducted for all the participants on selected physical fitness variables, such as strength, and flexibility. After determining the pre-test scores the participants were experimented with yoga therapy through selected yogic practices for 6 weeks. Immediately after the experimental period, both groups were measured in the physical fitness variables, strength, and flexibility. The difference between the pre- and post-test scores on selected physical fitness variables was considered effect of yoga therapy on the adolescent boys. The obtained data were subjected to statistical treatment and the results proved that the experimental group which underwent yoga therapy significantly improved strength and flexibility. The results proved that yoga therapy can contribute to healthful living of adolescent boys. It was concluded that yoga therapy may be practiced for improvement in physical fitness.

INTRODUCTION

"Yoga means the experience of oneness or unity with inner being. This unity comes after dissolving the duality of mind and matter into supreme reality. It is a science by which the individual approaches truth. The aim of all yoga practice is to achieve truth where the individual soul identifies itself with the supreme soul or God. Yoga has the surest remedies for man's physical as well as psychological ailments. It makes the organs of the body active in their functioning and has a good effect on the internal functioning of the human body. Yoga is a reeducation of one's mental process, along with the physical." (Gharate, 1982) "In other systems of physical exercises, the internal organs of the body mostly do not get proper exercises, whereas yogic practices give sufficient exercises to the internal organs of the body. Yoga practices have a greater impact on the mind and control of the senses. Yogic practices make possible not only physical and mental development but also intellectual and spiritual development. Yoga practices are called a "non-violent activity" (Sharma, 1984).

"The science of yoga works on physical, mental, emotional, psychic, and spiritual aspects of a person. When imbalance is experienced at this level, the organs, muscles, and nerves no longer function in harmony, rather they at in opposition to each other. Therefore yoga aims at bringing the different body functions into perfect coordination so that they work for the God of the whole body."

Yoga Therapy

"Yoga therapy is a new form of healing emerging out of the current popularity of yoga practices. Yoga therapy is created by the merging of traditional yoga with modern medicine. Medical assessments are taken into consideration to tailor yoga practices to individual needs. This approach makes yoga therapy more effective than general yoga practice for people who wish to treat specific medical conditions through yoga." (www.sivanandabahamas.org/yoga-terapy.htm).

"Yoga therapy has been applied in hospitals in India for some time now and medical research is providing increasing evidence to support the efficacy of yoga therapy. In the USA

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and Europe now, dedicated and respected yoga therapy centers are developing. There are professional trainings available in yoga therapy and some general practitioners will refer patients for yoga therapy." (www.sivanandabahamas.org/yoga-terapy.htm).

"Yoga therapy can be practiced alongside any other form of treatment or healing that a person may opt for, from mainstream medical treatment to acupuncture, homeopathy, osteopathy, and dietary therapy. Yoga therapy trainings sometimes specialize in one area of yoga therapy such as structural yoga therapy, yoga therapy for depression, or yoga therapy for cancer and/or heart disease. Yoga therapy of all types generally incorporates some lifestyle advice and nutritional recommendation." (www.sivanandabahamas.org/yoga-terapy.htm). Reddy and Kumar (2001) conducted a study on yogasanas and aerobic dance and their effects on selected motor fitness components in girl participants. It was concluded that the practice of yogasana improved significantly the speed, agility, flexibility, and cardiorespiratory endurance. Maity and Samanta (2001) conducted a study on the effect of calisthenics and yogasanas on the motor fitness status of fifth-grade girls and found yogasanas were effective in developing motor fitness of fifth-grade girls. Tiken, Kosana, Joy, and Inaobi (2002) conducted a study on the influence of specific yoga and aerobic exercise on the physical fitness of SAI athletes and found improvement of physical fitness assessed on three selected physical fitness tests after 4 months of yoga. Lohan and Rajesh (2002) studied the effect of asanas and pranayamas on the physical and physiological components of boys between the age group 12–16 years. It was concluded that physical and physiological fitness was improved by training of selected yogic exercises. The combined group of asanas and pranayama showed significant improvement in the physical and physiological fitness parameters. Harinath *et al*. (2004) conducted a study on the effect of hatha yoga and Omkar meditation on cardiorespiratory performance resulted in an improvement in cardiorespiratory performance and psychological profile.

The previous research proved that yogic practices have been beneficially practiced as yoga therapy for different groups of people for improving their physical fitness, physiological, and psychological levels for the all-round healthful life. The investigator was interested to scientifically document the effect of yoga therapy on selected physical fitness variables among adolescent boys.

METHODOLOGY

To facilitate the study, 30 adolescent schoolboys were randomly selected from different schools in Andhra Pradesh and divided into two groups of 15 in each. Their age was between 14 and 16 years. One group was considered the control group and the other was the experimental group. The experimental groups were asked to assemble in a common place to make them learn the selected yogic practices to be imparted to them as yogic therapy for 1 week. Thus, care was taken before experimental treatment, and the participants were well-versed with the yogic practices to be experimented on them. Pre-tests were conducted for all the participants on selected physical fitness variables, such as strength, and flexibility. After determining the pre-test scores, the participants were experimented with yoga therapy through selected yogic practices for 6 weeks. The yoga therapy experimented among the experimental group was given "Sundara Yoga Therapy."

Data Collection and Statistical Analysis

The strength of the experimental and control group, both at pre- and post-experimental periods was collected through the administration of push-up tests scored in terms of the number of push-ups performed and flexibility was measured through sit and reach tests scored in inches. The difference between the pre- and post-test scores on selected physical fitness variables was considered the effect of yoga therapy on the adolescent boys. The obtained data were subjected to statistical treatment using two groups ANCOVA.

RESULTS

Table 1: Effect of yoga therapy on strength of the adolescent boys

	Experimental group	Control	Source of variance	Sum of squares	Df	Mean squares	Obtained f
Pre-test mean	17.07	17.33	Between	0.5	1	0.53	0.061
			Within	244.3	28	8.72	
Post-test mean	19.60	17.53	Between	32.0	1	32.03	4.95*
			Within	181.3	28	6.48	
Adjusted post-test mean	19.71	17.42	Between	39.2	1	39.21	92.82*
			Within	11.4	27	0.42	
Mean diff	2.53	0.20					

Table F-ratio at 0.05 level of confidence for 1 and 38 (df)=4.08, 1 and 38 (df)=4.08

Table 2: Effect of yoga therapy on flexibility of adolescent boys

	Experimental group	Control	Source of variance	Sum of squares	Df	Mean squares	Obtained f
Pre-test mean	7.47	7.33	Between	0.13	1	0.13	0.015
			Within	251.07	28	8.97	
Post-test mean	9.93	7.80	Between	34.13	1	34.13	7.88*
			Within	121.33	28	4.33	
Adjusted post-test mean	9.89	7.84	Between	31.54	1	31.54	32.38*
			Within	26.30	27	0.97	
Mean diff.	2.47	0.47					

Table F-ratio at 0.05 level of confidence for 1 and 38 (df)=4.08, 1 and 37(df)=4.08

DISCUSSION

Results presents in Table 1 proved that the initial strength mean values of the experimental group was 17.07 and due to 6 weeks of yoga therapy training, among the adolescent boys improved strength with a mean value of 19.0 on the experimental group with a mean difference of 2.33. Similarly, table 2 proved that the initial scores on flexibility mean values of experimental groups was 7.47 inches was improved to 9.93 due to 6 weeks of yoga therapy training flexibility was improved to a mean value of 9.93 with a mean difference of 2.47. The statistical analysis proved that the post-test means of the experimental group on strength and flexibility were significant at 0.05 level and the adjusted mean F values 92.82 and 32.38, respectively, of the adolescent boys.

"Yoga therapy can be applied for a wide range of physical and mental-emotional conditions: for structural problems such as low back pain, arthritis, shoulder pain; for respiratory conditions such as asthma; for diseases of the digestive system such as irritable bowel syndrome; and for many other common health conditions such as multiple sclerosis, hypertension, anxiety, depression, chronic fatigue syndrome, and fibromyalgia." (www.sivanandabahamas.org/yoga-terapy.htm). The researcher is interested to make a study on the effect of yoga therapy on selected physical fitness variables, strength, and flexibility of adolescent boys. The results of this study proved that 6 weeks of yoga therapy suggested to the adolescent boys significantly improved physical fitness variables, strength, and flexibility. Moreover, the findings of this study were in agreement with the previous research cited.

CONCLUSION

It was concluded that yoga therapy significantly improved the strength and flexibility of adolescent boys, which will help them to lead a healthful life.

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Review Article

Effect of yoga on mental health

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ABSTRACT

Although widely popular for physical benefits, Yoga has been underutilized for the promotion of mental health. Health professionals and general public continue to remain in different about the suitability of Yoga for treating mental disorders, managing psychological wellness of patients and promoting mental health of the normal population. The need for effective population mental health promotion approaches is urgent as mental health concerns are escalating globally, and current allopathic treatment regimens are insufficient to bring people toward the state of mental well-being (citation). Successfully alleviating stress has the potential to promote well-being and prevent illness. Worldwide, yoga is gaining popularity as an accessible, acceptable, and cost-effective practice for mind and body. People are turning to yoga for mental health improvement due to preferences for self-treatment as opposed to clinical intervention; perceived greater efficacy than medication; fewer side effects; and lack of response to medication. Yoga has minimal side effects and is cost-effective in comparison with pharmacological treatments and psychotherapy. Yoga's added benefit is that it improves physical fitness and encourages self-reliance. In this brief article, we discuss the evidence for yoga as a form of mental health promotion, illness prevention, and treatment for depression.

Keywords: Asana, Bandhas and mudras, Mental health, Yoga

INTRODUCTION

By 2020, the World Health Organization predicts that depression will be the second-largest contributor to the global disease burden, after ischemic heart disease (cite). Anxiety is also being diagnosed at a greater rate than it was in the past. Despite these increases in diagnosis, treatment regimens typically include pharmaceutical therapies that are not sufficient to prevent further illness or promote mental well-being. Effectively addressing mental health concerns entail a comprehensive approach that addresses the root of the problems. In this paper, we provide evidence for yoga as a form of health promotion, illness prevention, and treatment for depression and other mental health imbalances. Like other therapies, yoga is not a complete solution to mental health concerns. In conjunction with other approaches, yoga has great potential to lead people toward greater mental well-being. The eight-limbed path of yoga includes yama (moral codes), niyama (self-discipline), asana (postures), pranayama (breath practices promoting life force), pratyahara (sensory transcendence), dharana (concentration), dhyana (meditation), and samadhi (state of bliss). The word roots of yoga mean "to join" in Sanskrit. Joining mind and body, and individual and collective selves is the essence of this ancient South Asian practice. Yogic philosophy posits that every life form is interconnected and united. "Yoga exists in the world because everything is linked." Yoga's greatest aim is to create compassion within and a deep sense of unity and oneness with all forms of life. Yoga is an individual activity that has social implications. Those who regularly participate in yoga typically interact with the world in calmer and more reasonable ways. More positive social interactions and relationships are one of the ripple effects of individual yoga practice. Accessible or complementary yoga classes offer low-income people the opportunity to experience the benefits of inner peace and a healthier body. When practices such as yoga are accessible to all, larger effects are possible. Without overstating the impacts, potential consequences of large scale population mental well-being initiatives such as this are less violence in society, less addiction, and greater ability to be authentic with one and other

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WHAT IS MENTAL HEALTH?

Mental health is a state of well-being in which a person understands his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to contribute to his or her community. Both physical and mental health are the result of a complex interplay between many individual and environmental factors, including:

- Family history of illness and disease/genetics
- Lifestyle and health behaviors (e.g., smoking, exercise, substance use)
- Levels of personal and workplace stress
- Exposure to toxins
- Exposure to trauma
- Personal life circumstances and history
- Access to supports (e.g., timely healthcare, social supports)
- Coping skills

When the demands placed on someone exceed their resources and coping abilities, their mental health will be negatively affected. Two examples of common demands are: (i) Working long hours under difficult circumstances and (ii) caring for a chronically ill relative. Economic hardship, unemployment, underemployment, and poverty also have the potential to harm mental health.

WHAT IS MENTAL ILLNESS?

A mental illness is a medical condition that disrupts a person's thinking, feeling, mood, ability to relate to others, and daily functioning. Just as diabetes is a disorder of the pancreas, mental illnesses are medical conditions that often result in a diminished capacity for coping with the ordinary demands of life. Serious mental illnesses include major depression, schizophrenia, bipolar disorder, obsessive compulsive disorder (OCD), panic disorder, post-traumatic stress disorder (PTSD), and borderline personality disorder. The good news about mental illness is that recovery is possible. Mental illnesses can affect persons of any age, race, religion, or income. Mental illnesses are not the result of personal weakness, lack of character, or poor upbringing. Mental illnesses are treatable. Most people diagnosed with a serious mental illness can experience relief from their symptoms by actively participating in an individual treatment plan. Find out more about a specific mental illness:

- Anxiety disorders
- Autism spectrum disorders
- Attention-deficit/hyperactivity disorder
- Bipolar disorder
- Borderline personality disorder
- Depression
- Dissociative disorders
- Dual diagnosis: Substance abuse and mental illness
- Eating disorders
- OCD
- Panic disorder
- PTSD
- Schizoaffective disorder
- Schizophrenia
- Seasonal affective disorder.

YOGA AND MENTAL HEALTH

As the Patanjali Sutras notes, "Yoga is the practice of quieting the mind." Positive mental health is "a state of well-being, in which every individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community. We searched for articles that examined yoga as a form of promoting mental well-being for healthy people. However, most of the literature in this area focuses on improving the quality of life for people with cancer and other applications. The literature on mental health and yoga is biased toward individualized mental health imbalances in a similar way as literature in physical health is biased toward individualized disease. Yoga has been shown to enhance the quality of life in people who are healthy and ill. A review study found that yoga is as effective or better than exercise at improving a variety of mental and physical health measures such as stress, quality of life, mood states, heart rate variability, pulmonary function, and so on. A meta-analysis concluded that because weight gain and toxicity are side effects of various pharmacotherapies, yoga may be an effective and less toxic auxiliary treatment for severe mental illness. In one study, yoga improved subjective well-being, mental health, and executive functioning within prison populations. Yoga improved the quality of life of pregnant women in various studies and enhanced their interpersonal relationships. Studies over the past 15 years have shown that yoga can improve psychological health during breast cancer treatment, as well as health-related quality of life in antipsychotic stabilized patients. In the treatment of mild-to-moderate (MDD), promising results indicate that yoga may be applied as a monotherapy. Level II evidence supports the use of yoga as an adjunctive therapy. Multiple studies conclude that (a) yoga is better than no treatment in improving MDD depressive symptoms in MDD, (b) yoga is equally as effective as TCAS (tricyclic antidepressants) jin severe MDD 1191, and (c) yoga in combination with antidepressants is better than antidepressants alone for depressive symptoms.

ASANA FOR MENTAL HEALTH

In today's hectic world, it has become quite obvious for people to lose their mental health balance. This loss of balance of mental health is depicted in the form of anxiety and depression. It is a proven fact that yoga really helps to stabilize

the mental health of human beings. Let us see how yoga can really help you enhance. Hatha Yoga describes Shatkarmas (six processes) in details for body purification and mind purification. Various asanas (Yoga Positions), six shatkarmas, mudras and bandhas (psychic knots or psycho-physiological energy release techniques), and Pranayama are described in old ancient Sanskrit texts of Hatha Yoga (Hatha Yoga Pradipika and Gherandasamhita). They work at the chitta (subtle aspect of consciousness) level that eliminates the physical and mental tensions. They are trained in supine and prone position of the body respectively. Shavasana and Vijrasana, Bhujangasana, Trikonasana, Halasana, Sarvangasana etc… important relaxative asanas.

BANDHAS AND MUDRASIN PRANAYAMA

Bandh is a special characteristic of Hatha Yoga. The various types of bandhas have been described in Yoga texts. However, none of them defines the term "Bandh" as such. The three types of bandhas, namely, Jalandhar Bandh, Uddiyan Bandh, and Mul Bandh have been described in many of the ancient texts. With the help of these descriptions, an attempt may be made to define the bandhas. Bandh may be defined as a particular action involving pressure or strain on the muscles. It is expected in Yoga to retain a firm pose in bandh as it is retained in the asanas. The bandhas are to be studied mainly while studying pranayama. We will study pranayam in detail afterwards. Bandhas have been described in Hathapradeepika in the chapter relating to Mudras. In all, 10 mudras have been described in it. They are describes all the two bandhas as mudras and Pranyama.

CONCLUSION

Taken together, while several reviews suggest positive benefits of Yoga, can helps to improve the mental health of all of them by reducing stress and improve prevention of physical and mental health to quality of life in all age groups. It is quite likely that yoga may help to improve self-efficacy, self-competence, physical fitness, and group support, and may well be effective as a supportive adjunct to mitigate mental medical conditions. The practice of yoga shows promise for promoting better population mental health. It is acceptable, accessible, cost effective, and encourages self-reliance. Yoga is an individual health-promoting practice that can be done in groups and supported by communities. Like other holistic practices such as tai chi, qigong, meditation, and so forth, it includes a community component. Practicing yoga together, in workplaces, schools, and other group settings have shown to promote population mental health (24), while yoga does not address the social determinants of mental illness; it does promote a greater sense of inner peace for those who partake. It appears that deep, slow breathing in combination with movement and other aspects of yoga are at the heart of yoga's ability to bring people a greater sense of tranquility. It meets the triple aim of improving health, improving care, and reducing cost. A recent article questions whether sufficient evidence exists for family physicians to recommend yoga to their patients. The evidence-based answer: "Yes, yoga can reduce symptoms of anxiety and depression (strength of recommendation: B, systematic reviews of randomized controlled trials [RCTs] with significant heterogeneity). Across multiple RCTs using varied yoga interventions and diverse study populations, yoga typically improves overall symptom scores for anxiety and depression by about 40%, both by itself and as an adjunctive treatment. It produces no reported harmful side effects." In some cases, yoga is taught for free such as yoga clubs in India and other countries, while it may not be for everyone, through a disciplined approach most people with or without mental health imbalances may feel more mental ease and relaxation through the practice of yoga.

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Research Article

Isolated combined elastic band base plyometric exercises and compound weight training impact on strength endurance of football players

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ABSTRACT

The study was to examine the isolated, combined elastic band base plyometric exercises (EBBPE), and compound weight training (CWTG) on strength endurance in term of bent knee sit-ups of male football players. Total n = 48 male college-level football players age ranging from 19 to 23 years selected from various colleges of Khammam district of Telangana. The chosen football players were randomly recruited into four groups each group n = 12 football players, that is, empirical Group I football players underwent: EBBPE, empirical Group II football players underwent: CWTG, empirical Group III underwent: Combined EBBPE and CWTG (EBPCWT), and control football players group (CFP). CFP was practiced only football. The training period was for 12-week duration. The measurement was done by conducting bent knee sit-ups test in numbers before and after the completion of training. The collected scores were analyzed by analysis of covariance and level of significant was restricted at 0.05 levels. The study found that isolated, combined EBPCWT had positive significant impact to increasing the muscular endurance in term of bent knee sit-ups test performances of the empirical group's football players comparative to control group. No significant difference found between isolated CWTG and combined EBPCWT.

Keywords: Elastic band, Plyometric, Strength enduranceand football, Weight

INTRODUCTION

Plyometric exercises were invented by Professor Yuri Verkhoshanksy. Plyometrics exercises or plyo mean explosive workouts and fast powerful movements. The purpose of athletes was to do plyometric exercises to improve jumping higher, running faster, throwing further, and hitting harder. When any plyometric exercises done with the elastic bands to enhance sports performance are known as elastic band base plyometric exercises (EBBPE). Plyometric exercises for lower body and upper body. Plyos can be performed with or without equipments (boxes and medicine balls and hurdles). Sets and repetitions depend on exercises.

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A compound exercise focuses on a variety of muscle groups being used through one movement. Due to the extra muscles used within the movement, athletes show the most strength on compound movements. Some research study suggests that the brief rises in anabolic hormone release and release of testosterone, after doing compound exercises with heavy weights that boost muscles protein synthesis. Najmeh *et al*. (2019) mentioned that compound circular exercises have a significant improvement impact on hematological parameters and immune system in non-athletes. Lee *et al*. (2012) study result showed that 12 weeks of regular compound exercises program had positive impact on leptin and insulin level of obese school girls. Kamranifaraz *et al*. (2016) mentioned in the study that compound exercises in water are low risk of injuries which had significant positive effect to improve strength and flexibility. More complex movements require better control and timing of multiple muscle groups-as well as the joints they act on. Coordination and control translate to other activities, helping you be stronger and more balanced.

STATEMENT OF THE RESEARCH PROBLEM

This study was to analyze the "isolated combined EBBPE and compound weight training (CWTG) impact on strength endurance in term of bent knee sit-ups performance of football players."

Research Hypothesis

- There will be a significant increase in strength endurance in term of bent knee sit-ups performance of empirical group's football players after the 12 weeks impact of isolated, combined EBBPE and CWTG (EBPCWT) when compared with control group football players.
- The combined EBPCWT will be superior to the isolated training.

METHODOLOGY

The study was to measure the isolated, combined EBPCWT on strength endurance in term of bent knee sit-ups performance of male football players. Total $n = 48$ male college-level football players age ranging from 19 to 23 years selected from various colleges of Khammam district of Telangana. The chosen football players were randomly recruited into four groups each group $n = 12$ football players, that is, empirical Groups I football players underwent: EBBPE, empirical Group II football players underwent: CWTG, empirical Group III underwent: combined EBPCWT, and control football players group (CFP). CFP was practiced only football. The training period was for 12-week duration. The measurement was done by conducting bent knee sit-ups test before and after the completion of training. The collected scores were analyzed by analysis of covariance and level of significant was restricted at 0.05 levels.

Table 1 shows that there is a significant difference on strength endurance performance among the four groups such as EBBPE, CWTG, combined EBPCWT, and CFP. Since the "F" value required being significant at 0.05 level for 3, 44 d/f and 3, 43 are 2.82, but the computation values of strength endurance in term of bent knee sit-ups test performance post and adjusted post-test "F" values are 42.29 and 68.45, respectively, which are greater than the tabulated value. Since the obtained "F" ratio is found significant.

On the bases of Scheffe's method test result on strength endurance of football player, the best method impact of isolated and combined EBPCWT for gaining muscular strength endurance was chosen.

Table shows that mean differences (MD) values of elastic band base plyometric exercises football players group (EBBPE) and CFP, CWTG football players group (CWTG) and CFP, and combined EBPCWT football players group (EBPCWT) and CFP were 7.13, 10.55, and 11.96, respectively, these values are high than CI value of 2.64. The result found that all three training were effective isolated and combined EBPCWT to increase the strength endurance of football players when comparison done with CFP.

The MD values comparison between CWTG and elastic band plyometric exercises (EBBPE) and, combined EBPCWT and EBBPE were 3.42 and 4.83, these values are high than CI value of 2.64. On the bases of result, study approved that CWTG and combined EBPCWT were more effective than isolated EBBPE to increase the strength endurance of football players.

The MD comparison between CWTG and combined EBPCWT is 1.41, this value is lower than CI value of 2.64. On bases of result, the study confirmed that CWTG and combined EBPCWT were equally effective to increase the strength endurance of football players.

The initial, final, and adjusted final mean values of strength endurance for the four group's football players, namely,

Table 1: Analysis of covariance for strength endurance in term of bent knee sit-ups performance on pre-test and post-test data of EBBPE, CWTG, EBPCWT, and CFP groups football players (in numbers)

Groups	EBBPE	CWTG	EBPCWT	CFP	Source of variance	Sum of squares	df	Mean squares	Obtained 'F'
Pre-test Mean	32.91	33.16	32.91	32.58	Between	2.06	3	0.68	0.075
SD	4.01	3.21	2.10	2.42	Within	404.41	44	9.19	
Post-test Mean	38.33	41.91	43.16	31.00	Between	1076.22	3	358.74	42.29*
SD	3.05	2.42	3.40	2.66	Within	373.25	44	8.48	
Adjusted Post-test mean	38.32	41.74	43.15	31.19	Between	1022.66	3	340.88	68.45*
					Within	214.14	43	4.98	
Mean diff	+5.42	+8.75	+10.25	-1.58	-	-	-	-	-

Table F-ratio value at 0.05 level of confidence for 3 and 44 (df) =2.82, 3 and 43 (df) =2.82. *Significant. EBBPE: Elastic band base plyometric exercises football players group, CWTG: Compound weight training football players group, EBPCWT: Combined elastic band base plyometric exercises and compound weight training football players group, CFP: Control football players group

EBBPE, CWTG, EBPCWT, and CFP present in line graph for clear understanding purpose in Figure 1.

Discussion on Hypothesis

- The first hypotheses stated that there will be a significant increase in strength endurance in term of bent knee sit-ups performance of empirical group's football players after the 12 weeks impact of isolated, combined EBPCWT when compared with control group football players. The statistical analysis proved that isolated, combined EBPCWT significantly increased the strength endurance in term of bent knee sit-ups performance. Hence, research hypothesis accepted.
- The second hypotheses stated that combined EBPCWT will be superior to the isolated training. The statistical analysis proved that there is no significant differences between isolated CWTG and combined EBPCWT. Hence, null hypotheses accepted.

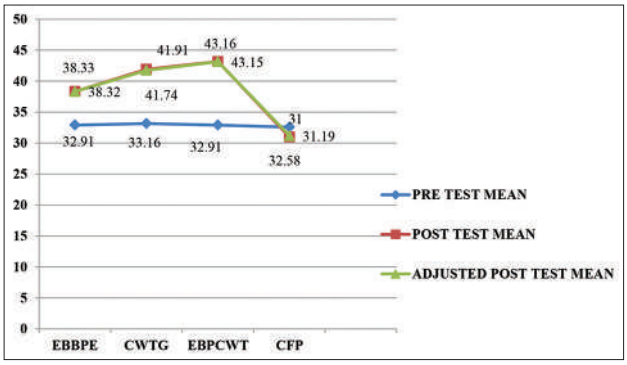

Figure 1: The strength endurance (IN NUMBERS) pre-post and adjusted post-test mean numbers in kilograms of EBBPE, CWTG, EBPCWT, and CFP groups of football players presented in line graph. EBBPE: Elastic band base plyometric exercises football players group, CWTG: Compound weight training football players group, EBPCWT: Combined elastic band base plyometric exercises and compound weight training football players group, CFP: Control football players group

Table 2: Scheffe's confidence interval test for paired adjusted final mean differences EBBPE, CWTG, EBPCWT, and CFP groups football players on strength endurance in term of bent knee sit-ups performance

ebbpe	cwtg	EBPCWT	CFP	MD	CI
38.32	41.74			3.42*	2.64
38.32	-	43.15	-	4.83*	
38.32	-	-	31.19	7.13*	
-	41.74	43.15	-	1.41	
-	41.74	-	31.19	10.55*	
-	-	43.15	31.19	11.96*	

EBBPE: Elastic band base plyometric exercises football players group, CWTG: Compound weight training football players group, EBPCWT: Combined elastic band base plyometric exercises and compound weight training football players group, CFP: Control football players group

DISCUSSION AND FINDINGS

The study demonstrated on the bases of analysis Tables 1 and 2 that isolated and combined 12 weeks training impact of EBPCWT positively increase the strength endurance of football players increased in bend knee sit-up test. The research articles results on strength endurance were Birtukan and Sisay (2018) noted that the final findings were significant improvements in squat, sit-ups, and push-ups performance of male football players of Tabor Secondary School with the 12 consistent weeks of physical fitness exercises. Javid *et al*., (2017) result demonstrated that circuit training and plyometric training made significant improvement on abdominal strength endurance of volleyball players. Further, it was also concluded that circuit training is best method training than plyometric exercises to improve abdominal strength endurance. Justin *et al*., (2019) found that muscles strength endurance of trained groups female significantly increased with the 12-week impact of traditional set training and compound set training. Hwang-Bo Kak *et al*., (2013) proved that aerobic and an anaerobic physical activity is effective for increasing abdominal muscular strength. Kukumoni *et al*., (2021) it was reported that bent knee sit-ups performance of football player's increase due to the development of muscular endurance with the plyometric training. Diwakar *et al*., (2014) found that resistance under the supervision of the therapist had positive effect to increase the abdominal muscular strength of volleyball players. Mohamad *et al*., (2021) results proved that muscular endurance of young elite football players is improved with both training double-pyramid resistance and pyramid speed training. Prakash and Kaba (2017) result showed that battle rope training is effective for increasing the strength endurance and arm strength of volleyball players. Ae Rim *et al*., (2014) study proved that muscles strength and endurance resulted increased directly from resistance training. Khursheed *et al*., (2017) results reveal that muscular strength endurance of young male college football players improved with the 12-week impact of circuit training and resistance training.

CONCLUSIONS

On the bases of analysis report, the study shows that isolated and combined elastic band base plyometric exercises and CWTG had positive impact on trained groups football players namely: EBBPE, CWTG and EBPCWT to increase the strength endurance in bend knee sit-up test when comparison done with CFP. The study concluded that CWTG and combined EBPCWT were more effective than isolated EBBPE to increase the strength endurance of football players. Further, the study confirmed, that CWTG and combined EBPCWT were equally effective to increase the strength endurance of football players.

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Review Article

A study of relationship between the academic achievement and selected health-related physical fitness components among the students

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ABSTRACT

Physical educational and sports science has always been the promotion and improvement of health and physical fitness. To achieve the purpose of the present study, 45 boys studying 12th standard in KVR Junior college, Khajipalem, Bapatla District, Andhra Pradesh, were selected based on their academic achievement in the 10th standard examination as high, moderate, and low achievers to a total of 45 students. The age of the subjects ranged between 15 and 17 years. The academic achievement of the subject in the 10th standard examination was considered as criterion variable for this study. The subjects those who scored more than 80% were considered as high achievers; subjects those who scored 60–79% in the 10th standard examinations were considered as moderate achievers; and the subjects those who scored below the 60% in the 10th examination were considered as low achievers. There existed insignificant relationship between the academic achievement and selected health related physical fitness components among high achievers. There existed insignificant relationship between the academic achievement and selected health-related physical fitness components among moderate achievers. There existed insignificant relationship between the academic achievement and selected health-related physical fitness components among low achievers.

Keywords: Academic achievement, Fitness, Health, Physical education

INTRODUCION

Physical educational and sports science has always been the promotion and improvement of "Health and physical fitness" through big muscular activity such as conditioning for various adaptations. Over the years, physical fitness – the ability to do one's work and have energy remaining for basic recreational activity has been advocated for two basic reasons, to prevent illness and diseases, and to help rehabilitation. These new goals of physical fitness are now recognized as significant outcomes of regular exercise (Kirtani, 1988).

FITNESS

Fitness is a term which is often used as synonyms to health in a limited manner. Fitness denotes different facts of health, the term fitness is the capacity of the individual to live and function effectively, purposefully, here and now to meet confidently the problems and crisis which are among his expectations. Fitness is a state which characterizes the degree to which a person is able to function. Ability to function depends up on the physical, mental, emotional, social, and spiritual components that have fitness, all which are related to each other and are mentally in dependent. This may be referred to as total fitness (Uppal, 2004).

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CARDIORESPIRATORY ENDURANCE

When the muscle contracts then burn glucose brought to them by the blood initially without the help of oxygen. This gives a byproduct called lactic acid, which accumulates in the muscles and then spills over into the blood. Endurance is the product of all psyche and physical organism and system. It is directly or indirectly connected with high performance accuracy, precision, rhythm, consistency, etc. where largely determined by the endurance level of the

athlete. Cardiopulmonary endurance of the most important aspect of fitness. It is basically how strong your heart is, which can potentially add years to your life. The heart is the most important muscle in the human body and if it is kept healthy than you can avoid numerous health problems. Another reasons that cardiopulmonary endurance is important are because your heart controls the oxygen flow to all your muscles-meaning cardiopulmonary health has a direct impact on your performance, both endurance and strength wise (David and Greenberg, 1989).

MUSCULAR STRENGTH

As your life and lower a weight, your muscle must generate enough force to move that weight. Muscular strength can be assessed by determining and amount of weight that can be lifted in one repetition of an exercise. Strength can be developed by increasing the amount of weight that can be lifted in an exercise after a lower weight can be lifted 10–12 items easily (Braill *et al*., 2000).

FLEXIBILITY

Flexibility is a vital component of total physical fitness, providing functional, recreational, and therapeutic benefits Corbin and Lindsey (1985) described flexibility as "a measure of the range of motion (ROM) available at joint or group of joints." After (1988) describes two type of flexibility: Static flexibility, or degree of movements possible through a range without emphasis on speed or time of movement, and dynamic flexibility, the dynamic quality of movements through a range of considering speed, such as during physical activity. ROM, measureable in linear or angular units, refers to the degree of motive at a joint, and stretching is the process of elongating muscle and connective tissue to increase ROM and improve flexibility (Miller, 1995).

MEHODOLOGY

To achieve the purpose of the present study, 45 boys studying 12th standard in KVR Junior college, Khajipalem, Bapatla District, Andhra Pradesh, were selected based on their academic achievement in the 10th standard examination as high, moderate, and low achievers to a total of 45 students. The age of the subjects ranged between 15 and 17 years. The academic achievement of the subject in the 10th standard examination was considered as criterion variable for this study. The subjects those who scored more than 80% were considered as high achievers; subjects those who scored 60–79% in the 10th standard examinations were considered as moderate achievers; and the subjects those who scored below the 60% in the 10th examination were considered as low achievers. The following health-related physical fitness components such as cardiorespiratory endurance, muscular strength, and flexibility from the subjects with the help of standardized test items mentioned in Table 1. The data were statistically analyzed using karl peason's product moment correlation to find out the relationship between the academic achievement and selected health-related physical fitness components among the government school students.

RESULT S OF THE STUDY

Table 2 shows that the correlation value between the academic achievement and selected health-related physical fitness components such as cardiorespiratory endurance, muscular strength, and flexibility was −0.256, −0.165, and 0.035, respectively. The above values are lesser than the table value of 0.0482. Hence, it is understood that there existed insignificant relationship between the academic achievement and all the selected health-related physical fitness components.

Table 1: Selection of variables and test

S. no.	Variables	Test items
1.	Academic achievement	10th standard marks
2.	Cardio respiratory endurance	Cooper's 12 min Ran/Walk
3.	Muscular strength	Modified sit-up
4.	Flexibility	Sit and reach

Table 2: Relationship between the academic achievement and selected health-related physical fitness components among high achievers

Correlation Coefficient (r)	Table value
r12–0.256	0.482
r13=0.165	0.482
R14=0.035	0.482

Table 3: Relationship between the academic achievement and selected health-related physical fitness components among moderate achievers

Correlation Coefficient (r)	Table value
r12–0.14	0.482
r13=0.16	0.482
R14=0.28	0.482

Table 4: Relationship between the academic achievement and selected health-related physical fitness components among low achievers

Correlation Coefficient (r)	Table value
r12=0.50*	0.482
r13=0.56*	0.482
r14=0.49*	0.482

Table 3 points out that correlation value between the academic achievement and selected health-related physical fitness components such as cardiorespiratory endurance, muscular strength, and flexibility were 0.14, 0.16, and 0.28, respectively. The above values are lesser than the table value of 0.482. Hence, it is understood that there existed insignificant relationship between the academic achievement and all the selected health-related physical fitness components.

Table 4 indicates that the correlation value between the academic achievement and selected health-related physical fitness components such as cardiorespiratory endurance, muscular strength, and flexibility were 0.50, 0.56, and 0.49, respectively. The above values are more than the table value of 0.482; hence, it is understood that there existed insignificant relationship between the academic achievement and all the selected health-related physical fitness components.

CONCLUSION

There existed insignificant relationship between the academic achievement and selected health-related physical fitness components among high achievers. There existed insignificant relationship between the academic achievement and selected health-related physical fitness components among moderate achievers. There existed insignificant relationship between the academic achievement and selected health-related physical fitness components among low achievers.

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Research Article

Exploring the combined effect of plyometric and aerobic exercise trainings on abdominal muscular strength, endurance, and flexibility in palamuru university long-distance runners

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ABSTRACT

Introduction: To increase the ability of the muscle fibers to generate additional tension and subsequent force production, the plyometric movement makes use of the pre-stretch of the muscle-tendon unit physiological length-tension curve. **Purpose:** The purpose of this study was to find out the exploring the combined effect of plyometric and aerobic exercise trainings on abdominal muscular strength endurance and flexibility among long-distance runners of Palamuru University. **Methodology:** The researcher has randomly selected 30 (n = 30) intercollegiate male long-distance runners of various colleges of Palamuru University, who were represented for their intercollegiate computation under Palamuru University, Mahabubnagar, were selected as subjects, and their age ranged between 18 and 21 years. The subjects were divided into two equal groups, each group consist of 15 total 30. Group 1 acted as experimental group and Group 2 acted as control group. The dependent variables abdominal muscular strength endurance and flexibility were selected, and abdominal muscular strength endurance is measured by setups in 1 min and flexibility was measured by sit and reach test for this study. **Statistical Tool:** The statistical tool paired samples "t" test was used for analyzing of the data and the obtained "t" ratio was tested for significance at 0.05 level of confidence. **Results:** The analysis of the data revealed that there was a significant improvement on the selected variable abdominal muscular strength endurance and flexibility by the application of varied types of combined plyometric and aerobic exercise training.

Keywords: Abdominal muscular strength endurance, Anaerobic exercise training, Flexibility, Plyometric training, T-test

INTRODUCTION

To increase the ability of the muscle fibers to generate additional tension and subsequent force production, the plyometric movement makes use of the pre-stretch of the muscle-tendon unit physiological length-tension curve. The ability to cover a long-distance, that is, (i.e. 800–10,000 m) rapidly is affected by a number of factors, including VO2max, lactate threshold, and running economy; this ability is also known as velocity performance (COYLE, 1995). However, maintaining submaximal velocity (such as 20.4–23.7 km/h) throughout long-distance running races may also call for the best neuromuscular traits connected to anaerobic traits, reflex neuronal activation, muscle force, and elasticity (NOAKES, 1988).

One of the assumptions of exercise physiology is that the inability of the heart and lungs to supply oxygen at a rate quick enough to fuel energy production by the working muscle mass limits performance during maximum exertion of short duration. This idea comes from research done in the 1920s by Hill and Lupton. The majority, if not all, studies explaining the effects of exercise training, detraining, or other treatments on human physiology as a result describe these changes in terms of either central adaptations boosting oxygen delivery to muscle or peripheral adaptations that modify. The rates at which the working muscles use oxygen or fuel. However, a close examination of Hill and Lupton's findings reveals that they suggested rather than proved that oxygen limitation occurs during maximal exertion. Modern studies also indicate that if such an oxygen constraint does in fact occur during maximal

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exertion, it appears in around 50% of test subjects. As a result, another mechanism might be required to account for the relatively large number of subjects that experienced tiredness during maximal exercise (NOAKES T. D., 1988).

Plyometrics is as the exercises that enable a muscle to reach maximum force in a short period of time. Plyometric training is a series of explosive body weight resistance exercises using the stretch-shortening cycle (SSC) of the muscle fiber to enhance physical capacity such as speed, strength, and power. It is a quick, powerful movement involving pre-stretching the muscle tendon unit followed by a subsequent stronger concentric contraction. This process of muscle lengthening followed by rapid shortening during the SSC is integral to plyometric exercise. The SSC process significantly enhances the ability of the muscle-tendon unit to produce maximal force in the shortest amount of time. These benefits have prompted the use of plyometric exercise as a bridge between pure strength and sport-related power and speed. Plyometric exercise is a popular form of training used to improve athletic performance. Plyometric exercises involve powerful movement that helps to lengthen the muscles, followed by muscle-shortening action. In this form of workout, your body exerts maximum force in a short period that helps to boost power and increase flexibility.

Plyometric training effects on endurance and explosive strength performance in competitive middle- and long-distance runners. Concurrent explosive strength and endurance training, when appropriately structured, could benefit middle- and long-distance runners' competitive performance, particularly in races characterized by sprinting movements with minor time disparities at the finish of the race (Ramírez-Campillo, 2014).

In well-trained endurance athletes, explosive strength and endurance training decreased the 5K time without affecting VO2 max. This improvement was brought about by better neuromuscular traits, which also led to better VMART and running economy (Paavolainen *et al*.,1999).

Aerobic exercise provides cardiovascular conditioning. The term aerobic actually means "with oxygen," which means that breathing controls the amount of oxygen that can make it to the muscles to help them burn fuel and move. Improves cardiovascular conditioning and decreases risk of heart disease. Aerobics is a form of physical exercise that combines rhythmic aerobic exercise with stretching and strength training routines with the goal of improving all elements of fitness (flexibility, muscular strength, and cardiovascular fitness).

Marti and Howald examined changes in physical training, subcutaneous fat, and maximum oxygen consumption (VO2 max) during a 15-year period in a sample of male former professional athletes and a control group (CG) of 23 healthy males. Increases in mileage, running speed, and truncal fat over a 15-year period in runners and general study men combined explained 51% of the variation in changes in VO2max normalized for body weight over that same period, according to multiple linear regression analysis. Changes in truncal fat in runners were affected by changes in both mileage and running pace. The 15-year decrease in maximal heart rate was only marginally predictive of the change in VO2max in the presence of physical training and anthropometric variables in the regression equation (Marti and Howald1990). The impact of Yogasana training also improves the volume of oxygen consumption in school children's (Reddy and Rathod, 2021).

METHODOLOGY

The purpose of this study was to find out the influence of the combined effect of plyometric and aerobic exercise training on abdominal muscular strength endurance and flexibility among long-distance runners of Palamuru University. Methodology: The researcher has randomly selected 30 ($n = 30$) intercollegiate male long-distance runners of various colleges of Palamuru University, who were represented for their intercollegiate computation under Palamuru University, Mahabubnagar, were selected as subjects, and their age ranged between 18 and 21 years. The subjects were divided into two equal groups, each group consist of 15 total 30. Group 1 acted as experimental group (EG) and Group 2 acted as CG. The dependent variables abdominal muscular strength endurance and flexibility were

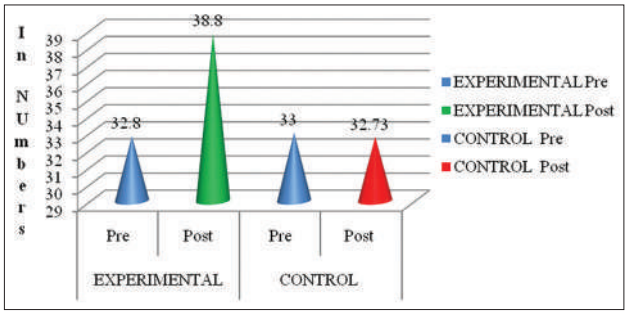

Figure 1: The mean difference of pre- and post-tests scores on abdominal muscular strength endurance of experimental and control groups

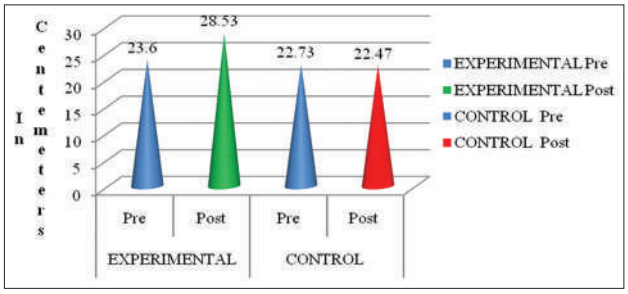

Figure 2: The mean difference of pre- and post-tests scores on flexibility of experimental and control groups

Table 1: Computation of "T" ratio between the pre- and post-tests on abdominal muscular strength endurance of experimental and control groups

Group	Tests	M	SD	DM	DM	t-ratio	*P*-value
Experimental	Pre	32.80	2.15	0.24	6.00	25.10*	0.00
	Post	38.80	2.01				
Control	Pre	33.00	2.00	0.18	0.27	1.47	0.16
	Post	32.73	2.15				

*Significance at 0.05 level

Table 2: Computation of "T" ratio between the pre- and post-tests on flexibility of experimental and control groups

Group	Tests	M	SD	DM	DM	t-ratio	*P*-value
Experimental	Pre	23.60	2.17	0.64	4.93	7.76	0.00
	Post	28.53	2.36				
Control	Pre	22.73	1.34	0.23	0.27	1.17	0.26
	Post	22.47	1.46				

*Significance at 0.05 level

selected, and abdominal muscular strength endurance is measured by setups in 1 min and flexibility was measured by sit and reach test for this study. Statistical Tool: The statistical tool paired samples "t" test was used for analyzing of the data and the obtained "t" ratio was tested for significance at 0.05 level of confidence.

It observes from Table 1 that the EG mean value for pre-test was 32.80 and post-test was 38.80. The standard deviation for the pre-test was 2.15 and post-test was 2.01. The standard error of the difference between the means was 0.24. The mean difference for the pre-test and post-test was 6.00. It revealed that the obtained t-ratio 25.10* was greater than the required t-ratio of 2.05. Hence, there was a significant improvement on abdominal muscular strength endurance of experiment group at 0.05 level of confidence.

It may be seen that the CG's mean value for pre-test was 33.00 and post-test was 32.73 the standard deviation for the pre-test was 2.00 and post-test was 2.15. The standard error of the difference between the means was found out and the value was 0.18. The mean difference for the pre-test and post-test was 0.27. It revealed that the obtained t-ratio 0.16 was lesser than the table value of 2.05; hence, there was no significant improvement on abdominal muscular strength endurance of CG at 0.05 level of confidence.

It observes from Table 2 that the EG mean value for pre-test was 23.60 and post-test was 28.53. The standard deviation for the pre-test was 2.17 and post-test was 2.36. The standard error of the difference between the means was 0.64. The mean difference for the pre-test and post-test was 4.93. It revealed that the obtained t-ratio 7.76* was greater than the required t-ratio of 2.05. Hence, there was a significant improvement on flexibility of experiment group at 0.05 level of confidence.

It may be seen that the CG's mean value for pre-test was 23.73 and post-test was 22.47. The standard deviation for the pre-test was 1.34 and post-test was 1.46. The standard error of the difference between the means was found out and the value was 0.23. The mean difference for the pre-test and post-test was 0.27. It revealed that the obtained t-ratio 1.17 was lesser than the table value of 2.05; hence, there was no significant improvement on flexibility of CG at 0.05 level of confidence.

DISCUSSION AND CONCLUSION

The results of the study reveal that there was a significant difference found from pre- to post-test means on abdominal muscular strength endurance and flexibility among long-distance runners of Palamuru University due to the 8 weeks of combined plyometric and aerobic training but the CG did not improved abdominal muscular strength endurance and flexibility.

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Research Article

Effect of core muscles with strength training on selected motor fitness variables of intercollegiate Kabaddi players

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ABSTRACT

The purpose of this study was to find out the effect of core muscles with strength training on selected motor fitness variables of intercollegiate kabaddi players. The investigator selected 24 college-level men kabaddi players who are studying in Sri Krishna College of Physical Education and Gopala Krishna College of Physical Education, Nalgonda, Telangana. Their age is ranged from 18 to 22 years. The selected subjects were considered as two groups in that 12 subjects were acted as control group and no training was given this group and another 12 subjects were acted as experimental group this group was undergone the training. The criterion variables, namely, shoulder strength, balance, and endurance have been selected as dependent variables for this study. The training period would be the 6 weeks. The data were analyzed by the use of dependent's test. The level of significance at 0.05. The result shows that shoulder strength, balance, and endurance of the selected subjects were significantly improved on experimental group of due to the effect of core muscles with strength training.

Keywords: Balance and endurance, Core muscle, Shoulder strength

INTRODUCTION

The goal of core stability is to maintain a solid, foundation and transfer energy from the centre of the body out to the limbs. Core strength training is an important part of any running or sports fitness program. A strong core will support running, training, and any other sports or physical activity. Strong core muscles provide with a strong base and are key in supporting a strong and enduring stride. Without strong core muscles the stride will be weak and lack endurance. Build to take force on the bone and direct autonomic force, through various joints, in the desired direction. The core muscles align the spine, rib, and pelvis of a person to resist a specific force, whether static or dynamic. Major muscles included are the pelvic floor muscles, transfers abdominis, multifidus, internal and external oblique, and rectus abdominis, erector spine (sacrospinalis) especially the longissimus thoracis, and the diaphragm. Minor core muscles include the latisimusdorsi, gluteus maximus, and trapezius. Core stability relates to the bodily region bounded by the abdominal wall, the pelvis, the lower back and the diaphragm and its ability to stabilise the body during movement.

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The game Kabaddi is one of the most ancient forms of outdoor sports for the entire human race. Its origin could be traced to pre-historic times when men learnt to defend groups against predatory beasts or attack weaker animals individually or groups to meet the demand of their natural food before invention of any weapons for attack and defence. The practice of these reflexes and responses in a game like kabaddi stimulates pleasurable feelings of joy and thrill. In the Indian epic "Mahabharata," it is narrated in one chapter that the youngest warrior of Pandavas, Abhimanyu was directed to fight against several war heroes of the enemy camp (Kauravas) inside the perimeter of the enemy line of defense. The greatest fighter Abhimanyu adopted a strategy to enter into the line of defence put up by the enemy. In fact, he was successful in entering into the arena of the enemy camp and fought gallantly but unfortunately, Abhimanyu could not come out of the place encircled by the seven heroes of Kauravas and ultimately he met his death fighting gallantly like a hero. The same planning and strategy is found in Kabaddi game when a raider goes to attack in the court of the opponent with seven anties. The purpose of the study is to investigate "the effect of

core muscles with strength training on selected motor fitness variables of intercollegiate kabaddi players."

METHODOLOGY

To achieve this purpose, total (n = 24) men college-level kabaddi players. Selected from Sri Ksrishna College of Physical Education and Gopala Krishna College of Physical Education, Nalgonda, Telangana. The subjects were equally divided randomly into two groups, namely, Group-I experimental group and Group-II control group. The subject's age was ranged from 19 to 24 years. The selected variables, namely, shoulder strength, balance, and endurance. Experimental group: 12 players are assigned randomly to the experimental group and they have undergone 6 weeks of training using the core muscles with strength training. Control group: Another 12 players are assigned randomly to the control group did not participate in any kind of training. The selected criterion variables measured by shoulder strength pull-ups test, balance-stork balance test, and endurance-12 min run/walk test. The prior and after test data were collected and treated with dependent "t" test. The level of confidence was fixed at 0.05.

RESULTS

Shoulder Strength

The data obtained on shoulder strength of the experimental and control group were analyzed using the dependent "t" test presented in Table 1.

Table 1 shows the mean values of shoulder strength in experimental and control groups. The experimental group obtained "t" result is 15.25 which is greater than the table value, so it is significant. The control group obtained "t" result is 0.41 which is lesser than table value, Hence, it is insignificant.

Balance

The data obtained on the balance of the experimental and control groups were analyzed using the dependent "t" test presented in Table 2.

Table 2 shows the mean values of balance experimental and control groups. The experimental group obtained "t" result is 18.66 which is greater than the table value, so it is significant. The control group obtained "t" result is 1.02 which is lesser than table value. Hence, it is insignificant.

Endurance

The data obtained on endurance of the experimental and control groups were analyzed using the dependent "t" test presented in Table 3.

Table 3 shows the mean values of endurance experimental and control groups. The experimental group obtained "t" result is 8.76 which is greater than the table value, so it is significant. The control group obtained "t" result is 1.51 which is lesser than table value. Hence, it is insignificant.

DISCUSSION ON MOTOR FITNESS VARIABLES

From the result of the present investigation, it was concluded that the kabaddi players are undergone the 6 weeks training on core muscles with strength training; it improved on selected motor fitness variables (shoulder strength, balance, and endurance). The results consent with other studie's effect of core strength and endurance training on performance in college students (Schilling *et al*., 2013). Effects of a 9-week core strengthening exercise program on vertical jump performances and static balance in volleyball players with trunk in stability (Sharma *et al*., 2012).

Table 1: The mean, standard deviation, and "t" value of experimental and control groups on shoulder strength

Group	Test	Mean	SD	DM	σ DM	't'
Experimental group	Pre-test	5.47	1.13	2.03	0.13	15.25*
	Post-test	7.50	0.93			
Control group	Pre-test	5.53	1.36	0.07	0.16	0.41
	Post-test	5.60	1.42			

*Significant level of confidence 0.05 with df 11 table value 2.20

Table 2: The mean, standard deviation, and "t" value of experimental and control groups on balance

Group	Test	Mean	S.D	D.M	σ DM	't'
Experimental group	Pre-test	16.42	7.54	3.36	0.18	18.66*
	Post-test	19.78	7.15			
Control group	Pre-test	11.18	1.47	0.08	0.078	1.02
	Post-test	11.26	1.57			

*Significant level of confidence 0.05 with df 11 table value 2.20

Table 3: The mean, standard deviation, and "t" value of experimental and control groups on endurance

Group	Test	Mean	SD	DM	σ DM	't'
Experimental group	Pre-test	2279.46	232.97	128.16	14.64	8.76*
	Post-test	2407.62	185.14			
Control group	Pre-test	2252.44	218.16	1.66	1.10	1.51
	Post-test	2250.78	218.63			

*Significant level of confidence 0.05 with df 11 table value 2.20

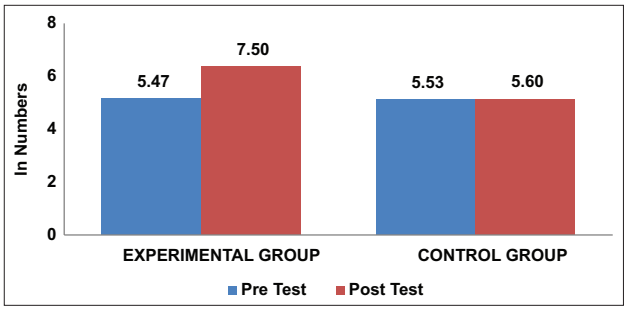

Figure 1: The mean values of experimental and control groups on shoulder strength

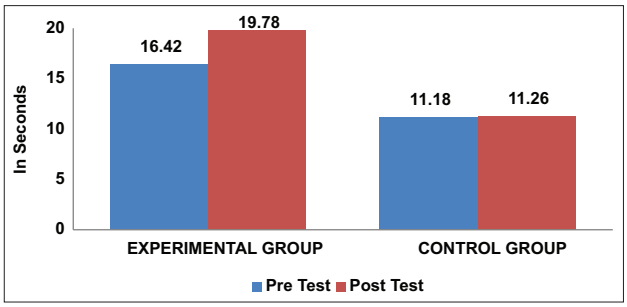

Figure 2: The mean values of experimental and control group on balance

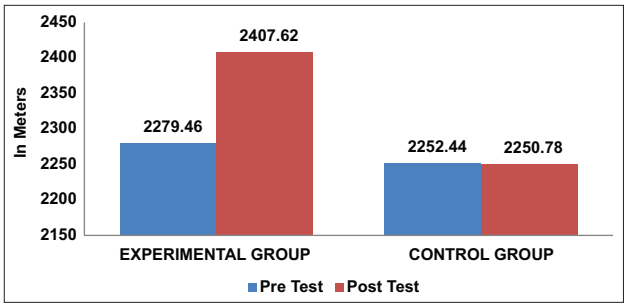

Figure 3: The mean values of experimental group and control groups on endurance

DISCUSSION ON HYPOTHESES

The hypothesis stated that there may be a significant improvement with the core muscle with strength training on selected motor fitness variables (shoulder strength, balance, and endurance) at 0.05 level of confidence. Hence, the hypothesis held true and researcher's hypothesis accepted.

CONCLUSION

Within the limitation of this study, the following conclusions have been drawn.

1. It was concluded that the motor fitness variable, namely, shoulder strength has significantly improved through core muscle with strength training.
2. It was concluded that the motor fitness variable, namely, balance has significantly improved through core muscle with strength training.
3. It was concluded that the motor fitness variable, namely, endurance has significantly improved through core muscle with strength training.

RECOMMENDATIONS

The following recommendation may be from the study for further research.

1. The similar may be conducted different disciplines of games
2. The similar study may be conducted on female subjects too
3. The similar study may be conducted different variables such as anthropometrical biomechanical physiological, psychological, and biochemical variables
4. The similar study may be conducted different levels of players (district, state, national, and international).

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International Federation of Physical Education, Fitness and Sports Science Association

Review Article

Impact of physical exercises program for older adults

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ABSTRACT

Regular physical activity (PA) is one of the most important things people can do to improve their health. Moving more and sitting less have tremendous benefits for everyone, regardless of age, sex, race, ethnicity, or current fitness level. The benefits of regular PA in older adults are extensive. As noted in the adult recommendation, regular PA reduces risk of cardiovascular disease, thromboembolic stroke, hypertension, Type 2 diabetes mellitus, osteoporosis, obesity, colon cancer, breast cancer, anxiety, and depression. Particular importance to older adults, there is substantial evidence that PA reduces risk of falls and injuries from falls, prevents or mitigates functional limitations, and is effective therapy for many chronic diseases. Clinical practice guidelines identify a substantial therapeutic role for PA in coronary heart disease. PA in the management of depression and anxiety disorders, dementia, pain, congestive heart failure, syncope, stroke, prophylaxis of venous thromboembolism, back pain, and constipation. Chronic conditions increase risk of activity-related adverse events, for example, heart disease increases risk of sudden death and osteoporosis increases risk of activity-related fractures. Activity-related musculoskeletal injuries act as a major barrier to regular PA. PA reduces high-risk injury. Individuals with a chronic disease or a disability benefit from regular PA. The scientific evidence continues to build PA is linked with even more positive health outcomes. Moreover, even better, benefits can start accumulating with small amounts of, and immediately after doing, PA.

INTRODUCTION

Exercise and nutrition are essential parts of a healthy lifestyle throughout one's life, and as we age, our requirements are ever changing. A growing body of research illustrates how regular exercise is especially important for seniors, and how more seniors are opting for an active lifestyle instead of a sedentary one. This study will show you the benefits of exercise for older adults, the best forms of exercise for seniors. Physical activity (PA) in older people is critically important in the prevention of disease, maintenance of independence, and improvement of quality of life. An older adult, regular PA is one of the most important things you can do for your health. It can prevent or delay many of the health problems that seem to come with age. It also helps your muscles grow stronger so you can keep doing your day-to-day activities without dependent on others. Keep in mind, some PA is better than none at all. Health benefits will also increase with the more PA that you do. Exercise is important in all phases of life, but for seniors, it is critical to maintaining independence, among other benefits. When it comes to determining the best exercises for seniors, variety is key. Adults of all ages but especially people older than 65 should focus on a combination of strength and mobility exercises, as well as balance exercises and aerobic activity. However, the best exercises for seniors are the ones they want to do and will do consistently being active benefits older adults preventing falls, remaining independent, reducing isolation, and maintaining social links to improve psychosocial health. Regular PA can bring significant health benefits to people of all ages independent living, reduce disability, and improve the quality of life for older people.

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HEALTH ISSUES FOR OLDER ADULTS

Lack of PA is a major risk factor for the epidemic of chronic disease and disability facing an aging population. Muscle loss can be devastating and debilitating for older adults. Muscle loss leads to hormone problems, a decrease in the ability to metabolize protein, and other problems. The

body changes such as reduced muscle and bone mass are inevitable the older adults. Falls become more common, leading to fractures, head injuries, and other problems that affect both mental and physical health. Multiple systems work together to help us maintain our balance, which are integrated into the brain and then translated into motor output through our musculoskeletal systems. As we age, these systems can function less well, but working to maintain them can help prevent the rate of decline. Women and men become less active as they get older age. Aging biologically changes occur molecular and cellular damage which leads to a decrease in physiological reserve and increased risk of many diseases. Even in healthy and active people, strength, endurance, bone density, and flexibility all decline at a rate of approximately 10% of per decade. Muscle power is lost faster, at a rate of about 30% of per decade. This can lead to a decrease in a person's level of function. Older people decrease in muscle strength (both hip abductors and knee extensors) walking capacity, speed, mobility, sit-to-stand performance, upper extremity function, and balance performance. Above 65 years people average 10.7 h per day sitting, with 40% of this age group living a sedentary lifestyle. Older age people major facing issues arthritis, migraine, cardiovascular disease, vision impairment, and medication side effects.

HEALTH BENEFITS OF EXERCISE IN OLDER ADULTS

Exercise is important for older adults (age 65+) because being physically active makes it easier to perform activities of daily living (ADLs), including eating, bathing, toileting, dressing, getting into or out of a bed or chair, and moving around the house or a neighborhood. Exercise improves muscle strength and bone density as well, which is especially important for women since they lose bone density at a faster rate after menopause than men. Meanwhile, the benefits of exercise for the heart and lungs help promote overall health and offset some risks for chronic illnesses and diseases. Our biology changes as we get older, causing seniors to have different reasons for staying in shape than younger generations. Although physical fitness provides benefits at any age, the health perks physically fit seniors enjoy are more notable. Physicians and researchers say seniors should remain as active as possible, without overexerting one's self. In older adults, exercise helps you live a longer, healthier, and more joyous life.

Seniors that exercise regularly are less likely to depend on others. Regular exercise promotes an older adult's ability to walk, bathe, cook, eat, dress, and use the restroom. If self-reliance is a priority, exercise is one of the best ways to maintain independence for older adults.

Falling down is a much bigger deal for older adults than younger ones. Every 11 seconds, an older adult is admitted to an emergency room for a fall-related injury, and every 19 min, a senior dies from a fall, though no two falls are alike, and preventing falls is very complex, regular exercise reduces the likelihood of falling by 23%.

Although it seems counter-intuitive, being inactive makes you tired and being active gives you more energy. Any amount of exercise promotes the release of endorphins, which are essential neurotransmitters linked to pain mitigation and a sense of well-being. Endorphins combat stress hormones, promote healthy sleep, and make you feel more lively and energetic, overall.

Heart disease, osteoporosis, depression, and diabetes are common diseases among older adults and are often deadly. Fortunately, adopting a more active lifestyle can contribute to prevention of these diseases, or reduce the unpleasant symptoms of these diseases if you already have them. If you are at risk for disease, exercise may be the key to warding off an unpleasant condition.

One of the most remarkable developments in health science is the revelation that the mind and the body are much more closely linked. A healthy body likely means a healthy mind, and seniors that exercise on a regular basis have improved cognitive health. The regular exercise has been shown to reduce your risk of developing Alzheimer's disease or dementia by nearly 50%.

Exercise is crucial for older adults, but it can be hard to know where to begin. If you have not worked out for a while, re-entry into the active world can be daunting. There is also a good chance the exercises you were once accustomed to are not ideal for older adults. Resistance training will improve strength and can reverse or delay the decline of muscle mass and strength that occurs with ageing. Aerobic exercise can help to improve endurance by increasing the capillary density, mitochondrial, and enzyme levels in the skeletal muscles. Exercise can also help to reduce the risk of many non-communicable diseases.

- Reduce the risk of coronary heart disease, stroke, certain types of cancers, and diabetes
- Prevent post-menopausal osteoporosis and therefore reduce the risk of osteoporotic fractures
- Reduce the complications of immobility
- Reduce the risk of accidental falls
- Improve mental/cognitive function, reduces stress/anxiety, and improve self-confidence.

S. no	Form of exercises	List of exercises	Benefits of exercises
1.	Water aerobics	• Aqua jogging • Flutter kicking • Leg lifts • Standing water push-ups • Arm curls	• The exercises improve your strength, flexibility, and balance with minimal stress on your body. • Buoyancy of the water puts less stress on your joints. • In addition, water brings natural resistance, which eliminates the need for weights in strength training.
2.	Chair yoga	• Overhead stretch • Seated cow stretch • Seated cat stretch • Seated mountain pose • Seated twist	• These exercises low-impact form of exercise that improves muscle strength, mobility, balance and flexibility, this exercises crucial health aspects for seniors. • It improves mental health in older adults. • Regular chair yoga participants have better quality sleep, lower instances of depression, and report a general sense of well-being.
3.	Resistance band workouts	• Leg press • Triceps press • Lateral raise • Bicep curl • Band pull apart	• This workouts with reduced stress on your body. • These exercises are ideal for strengthening your core, which improves posture, mobility, and balance.
4.	Pilates	• Mermaid movement • Side circles • Food slides • Step-ups • Leg circle	• This exercise is also low-impact form of exercise. • These exercises improve breathing, alignment, concentration, and core strength • It helps to build strength without the stress of higher-impact exercises. • It has been shown to improve balance, develop core strength, and increase flexibility in older adults.
5.	Walking	• Find a moderate walk through a park • Find an audiobook or a playlist for stimulation during your walk	• One of the least stressful and accessible forms of exercise is walking. • 10,000 steps per day is advised for a healthy lifestyle, but those with difficulty walking or joint pain may settle for a smaller number as a goal. • Walking promotes a healthy lifestyle, while strengthening muscles, lowering your risk of heart disease, stroke, diabetes, and colon cancer.
6.	Body weight workouts	• Squats to chair • Step-up • Bird dog • Lying hip bridges • Side-lying circles	• These workouts are one of the best ways to counteract the effects of muscle atrophy in older adults. • It improves strengthening muscle and maintains good body posture.
7.	Dumbbell strength training	• Bent-over row • Triceps extension • Bicep curl • Overhead press • Front raise	• Strength training has been alleviate the symptoms of diabetes, osteoporosis, back pain, and depression, also helping manage your weight. • It contributes to a higher metabolism and enhanced glucose control. • These exercises allow seniors adults to isolate muscle groups to strengthen, while improving balance and flexibility.
8.	Balance exercises	• Walking heel-to-toe • Back leg raises • Tree pose • Single foot balance • Heel-toe raises	• Exercises can help build strength and improve posture, stability, and coordination. • It also helps to improve coordination, leg strength, and ankle mobility. • The effectiveness of balance and coordination exercises in improving the overall quality of life in older adults. • It recommended for older adults at reduced risk of falls.
9.	Cycling	• Outdoor bicycle or a stationary bike	• Cycling requires larger muscles group, like lower body musclesits leads to increased blood flow and demand on the heart and lungs. • Making the exercise beneficial for the heart and the lungs. Cycling is also a non-impact activity. • This can be beneficial for anyone who needs to reduce ground reaction forces during exercise to help with joint or muscle pain or dysfunction.
10.	Dancing	• Zumba or Line Dancing or Tango	• It improves heart rate. • Dancing not only elevates cardio it also improves balance, strengthens multiple large muscle groups, and lifts your spirits.

CONCLUSION

1. Physical exercises improve your strength. This helps you stay independent.
2. It improves your balance. This prevents falls.
3. It gives you more energy. Hence, it could be more active.
4. It prevents or delays diseases, such as heart disease, diabetes, or osteoporosis all other health problems.
5. It can improve your mood and fight off depression.
6. It may improve cognitive function (how your brain works).
7. It is safe for most adults over 65 years old to exercise. Even most patients who have chronic illnesses can exercise safely.
8. These include heart disease, high blood pressure, diabetes, and arthritis. Many of these conditions are improved with exercise.

RECOMMENDATIONS

1. Make your move- sit less- be active for life
2. Growing stronger- strength training for older adults
3. Being movable, strong, and steady on your feet can help you stay independent, which can boost your confidence and well-being as you get older.
4. PA levels among older people are needed to inform public health strategies which could extend the health and quality of life of people into old age.
5. Physical exercises improve your quality of life. Therefore, older people should be encouraged to perform or maintain regular physical activities throughout their ageing process.

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Research Article

The combined effect of yoga and endurance exercise on passing skill among football players

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ABSTRACT

The purpose of the study was to find out the combined effect of yoga and endurance exercises on performance-related parameter among intercollegiate football players. To achieve the purpose of the study, 45 ($n = 45$) men intercollegiate football players studying in Engineering Colleges in Hyderabad, Kl University, Osmania University, Telangana state, India, during the academic year 2022–2023 were selected randomly as subjects and their ages ranged between 18 and 21 years. The subjects were randomly divided into three groups of 15 each, namely, yoga training (n = 15), endurance exercise (n = 15), and combined yoga and endurance exercise (n = 15), respectively. The training period was limited to 6 weeks. The criterion variable selected for this study was football passing skill. The selected parameter was assessed using selected testing protocol before and immediately after the training period. The analysis of covariance was used to analyze the significant differences, if any, among the groups. Since three groups were compared, whenever the obtained "F" ratio for adjusted post-test was found to be significant, the Scheffe's test was used to find out the paired mean differences, if any. The 0.05 level of confidence was fixed as the level of significance to test the "F" ratio obtained by the analysis of covariance, which was considered appropriate.

Keywords: Endurance exercise, Engineering students, "F" ratio, Hyderabad, Passing, Yoga training

INTRODUCTION

Yoga is an excellent method of enhancing the performance of sports participants. Salient feature of yoga is the combination of both physical conditioning and focused concentration. One of the most essential elements for athletic performance is balance. Physical fitness is a must for any good performance in sports. Different sports require different types of fitness emphasizing a particular fitness factor. However, general level of physical fitness is necessary for every sportsman. The law of use and disuse suggests that if you want to be fit you must exercise. The routine of exercise differs from individual to individual according to purpose.

Sportsmen also select different routines of participation. This can be attained excellently by indulging in Yogic routine. Yogic exercises deal with the vital organs of the body on which health depends. The precursor of physical fitness lies in the efficient working of the vital organs of the body and yoga aims at it. The various selected asanas giving different movements to the spine, controlled respiration, relaxation technique, and concentration practice as a whole form an excellent routine to taking care of the health of the vital organs of the body.

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Endurance exercise is the act of exercising to increase stamina and endurance. The term "endurance exercise" generally refers to training the aerobic system as opposed to anaerobic. The need for endurance in sports is often predicated as the need for cardiovascular and simple muscular endurance, but the issue of endurance is far more complex. It can be shown that endurance in sport is closely tied to the execution of skill and technique. A well-conditioned athlete can be defined as, the athlete who executes his or her technique consistently and effectively with the least effort (Yessis, 2008).

The increased ability to perform is mainly accomplished through an increase in maximal oxygen uptake (Vo2max) and an increased ability of skeletal muscle to generate energy through oxidative metabolism without improvements in muscle strength. Strength training, which represents the other extreme of physical

activity, encompasses short-duration activity at high or maximal exercise intensities, increases the capacity to perform high-intensity, high resistance exercise of a single or relatively few repetitions such as Olympic weightlifting, power lifting, and throwing events in track and field. Improved strength-related performance is accomplished through neuromuscular learning and increased fiber-recruitment synchronicity, muscle cell hypertrophy, and, possibly, hyperplasia without changes in Vo2max or in the capacity to generate ATP through oxidative metabolism (Fletcher *et al*., 2001).

MATERIALS AND TOOLS

Collection of Data

To achieve the purpose of the study, 45 (n = 45) men intercollegiate football players studying in, Engineering Colleges in Hyderabad, Kl University, Osmania University, Telangana state, India, during the academic year 2022–2023 were selected randomly as subjects and their ages ranged between 18 and 21 years. The subjects were randomly divided into three groups of 15 each, namely, yoga training (n = 15), endurance exercise (n = 15), and combined yoga and endurance exercise (n = 15), respectively.

RESULTS

The analysis of covariance on passing of the pre-, post-, and adjusted test scores of yoga training, endurance exercise, and combined yoga and endurance exercise group have been analyzed and presented in Table 1.

Table shows that the pre-test mean and standard deviation values on passing of experimental groups "A," "B," and "C" group were 8.27, 8.20, and 8.07 and ±0.80, ±0.68, and ±0.80, respectively. The obtained "F" ratio of 0.27 for pre-test scores was lesser than the table value of 3.22 for degrees of freedom 2 and 42 required for significance at 0.05 level of confidence on passing.

The post-test mean and standard deviation values on passing of experimental groups "A," "B," and "C" group were 9.27, 9.73, and 9.93 and ± 0.80, ±0.46, and ±0.26, respectively. The obtained "F" ratio of 5.76 for post-test scores was greater than the table value of 3.22 for degrees of freedom 2 and 42 required for significance at 0.05 level of confidence on passing.

The adjusted post-test means on passing of experimental groups "A," "B," and "C" group were 9.22, 9.72, and 9.99, respectively. The obtained "F" ratio of 12.96 for adjusted post-test mean was greater than the table value of 3.23 for degrees of freedom 2 and 41 required for significance at 0.05 level of confidence on passing. The results of the study indicated that there was a significant difference between the adjusted post-test means of yoga training, endurance exercise, and combined yoga and endurance exercise group on passing.

Since, three groups were compared, whenever the obtained "F" ratio for adjusted post-test was found to be significant, the Scheffe's test was used to find out the paired mean difference and it is presented in Table 2.

Table shows that the mean difference values of experimental group "A" and experimental group "B," experimental group "A" and experimental group "C" group were 0.50 and 0.76, respectively, which were greater than the confidence interval value of 0.39 on passing at 0.05 level of confidence. The results of the study showed that there was a significant difference between experimental group "A" and experimental group "B" and experimental group "A" and experimental group "C" group. The mean difference values of experimental group "B" and experimental group "C" was 0.26, which showed no significant differences.

The above data also reveal that the combined yoga and endurance exercise group were better than the yoga group and the endurance exercise group on passing.

Table 1: Analysis of covariance of the data on passing of pre-, post-, and adjusted scores of experimental groups (in seconds)

Test	Yoga training group (group–I) expt. group 'A	Endurance exercise group (group-II) expt. group 'B	Combined Yoga and endurance exercise group (group- III) expt. group 'C	Source of variance	Sum of squares	df	Mean squares	F-ratio
Pre-Test SD(±)	8.27±0.80	8.20±0.68	8.07±0.80	Between groups	0.31	2	0.16	0.27
				Within groups	24.27	42	0.58	
Post-Test SD(±)	9.27±0.80	9.73±0.46	9.93±0.26	Between groups	3.51	2	1.76	5.76*
				Within groups	12.80	42	0.30	
Adjusted Post-Test	9.22	9.72	9.99	Between Sets	4.46	2	2.23	12.96*
				Within Sets	7.06	41	0.17	

*Significant at 0.05 level of confidence. Table value for df (2, 42) at 0.05 level=3.22 Table value for df (2, 41) at 0.05 level=3.23

Table 2: Scheffe's test for the difference between paired means on passing

Yoga Training Group (Group–I) Expt. Group "A"	Endurance Exercise (Group-II) Expt. Group "B"	Combined Yoga and endurance exercise Group (Group-III) Expt. Group "C"	Mean difference	Confident interval value
9.22	9.72	---	0.50*	0.39
9.22	---	9.98	0.76*	
---	9.72	9.98	0.26*	

*Significant at 0.05 level of confidence

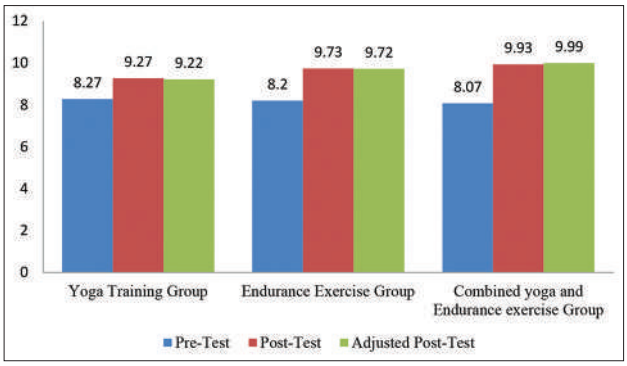

Figure 1: The pre-, post-, and adjusted mean values of Yoga training, Endurance exercise, and Combined Yoga and Endurance exercise group on passing

The pre-, post-, and adjusted mean values of yoga training, endurance exercise, and combined yoga and endurance exercise group on passing are graphically represented in Figure 1.

CONCLUSION

From the analysis of the data, the following conclusions were drawn.

1. There was a significant difference among yoga training, endurance exercise, and combined yoga and endurance exercise on selected football performance parameters such as passing among intercollegiate football players.
2. The significant improvements were noticed on selected football performance parameters such as passing due to yoga training, endurance exercise, and combined yoga and endurance exercise.
3. Among the experimental groups, combined yoga and endurance exercise group had shown significant improvement on the selected dependent variable, namely, passing than that of yoga training and endurance exercise groups.

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Research Article

The lives of active and passive polytechnic university of the Philippines student-athletes

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ABSTRACT

The aim of the study was to assess the lives of active and passive Polytechnic University of the Philippines student-athletes and identify the following factors: The beginning and advantages of student athletes, their experience, the motivation for active students, the reasons for non-active students' quitting sports, other things that could enhance the performance of active student-athletes, and things and circumstances that could possibly convince inactive students to become active. A thorough interview was conducted using a qualitative and phenomenological design for research. Results have shown that delayed allowance, a lack of equipment, a failure to manage stress, and demotivation or loss of self-esteem are the common problems faced by inactive members, whereas the common motivation of active people is alien motivation, such as support from their family and friends and their desire to complete studies. The researchers indicated that the school management needs to seek intensive materials and funding help from the Alumni Federation. Researchers proposed that AB psychology students could get involved in the varsity teams and support athletes in stress management to solve the difficulties in terms of demotivation and stress.

Keywords: Active, Demotivation, Extrinsic motivation, Passive, Polytechnic university of the Philippines, Self-esteem, Stress, Student-ahlete

INTRODUCTION

The Republic Act 10676 defines "student-athletes" as students who are enrolled in and members of the sports teams and programs of any school. They represent their schools at different competitions among the schools. Being an athlete-student is not an easy job. Lojo and Alvarez (2013) said that it is an awful challenge to be a student athlete. It calls for a mix of athletic, academic, and long-term career aspirations. They are also subject to the regulations outlined in Section 6.1 of Senate Bill 2166 or Senator Pia Cayeto's Magna Carta for Students-Athletes, as well as those outlined in their sport programs or by the school administration.

There should be consideration of the importance of student-athletes. You are also athletes who always carry the name of the school on their back and represent what they love, not just average pupils (Story, 2016). Emma (2019) stated that the responsibility of students – university athletes – is to be the presence of their institutions, in addition to completing their love. She thinks that college sports are usually linked to the school's name and reputation.

The majority of student-athletes at the university are students from the College of Human Kinetics who are in the bachelor physical education (BPE) program. It has been noted that many student-athletes find it difficult to balance their athletic and academic interests, thereby concentrating on their athletic responsibilities and setting academics aside. On the other hand, there are athletes who are able to balance their academic and athletic priorities and are excellent in both academic and sporting fields. Furthermore, there are student-athletes who stop attending trainings and practices to focus on their academics for a variety of reasons. The researchers chose this study because they have noticed an increase in the number of student-athletes who are no longer active in terms of athletic commitments. Therefore, the researchers would want to find out the different reasons and see how their condition compares to other active student-athletes.

This study focuses on eight participants who are active and inactive Polytechnic University of the Philippines

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student-athletes who have represented the university in SCUAA and/or other athletic competitions. The following variables were studied in this study: student-athletes' reasons for choosing the university, athletic status, life and experiences, motivations, problems, perspectives, and suggestions. This study was limited to the Polytechnic University of the Philippines, academic year 2018–2019, and it used interview guide questions created by the researchers.

The objective of the study is to find out why other students-athletes-have left training and why some of them have remained in the sport program. The aim of the study is also to learn about the student's motivation, problems, difficulties, and perspectives, along with his proposals and recommendations on improving the quality of the university's sports development program as well as the quality of the student's learning management as a sports athlete's university engagement.

The conceptual framework distinguishes between active and inactive student-athletes in terms of their beginning as a student-athlete. It is the primary point at which they form their identity as a student-athlete. The term "benefits" refers to the tangible and intangible things that participants enjoy as a student-athlete. The term "experiences" refers to the participants' live experiences as a student-athlete. Athletic status refers to a participant's status as a student-athlete. They can be either active or inactive.

Active refers to people who regularly train for their respective events, while inactive refers to participants who do not participate in their trainings but who continue to participate in their classes. The motivation is to continue training and to represent the university as an active student-athlete. The reasons for quitting are the reasons why inactive participants choose to stop training for their respective events.

Other motivating elements include other things, other than the motivation of the participants, which might make them perform at their best, while the chance to return to training concerns events or things that could make participants return to training. Finally, proposals pertain to views from participants on how to further strengthen the university's Sports Development Program. Within this conceptual framework, researchers can ask participants for qualitative answers and analyze them to come up with workable solutions to their problems.

METHODOLOGY

The study employed a qualitative, phenomenological research design, with the goal of determining the participants' life experiences, allowing the researchers to delve into the understanding, perceptions, perspectives, and feelings of participants who had actually encountered or experienced a certain situation or phenomenon.

For this study, the researchers used a narrative approach as a method of inquiry. The researchers used an in-depth individual interview to elicit responses from the study's participants and key informants. The researchers chose eight Polytechnic University of the Philippines student-athletes as participants in this research study based on referrals from their teammates. One pair is a volleyball athlete, one pair is an arnis athlete, one pair is a karate athlete, and one pair is an athletics athlete. The key informants are the participants' respective coaches.

RESULTS AND DISCUSSIONS

Motivation

Five of the participants became athletes because of extrinsic motivation, like support from family and friends, family tradition, and inspiration from other people.

The information from the five participants backs up (Dunn *et al*., 2016) study, emphasized that athletes are more likely to achieve positive results (high performance, a successful sports career) when they are encouraged and supported by positive feedback and are supported by family members and coaches that encourage autonomy and by teammates who assist in their personal and moral development (Valero-Valenzuela *et al*., 2020).

In addition, the athletics coach, who has been supported by the Arnis Coach, says that student athletes have to be good at both academics and sports to represent the university, and to be capable of representing the university, they must have the heart and passion for their respective events and be consistent in their studies.

Tangible Benefits

All eight participants claimed that they get and are motivated by tangible university privileges, such as monthly allowances, facilities, dormitory services, and free food during contests.

The participants' ideas are backed up by the study by Jorge (2012), which shows that students are encouraged and given grants and other rewards because most of them do not just play sports because they enjoy them. The participants are also motivated to do their workouts and participate in practices, since they expect something in return.

The three coaches from different events have helped the student-athletes, for example, receive allowances, equipment, facilities, and rewards from the institution. The Karate coach is nevertheless disappointed at the fact that the benefits are constantly delayed and the equipment provided for his event by the university does not satisfy the standards specified by its regulatory organization.

Intangible Benefits

Despite the concrete benefits of all eight participants, two of them were aware of the immaterial benefits of being a student-

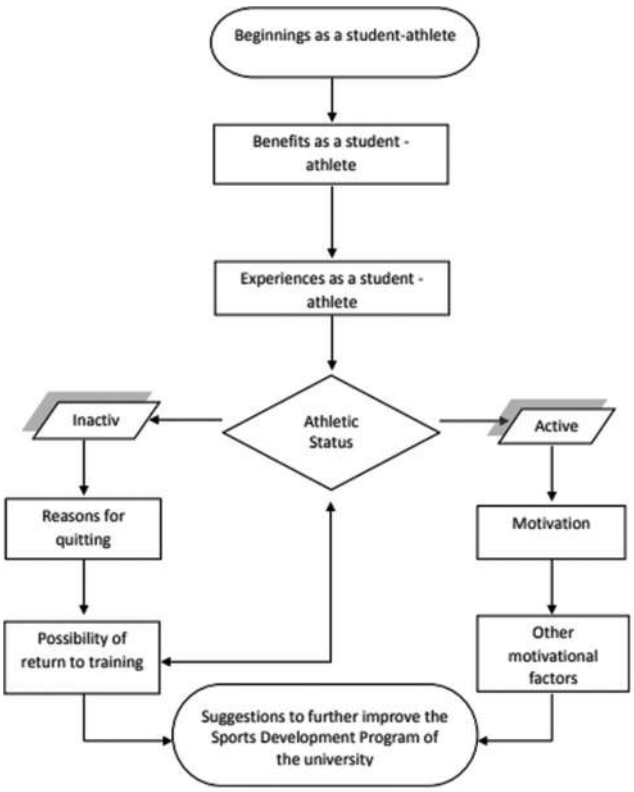

Figure 1: Active and passive student-athlete

athletes such as free education, competitor possibilities, and life lessons from their trainers.

The participants' views on the news from the ncaa.org website (2015) indicate that free access to a qualitative education is the most important advantage of being a student athlete.

Their observations also corroborate an article on www.ngosports.com (2014), which indicates that one is making the most out of one's college sports career with life lessons, a high level of responsibility, skills developed, and connections.

Arnis, athletics, and volleyball coaches noted that athletes and students receive immaterial benefits as well as free access to college learning, in addition to gaining material benefits from the university.

Positive Experiences

The participants had positive experiences such as winning competitions, traveling to other places, being cared for and enjoyed by their coach, and having the cheers and applause of spectators support an article on stathblog.com (2017) that not only represents the school's team but also has no better feeling for the student to become an integral partner.

Arnis' coach also said that their victory moments throughout the contests were the most memorable ones for sportsmen. The karate coach was supported by a champion squad from the beginning.

The volleyball coach nonetheless said he felt like he was part of his team. He said he sees his extending family as the volleyball team.

Unfortunate Experiences

The unfavorable situations experienced by participants include injuries, frustrations, loss of life, physical and mental stress, and the loss of a sense of belonging.

Overall, the athletes' insight clearly endorses Lojo and Alvarez's study (2013) that it is a tough endeavor to be a student-athlete. The students' problems as athletes have been stated by Morilla *et al*. (2017). Patel and Westergaard (2011) also pointed out that life as a student-athlete provides both problems and opportunity.

When he managed the event, the athletics coach highlighted the athletes' attitude, lack of discipline, and speaking lies throughout the training.

Extrinsic Motivation

One out of four active participants claimed that the perks, facilities, and competitiveness opportunities of a student-athletes-have been the motivations for his competitiveness corroborated by the study of Jorge (2012). Two have indicated their families as a motivating source to support the (Dunn *et al*., 2016) that the continued support of family and friends is one of the main elements that impact athletic performance.

Intrinsic Motivation

Only one active athlete answered that he trains and plays his sport because he enjoys it. He indicated that the things that keep him motivated are personal determination and self-discipline. The study of Moling (2009), which says that motivation is one thing man needs to bear in terms of his actions, is largely supported by insights from the active participants.

The Arnis Team coach stated that athletes should not solely rely on academic training. She noted that student athletes must also be self-trained and loved as an athlete. She stated student-athletes had to be fit in their physical, psychological, and emotional components.

Teamwork

One participant said that he would be able to work together and to have a common sense of belonging. He stated that he hoped that the school administration might push them to fight for and compete for the university.

Support

The similar insights provided by the three active participants are the timely delivery of advantages, innovation of facilities and equipment, and close coach mentorship.

This validates the Jorge (2012) study, which shows that student athletes benefit from grants and incentives. Create a mentality that will allow you to remain in the institution.

Karate's coach also stressed that awarding accolades might increase its performance by showcasing its talents. It has been backed by athletics coaches, who must be exposed to larger ranks and contests to stimulate the student-athletes. In their future competitions, therefore, they will be more confident.

CONCLUSION

The most important external elements in participants' growth are family and friends. By inspiring and helping their family and friends who practiced their individual events, they began becoming athletes.

All the participants said that they get benefits as university student athletes. However, the appreciation of the benefits differs. A number of them enjoyed material advantages, such as allowances, equipment, and facilities, but others enjoyed free education and the privilege to respect universities and their coaches to learn life.

To be a student athlete, participants must have diverse experiences. Some of them are student athletes due to the privilege of traveling and participating in various areas. Some of them faced difficulties because of their personal lives. Some people enjoy the mood of the fans, while others are sad because their coaches have lost their motivation and they no longer feel like they belong. Different factors serve as motivation for active participants. Family and friends, benefits, self-determination, and their desire to finish their studies and deliver their families out of poverty.

Active participants said that improving sports programs, equipment, benefits, facilities, and a sense of belonging are all things that could help them do better in the student-athlon. This supplies Abraham Maslow's hierarchy of requirements, which says that physiological requirements and rewards of love/appearance effect your motivation directly. While inactive athletes have various viewpoints as to whether or not they should return to training. Some people have suggested that they should return when some criteria are fulfilled, such as improvements in sport development management. Some said that it was not possible to come back. Participants advised the future student-athletes at the university that they should keep themselves motivated by focusing on their dreams, displaying diligence in whatever they do, and also studying hard.

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Research Article

Effects of Yogic training on anthropometric physical fitness: Some evidence from physical education trainees in Nalgonda, Telangana State

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ABSTRACT

The objective of the study is to investigate the effects of yogic training on anthropometric physical fitness among physical education trainees in Telangana state. To achieve this purpose, 60 physical education trainees pursuing physical education from two colleges affiliated with Mahatma Gandhi University are selected randomly. The data were collected from 30 trainees representing two colleges. The selected trainees are divided into two equal groups of 15 each, namely the yogic practice group (Group A) and the control group (Group B). The experimental group had undergone yogic practices for 10 weeks (training is given 5 days/week). Whereas the control group (Group B) maintained their daily routine activities and no special training was given. The subjects of the two groups were tested using standardized tests and procedures on selected physical variables before and after the training period to find out the training efforts in the following test items: Body mass index (BMI) by measuring their height and weight and flexibility by sitting and reaching boxes. The collected data were analyzed statistically through paired sample t test to find out the pre- and post-training performances of the physical education trainees. The results of the study found that the yogic practice group showed significant improvement in anthropometric physical fitness due to 10 weeks of training on BMI and flexibility compared to the control group. Therefore, the results of the study suggest that governments should mandate and promote yogic training facilities in schools, colleges, and universities, both in public and private institutions.

Keywords: Analysis of variance, Anthropometric physical fitness, Telangana, Yogic training

INTRODUCTION

Yoga, a centuries-old practice originating from ancient India, has gained immense popularity worldwide for its holistic approach to physical, mental, and spiritual well-being.[1] While traditionally associated with meditation and relaxation, yoga also encompasses a wide range of physical postures and movements known as asanas. These asanas, when performed regularly and correctly, can have profound effects on an individual's anthropometric physical fitness.

Anthropometric physical fitness refers to the quantitative measurement of various body dimensions and composition, such as height, weight, body mass index (BMI), body fat percentage, and muscle mass.[2] These parameters play a crucial role in determining an individual's overall health and fitness levels. Yogic training, which incorporates a combination of asanas, pranayama (breathing exercises), and meditation, can significantly impact these anthropometric measurements, leading to improved physical fitness.

Regular practice of yoga asanas helps in toning and strengthening the muscles, leading to improved muscle mass and overall body composition.[3] The asanas involve stretching and contracting different muscle groups, resulting in increased flexibility, endurance, and resistance to injuries. In addition, specific asanas target core muscles, which play a key role in maintaining good posture, balance, and stability.[4]

Yogic training can also influence body weight and BMI. Certain asanas, such as the Sun Salutation sequence, are dynamic

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and involve continuous movements that can burn calories and contribute to weight management.[5] Furthermore, yoga practice has been associated with stress reduction and improved sleep patterns, which can indirectly impact body weight by reducing stress-induced overeating and promoting healthy lifestyle choices.[6]

Body fat percentage, another crucial anthropometric measurement, can also be positively affected by yogic training. Regular practice of vigorous asanas combined with mindful eating habits can contribute to fat loss and the development of lean muscle mass.[7] Yoga's emphasis on deep breathing and relaxation techniques can also support healthy digestion and metabolism, further aiding in weight management and fat reduction.[8]

In conclusion, yogic training has profound effects on anthropometric physical fitness. Through regular practice of asanas, pranayama, and meditation, individuals can experience improvements in muscle strength and tone, flexibility, body weight management, and body composition. It is important to note that the effects of yogic training may vary depending on individual factors such as age, fitness level, and consistency of practice. Nevertheless, incorporating yoga into one's fitness routine can lead to significant improvements in overall physical well-being.

Purpose of the Study

The purpose of this research study is to investigate and analyze the effects of yogic training on anthropometric physical fitness parameters. The study aims to provide a comprehensive understanding of how regular practice of yoga, including asanas, pranayama, and meditation, influences various anthropometric measurements such as height, weight, BMI, body fat percentage, and muscle mass.

METHODOLOGY

In this research study, a sample of 60 physical education trainees pursuing physical education from two colleges affiliated with Mahatma Gandhi University was selected randomly. Data were collected from 30 trainees representing both colleges. The selected trainees were then divided into two equal groups, each consisting of 15 participants. The first group, referred to as the yogic practice group (Group A), underwent yogic practices for a duration of 10 weeks, with training sessions held 5 days/week. On the other hand, the second group, referred to as the control group (Group B), maintained their regular daily routine activities without receiving any special training.

The purpose of dividing the participants into two groups was to compare the effects of yogic training against a control group that did not receive any specific training. By comparing the two groups, the researchers aimed to determine the impact of yogic training on the selected physical variables.

To assess the training effects, standardized tests and procedures were employed on the participants before and after the 10-week training period. The physical variables that were measured included BMI by recording height and weight, as well as flexibility by using a sitting and reaching box. These variables were chosen as indicators of anthropometric physical fitness.

The study employed the paired sample t test. A paired t-test is a statistical test that is used to see if there is a big difference between the means of two groups that are linked. The Ho stands for the "null hypothesis," which says that the average difference is 0. Ha stands for the other theories. In this case, there are three possible answers: Mean (diff) = 0 (one-tailed left), mean (diff)! = 0 (two-tailed), and mean (diff) >0 (one-tailed right).

By conducting this research and analyzing the data, the researchers aimed to provide insights into the effects of yogic training on the selected physical variables, specifically BMI and flexibility. The statistical analysis would allow for comparisons of the pre- and post-training performances within each group, as well as between the yogic practice group and the control group. The findings of this research study would contribute to the understanding of how yogic training can impact anthropometric physical fitness in the context of physical education trainees.

RESULTS AND DISCUSSION

Table 1 reveals the sample respondents fat differences before and after the yoga training. Fat before yoga has a mean of 12.2, a standard error of 0.2, and a standard deviation of approximately 0.775. When it comes to the fat after yoga, it has a mean of 9.766667, a standard error of 0.2666667, and a standard deviation of approximately 1.033. The results indicate that there is a statistically significant difference between the means of fat before yoga training and fat after yoga training. The *P*-values for all three alternative hypotheses are very close to zero, which means that you have strong evidence to reject the null hypothesis. In practical terms, it suggests that there is a significant difference in fat content between the two groups. Since the *P*-values are so small, we can conclude that the mean fat content has increased significantly. These findings are corroboration with (Sukesh *et al*., 2011; Telles *et al*., 2013; D'souza, and Avadhany, 2014; Ross and Thomas, 2010; D'souza, and Avadhany, 2014).

Table 2 demonstrates the weight differences of the sample respondents before and after yoga training. The mean weight for "weight before yoga" is approximately 62.79, and for "weight after yoga," it is about 59.12. The standard deviation for "weight before yoga" is approximately 5.99, and for "weight

after yoga," it is about 5.26. The t-value is calculated as 6.8981. This value measures how much the means of the two groups differs relative to the variability in the data. In this case, it indicates a significant difference between the means. Based on the extremely low p-values, you can conclude that there is a statistically significant difference between the means of "weight after yoga" and "weight after yoga." The data provides strong evidence to suggest that the mean difference is not zero and that the direction of the difference is either < or >0, depending on the specific alternative hypothesis you are interested in. These findings are in corroborates the findings of (Nongkhai *et al*., 2022; Telles *et al*., 2013; D'souza, and Avadhany, 2014; Ross, and Thomas, 2010; and Karak *et al*., 2015).

Table 3 explains the shoulder strength differences of the sample respondents before and after yoga training. Shoulder strength before yoga has a mean of 5.4 and a standard deviation of approximately 1.68, and after yoga training, the average shoulder strength is approximately 7.87 and has a standard deviation of approximately 2.42. In summary, based on the extremely low *P*-values, it can be concluded that there is strong evidence to reject the null hypothesis. This suggests that there is a statistically significant difference between the mean "shoulder strength before yoga" and "shoulder strength after yoga" measurements. The direction of this difference depends on the specific alternative hypothesis being tested (less than, not equal to, or greater than).These findings are in corroborates the findings of (Nongkhai, Huntula, Kumar, and Narkkul, 2022; and Karak, Jana, and Manna, 2015).

Table 4 describes the sit and reach differences of sample respondents before and after the yoga training. The mean of "Sit and Reach before yoga" is approximately 12.07 with a standard error of 0.51, and after training it is approximately 17.13 average with a standard error of 0.60. In summary, the results suggest that there is strong evidence to reject the null hypothesis that the mean difference between the two variables is zero. The mean difference is significantly negative (around −5.07), indicating that sit and reach before yoga" tends to be significantly larger than sit and reach after yoga." The *P*-values for both one-tailed and two-tailed tests are very close to 0, which supports this conclusion. These findings are in corroborates the findings of (D'souza, and Avadhany, 2014 Nongkhai *et al*., 2022; and Karak *et al*., 2015).

Table 5 describes the side-bending details of sample respondents before and after the yoga training. The mean of "side bending before yoga" is approximately 11.33, while the mean of "side bending after yoga" is approximately 15.67. The standard deviation of the differences is approximately 1.23. Based on the very low *P*-values for both one-sided and two-sided alternatives, it can be concluded that there is strong statistical evidence to reject the null hypothesis. This suggests that the mean difference between the two paired groups is significantly different from zero. In the context of the data, this indicates that there is a significant difference between the means of "side bending before yoga" and "side bending after yoga," and this difference is most likely negative. The data provides substantial evidence to

Table 1: Fat levels of sample respondents before and after yoga training

Variable	OBS	Mean	Std. Err.	SD	95% Conf.	Interval
Fat before yoga	15	12.20	0.20	0.77	11.77	12.63
Fat after yoga	15	9.77	0.27	1.03	9.19	10.34
diff		2.43	0.33	1.28	1.72	3.14

t=7.3634 and Pr (T<t) = 1.0000 Pr (|T|>|t|)=0.0000 Pr (T>t) = 0.000. Source: Author's estimation

Table 2: Weights difference of sample respondents before and after the yoga training

Variable	Obs	Mean	Std. Err.	SD	95% Conf.	Interval
Weight before yoga	15	62.79	1.55	5.99	59.47	66.10
Weight after yoga	15	59.12	1.36	5.26	56.21	62.03
diff		3.67	0.53	2.06	2.53	4.81

t=6.8981. Pr (T<t)=1.0000 Pr (|T|>|t|)=0.0000 Pr (T>t)=0.0000. Source: Author's estimation

Table 3: Shoulder strength differences among the sample respondents before and after the training of yoga

Variable	Obs	Mean	SE	SD	95% Conf.	Interval
Shoulder strength before yoga	15	5.40	0.43	1.68	4.47	6.33
Shoulder strength after yoga	15	7.87	0.62	2.42	6.53	9.20
diff		−2.47	0.39	1.51	−3.30	−1.63

t=−6.3454. Pr (T<t)=0.0000 Pr (|T|>|t|)=0.0000 Pr (T>t)=1.0000. Source: Author's estimation

Table 4: Sit and Reach differences of sample respondents before and after yoga training

Variable	Obs	Mean	SE	SD	95% Conf.	Interval
Sit and Reach before yoga	15	12.07	0.51	1.98	10.97	13.16
Sit and Reach after yoga	15	17.13	0.60	2.33	15.85	18.42
diff		−5.07	0.40	1.53	−5.92	−4.22

t=−12.7942. Pr (T<t)=0.0000 Pr (|T|>|t|)=0.0000 Pr (T>t)=1.0000. Source: Author's estimation

Table 5: Side bending difference between the before and after yoga training

Variable	Obs	Mean	SE	SD	95% Conf.	Interval
Side bending before yoga	15	11.33	0.41	1.59	10.45	12.21
Side bending after yoga	15	15.67	0.50	1.95	14.59	16.75
diff		−4.33	0.32	1.23	−5.02	−3.65

t=−13.5957. Pr (T<t)=0.0000 Pr (|T|>|t|)=0.0000 Pr (T>t) = 1.0000

Table 6: V-sit and reach difference among the sample respondents before and after the yoga practice

Variable	Obs	Mean	SE	SD	95% Conf.	Interval
V-sit reach before yoga	15	9.95	0.42	1.62	9.05	10.84
V-sit reach after yoga	15	10.25	0.39	1.52	9.41	11.10
diff		−0.31	0.29	1.14	−0.94	0.32

t=−1.0431. Pr (T<t)=0.1573 Pr (|T|>|t|)=0.3146 Pr (T>t) = 0.8427. Source: Author's estimation

support this conclusion. These findings are in corroborates the findings of (Telles *et al*., 2013; D'souza, and Avadhany, 2014; Ross, and Thomas, 2010; Nongkhai *et al*., 2022; and Karak *et al*., 2015).

Table 6 provides the sample respondents v-sit differences before and after the yoga training. The mean vales of V-sit before and after yoga training are approximately 9.95 and 10.25, respectively. Further, the standard deviation of the said variables is approximately 1.62 and 1.52, respectively. The calculated t statistic of −1.0431 does not strongly deviate from 0. The probability values suggest that there is no strong evidence to reject the null hypothesis. In simpler terms, the difference in means between the two variables is not statistically significant. The differences observed could plausibly have occurred due to random variability. These findings are in corroborates the findings of (Nongkhai *et al*., 2022; and Karak *et al*., 2015).

CONCLUSION

The most common problem among the public is imbalances in BMI. To maintain a normal BMI, yoga acts as a weapon. Yoga training and practice are beneficial in maintaining good health by regulating BMI and oxidative status, improving the biochemical functions of the body, and helping to overcome several health complications. Hence, from our study, it is concluded that the efficacy of yoga practice on body weight, fat levels, shoulder strength, V-sit and reach, side bending, and sit and reach status in physical education trainees in the state of Telangana, India, may have a direct impact on the use of yoga training as a safe therapeutic modality for combating several health issues and maintaining a balanced BMI among physical education trainees and common people in general. Further, the study also concluded that there are clear differences in BMI and specific variables before and after the yoga practice. Therefore, the governments at various levels should promote and sponsor yoga education and make yoga a compulsory course in all educational institutions in Telangana, India.

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Research Article

Risk factors of lumbar pain among university players: The case of Rayalaseema University, A.P

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ABSTRACT

Introduction: For many reasons, athletes are at greater risk of sustaining a lumbar (lower) spine injury due to physical activity. To the best of our knowledge, no previous studies have examined the prevalence of low back pain (LBP) in universities of Ethiopia, related physical education students at Rayalaseema University. **Aims:** The aim of the study was to assess the frequency of LBP in different sports among students studying in physical education under Rayalaseema University, to determine the causes of the injuries, and to propose solutions. **Methods:** There were 190 girls and 220 boys studied in this research. A retrospective and cross-sectional survey was conducted on a group of students aged 18.5–24.5 years at the Rayalaseema University, to guess the frequency of LBP and its relation to the type of sports. Data on age, weight, height, smoking, and the sport in which the student was injured in the low back were collected for the academic year 2021–2022. **Results:** LBP was reported by 77 of the 520 study participants (14.8%). The frequency of LBP was considerably higher (pB0.001) in females (17.6%) than in males (12.5%). LBP pervasiveness did not differ by body mass index or smoking habit ($P > 0.05$). The sports associated with the higher rates of LBP were football, gymnastics, basketball, taekwondo, handball, and volleyball, followed by athletics. **Conclusion:** LBP is frequent among physical education students of Rayalaseema University. It is strongly associated with fatigue after the long periods of training in different sports. Basketball, gymnastics, weightlifting, and football were identified as high-risk sports for causing LBP.

Keywords: Low back pain, Risk factors, Sports science students, Sports training

INTRODUCTION

Van Hilst *et al*.[10] studied to determine the prevalence of LBP and risk factors among elite youth athletes in three sports: Basketball, gymnastics, and football. They suggested that there is a direct link between LBP and particular sports. According to the researcher, specific player movements stress and actions may have an impact on LBP. The literature review of Balague *et al*.[11] on the epidemiology of LBP in children and adolescents shows that the prevalence of LBP is higher among girls than among boys.[10,11] Moreover, both researches the incidence of back pain amplify with age,[3,4] in addition to possible roles for genetic[2,3] and psychosocial factors,[5,11] school performance,[6,7] and/or television watching,[4,2,7] There are relations between back pain and anthropometric parameters,[6,8] smoking,[9] spinal mobility, and/or flexibility of muscles and joints.[6,9] LBP is estimated to occur in 10–15% of young athletes, but the occurrence may be higher in certain sports.[6,4] In physical education and sports departments, students spend a lot of time participating in both individual and team sports these activities, such as bending, lifting, twisting, pushing, pulling, and vibrations, have often been associated with LBP. This study intended to determine the prevalence of LBP among students at a department of physical education an sports science, Rayalaseema University for the academic year 2021–2022.

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METHODS

This is a retrospective and cross-sectional survey connecting sports science students at the Rayalaseema University. Students were both males and females aged 18.5–24.5 years. Data on age, weight, height, and smoking habits are collected routinely, and then the sport in which the student is injured

in the low back is registered in the competition season. We collected information for the academic year 2021–2022. Body mass index (BMI; kg/m^2) was determined for each participant by dividing the weight in kilogram by the height in meter square, in this study, we used the standard BMI with categories of underweight (BMI of B18.5), normal weight (BMI of 18.5–B25), overweight (BMI of 25–B30), and obesity (BMI of >30). Smoking was categorized as non-smoker, B<20 cigarettes per day, and >20 cigarettes per day. BMI, smoking habits, and history of any pain or injuries were taken for all the students in the beginning of the first semester. Thus, we registered only students who were injured in the institute. Students with a previous history of LBP were not included. On the basis of the collected data, participants were dichotomized into those with or without LBP, while identifying the sport in which they were injured, or that they were injured as a result of accumulated tiredness from the numerous hours engage in physical activity. In 1 week, all students practice for a total of 16.5 h, spending 1.5 h in each of the following sports: soccer, handball, basketball, volleyball, judo, weightlifting, swimming, and athletics. In addition, football and basketball are practiced twice a week. LBP was defined as pain or discomfort in the low-back region, from the lower rib curvature to the lower part of the seat region. The questionnaire used was systematically prepared by the physiotherapist, to identify present injury status and past history related to LBP. In cases of serious injury, students were swiftly transported to the hospital. Furthermore, the severity for each injury which led to LBP was documented, but the sport in which the student sustained the injury was the most important information for us. Students who had injuries more than once were only considered to have LBP for their initial incident.

Statistical Analysis

The Chi-square test was employed to assess the prevalence of LBP between males and females in addition to examining the connections between LBP and other categorical variables (sex, obesity, and smoking habit). $P < 0.05$ was necessary for statistical significance.

RESULTS

It shows that the occurrence of LBP was significantly higher ($P < 0.001$) among females (17.6%) than among males (12.5%). LBP prevalence did not differ by BMI or smoking habit ($P > 0.05$). LBP occurred in 17.1% of those classified by BMI as lean, 14.8% of those in the normal range, 14.3% among those who were overweight, and 12.7% of those who were obese. In addition, 13.9% of students smoking <20 cigarettes and 13.3% of students smoking ≥20 cigarettes had LBP. We discovered that fatigue was strongly correlated with LBP in both sexes when looking at the risk factors for LBP during sports exercise. In the analysis of risk factors for LBP in sports training, we found that in combining both sexes, LBP was positively associated with fatigue (caused by the long time spent in training), gymnastics, judo, handball, and swimming. The increased prevalence of LBP is more in volleyball, athletics and even more in, basketball, gymnastics, weightlifting, and Football.

We observed a high occurrence of LBP associated with the exhaustion caused by the long time spent in physical activity (16.5 h/week). The frequency of LBP is influenced by the volume and intensity of physical activity. However, this point of view is attractive in terms of prevention as physical activity is amenable to behavioral intervention and physical training programs at physical education department and leisure activities may be adjusted to aim at strengthening the back.[6] Moreover, both physical inactivity and intensive sports activity have been associated with LBP in some studies.[2] Our findings indicate that more physical activity raised the incidence of LBP, particularly in the sports of basketball, gymnastics and Weightlifting and Football.

CONCLUSION

LBP was strongly associated with the amount of time reserved to practice the different sports planned in this department of physical education in Rayalaseema University. The sports identified as posing the greatest risk for LBP were gymnastics, basketball, followed by weightlifting and football. Moreover, the prevalence of LBP was significantly greater among females than males.

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Review Article

Synergies of movement and mind: Exploring the multifaceted impact of physical activity on mental well-being

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ABSTRACT

This paper presents a comprehensive analysis of the intricate interplay between physical activity and mental well-being. Drawing on an extensive range of literature, the paper examines the diverse impacts of exercise on mental health across varying types, intensities, and populations. The review begins by elucidating the neurobiological mechanisms that underpin the exercise-mental health relationship, highlighting the role of neurotransmitters, hormones, and brain plasticity. It proceeds to explore how different forms of physical activity contribute to mood modulation, stress alleviation, and cognitive augmentation. Furthermore, the influence of demographic factors, such as age, gender, and cultural context, is scrutinized in relation to exercise's effects on mental well-being. The psychosocial benefits of group exercise settings are also investigated, shedding light on their contributions to social interaction and psychological well-being. Examining exercise's potential as both a preventive measure and a complementary therapeutic approach for mental health issues, the review emphasizes its growing significance within conventional treatments. The long-term consequences of sustained physical activity on mental health outcomes are also probed through longitudinal studies. In summation, this comprehensive review amalgamates current research to establish a profound understanding of how regular physical activity fosters and enhances mental well-being. By delving into the intricate dynamics of the exercise-mental health connection, this paper underscores the pivotal role of exercise in promoting holistic mental well-being.

INTRODUCTION

In an era marked by the intricate interplay between physical and psychological well-being, the relationship between exercise and mental health has emerged as a compelling area of study. The recognition of physical activity as not only a cornerstone of physical health but also a catalyst for mental well-being has sparked extensive research into their interconnected dynamics. This paper delves into the depths of this relationship, aiming to comprehensively explore the myriad ways in which physical activity impacts mental well-being.

Background and Context

The profound impact of mental health on overall quality of life and societal well-being is undeniable. Mental health issues ranging from anxiety to depression affect millions worldwide, leading to personal hardships and societal burdens. Addressing mental health concerns has become a global imperative, prompting researchers and practitioners to seek holistic approaches that encompass both conventional therapies and novel interventions. Amidst this backdrop, the role of physical activity has gained prominence as a potential avenue for enhancing mental well-being.

Concurrently, the field of exercise science has witnessed a paradigm shift. While exercise was traditionally viewed as primarily benefiting physical health, emerging evidence highlights its substantial impact on cognitive function, mood regulation, and stress management. These findings, along with the need for comprehensive mental health promotion, have ignited a surge of interest in understanding the underlying mechanisms and practical implications of the exercise-mental health relationship.

Research Objectives

Against this backdrop, the primary objectives of this comprehensive review are twofold:

To synthesize existing research and literature concerning the diverse impacts of physical activity on mental well-being.

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This synthesis aims to provide a comprehensive understanding of the physiological, psychological, and social mechanisms through which exercise influences mental health outcomes.

To explore the various dimensions of the exercise-mental health relationship, encompassing different types and intensities of physical activity, demographic variations, and the potential roles of exercise as both a preventive measure and a complementary therapeutic approach.

Through these objectives, this review seeks to contribute to the ongoing discourse on mental health enhancement by highlighting the significance of physical activity within the broader spectrum of holistic well-being.

NEUROBIOLOGICAL MECHANISMS

Physical activity's impact on mental well-being extends beyond the realm of subjective experience, delving into the intricate neurobiological mechanisms that underlie this relationship. This section explores the intricate interplay between physical activity and neurobiology, encompassing the role of neurotransmitters, the influence of hormones, and the connection between brain plasticity and mental health.

Role of Neurotransmitters

Neurotransmitters, the chemical messengers of the brain, play a pivotal role in shaping our mental states. Physical activity has been shown to stimulate the release of neurotransmitters such as serotonin, dopamine, and norepinephrine. These neurotransmitters are intimately involved in mood regulation, reward mechanisms, and stress responses. The increased availability of these neurotransmitters post-exercise contributes to the sense of well-being, reduced anxiety, and enhanced mood commonly reported by individuals engaging in regular physical activity.

Influence of Hormones

The hormonal landscape is another facet through which physical activity influences mental well-being. Exercise triggers the release of endorphins, often referred to as "feel-good" hormones, which induce a sense of euphoria and pain relief. In addition, physical activity can lead to reductions in cortisol, the stress hormone. This hormonal modulation not only contributes to stress reduction but also has far-reaching effects on cognitive function, sleep patterns, and emotional resilience.

Brain Plasticity and Mental Health

The brain's remarkable plasticity, its ability to adapt and reorganize, is a cornerstone of mental health. Physical activity has been shown to stimulate neurogenesis, the formation of new neurons, particularly in regions associated with memory and learning. Furthermore, exercise enhances synaptic plasticity, strengthening connections between neurons and fostering efficient communication within neural networks. This heightened plasticity is linked to cognitive enhancement, emotional regulation, and a potential buffer against neurodegenerative conditions.

Neurobiological mechanisms through which physical activity impacts mental well-being are intricate and multifaceted. By influencing neurotransmitter release, hormone regulation, and brain plasticity, exercise exerts a profound influence on cognitive function, mood, and overall mental health.

TYPES AND INTENSITIES OF PHYSICAL ACTIVITY

The varied manifestations of physical activity offer a spectrum of effects on mental well-being. This section explores the distinct contributions of different types and intensities of exercise to mood regulation, stress reduction, and cognitive function.

Aerobic Exercise and Mood Regulation

Aerobic exercise, characterized by sustained, rhythmic movements that elevate heart rate, has emerged as a potent mood enhancer. The release of endorphins during aerobic activity contributes to the sense of euphoria often termed the "runner's high." Beyond endorphins, aerobic exercise stimulates the production of brain-derived neurotrophic factor (BDNF), promoting neural growth and fostering emotional resilience. Regular engagement in aerobic activities such as jogging, swimming, or cycling has been linked to reduced symptoms of depression, anxiety, and improved overall emotional well-being.

Strength Training and Stress Reduction

Strength training, encompassing resistance exercises and weightlifting, offers a unique avenue for stress reduction. The physical challenge of lifting weights triggers the body's relaxation response, leading to reductions in cortisol levels. This stress-reducing effect is coupled with an increased sense of mastery and self-efficacy, contributing to enhanced self-esteem. Moreover, strength training promotes the release of endorphins, further amplifying its impact on mood improvement. By incorporating strength training into one's routine, individuals may find an effective means of alleviating stress and fostering mental resilience.

Flexibility Exercises and Cognitive Function

While often overshadowed, flexibility exercises such as yoga and stretching offer distinct advantages for cognitive function and mental health. Yoga, in particular, combines physical postures with mindfulness and controlled breathing. This synthesis promotes relaxation, reduces stress, and enhances emotional regulation. In addition, the mind-body connection

fostered by flexibility exercises contributes to improved self-awareness and introspection. Regular practice has been associated with increased attention, enhanced working memory, and reduced cognitive decline in aging populations.

In essence, the varying types and intensities of physical activity encompass a rich tapestry of effects on mental well-being. From aerobic exercise's mood-enhancing effects to strength training's stress-reducing qualities and flexibility exercises' cognitive benefits, each mode of physical activity offers a unique pathway to holistic mental health.

POPULATION DIFFERENCES AND DEMOGRAPHIC FACTORS

The interaction between physical activity and mental well-being is not uniform across all individuals; instead, it is influenced by a myriad of demographic factors. This section delves into how age-related variations, gender-related influences, and cultural contexts shape the exercise-mental health connection.

AGE-RELATED VARIATIONS

Physical activity's impact on mental well-being evolves over the course of a lifetime. In children and adolescents, exercise plays a pivotal role in cognitive development, emotional regulation, and social integration. For older adults, physical activity acts as a shield against cognitive decline and enhances overall quality of life. However, age-related factors such as fitness levels, lifestyle changes, and health conditions can modulate the effects of exercise on mental health. Recognizing these age-related nuances is crucial for tailoring exercise interventions to meet the unique needs of different age groups.

Gender-related Influences

Gender plays a role in shaping the exercise-mental health relationship, albeit with complexities. Women tend to engage more in aerobic and flexibility activities, aligning with their preferences for holistic well-being. Men, on the other hand, often gravitate toward strength training and competitive activities, reflecting their inclination toward mastery and achievement. These gender-related exercise preferences intersect with societal expectations and body image concerns, influencing mental well-being outcomes. Understanding these gender-related nuances can inform the design of exercise interventions that cater to diverse needs.

CULTURAL CONTEXT AND MENTAL WELL-BEING

Cultural factors intricately weave into the exercise-mental health tapestry, shaping attitudes, beliefs, and behavioral patterns. Cultural norms surrounding body image, physical activity, and mental health play a pivotal role in determining the perceived benefits of exercise. Cultural diversity extends to exercise practices themselves, ranging from traditional forms like Tai Chi to modern fitness routines. Acknowledging the cultural context is vital to ensure exercise interventions are culturally sensitive, relevant, and effective in promoting mental well-being across diverse populations.

In summary, the relationship between physical activity and mental well-being is a nuanced interplay influenced by age-related variations, gender-related influences, and cultural contexts. Recognizing these demographic factors enriches our understanding of how exercise interventions can be tailored to optimize mental health outcomes for diverse populations.

PSYCHOSOCIAL BENEFITS OF GROUP EXERCISE

The dimension of group exercise offers unique psychosocial benefits that extend beyond the physiological realm. This section delves into the social interaction, sense of community, and psychological factors that contribute to the enhanced mental well-being experienced within group exercise settings.

Social Interaction and Sense of Community

Group exercise environments foster social interaction and the formation of connections among participants. Shared experiences, collective goals, and mutual support create a sense of camaraderie, promoting feelings of belonging and acceptance. These interactions extend beyond the confines of the exercise session, leading to the development of a supportive community that enhances social well-being. The relationships formed in group exercise settings provide a buffer against feelings of isolation and loneliness, contributing positively to mental health.

Psychological Factors in Group Settings

Psychological factors, such as motivation and accountability, are amplified within group exercise contexts. The presence of peers and instructors acts as a motivational force, encouraging consistent engagement in physical activity. Moreover, the psychological benefits of exercise, such as stress reduction and mood enhancement, are intensified through shared experiences. The collective energy and positive atmosphere within group settings contribute to the amplification of mental well-being outcomes.

EXERCISE AS PREVENTIVE AND ADJUNCTIVE THERAPY

Physical activity's potential as both a preventive measure and an adjunct to conventional therapies for mental health concerns

is a burgeoning area of research and application. This section explores the dual roles of exercise in safeguarding mental well-being and enhancing treatment outcomes.

Exercise as a Preventive Measure

Increasingly, exercise is recognized as a modifiable factor that can mitigate the risk of mental health issues. Engaging in regular physical activity establishes a protective buffer against the onset of conditions such as depression and anxiety. The neurobiological, psychological, and social benefits of exercise collectively contribute to improved resilience to stressors and emotional challenges.

Complementary Role in Conventional Treatments

In tandem with conventional treatments, exercise assumes a complementary role in managing mental health conditions. Exercise interventions have demonstrated efficacy as adjunctive therapies for depression, anxiety disorders, and even severe mental illnesses. The physiological and psychological effects of exercise synergize with pharmacological and psychotherapeutic interventions, potentially enhancing treatment outcomes and reducing reliance on medications.

LONG-TERM EFFECTS OF PHYSICAL ACTIVITY

The lasting impact of physical activity on mental well-being extends far beyond the immediate benefits. This section delves into longitudinal studies that illuminate the sustained advantages of engaging in regular exercise for mental health outcomes.

Longitudinal Studies and Sustained Benefits

Long-term research underscores the enduring benefits of consistent physical activity. Longitudinal studies reveal that individuals who maintain active lifestyles over time experience lower rates of depression, improved cognitive function, and increased emotional well-being. The cumulative effects of exercise on brain plasticity, hormone regulation, and psychological resilience contribute to sustained mental well-being benefits.

CONCLUSION

The intricate relationship between physical activity and mental well-being spans neurobiology, psychology, and social dynamics, ultimately fostering holistic mental health. This paper navigated through the multifaceted dimensions of this relationship, from neurobiological mechanisms to diverse types of exercise, demographic influences, and the psychosocial context. As we culminate this exploration, key findings and implications emerge, resonating with both individuals and the broader field of mental health promotion.

Summarizing Key Findings

The synthesis of current research highlighted the diverse impacts of physical activity on mental well-being. Neurotransmitter release, hormone modulation, and brain plasticity emerge as pivotal mechanisms underpinning the exercise-mental health connection. Different modes of exercise—be it aerobic, strength-based, or flexibility-focused—exert unique effects, addressing mood regulation, stress reduction, cognitive enhancement, and beyond. Demographic factors, including age, gender, and cultural context, weave intricate nuances into this relationship, calling for personalized approaches. Group exercise settings magnify psychosocial benefits, fostering social interaction, sense of community, and psychological upliftment. Furthermore, exercise proves its mettle as both a preventive measure against mental health concerns and an adjunctive therapy, synergizing with conventional treatments. Longitudinal studies substantiate the enduring advantages of sustained physical activity, offering a resilient foundation for lifelong mental well-being.

Implications for Mental Health Promotion

The implications of these findings reverberate across the spectrum of mental health promotion. Holistic approaches to mental well-being should encompass physical activity as a cornerstone. Incorporating diverse exercise modalities in intervention strategies can yield a comprehensive impact on mood disorders, stress management, and cognitive function. Recognizing the nuances of age-related, gender-related, and cultural influences is vital for tailoring exercise recommendations that resonate with diverse populations. Group exercise environments stand as fertile ground for fostering a sense of belonging, social support, and motivation, thereby augmenting mental well-being. From a preventive standpoint, integrating exercise into daily routines can serve as a preemptive defense against mental health issues, bolstering resilience to emotional challenges. The complementary nature of exercise with conventional therapies showcases its potential to elevate treatment outcomes, potentially reducing the burden of psychotropic medications and enhancing psychotherapeutic interventions.

In conclusion, the symbiotic relationship between physical activity and mental well-being transcends disciplinary boundaries, echoing the innate interconnectedness of mind and body. As we step into an era that embraces holistic health, exercise emerges as a potent tool that empowers individuals to cultivate their mental well-being. This journey of exploration underscores the enduring power of movement in shaping a balanced and vibrant existence.

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Research Article

Affluence of different proportions of aerobic and anaerobic demands on physiological parameters among elite athletes

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ABSTRACT

Regular and systematic sports training is most importance for every athlete to achieving excellence in sports. This present scientific study was to the affluence of different proportions of aerobic and anaerobic demands on cardiovascular parameters among elite athletes. For this study, 45 (N = 45) healthy male elite athletes were volunteered as subjects from different parts of Andhra Pradesh and Telangana State, India, Athletes age between 20 and 25 years. The investigator has distributed them into three groups according to their events and utilization of different aerobic and anaerobic proportions. Group I is 10% aerobic and 90% anaerobic group (200 m race), Group II is 50% aerobic and 50% anaerobic group (1500 m race), and Group III is 90% aerobic and 10% anaerobic group (10,000 m race) (Edward L. Fox, 1989) for the groups cardiovascular parameters, heart rate (HR) and stroke volume (SV) were measured using electrocardiograph (ECG) and M-mode Doppler echocardiograph, respectively. The results of the study were HR at rest mean values of 10% aerobic and 90% anaerobic group, 50% aerobic and 50% anaerobic group, and 90% aerobic and 10% anaerobic group were 56.13, 51, and 46.06 beats/min (P = 0.05), respectively. SV at rest mean values of three groups 81.19, 89.67, and 102.08 ml/beat (P = 0.05), respectively. The values obtained were analyzed by SPSS. The result indicates that 90% aerobic and 10% anaerobic group has significantly decreased HR and increased SV as compared to 50% aerobic and 50% anaerobic and 10% aerobic and 90% anaerobic group. It is concluded that 90% aerobic and 10% anaerobic proportion of sports training is better training protocol to decrease the heart rate and increase stroke volume among athletes compared to 50% aerobic and 50% anaerobic group and 10% aerobic and 90% anaerobic group for physiological efficiency.

Keywords: Sports training, Heart rate, Stroke volume, Aerobic exercise, Anaerobic exercise

INTRODUCTION

Heart is one of the exceptional organs that require an alternate transformation period when contrasted with different living beings. Further, the preparation with various forces surely prompts different physical and physiological preparation impacts, When he/she goes through preparing with the most extreme power prompts improvement of speed capacities while with low powers, prompts further develop various sorts perseverance capacities. Separated when a game man goes through extremely low power preparing it does not influence on execution factor yet it is really great for speeding up recuperation process. At the point when an athlete efficiently goes through the persistent preparation, the various organic entities will get influence distinctively with various transformation period. "Competitor is an extraordinary person who swims in the expanse of lactic corrosive." It is very much found that the high-impact preparing with various extent brings about a perceptible reduction in resting HR and SV together. A variety of cardiovascular changes are associated with regular and systematic dynamic exercises (Reddy *et al.* 2010). The cardiovascular outcomes of a unique exercise incorporate HR and SV (O'Sullivan 2000; Greenleaf *et al.* 1981). According to Raglin and Willson (2000) if an athlete seeks a significant change on selected cardiovascular parameters the subjects should be exposed to greater volume of training than that of the amount required to achieve physical fitness. About 90% of aerobic training and 10% of anaerobic training result in lower HR and increased SV as a result of Starling's law of mechanism. Resting and post-exercise HR variability are responsive to the impact of training loads in endurance and team sports. Vagal-related heart rate variability indices at rest are augmented in rejoinder to training loads, to develop exercise performance (Nummela *et al.*, 2010).[18] HR variability

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is useful for sprinters to know the possibility of training-related adaptations (Cesar Abad *et al.* 2017).

METHODOLOGY

Forty-five ($N = 45$) healthy male elite athletes were volunteered as subjects from different parts of Andhra Pradesh and Telangana, India. The investigator has elected 10% aerobic and 90% anaerobic and 50% aerobic and 50% anaerobic and 90% aerobic and 10% anaerobic proportions as independent variables, to meet this criteria 15 ($n = 15$) elite athletes from 200 m, 15 men (n=15) elite athletes from 1500 m and 15 men ($n = 15$) elite athletes from 10,000 m race, respectively (Edward L. Fox, 1989) [4] who have been effectively taking an interest at National and University level sports. Subjects underwent regular training program under the direction of their regular coaches as per specialized sports event. The subjects age between 20 and 25 years. The training diary revealed that volunteered elite subject athletes were not reported any injuries during their training period and their sports age is 5–7 years. The assessed parameters are HR at rest, and SV at rest was measured by 'M-mode Doppler echocardiography (Philips CX50 ultra image system). Statistical analysis of the obtained information on chose factors has been investigated and displayed below. The information gathered from experimental groups on HR at rest and SV at rest was statistically verified by utilizing analysis of variance (ANOVA), and the degree of freedom was fixed at 0.05 for significance. To decide the significance difference among the means of three experimental groups, the Scheffe'S test was used as post-hoc test

RESULTS

Means, standard deviation (SD), and the ANOVA for data on HR at rest, SV at rest of 10% aerobic and 90% anaerobic, 50% aerobic and 50% anaerobic, and 90% aerobic and 10% anaerobic group were analyzed and presented in the Table 1. The table value for significance at 0.05 level with df^2 and 42 is 3.222.

Table 1 displays that the heart rate at rest for 10% aerobic and 90% anaerobic, 50% aerobic and 50% anaerobic, and 90% aerobic and 10% anaerobic groups is 56.13, 51, and 46.07 beats/min ($P = 0.05$), respectively. The acquired "F" ratio of 172.28 is greater than the table value of 3.22 for df2 and 42 required for significant at 0.05 level. The means of stroke volume at rest for three groups are 81.187, 89.667, and 102.08 ml/beat ($P = 0.05$), respectively. The acquired "F" ratio of 399.4403 is greater than the table value of 3.22 for df2 and 42 required for significant at 0.05 level.

The consequences of the study indicate that the significant difference exists among 10% aerobic and 90% anaerobic group, 50% aerobic and 50% anaerobic group, and 90% aerobic and 10% anaerobic groups on HR at rest and SV at rest. To define the noteworthy variation among the means of three experimental groups, the Scheffe's test was employed as post-hoc test and the outcomes were exhibited in Table 2.

Table 2 displays that the test mean deviation on HR at rest between 10% aerobic and 90% anaerobic group and 50% aerobic and 50% anaerobic group is 5.133 which is much greater than the confidence interval value 3.604 at 0.05 level of assurance. The test mean deviation on HR at rest between 10% aerobic and 90% anaerobic group and 90% aerobic and 10% anaerobic group is 10.067 which is much greater than the confidence interval value 3.604 at 0.05 level of assurance. The test's mean deviation on HR at rest between 50% aerobic and 50% anaerobic group and 90% aerobic and 10% anaerobic group is 4.933 which is greater than the confidence interval value 3.604 at 0.05 level of assurance. Hence, it is concluded from the consequences that the significant deviation exists between three experimental groups: 10% aerobic and 90% anaerobic group, 50% aerobic and 50% anaerobic group, and 90% aerobic and 10% anaerobic group on HR at rest.

The test mean deviation on SV at rest between 10% aerobic and 90% anaerobic group and 50% aerobic and 50% anaerobic group is 8.48 which is much greater than the confidence interval value 5.05 at 0.05 level of assurance. The test mean deviation on SV at rest between 10% aerobic and 90% anaerobic group and 90% aerobic and 10% anaerobic group is 12.413 which is much greater than the confidence interval value 5.05 at 0.05 level of assurance. The test's mean deviation on SV at rest between 50% aerobic and 50% anaerobic group and 90% aerobic and 10% anaerobic group is 2.893 which is greater than the confidence interval value 5.05 at 0.05 level of assurance. Hence, it is concluded from the values that the significant deviation exists between three experimental groups: 10% aerobic and 90% anaerobic group, 50% aerobic and 50% anaerobic group, and 90% aerobic and 10% anaerobic group on SV at rest.

From the results, it was concluded that 90% aerobic and 10% anaerobic group has decreased the HR at rest and increased SV at rest as compared to the 10% aerobic and 90% anaerobic group and 50% aerobic and 50% anaerobic group. Further, it is concluded that the highest mean deviation exists between 10% aerobic and 90% anaerobic group and 90% aerobic and 10% anaerobic group.

The test's mean values on HR at rest and SV at rest of three experimental groups are graphically depicted in Figure 1.

DISCUSSIONS

The resting heart rate is reduced by a balance between sympathetic and parasympathetic tone with a prevalence of the

Table 1

	Test	10% Aerobic and 90% Anaerobic Group	50% Aerobic and 50% Anaerobic Group	90% Aerobic and 10% Anaerobic Group	Source of Variance	df	Sum of Squares	Mean Squares	Obtained 'F' ratio	Table 'F' ratio
HR	Mean	56.13	51	46.07	B:	2	760.13	380.067	172.28*	3.222
	SD	1.506	1.648	1.28	W:	42	92.67	2.206		
SV	Mean	81.187	89.667	102.08	B:	2	3312.663	1656.332	399.403*	
	SD	1.851	2.246	1.993	W:	42	174.175	4.147		

*Significant at 0.05 level of assurance.

Table 2

Variable	10% Aerobic and 90% Anaerobic Group	50% Aerobic and 50% Anaerobic Group	90% Aerobic and 10% Anaerobic Group	Mean deviations	Confidence Interval 0.05 Level
HR	56.13	51	-	5.133*	3.604
	56.13	-	46.07	10.067*	
	-	51	46.07	4.933*	
SV	81.1867	89.667	-	8.48*	5.05
	81.1867	-	102.08	12.413*	
	-	89.667	102.08	20.893*	

*Significant at 0.05 level of assurance

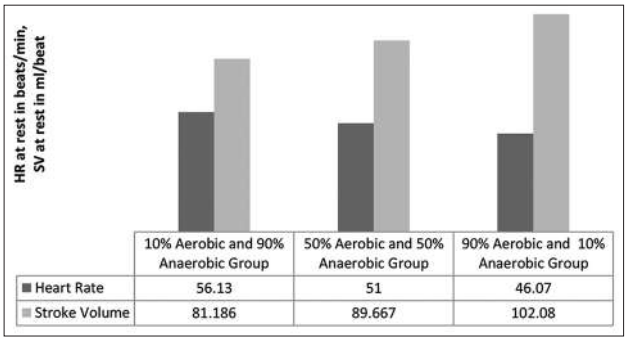

Figure 1: Bar chart on heart rate and stroke volume at rest means of 10% aerobic and 90% anaerobic group, 50% aerobic and 50% anaerobic group, and 90% aerobic and 10% anaerobic group

latter (Lakatta EG, 1995) on this basis, few reports expressed that an expanded vagal tonus is the main fundamental instrument for the bradycardia initiated by aerobic physical training. According to Goldsmith *et al.* (1992), the bradycardia shown by endurance-trained people is attributed, in any event to a limited extent to greater parasympathetic activity. Sprinters present comparative HRV initiates when contrasted with endurance sprinters. Suggest that former populations might be present akin cardiac autonomic changes when equated with endurance runners after expose to prolonged training activity (Lepretre *et al.* 2012). Heart rate variability is diminished when athletes present outreach and overtraining symptoms (Kiviniemi *et al.* 2014). People who exposed to aerobic exercise their resting heart rate is 40 – 60 bpm, which is near bradyrhythmia likewise SV is also huge (Maron and Pelliccia, 2006). Sullivan and Bell (2000) found in a troop of previous inactive subjects that 6 weeks of systematic, moderate aerobic exercise are adequate to outcome a considerable lowering heart rate. Franklin (1997) stated that the increased aerobic capacity in athletes appears to be primarily the aftereffect of augmented maximal cardiac output, due to a more noteworthy addition in HR and to lesser extent SV, as opposed to an extended peripheral extraction of oxygen. Because there is little variety in maximal HR and maximal systemic arteriovenous oxygen contrasts with training. Maron (1986) coined that high SV is kept up with a low heart rate, while low SV is kept up with a high HR. In addition, standard exercise makes the progression of the venous blood smooth, along these lines expanding the amount of blood coming back to diastolic heart, which increments cardiac output. According to Hoogsteen *et al.* (2004), athletes who do continuance practices and are prepared hard, eccentric progression change was appeared. It is then categorized that the internal diameter of the ventricle was expanded on account of such eccentric hypertrophy, and due to huge the left ventricular volume, the SV was additionally high. Furthermore, a high SV in the vigorous aerobic exercise group was appeared with low HR.

CONCLUSIONS

Findings of the data have significant difference exist between 10% aerobic and 90% anaerobic group, 50% aerobic and 50% anaerobic group, and 90% aerobic and 10% anaerobic group

and regarding their influence on HR and SV. From the results of the study, 90% aerobic and 10% anaerobic group has reduced the heart rate and increased the stroke volume as compared to 10% aerobic and 90% anaerobic group.

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Review Article

Assessment of psychological modules and social modules on physical literacy among adolescence

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ABSTRACT

Introduction: Physical literacy is the drive, confidence, physical skill, knowledge, and understanding required to value and accept responsibility for lifelong participation in physical activities. Physical exercise is defined as any movement of the body that requires energy and raises the heart rate, as well as respiratory rate. Children should develop their confidence level, motivation, physical competence, knowledge, and understanding at the right age as an integral part of their lifestyle. **Purpose of the Study:** The purpose of this study helps to understand the validity and reliability evidence of psychological modules and social modules on physical literacy among adolescence. **Methodology:** The aim of this study was to compare psychological and social modules of physical literacy among adolescence. To accomplish this purpose, the researcher selected 200 subjects from Santhomehr Sec. School, Mylapore, Chennai. The subjects ranged in age from 12 to 15 years. The convenient sampling design was used in this study. Portuguese Physical Literacy Assessment Questionnaire was selected for the questionnaire; it consists of 48 questions and I have requested students to fill the same, and 200 responses were received. **Statistical Tool:** The statistical tool "t" test was used for analyzing of the data and the obtained "t" ratio was tested for significance at 0.05 level of confidence. **Results and Conclusion:** The results proved that the mean values of psychological and social modules of physical literacy are 44.16 ± 9.17 and 42.61 ± 9.79, respectively. The obtained "t" ratio 2.71 is greater than the required table value of 1.97 for df = 199 at 0.05 level ($P \geq 0.05$), which means there is a significant difference occurred in psychological modules and social modules of physical literacy among adolescence.

Keywords: Adolescence, Physical literacy, Portuguese Physical Literacy Assessment Questionnaire

INTRODUCTION

Physical literacy is the motivation, confidence, physical competence, knowledge, and understanding to value and take responsibility to participate in physical activities for life. Physical activity is any movement using the body that requires energy and increases heart rate and respiratory rate. The more we participate in various activities, the more physically literate we become, and the more we enjoy and want to continue being active. As our physical literacy and physical activity levels increase, our health outcomes improve. Developing physical literacy is a lifelong journey. Individuals of any age and ability can explore, learn, and improve movement skills, which enable participation in physical activities that contribute to improved health and quality of life.

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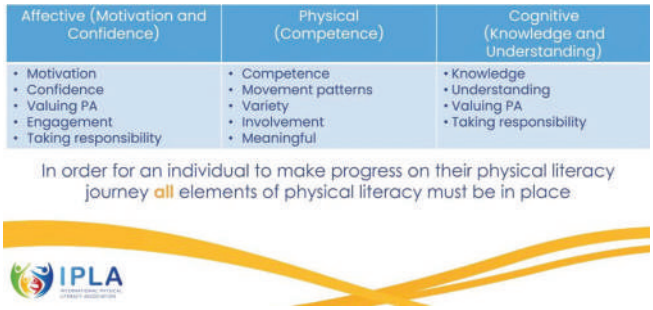
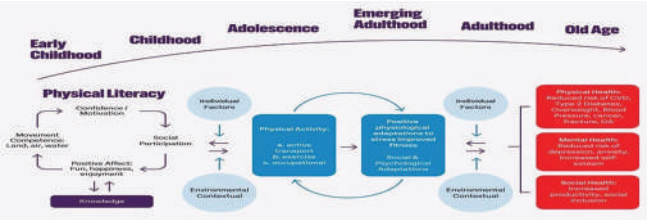
WHY PHYSICAL LITERACY IS IMPORTANT

An inactive population research shows that most Canadians are not as active as we could – or should – be. According to recommendations from the federal government, adults should get 150 min of moderate-to-vigorous physical activity per week, while children and youth should do the same for 60 min each day. Unfortunately, the vast majority of us are failing to meet those standards. More than 60% of children and youth and over 80% of adults fail to get the recommended amount of physical activity. In addition to hurting our health, our inactivity is costing us. According to government figures, treatment of chronic diseases linked to physical inactivity costs the health-care system up to $6.8 billion annually.



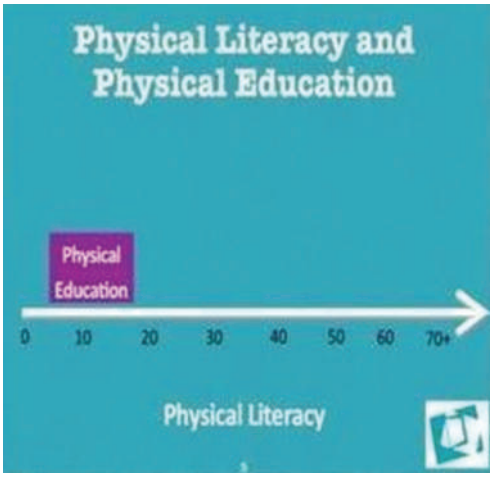
A gateway to physical activity. Physical literacy serves as a gateway to physical activity. Research strongly suggests that one of the best ways to help the population and avoid the negative effects of physical inactivity is to foster physical literacy in people from a young age, which empowers them to be more physically active throughout their lives.

In fact, a study published by Dr. John *et al.* shows the connections between physical literacy, physical activity, and health outcomes across an individual's entire life span. He findings? Physical literacy in early childhood leads to increase physical, mental and social health into old age.



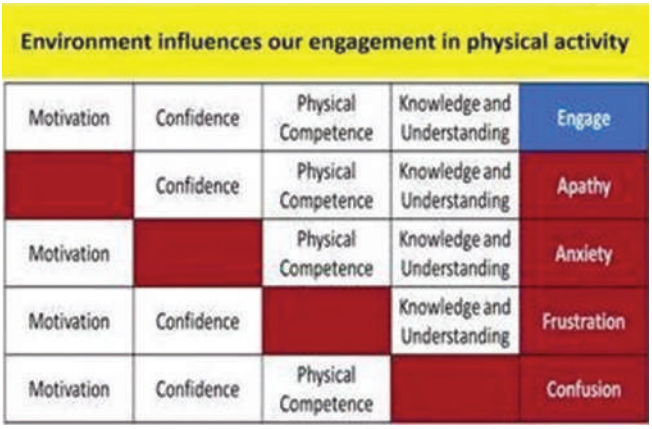
PHYSICAL EDUCATION AND PHYSICAL LITERACY

The physical education curriculum is based on the vision that the knowledge and skills students acquire that the program will benefit them throughout their lives and enable them to thrive an ever-changing world by helping them to develop mental health and physical well-being, physical and health literacy, and the comprehension, capacity, and commitment. They will need to lead healthy, active lives and promote healthy, active living.



PSYCHOLOGICAL MODULES

Psychology is the scientific study of the mind and behavior. Psychologists are actively involved in studying and understanding mental processes, brain functions, and behavior. The field of psychology is considered a "Hub Science" with strong connections to the medical sciences, social sciences, and education (Boyack *et al.*,2005)



SOCIAL MODULES

Social modules provide functionality that helps create a community in your site by allowing users to interact with each other and post their own content.

METHODOLOGY

The aim of this study was to compare psychological and social modules of physical literacy among adolescence.

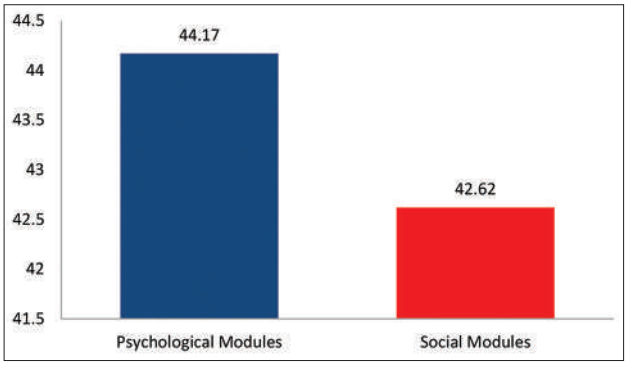


Figure 1: The comparisons of the mean scores of the psychological and social modules of physical literacy were presented graphically

Table 1: Significant difference between the means of psychological modules and social modules on physical literacy among adolescence

	Mean	SD	't' ratio
Psychological modules	44.17	9.17	2.71*
Social modules	42.62	9.79	

To accomplish this purpose, the researcher selected 200 subjects from Santhomehr Sec. School, Mylapore, Chennai. The subjects ranged in age from 12 to 15 years. The convenient sampling design was used in this study. Portuguese Physical Literacy Assessment Questionnaire was selected for the questionnaire; it consists of 48 questions and I have requested students to fill the same, and 200 responses were received.

Statistical Tool

The statistical tool "t" test was used for analyzing of the data and the obtained "t" ratio was tested for significance at 0.05 level of confidence.

Table shows that the mean values of psychological and social modules of physical literacy are 44.17 ± 9.17 and 42.62 ± 9.79, respectively. The obtained "*t*" ratio of 2.71 is greater than the required table value of 1.97 for df 199 at 0.05 level ($P \geq 0.05$), which means that there is a significant difference occurred in psychological modules and social modules of physical literacy. Scores are graphically represented in Figure 1.

Findings

There is a significant difference between psychological modules and social modules on physical literacy among adolescence.

CONCLUSION

With in the limitation and delimitation of the study, the following conclusion was drawn from the research.

1. It was concluded that psychological and social modules of physical literacy having significant difference.
2. This assessment of the study improves adolescence physical literacy.

RECOMMENDATION

From the knowledge obtained from the study, the investigator desired to recommend the following.

1. Frequently assessing the children can know their confidence level, motivation, physical competence, knowledge, and understanding.
2. Physical educators, coaches, and parents may come forward to get adequate knowledge in physical literacy.
3. Physical literacy focuses on the holistic development of children.
4. Similar research may be conducted among various age groups.

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Research Article

Evaluation of a body height and weight harmony among National Institute of Technology Students

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ABSTRACT

Introduction: The aim of this research was to compare objective and subjective evaluations of the body weight and height correlation by NIT Warangal students. Aiming a harmony between body weight and height is one of the most important signs of the right body composition. **Material and Methods:** Students of 4-year bachelor programs in the NIT students were investigated: 100 males in the age of 20 years, body height – 175.0 ± 7.9 cm, and body weight – 69.6 ± 12.3 kg; 50 females in the age of 18 years, body height – 156.4 ± 6.0 cm, and body weight – 49.6 ± 8.9 kg. During the lessons of extra academic activity (EAA), students were asked to evaluate mentally their body weight value using three categories: Normal, overweight, and underweight. A body weight value was evaluated using BMI model too. Correlation between results of these two evaluations was determined using the Pearson interclass correlation coefficient. **Results:** One-way ANOVA showed relatively small differences between BMI values of three studied groups ($P = 0.234$). Within groups, variation was in the medium interval: From V = 10.4% in the B. Tech group up to 16.6% – in the EAA. Totally for all the participants, Pearson interclass correlation showed a moderate significant correlation ($r = 0.354$, $P < 0.001$) between results of the objective as BMI values and subjective evaluations as data received from a special questionnaire. **Conclusions:** Comparison of the objective evaluation results of body weight by BMI and results of subjective evaluation regarding body weight were compared versus results evaluated mentally by students. Subjective evaluated results very good met results obtained from BMI values. Corresponding error appeared negligible small. Statistical hypothesis regarding a common general population in these two samples was accepted.

Keywords: Physical education, Extra academic activity, Bachelor, Body composition, Body mass index, Modeling

INTRODUCTION

A body height and a body weight are two most important and popular kinesiology parameters of a human body regarding extra academic activity (EAA). Physical education and family areas of human movements such as physical activity, sports, and others. A harmony between these two parameters is one of the most important signs of a right body composition. Body mass index (BMI) is the most popular model for determination of quality of the body composition. Because a body height is much more conservative parameter than a body weight, for determination of the optimal correlation between these parameters, the second one is used usually as a function of the independent body height. With a purpose to improve health and general conditions and to get a right body composition, people try to reduce a body weight to the acceptable level. Especially, this problem is an actual one for young persons and students. Last several decades, longing for "an ideal body composition" became a standard among the NIT students. The frequency of overweight and obesity occurrence is systematically rising. One of its causes is the deteriorated perception of one's body. Wrong BMI estimation causes risky eating habits, which may outcome as serious health problems.

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Hypothesis of the Study

Hypothesis of the study is subjective one and should be evaluated using some objective criterion. BMI model is an objective method for quantitative determination of a body composition parameter. Hence, BMI could be used as an objective criterion for result of a subjective evaluation of a body composition. Therefore, the hypothesis of the study was formulated as follows: Results of the subjective evaluation of body weight versus body height are rather similar to results received from BMI model an alternative hypothesis

states independent results of the subjective and objective evaluations.

Purpose of the Study

1. Participants body height and body weight were measured and corresponding BMI values were calculated.
2. Evaluation of these body height and weight correlation was done using BMI values, that is, the objective indicator, as well as values of the subjective indicator using results of the participant's mental evaluation on the problem.
3. To study a comparison of these two methods of evaluation, differences between correlation results regarding gender and specialty have been determined too.

MATERIALS AND METHODS

Students from B. Tech Physio-Therapeutics, and Physical Education 4-year bachelor programs at Technological University in NIT Warangal were investigated: 137 males in the age of 20 years (mean ± SD), body height – 159 ± 7.9 cm, and body weight – 69.6 ± 12.3 kg; 50 females in the age of 18 years body height – 156.4 ± 6.0 cm, and body weight – 49.6 ± 8.9 kg. The study was approved in advance by the study of the National Institute of Technology Warangal. Students who participated in the research voluntarily provided written informed consent before participating. The research has been carried out during 2021–2022 academic year. Regarding the lessons of (EAA) physical education, students were asked to evaluate their body weight value using three categories as results: Normal, overweight, and underweight. A body weight value was evaluated using BMI value too: 18.5÷24.5 – Normal, >24.5 – Overweight, and underweight. A body weight value was evaluated using BMI value too: 18.5÷24.5 – Normal, >24.5 – Overweight, and correlation between results of these two evaluations was determined using interclass correlation coefficient. BMI was calculated according to the formula as follows: BMI = (Body mass)/(Body weight)^2 in (kg)/(squared meters). The body weight was determined using electronic scales with an error ±0.05 kg.

Statistical Analysis

One-way ANOVA was used with a purpose to determine differences between BMI values of three studied groups. The factor of the analysis was a bachelor program of studied NIT students, that is, B. Tech and (EAA) Physical Education. This method as well as coefficient of variation n (V=100*SD/Mean, %) was used to determine dispersions of BMI values within studied groups. Corresponding results were evaluated using the scale as follow: V=0–10% small variation, 11–20% – moderate, and over of 20% – high variation. The objective evaluation results of a body weight determined using BMI and results of the subjective evaluation regarding the body weight were compared versus results evaluated by students using the two samples paired T-test. Pearson interclass correlation was used to study correlation between results of objective (as BMI) and subjective, that is, data from the students' questionnaire. Lower than 0.2 is a weak correlation, over than 0.2 and lower than 0.4 is a moderate correlation, over than 0.4, and lower than 0.7 is a medium correlation, and over than 0.7 is a strong correlation. Calculations have been done using data analysis of Excel package (one-way ANOVA, paired two samples t-test) and Statistical computer program.

RESULTS

BMI values were elaborated using methods of parametric statistics (Table 1). One-way ANOVA showed relatively small

Table 1: Parameters of participants: Males (nM=137) and females (nF=281)*

Statistics	Age (year)		Body height (cm)		Body weight (kg)		BMI	
	Males	Females	Males	Females	Males	Females	Males	Females
Mean	22.1	21.5	180.0	166.4	79.6	59.6	24.5	21.5
SD	1.7	2.1	7.9	6.0	12.3	8.9	3.1	2.8
Max	29.0	43.1	204.0	186.0	125.0	91.0	38.6	33.8
Min	18.0	19.0	154.0	150.0	55.0	43.0	16.5	16.6
D	0.131	0.163	0.085	0.075	0.101	0.085	0.106	0.147

*Notes: nM and nF are male and female participants' numbers correspondingly, M is arithmetic mean value, SD is standard deviation, D is Kolmogorov – statistics, *P* is significance, *P* (D)>0.05

Table 2: Results of ANOVA of BMI values

Source of dispersion	SS*	df	MS	*F*	*P*	F (0.05, 2, 415)	Q, %
Between groups	30.4	2	15.2	1.453	0.235	0.051	0.7
Within groups	4346.4	415	10.5				99.3
Total	4376.8	417	10.5				100.0

*Note: SS is sum of squares, df is degree of freedom, MS – mean squares (variance), F is Fisher statistics, Q is a part of the total dispersion, *P* is significance.

Table 3: Results of the subjective evaluation of body weight (from questionnaire) versus BMI values

Statistics	Group			Total
	B. Tech	Physio-therapeutics	Physical education	
N	140	184	94	418
M	22.2	22.6	22.9	22.5
SD	3.7	3.2	2.6	3.2
V (%)	16.6	14.1	11.4	14.4
r	0.377	0.451	0.164	0.354
t	4.784	6.861	1.590	7.727
P (r)	<0.001	<0.001	0.058	<0.001

*Notes: n is participants' number, M is arithmetic mean value, SD is standard deviation, V is coefficient of variation, r is Pearson correlation coefficient, t is Student statistics, *P* (r) is significance. BMI: Body mass index

Table 4: Comparison of the objective evaluation results of body weight by BMI and subjective evaluation results by questionnaire

Statistics	Types of evaluation	
	Objective (using BMI)	Subjective (questionnaire)
N	418	418
M	1.15	1.17
SD	0.53	0.5
r, *P* (r)	0.326, <0.001	14.1
D, *P* (D)	<0.001	<0.001

*Notes: n is participants' number, M is arithmetic mean value, SD is standard deviation, r is Pearson correlation coefficient, D is difference of means, *P* (D) and *P* (r) are significances. BMI: Body mass index

differences between BMI values in three studied groups: 22.2÷22.9 (P = 0.235, Table 2). Corresponding variation of data accumulated only Q = 0.7% of the total variation. Practically, all the variation was caused by the within variation in groups (Q = 99.3%). Within group, variation was in the medium interval: From V = 11.4% in the B. Tech group up to 16.6% – in the (EAA) physical education group. Totally, for all the participants, Pearson interclass correlation showed a moderate significant correlation (r = 0.354, P < 0.001) between results of the objective (BMI values) and subjective evaluation data received from the students' questionnaire (Table 3). Comparison of the objective evaluation results of body weight by BMI and results of subjective evaluation regarding the body weight were compared versus results evaluated by students (Table 4). Subjective evaluated results very good met results obtained from BMI values. Corresponding error appeared 0.02 point (2.3%). Statistical hypothesis regarding a common general population in these two samples was accepted using pared T-test on the convincing level of significance (P = 0.395). Significant and moderate correlation between these two samples was fixed as follows (r = 0.326, P < 0.001).

DISCUSSION

According to the purpose of the research, correlation results of the objective and subjective evaluations of body height and weight by NIT students have been compared. Hypothesis of the study about the significant right correlation between results of the objective and subjective has been accepts (r = 0.354, P < 0.001), but the problem of overweight is rather familiar to the theme of this research.

CONCLUSIONS

Comparison of the objective evaluation results of body weight by BMI and results of subjective evaluation regarding the body weight were compared versus results evaluated by students. Subjective evaluated results very good met results obtained from BMI values. Corresponding error appeared negligible small. Statistical hypothesis regarding a common general population in these two samples was accepted using pared t-test on the convincing level of significance.

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Research Article

Sports injuries among long jumpers

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ABSTRACT

Games and sports can also result in injuries, some minor, some serious, and still other in life-long medical problem. Sports injuries result from acute trauma or repetitive stress associated with athletic activities. Sports injuries can affect bones or soft tissue (ligaments, muscles, and tendons). There are numerous sports injuries happened in the field of sports. The sample for the study consists 20 long jumpers of Telangana State between the age group of 20–22 Years. The questionnaire was used in the study. It is concluded that sprinters have secured the lower extremities injuries are 80%, upper extremities injuries are 10%, head-and-neck injuries are 5%, and spine 5%. It was concluded that long jumpers are more prone to lower extremities injuries due to the high sprinting and jumping activity. The study also helps injured athletes and coaches to select recovery technique depending on type of injury.

Keywords: Long jumpers, Sports injuries, Sprinting, Jumping

INTRODUCTION

Every day, a lot of people all over the world participate in games and sports activities or competitions. Participation in sports improves physical fitness and overall health and wellness. Games and sports can also result in injuries, some minor, some serious, and still other in life-long medical problem. Sports injuries result from acute trauma or repetitive stress associated with athletic activities. Sports injuries can affect bones or soft tissue (ligaments, muscles, and tendons). There are numerous sports injuries happened in the field of sports. It is very important for all coaches, trainers, and players to know the causes symptoms, prevention, and treatment for all these common injuries to avoid most of these types of injuries, and also to update the poor training methods.

The lower leg complex (feet, ankles, plantarflexor, and dorsiflexors – Figure 1) is the point of contact where the force generated from up the chain is put into the ground. We talked about how have a weak/unstable ankles or feet will also cause energy leaks.

Lower leg stiffness will enhance ground contact times, vertical impulses, activation and involvement from muscles up the chain, and elastic return. Ankle stiffness is also key for muscles up the chain to work optimally. For example, instability in your ankle decreases the activity of the gluteus maximus. Hence, working on ankle stiffness will help your sprinting in a number of different ways. Now doing balance drills or band resisted ankle strengthening drills will not increase your ankle stiffness. You need to drills that stress that lower leg complex in a manner that will carry over to actual acceleration and sprinting.

Hamstrings Injuries on Long Jumpers

Long jumpers put extreme pressure on the body that has been a risk, especially on hamstring muscles in higher degree of overlapping. Hamstring injuries are the most prevalent time-loss injuries in sprinting. In spite of unclear understanding between thigh and hamstring muscles especially flexion

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of knee and hip extension may cause to a small part or organ to hamstring incidence. In the competitive sprinting, the gait cycle during swing phase mostly occurred hamstring strain.

The management of hamstring injuries' goals when treating hamstring injuries is to achieve maximal reduction in pain intensity as quickly as possible, to rehabilitate every individual's muscle pain, to function your body for everyday activities, and to facilitate the injured passage through the legal impediments rehabilitation. In the current phenomena of sprint demand, the condition of muscle ability needs to try several treatments to determine what works best for them.

Table 1: The sample of the study

S. No.	Game	No of subjects
1.	Long jumpers (Boys 10+Girls 10)	20
3.	Total subjects	20

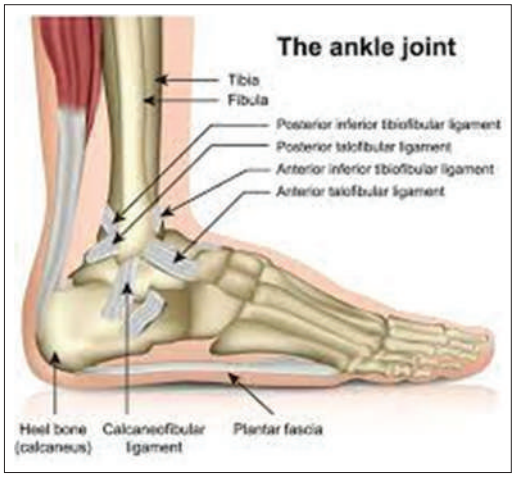

Figure 1

Enoki *et al.*, (2021) studied Injuries in Collegiate Track and Field Jumping: A 2-year prospective surveillance study. Athletes participating in track and field jumping events (long jump, triple jump, high jump, and pole vault) are exposed to ground-reaction forces on the takeoff leg that are several times their body weight. This can cause injuries specific to such activities. A total of 51 jumpers between April 2016 and March 2017 and 54 jumpers between April 2017 and March 2018 participated in this study. All athletes were from a single college in Japan. Baseline information on athletes participating in the long jump, triple jump, high jump, and pole vault was collected at study enrollment. Practice and competition exposures were reported by the team trainer. Injury incidence was calculated as the number of injuries per 1000 athlete-exposures. A total of 147 injuries were reported among 16,998 exposures (8.65 injuries/1000 AEs). The most common injury locations were the posterior thigh and lateral ankle (17.0%), followed by the posterior foot or toe (12.9%); the most frequent type of injury was strain/muscle rupture/tear (21.1%). The most common injury for long jumpers was ankle sprain (23.3%); for high jumpers, flexor hallucis longus tendinosis (15.8%); and for pole vaulters, hamstring strain (13.2%).

METHODOLOGY

The sample for the study consists 20 long jumpers of Telangana State between the age group of 20–22 years.

The questionnaire was used in the study.

RESULTS AND DISCUSSION

In Table 2, it is concluded that sprinters have secured the lower extremities injuries are 80%, upper extremities injuries are 10%, head–and-neck injuries are 5%, and Spine 5%.

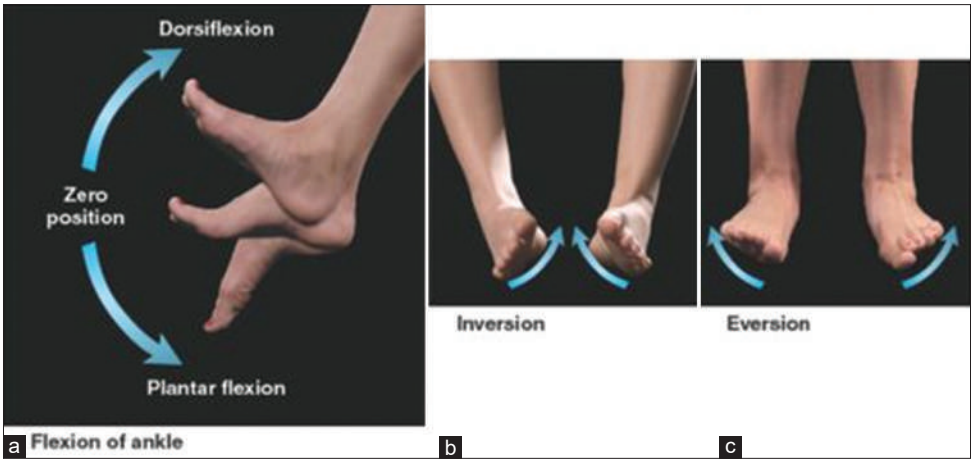

Figure 2: (a-c) Feet, ankles, plantarflexor, and dorsiflexors injuries for sprinters

Table 2: Percentage of injuries among sprinters

Lower extremities injuries (hamstring strain, Knee ligament, sprained ankle, achilles tendon, shin bone, patella dislocation, heel pain, etc.)	Upper extremities (rotator cuff, elbow injury, and fractures in hand)	Head and neck	Spine
80	10	5	5

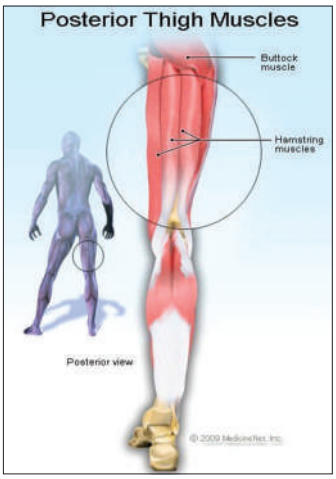

Figure 3: Hamstrings muscles injury

CONCLUSIONS

Long jumpers are more prone to lower extremities injuries due to the high sprinting activity.

RECOMMENDATIONS

The following suggestions are made for the benefit of players, coach's academicians, and sports scientists.

- The study also helps the injured athletes, physical educationist, sports scientists, etc. for their ongoing activities.
- The study helps the physical educationist and coaches for selecting the best recovery techniques for injured athletes.
- The study also helps the physical educationists and coaches compass the knowledge of performance and recovery among injured athletes.
- The study also helps injured athletes and coaches to select recovery technique depending on type of injury.

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Research Article

Effect of own body weight exercises and medicine ball exercises on selected physical variables among college students of Gulbarga university

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ABSTRACT

Body weight exercises capitalize on the ability of your own weight to provide resistance. It helps to build strength, burn fat, prevent injuries, and boost overall fitness. Medicine ball exercises work the core muscles through a range of movements that impact balance, posture, and flexibility, while also training intramuscular coordination. The purpose of the study was to find out the effect of own body weight exercises and medicine ball exercises on selected physical variables among physical education college students. To achieve this purpose, the 45 men physical education students in the age group of 18–23 years from various department of Physical Education, Gulbarga University. The selected 45 subjects were divided into three equal groups of 15 each as two experimental groups and one control group, in which Group – I (n = 15) underwent own body weight exercises for 3 days/week for 6 weeks, Group – II (n = 15) underwent medicine ball exercises for 3 days/week for 6 weeks, and Group – III (n = 15) acted as control who are not participate any training apart from their regular activities. The selected criterion variables such as abdominal strength (Sit Ups Test), speed (50M) explosive power of legs (Standing Broad Jump) were assessed before and after the training period. The collected data were statistically analyzed using analysis of covariance and Scheffĕ's *post-hoc* Test. From the results of the study, it was found that there was a significant difference when compared with the control group. There was a significant difference between own body weight exercises and medicine ball exercises and control group. The medicine ball exercises group has shown significant improvement compare to own body weight exercises group.

INTRODUCTION

Body weight exercises capitalize on the ability of your own weight to provide resistance. It helps to build strength, burn fat, prevent injuries, and boost overall fitness. Medicine ball exercises work the core muscles through a range of movements that impact balance, posture, and flexibility, while also training intramuscular coordination.

Trajković *et al*. (2017) studied the effects of medicine ball training on physical fitness in Primary School Children. Medicine balls provide an effective means of improving muscular power, endurance, and functional fitness. The aim of this research was to determine the effects of medicine ball training on physical fitness in primary school children. A total of 60 (26 girls) primary school children aged 10–12 voluntarily participated in this study. The physical fitness of the children was estimated by the following tests: Standing broad jump, vertical jump, bent-arm hang, sit-ups, push ups, and medicine ball tests. The experimental group had twice per week medicine ball training on non-consecutive days for 12 weeks under monitored conditions in school. Compared with the initial testing, there was a significant ($P < 0.05$) improvement in both jump tests. In the medicine ball tests, the analysis of variance revealed a statistically significant difference between groups pre- and post-training ($P < 0.05$) in backward overhead medicine ball throw. There were significant differences ($P < 0.05$) between the initial and final testing for the flexed arm hang, push ups, and sit ups in both groups. Findings from the present study indicate that medicine ball training instructed by qualified professionals can result in significant improvements in selected physical fitness components in children and is a cost-effective and time efficient method for promoting physical activity in school-based programs.

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Table 1: Analysis of covariance and "f" ratio for abdominal strength, speed, and leg explosive power for own body weight exercises and medicine ball exercises and control group

Variable Name	Group name	Control group	Own body weight exercises	Medicine ball exercises	'F' ratio
Abdominal strength (in Numbers)	Pre-test Mean±SD	37.13±1.15	37.2±1.25	37.2±1.21	0.001
	Post-test Mean±SD	37.32±1.16	39.13±1.31	42.21±1.36	3.935*
	Adj. Post-test Mean±SD	37.50	39.17	42.19	23.250*
Leg explosive power (in Meters)	Pre-test Mean±SD	1.816±0.12	1.818±0.135	1.822±0.13	0.003
	Post-test Mean±SD	1.819±0.12	1.978±0.22	2.141±0.31	3.034*
	Adj. Post-test Mean±SD	1.822	1.979	2.139	3.265*
Speed (in Seconds)	Pre-test Mean±SD	7.9±0.008	7.89±0.0089	7.9±0.0083	0.006
	Post-test Mean±SD	7.88±0.0081	7.59±0.0092	7.48±0.0097	6.766*
	Adj. Post-test Mean±SD	7.89	7.589	7.492	15.095*

*Significant at 0.05 level of confidence

Purpose of the Study

The purpose of the study was to find out the effect of own body weight exercises and medicine ball exercises on selected physical variables among physical education college students.

METHODOLOGY

To achieve this purpose, the 45 men physical education students in the age group of 18–23 years from various Department of Physical Education, Gulbarga University. The selected 45 subjects were divided into three equal groups of 15 each as two experimental groups and one control group, in which Group – I (n = 15) underwent own body weight exercises for 3 days/week for 6 weeks, Group – II (n = 15) underwent medicine ball exercises for 3 days/week for 6 weeks, and Group – III (n = 15) acted as control who are not participate any training apart from their regular activities. The selected criterion variables such as abdominal strength (Sit Ups Test) and speed (50M) explosive power of legs (Standing Broad Jump) were assessed before and after the training period. The collected data were statistically analyzed using Analysis of Covariance and Scheffĕ'c *post-hoc* Test.

RESULTS AND DISCUSSION

(The Table 1 value required for significance at 0.05 level of confidence with df 2 and 43 and 2 and 42 were 3.21 and 3.22, respectively).

The pre-test mean of abdominal strength for own body weight exercises is 37.2, medicine ball exercises in 37.2 and control group is 37.13 and post-test mean of own body weight exercises is 39.3, medicine ball exercises in 42.21 and control group is 37.32. There is a improvement due to medicine ball training, own body weight exercises in abdominal strength. The medicine ball training is effective.

The Pre-test mean of leg explosive power for own body weight exercises is 1.81, medicine ball exercises in 1.82 and control group is 1.81 and post-test mean of own body weight exercises is 1.97 medicine ball exercises in 2.14 and control group is 1.81. There is a improvement due to medicine ball training, own body weight exercises in leg explosive power. The medicine ball training is effective The pre-test mean of speed for own body weight exercises is 7.89, medicine ball exercises is 7.90 and control group is 7.90 and post-test mean of own body weight exercises is 7.59 medicine ball exercises in 7.48 and control group is 7.88. There is a improvement due to medicine ball training and own body weight exercises in speed. The medicine ball training is effective.

CONCLUSION

1. There is a significant improvement due to medicine ball exercises in abdominal strength, leg explosive power and speed. This training is effective for developing the physical fitness compare to own body weight exercises.
2. There is a little improvement due to own body weight exercises in abdominal strength, leg explosive power and speed. This training is also effective for developing the physical fitness.

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Research Article

A comparative study of explosive power and speed among Net ball players and Korf Ball players of Osmania University

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ABSTRACT

Introduction: Korfball is a ball sport, with similarities to netball and basketball. Korfball is a mixed gender team sport, with similarities to netball and basketball. A team consists of eight players; four female and four male. Netball is a ball sport played by two teams of seven players. Its development derived from early versions of basketball. The purpose of the study is to compare the explosive power and speed among korf ball players and net ball players. **Methodology**: The sample for the present study consists of 20 male korf ball players and 20 male net ball players of a Osmania University between the age group of 18–25 Years. The korf ball players and net ball players are the regular players of the Osmania University. To asses the Explosive Power Standing Broad jump test are used and to assess the speed the 30 M Run were conducted. The mean values of 30 M run of net ball players is 5.02 and korf ball players is 5. 30 It shows that net ball players are having the better speed compare to korf ball players. The mean values of standing broad jump is 2.25 of korf ball players and 2.16 of net ball players. The values shows that the korfball players are having better explosive power compare to net ball players. The results of the study shows that korf ball players are having the better explosive power and net ball players are having better speed. Speed and explosive power are important components of success in many sports. Hence, coaches in korf ball and net ball must make their players to improve the fitness ability to play better korf ball and net ball without getting the fatigue. Physical conditioning of korf ball players and net ball players are very important to achieve the high level of performances.

Keywords: Explosive strength and speed, Korf ball, Net ball

INTRODUCTION

Korfball is a ball sport, with similarities to netball and basketball. It is played by two teams of eight players with either eight females in each team or with four females and four males in each team. The objective is to throw a ball through a bottomless basket that is mounted on a 3.5 m (11.5 feet) high pole. The sport was invented by Dutch school teacher Nico Broekhuysen in 1902. In the Netherlands, there are around 580 clubs and over 100,000 people playing korfball. It has a mixed-gender league and an all-women league, but no all-men league. The sport is also very popular in Belgium and Taiwan and is played in many other countries. Mixed-gender korfball is more generally played in the north of the Netherlands, while all-female korfball is generally played in the south.

Netball is a ball sport played by two teams of seven players. Its development, derived from early versions of basketball, began in England in the 1890s. By 1960, international playing rules had been standardized for the game, and the International Federation of Netball and Women's Basketball was formed. As of 2011, the INF comprises more than 60 teams organized into five global regions. Games are played on a rectangular court with raised goal rings at each end. Each team attempts to score goals by passing a ball down the court and shooting it through its goal ring. Players are assigned specific positions, which define their roles within the team and restrict their movement to certain areas of the court. During general play, a player with

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Table 1: The mean values of Net Ball Players and Korf Ball Players in 30 M Run and Standing Broad Jump

Test items	Group	*n*	Mean	SD	SEmean	t	df	Sig. (2-tailed)
30 M	Net ball	20	5.02	0.23	0.07	-1.80	38.00	0.09
	Korf Ball	20	5.30	0.45	0.14			
SBJ	Korf ball	20	2.25	0.11	0.04	3.62	38.00	0.00
	Net Ball	20	2.16	0.05	0.02			

the ball can hold onto it for only three seconds before shooting for a goal or passing to another player. The winning team is the one that scores the most goals. Netball games are 60 min long. Variations have been developed to increase the game's pace and appeal to a wider audience.

Rathod (2018) studied the effect of agility among Korfball players and netball players of Hyderabad District in India. Twenty male korfball players and 20 male netball players were used as samples for this study. The Illinois Agility Test was used to conduct agility test for both groups. The result of this study shows that netball players have good agility compare to korfball players. Playing netball is just like playing basketball, but there is no dribbling once a player has the ball, because they are not allowed to take more than a single step. Speed and agility are of a great importance because it helps players to stay open to get the ball, and make a great shot.

Purpose of the Study

The purpose of the study is to compare the explosive power and speed among korf ball players and net ball players.

METHODOLOGY

The sample for the present study consists of 20 male korf ball players and 20 male net ball players of a Osmania University between the age group of 18–25 years. The korf ball players and net ball players are the regular players of the Osmania University. To assess the Explosive Power Standing Broad jump test are used and to assess the speed the 30 M Run were conducted.

RESULTS AND DISCUSSION

The mean values of 30 M run of net ball players is 5.02 and korf ball players is 5. 30 It shows that net ball players are having the better speed compare to korf ball players. The mean values of standing broad jump is 2.25 of korf ball players and 2.16 of net ball players. The values shows that the korfball players are having better explosive strength compare to net ball players.

The strength, speed, and endurance are the important abilities for successful performance. The dominant ability is the one from which the sport requires higher contribution to achieve the high success in the sports and games. Most sports require peak performance in at least two abilities. The relationships among strength, speed, and endurance create crucial physical athletic qualities. Specific development of a biomotor ability must be methodical. A developed dominant ability directly or indirectly effects the other motor abilities. When an athlete develops strength he may experience a positive transfer to speed and endurance. The results of the study shows that korf ball players are having the better explosive strength and net ball players are having better speed. Speed and explosive power are important components of success in many sports. Hence, coaches in korf ball and net ball must make their players to improve the fitness ability to play better korf ball and net ball without getting the fatigue. Physical conditioning of korf ball players and net ball players are very important to achieve the high level of performances.

CONCLUSION

The korf ball players are having better explosive strength compare to net ball players. The net ball players is also having better speed compare to korf ball players.

RECOMMENDATIONS

Similar studies can be conducted among females and in other sports and games. This study is useful to the coaches to prepare the conditioning program to improve the motor abilities of the korf ball players and net ball players.

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Research Article

Comparison of speed and agility among soft ball players and cricketers of Osmania University in India

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ABSTRACT

Soft ball players and cricketers need to perform in multiple busts of speed. Agility being the key component of cricket is a collective coordinative ability that includes speed, balance, and coordination and plays an important role in determining a player's performance. Athletes who work to improve their agility also see improvements in their overall athletic abilities, including in critical areas such as balance and stability, coordination, body control, cognition, and recovery time. The purpose of the present study to find out the speed and agility among soft ball players and cricketers of Osmania University in India. The sample for the present study consists of 20 male soft ball players and 20 male cricketers of Osmania University. The 50 M run test is used to assess the speed, 4 × 10 agility shuttle run test is used to assess the agility among male soft ball players and cricketers. The descriptive statistics is used to analyze the results of the study. The mean values of cricketers in 50 M Run is 7.24 and soft ball players is 7.74. Hence, the cricketers are having good speed compare to soft ball players. The mean values of cricketers in shuttle run test is 15.59 and soft ball players is 14.31. Hence, the soft ball players are having good agility compare to cricketers

INTRODUCTION

Soft ball players and Cricketers need to perform in multiple busts of speed. Agility being the key component of cricket is a collective coordinative ability that includes speed, balance, and coordination and plays an important role in determining a player's performance. Athletes who work to improve their agility also see improvements in their overall athletic abilities, including in critical areas such as balance and stability, coordination, body control, cognition, and recovery time.

Cricket is a bat-and-ball game played between two teams of 11 players each on a field at the center of which is a rectangular 22-yard long pitch. The game is played by 120 million players in many countries, making it the world's second most popular sport. Each team takes its turn to bat, attempting to score runs, while the other team fields. Each turn is known as an innings. The bowler delivers the ball to the batsman who attempts to hit the ball with his bat away from the fielders so he can run to the other end of the pitch and score a run. Each batsman continues batting until he is out. The batting team continues batting until ten batsmen are out, or a specified number of over's of six balls have been bowled, at which point the teams switch roles and the fielding team comes in to bat.

Softball is a variant of baseball played with a larger ball on a smaller field. It was invented in 1887 in Chicago as an indoor game. It was at various times called indoor baseball, mush ball, playground, soft bund ball, kitten ball, and, because it was also played by women, ladies' baseball. The name softball was given to the game in 1926. A tournament held in 1933 at the Fairs purred interest in the game.

Softball is a sport that requires both muscular strength and endurance, and for this reason when training with weights you need to concentrate on developing strong muscles with high endurance capabilities. Speed is a key component of physical fitness which is very important for softball players for giving the high level of performance in competition. Speed is the performance pre-requisite to do motor actions under given conditions in minimum of time. Speed is the ability to move all or part of the body quickly, that is, speed is the quickness of movement of a limb, whether this is the legs of a runner

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Table 1: Mean values and Independent samples test of 50 M Run between crickets and soft ball players

Variables	Group	Mean	SD	*t*	*P*-value
50 M Run	Cricketers	7.24	0.262	4.58	0.000
	Soft Ball Players	7.74	0.408		

*Significant at 0.05 level

Table 2: The Mean values and Independent Samples Test of shuttle run test for agility between Cricketers and Soft ball Players

Variables	Group	Mean	SD	*t*	*P*-value
Shuttle Run test	Cricketers	15.59	0.21	2.54	0.000
	Soft Ball Players	14.31	0.57		

*Significant at 0.05 level

or the arm of the shot putter. Speed means relative rapidity in moving, going, etc.; rate of motion or progress: Speed is an integral part of every sport and can be expressed as any one of, or combination of, the following: Maximum speed, elastic strength and speed endurance, combination of reflexes, and stamina. Speed training is something that should be done throughout the year – unless there are some points of the season where you do not have to move fast –so little and often is better. Constantly reinforce the quality of execution of your speed.

Shantanu Singh Kakran and Dr. Manju Arora (2019) studied the selected physical variables between cricket and softball players. A total of 60 male subjects (30 each in softball and cricket) age ranges from 18 to 26 were selected purposively for the study from different region of Madhya Pradesh who have participated in interuniversity tournaments. The data were collected for different physical variables, that is, back strength, hand grip (right and left), and balance (dynamic and static). For the analysis of data, independent t-test has been employed. The level of significance was set at 0.05. The significant difference was found between cricket and softball players on dynamic balance. Whereas, insignificant differences were found for other physical variables, that is, back strength, static balance and handgrip strength (right and left) among softball and cricket player.

Purpose of the Study

The purpose of the present study to find out the speed and agility among soft ball players and cricketers of Osmania University in India.

METHODOLOGY

The sample for the present study consists of 20 male soft ball players and 20 male cricketers which includes all rounders in cricket of Osmania University. The 50 M run test is used to assess the speed, 4 × 10 agility shuttle run test is used to assess the agility among male soft ball players and cricketers. The descriptive statistics is used to analyze the results of the study.

RESULTS AND DISCUSSION

The results of the study show that cricketers are having good speed compare to soft ball players.

In Table 1, the mean values of cricketers in 50 M Run is 7.24 and soft ball players is 7.74. Hence, cricketers are having good speed compare to soft ball players.

In Table 2, the mean values of cricketers in shuttle run test is 15.59 and soft ball players is 14.31. Hence, the soft ball players are having good agility compare to cricketers.

There is a range of physical and mental components that contribute to successful performance in sports. Each sport and activity requires a specific set of these skills. Being successful in one sport does not necessarily make you successful in another, as success requires a whole range of factors to come together and interact in the right way. Fitness is just one of the factors, and for many sports plays a major role in success.

CONCLUSION

1. Cricketers are having better speed compare to soft ball players cricketers are having abilities such as 5 M Sprint, 10 M Sprint and 20 M Sprint. It is concluded that soft ball players are having better agility than cricketers.
2. Sprint training is not all about running fast. It is important to have a good fitness base to build speed on, and to have the capacity to train regularly.

RECOMMENDATIONS

1. Similar studies can be conducted on other events and among females
2. This study also helps the physical educators and coaches to improve their training regime to excel in soft ball and cricketers
3. Sprint training session should begin with a series of sprint drills that will help the athlete train the firing patterns for the appropriate muscle groups, and also strengthen those muscles while performing action specific exercises. It is important for cricketers and soft ball players.

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Research Article

A systematic review of the health and longevity by physical activity

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ABSTRACT

Exercise has potent effects on the body's biochemical mechanisms of growth and repair, which are constantly counterpoised against the biological processes that cause decline and decay. Our biological systems are not static but are in a continual state of renewal. Regular physical activity is well established to be associated with reduced risk of cardiovascular disease outcomes. Pooled observational cohort studies suggest that the absence of associations reported between regular physical activity and AF risk in previous general population studies and their aggregate analyses could be driven by a sex-specific difference in the associations – an increased risk in men and a decreased risk in women. Exercise can harness the benefits of the inflammatory response. With each body movement, our muscles send chemical messengers to communicate with the rest of the body. A very important chemical signal related to inflammation is Interleukin-6 (IL-6). During an inflammatory response, the release of IL-6 is triggered by other chemicals, including IL-1 and tumor necrosis factor-alpha.Physical activity brought a longevity boost. Increasing activity by 10 min a day was associated with a 7% drop in the number of deaths per year; adding 20 min per day equated to a 13% drop; and adding 30 min produced a 17% decrease. The study does not prove that exercising more would save all those lives.

Keywords: Cardiovascular, Longevity, Physical activity, Risk factor, Systematic review

Disease prevention, healthcare, and more-effective treatment of age-related diseases as heart disease and osteoporosis help people live longer. Far fewer people now die from infectious childhood disease, so those with the genetic potential actualize their proclivity for longevity. On a different but parallel front, anticipated breakthroughs in genetic therapies may slow the aging of individual cells. Cellular damage results from (1). Accumulated mutations in mitochondrial DNA perhaps produced by injury and deterioration from oxidative stress and/or (2). Gene alterations that blunt synthesis of telomerase, the enzyme that protects telomeres at the ends of chromosomes so the cell continues to divide properly. Gene therapies could boost human life spans to a much greater extent than improved medical treatment or even the eradication of certain diseases.

We have failed to adopt effectively to their sedentary lifestyles. Cigarette smoking, elevated body mass index, body fatness, and reduced exercise in midlife and late adulthood provide potent predictors of subsequent disability. Inadequate physical activity causes nearly 30% of all deaths from heart disease, colon cancer, and diabetes. Changing to a more physically active lifestyle could significantly reduce mortality from these ailments in older adults and greatly improve cardiovascular and muscular functional capacities, quality of life, and independent living. The greatest health benefits would derive from strategies that get the populations most sedentary adults into only light–to–moderate patterns of regular physical activity. At any age, behavioral changes such as becoming more physically active, quitting cigarette smoking, and controlling body weight and blood pressure act independently to delay all-cause mortality and extent life. Not only do persons with more- healthful lifestyles survive longer, but the risk of disability is postponed and compressed into fewer years at the end of life.

Many gerontologists maintain that research on aging should focus not simply on increasing life span but rather on improving "healthspan," the total number of years a person remains in excellent health. The new gerontology addresses areas beyond age-related diseases and their prevention to recognize that successful aging requires maintenance of enhanced physiologic

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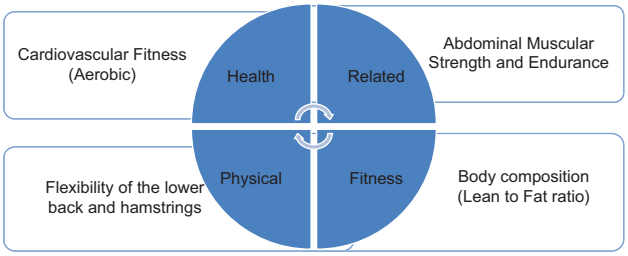
function and physical fitness. Researchers now view much of the physiologic deterioration previously considered "normal aging" as dependent on lifestyle and environmental influences subject to significant modification with proper diet and exercise. For those achieving older age, low muscular strength, diminished cardiovascular function, and poor joint range of motion as well as sleep disturbances relate directly to functional limitations, regardless of disease status.

Life expectancy estimates determine the overall length of life based on mortality data, without considering the quality of life as aging progresses. To estimate healthful longevity, the World Health Organization has introduced the concept of healthy life expectancy – The expected number of years a person might live in the equivalent of full health. This involves computation of disability-adjusted life expectancy, which considers the years of ill health, weighted according to severity, and subtracted from expected overall life expectancy to compute the equivalent years of healthy life.

Epidemiology involves quantifying factors that influence the occurrence of illness to better understand, modify, and or control a disease pattern in the general population. The specific field of physical activity epidemiology applies the general research strategies of epidemiology to study physical activity as a health-related behavior linked to disease and other outcomes. Physical activity becomes a generic term with exercise its major component. Similarly health focuses on broad spectrum of well-being that ranges from complete absence of health to the highest levels of physiologic function. The trend in physical fitness assessment during the past 25 years deemphasizes tests that stress motor performance and athletic fitness. Instead current assessment focuses on functional capacities related to overall good health and disease prevention. The four most common components of health-related physical fitness are as below.



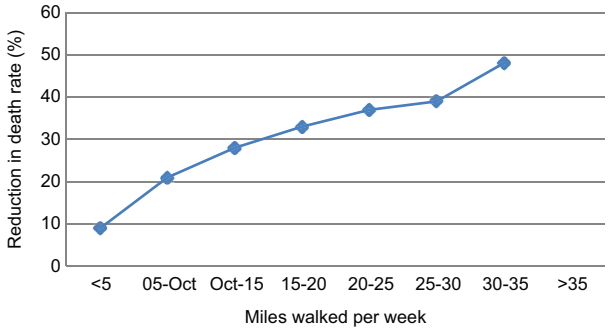
Current debate suggests that the age-related decline in physical activity among humans has a biologic basis related to altered neurotransmission involving the central dopamine system, the system that regulates motivation for locomotion. Regardless of the cause for progressive inactivity as adults age, increased levels of physical activity predict decreased levels of morbidity and mortality. Clearly, a need exists to improve the physical activity profile of the population. With this in mind, the public health service established healthy people objectives, designed to improve the health status by reducing preventable death, disability, and disease. One important objective focused on upgrading exercise participation by the large number of sedentary men and women, with extra emphasis on developing muscular strength and joint flexibility.

The surgeon general of the united states acknowledged the importance of physical activity to the nation with release of the first surgeon generals report on physical activity and health. This report summarized the benefits of regular physical activity in disease prevention. The conclusions of the report are: (1). Men and women of all ages benefits from regular physical activity. (2). Significant health benefits accrue from including moderate physical activity on most, if not all days of the week. Achieving this goal improves most of the people's health and quality of life.

Several well-publicized reports of sudden death during exercise raised the question of exercise safety. The death rate during exercise has declined over the years despite an overall increase in exercise participation. Heavy physical exertion does raise a small risk of sudden death during the activity, particularly for sedentary people with a genetic predisposition to sudden death. Nonetheless, the longer-term reduction in overall death risk from regular exercise far outweighs any small potential for acute cardiovascular complications. Furthermore, considerably less risk of death exists during physical activity in regular exercisers. Perhaps not surprisingly, musculoskeletal injuries represent the most prevalent exercise complications. Most injuries required no treatment or physical activity reduction. Age does not appear to affect incidence of orthopedic problems for exercise of moderate intensity and duration. For activities involving running, the greatest orthopedic injury risk exists in individuals who exercise for protracted periods.

The physical activity pyramid summarizes major goals for increasing the levels of regular physical activity in the general population, emphasizing diverse forms of behavioral and lifestyle options.

Researchers attempted to study the relation of health, exercise, and longevity and findings found that athletic participation as a young adult does not ensure good health and longevity later in life. However, maintaining increased physical activity and fitness throughout life provides significant health and longevity benefits. Furthermore, aerobic fitness is more important precursor of mortality than any of the other significant coronary heart disease risk factors. In addition, inverse risk gradients emerged across categories of low, moderate, and high fitness with a lower death rate among moderately fit individuals than those in the low fitness group. Low physical fitness was a more powerful risk factor than high blood pressure, high cholesterol, obesity, and family history.



Life expectancy was higher for men who exercised at the equivalent of light sport activity than for sedentary men. Life expectancy of Harward alumni increased steadily from a weekly exercise energy expenditure of 500 kcal up to 3500 kcal, a value equivalent to 6–8 h of strenuous exercise. In addition, the active men lived an average of 1–2 years longer than their sedentary classmates. Ensuring research with the same group indicates that vigorous regular exercise exerts the greatest effect on extending life.

RECOMMENDATIONS

1. Health benefits accrue from including a moderate amount of physical activity
2. The longer-term health benefits of regular exercise outweigh the risk of acute cardiovascular complications
3. For activities that involve running, the greater orthopedic injury potential exists among individuals who exercise for extended durations
4. Vigorous physical activity early in life contributes little to increased longevity or health in later life
5. Physically active lifestyle throughout life confers significant health benefits.

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Research Article

Exploring innovative applications of educational media and technology in enhancing physical education: A comprehensive analysis

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ABSTRACT

This research paper dives into the innovative usage of educational media and technology inside the domain of physical education (PE). With an emphasis on PE, this study looks at the different manners by which technology and media are tackled to upgrade academic practices, engagement, and learning outcomes in the field. Through a mix of writing audit, contextual investigations, and reviews, the paper assesses the effect of integrating innovative innovations on understudy inspiration, skill development, and generally physical prosperity. Besides, it tends to likely have difficulties and contemplations related with the coordination of educational media and technology in PE. This study delves into the dynamic intersection of educational media and technology with the realm of PE, aiming to comprehensively analyze their innovative applications and their potential to enhance the overall learning experience. In the modern era, where technology has seamlessly integrated into various aspects of education, its incorporation into PE offers intriguing opportunities for pedagogical advancement and transformative learning outcomes. Drawing from a diverse array of literature and empirical studies, this research investigates the multifaceted ways in which educational media and technology are being harnessed within the domain of PE. It scrutinizes their impact on curriculum design, student engagement, skill acquisition, and the cultivation of a holistic approach to well-being. Through a critical lens, the study examines both the benefits and challenges posed by the integration of these technologies, considering factors such as accessibility, equity, and the preservation of traditional teaching methods. The research employs a mixed-methods approach, encompassing both qualitative analyses of educators' experiences and perceptions, and quantitative assessments of student learning outcomes. These methodologies contribute to a nuanced understanding of the potential enhancements, limitations, and implications of utilizing educational media and technology in the realm of PE. The study concludes by synthesizing the findings into a holistic framework that highlights best practices and strategies for effectively harnessing educational media and technology to enrich PE pedagogy. As the education landscape continually evolves, this research serves as a valuable resource for educators, policymakers, and stakeholders in adapting and optimizing the integration of innovative technologies to elevate the quality of PE, fostering holistic growth, and well-being in learners.

Keywords: Educational media, Engagement, Innovative, Learning outcomes, Pedagogy, Physical education, Skill development, Technology

INTRODUCTION

The reconciliation of educational media and technology in the field of physical education (PE) has acquired expanding consideration lately. As current culture turns out to be more dependent on technology, instructors and professionals inside the Division of PE are investigating innovative ways of utilizing these devices to improve instructing and learning encounters. This research paper means to investigate the assorted applications of educational media and technology in PE, zeroing in on their effect on understudy engagement, skill development, and generally speaking physical prosperity. By researching the open doors and difficulties related with these innovative methodologies, this study looks to add to a more profound comprehension of how technology can be successfully saddled to propel the field of PE.

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Background and Rationale

Customarily, PE has fixated on physical exercises, activities, and sports to advance physical wellness and prosperity. Notwithstanding, the computerized time has introduced a change in educational standards, requiring a change in how PE is educated and polished. With the multiplication of cell phones, tablets, and online stages, there exists an immense scene of opportunities for integrating technology into PE educational plans. This shift offers the possibility to establish dynamic and intuitive learning conditions that take care of the advanced local age of understudies. By perceiving the advancing requirements and inclinations of students, the coordination of educational media and technology can reinvigorate customary PE works, making them really captivating, intelligent, and compelling.

Research Objectives

The essential point of this research paper is to investigate and fundamentally break down the innovative utilization of educational media and technology with regards to PE. To accomplish this general point, the accompanying explicit goals will direct the review:

1. To analyze the different types of educational media and technology being used in PE guidance
2. To evaluate the effect of innovative PE advancements on understudy engagement, inspiration, and support
3. To assess the viability of technology-upgraded PE rehearses in skill development and learning outcomes
4. To distinguish difficulties and concerns related with the reconciliation of educational media and technology in PE
5. To give suggestions to streamlining the utilization of technology to improve instructional practices inside the Branch of PE.

Research Questions

1. How is educational media and technology at present incorporated into PE guidance inside the Branch of PE?
2. What are the apparent advantages and difficulties of involving innovative advancements in PE, as per the two understudies and teachers?
3. How much does the consolidation of educational media and technology improve understudy engagement, skill development, and learning outcomes in PE?
4. What are the key elements impacting the effective execution of innovative advancements in PE guidance?
5. How does the utilization of educational media and technology affect the showing strategies and academic methodologies of PE teachers?

METHODOLOGY

This research will utilize a blended technique to completely investigate the innovative utilization of educational media and technology in PE inside the branch of PE. The review will include both quantitative and subjective information assortment and analysis to give an all encompassing comprehension of the peculiarity.

Hypothesis

The innovative combination of educational media and technology in PE inside the division of PE improves understudy engagement, skill development, and in general learning outcomes, eventually adding to a more successful and exhaustive academic methodology. This theory proposes that by consolidating innovative advancements, for example, computer-generated reality, gamification, wellness GPS beacons, and web-based learning stages, understudies' advantage and support in PE classes will increase. Besides, it places that these mechanical mediations will bring about better skill procurement, as understudies participate in intelligent and vivid learning encounters. Finally, the utilization of educational media and technology in PE is supposed to prompt improved learning outcomes and add to a more comprehensive way to deal with physical prosperity.

Scope and Significance

This research paper centers around the joining of educational media and technology inside the setting of PE at the Division of PE. The review will incorporate a great many innovative innovations, including computer-generated reality, gamification, wearable gadgets, online stages, and video analysis devices. By analyzing the effect of these innovations on understudy engagement, skill securing, and generally learning encounters, this research intends to contribute important experiences that can illuminate educational plan development, showing techniques, and the general improvement of PE programs. The discoveries of this study hold critical potential to shape the fate of PE, adjusting it to the mechanical headways of the 21st hundred years and taking special care of the developing necessities of students.

LITERATURE REVIEW

Customary Ways to Deal with PE Guidance

Customary techniques for PE have frequently underscored physical action and skill development. Ordinary practices are essentially based on organized physical activities, sports drills, and wellness schedules. While these methodologies have authentic importance, they may at times come up short on individualization and engagement expected to take care of different understudy needs.

Arising Job of Educational Media and Technology in PE

The development of educational media and technology has prompted a change in outlook in the field of PE. Intuitive multimedia, computer-generated reality, increased reality, gamification, wearable gadgets, and online stages have furnished teachers with innovative apparatuses to change the learning experience. These advances offer vivid and dynamic

ways of connecting with understudies, making learning more intelligent and customized.

Advantages of Consolidating Technology in PE

The joining of educational media and technology in PE brings various advantages. First and foremost, these apparatuses consider intuitive and experiential learning, supporting the development of coordinated movements and enhancing understudy engagement. Besides, technology can give constant criticism, helping with execution improvement. Third, computerized stages empower the following wellness progress and physical action, elevating a comprehensive way to deal with well-being and prosperity. Besides, technology works with the production of a different and comprehensive climate, obliging different learning styles and capacities.

Difficulties and Concerns

While technology presents extraordinary open doors in PE, it likewise accompanies its arrangement of difficulties. One central issue is access and value, as not all understudies might have equivalent admittance to gadgets and the web. Furthermore, the over-dependence on technology could frustrate the development of relational skills and the capacity to see the value in physical exercises without mechanical guides. Protection concerns connected with wellness following and information assortment are additionally areas of thought.

Computer-generated Reality (VR) and Expanded Reality (AR) in PE Guidance

Computer-generated reality and expanded reality advancements are being coordinated into PE guidance to give vivid encounters. Understudies can take part in computer experiences of sports, activities, and conditions, enhancing their comprehension and reasonable skills. AR overlays advanced data onto this present reality, empowering intelligent learning through cell phones or wearables.

Gamification and Intelligent Applications for Skill Improvement

Gamification methods, for example, integrating game components and mechanics into PE exercises, advance engagement, and inspiration. Intuitive applications offer customized exercises, difficulties, and progress following, empowering understudies to effectively take part and work on their skills while partaking in the learning system.

Wearable Advancements and Wellness GPS Beacons

Wearable gadgets, similar to wellness trackers and smartwatches, empower constant observing of physical movement, pulse, and other crucial measurements. These advancements enable understudies to put forth wellness objectives, keep tabs on their development, and come to informed conclusions about their well-being and prosperity.

Web Based Learning Stages and Crossover PE Classes

Online stages work with the conveyance of PE content past the customary study hall setting. Mixture PE classes consolidate face-to-face meetings with online assets, permitting understudies to get to educational recordings, instructional exercises, and evaluations from a distance. This adaptability upgrades learning valuable open doors and obliges assorted learning styles.

Video Analysis and Input for Execution Improvement

Video analysis instruments catch understudies' physical developments and activities, giving significant visual input to skill refinement. Educators can offer customized direction and amendments in light of video accounts, speeding up the learning bend and enhancing execution outcomes.

CASE STUDIES AND EXEMPLARS

Execution of a VR-based Sports Recreation in PE

This contextual analysis investigates the combination of augmented reality (VR) technology in PE classes. By utilizing VR-based sports reproductions, understudies can take part in vivid virtual conditions that recreate genuine games situations. This approach upgrades' comprehension understudies might interpret sports methods, critical thinking abilities, and strategic mindfulness, adding to a more intelligent and dynamic learning experience.

Utilizing Wellness Trackers to Screen Physical Movement and Progress:

This model spotlights on the utilization of wellness trackers and wearable advancements in PE. Wellness trackers screen understudies' physical movement levels, pulse, and other well being measurements, giving ongoing input. By examining information gathered from these gadgets, teachers can customize wellness schedules, track progress, and spur understudies to keep up with dynamic and sound ways of life.

Combination of Gamification in Skill Development Projects

This contextual investigation looks at the consolidation of gamification components into skill development programs inside PE. Gamification includes utilizing game plan standards to connect with and inspire understudies. By transforming skill-incorporating practices into intuitive games or difficulties, teachers can improve understudies' support, contest, and skill refinement, making the learning system pleasant and powerful.

Flipped Study Hall Approach in PE

This model talks about the reception of the flipped study hall model in PE. In a flipped homeroom, understudies draw in with educational substance beyond class, frequently through computerized assets, permitting in-class time for dynamic

learning and useful activities. This approach empowers teachers to zero in on skill application, collaboration, and customized training during eye-to-eye meetings.

Study Discoveries and Analysis

In the review directed among understudies in the Division of PE, an extensive comprehension of their discernments and mentalities toward innovative PE advancements was gotten. The overview consisted of a different scope of inquiries pointed toward measuring understudies' knowledge of and readiness to take on innovative advancements in their PE educational program. Reactions featured changing levels of openness, with a greater part communicating energy for incorporating technology to upgrade their learning encounters.

Understudy Discernments and Mentalities toward Innovative PE Advances

Understudies commonly showed positive discernments and mentalities toward the fuse of innovative PE advancements. A critical part of respondents recognized the possible advantages of technology in enhancing their engagement, skill development, and by and large interest in physical exercises. A greater part of understudies showed a readiness to embrace innovations like computer-generated experience recreations, intuitive applications, and wellness trackers, seeing them as important instruments for further developing their PE process.

Influence on Understudy Engagement and Cooperation

The mix of innovative PE advances prominently affected understudy engagement and interest. Understudies detailed more significant levels of inspiration and fervor while utilizing technology-helped learning apparatuses. The intuitive and vivid nature of these advances added to expanded dynamic cooperation in physical exercises, cultivating a more unique and charming learning climate.

Viability in Skill Obtaining and Learning Outcomes

Study discoveries demonstrated a positive connection between the utilization of innovative PE advances and skill obtaining. A critical extent of understudies revealed superior skill development through technology-empowered works on, referring to continuous input and designated practices as contributing variables. Moreover, a larger part of respondents communicated trust in the positive impact of these advancements on their general learning outcomes, demonstrating improved capability in different physical exercises.

DISCUSSION

Benefits and Inconveniences of Innovative PE Advancements

Consolidating innovative educational media and technology in PE offers a few benefits. These innovations make intuitive and drawing in learning encounters, making PE more agreeable for understudies. Computer-generated Reality (VR) and increased reality (AR) reenactments improve the comprehension of perplexing developments and methods. Gamification propels understudies through difficulties and prizes, helping investment. Nonetheless, these advances may likewise have burdens, including expected interruptions and unreasonable screen time. Offsetting the advantages with these downsides is significant for compelling execution.

Suggestions for Instructive Practices

The combination of innovative PE advancements reshapes educational practices. Conventional educator-focused approaches shift toward understudy-focused, dynamic learning. Instructors become facilitators, directing understudies through intuitive encounters. Versatile learning stages customize guidance in view of individual capacities, advancing inclusivity. Nonetheless, instructors need proficient development to successfully utilize these apparatuses and adjust their educating strategies. The shift toward technology-empowered pedagogy requests a dynamic and responsive way to deal with educational plans.

Future Bearings and Proposals

As technology keeps on advancing, a few future headings and proposals arise. Coordinated effort between PE educators and technology specialists ought to prompt the development of tailor-made applications and apparatuses. Research into the drawn-out effect of innovative advances on physical wellness and skill maintenance is fundamental. Foundations ought to put resources into framework and assets to help technology incorporation. Besides, a decent methodology, joining technology with customary PE exercises, guarantees a comprehensive educational encounter. Constant evaluation and transformation of these advancements will drive their successful use from here on out.

CONCLUSION

The investigation of innovative applications of educational media and technology in the field of PE inside the division of PE has uncovered a promising scene of chances and difficulties. This research paper has enlightened the extraordinary capability of coordinating technology into conventional academic works on, enhancing understudy engagement, skill development, and generally speaking learning outcomes.

Through a broad survey of writing, it became obvious that the customary ways to deal with PE are being reshaped by the fuse of educational media and technology. Computer-generated reality (VR) and expanded reality (AR) have presented vivid learning encounters, empowering understudies to take part in sensible games reproductions and intuitive skill-building works out. Gamification and intuitive applications have prevailed

with regards to making PE meetings really captivating, while wellness GPS beacons and wearable innovations have cultivated a culture of self-observing and wellness cognizance.

The contextual analyses and models exhibited in this paper have additionally validated the positive effect of innovative PE advancements. From using VR-based sports reenactments to executing flipped homeroom draws near, these models represent how technology can work on educational practices as well as engage understudies to take responsibility for physical prosperity.

Review discoveries have given important bits of knowledge into understudy discernments and mentalities toward these advancements. The outcomes demonstrate that most understudies view the reconciliation of educational media and technology in PE as a positive development, enhancing their inspiration, cooperation, and skill securing. Nonetheless, difficulties, for example, admittance to technology and potential interruptions, have additionally been recognized, highlighting the requirement for cautious execution systems.

Taking everything into account, the innovative utilization of educational media and technology holds huge potential to alter the scene of PE inside the Division of PE. By embracing these mechanical progressions, teachers can establish dynamic and intuitive learning conditions that take special care of the assorted necessities and interests of understudies. As the field keeps on developing, it is crucial for work out some kind of harmony among custom and advancement, guaranteeing that technology stays an instrument to expand pedagogy as opposed to supplant it.

Pushing ahead, further research, coordinated effort, and expert development will be vital in saddling the maximum capacity of educational media and technology in PE. Thus, the division of PE can add to the all encompassing development of understudies, encouraging a culture of physical prosperity, deep-rooted learning, and strengthening.

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