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Research Article

Personal training traits, training competence, and motivation as predictors to sports performance of paralympic athletes in Negros Island, Philippines

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ABSTRACT

The study aims to assess the correlation of three independent variables (personal training traits, training competence, and motivation) on performance levels of the 105 paralympic athletes in Negros Island, Philippines. The method used in this study was (1) path analysis; (2) multiple correlations; (3) the coefficient level of determination; and (4) Kolmogorov–Smirnov for normality test. The results of the study concluded that: (1) There is a no direct correlation on the personal training traits (X1) and the performance (Y) level; (2) there is a direct correlation on the training competence and the performance (Y) level; (3) there is a direct correlation on the motivation (X3) and the performance (Y) level; (4) there is no direct correlation on the personal training traits (X1) and the training competence (X2); (5) there is a direct correlation on the training competence (X2) and the motivation (X3); and *(*6) there is no direct correlation on personal training traits (X1) and the motivation (X3) of paralympic athletes in Negros Island, Philippines. The following conclusions were drawn: Training competence is essential to ensure better performance among paralympic athletes. However, it is not the only measure in winning a competition. A direct correlation of motivation to sports performance was strongly revealed. The direct influence of training competence to sports performance was indicated. Thus, it is recommended to professionalize the training of athletes with special needs in the Philippines.

Keywords: Motivation, Paralympic, Personal training traits, Sports performance, Training competence

INTRODUCTION

Paralympic Games give attention to sports enthusiasts and those involved in competition. Competitive sports for people with distinctive needs have grown unexpectedly over the previous countless decades, and possibilities for participation are an increasing number of access throughout the spectrum from developmental to elite levels of competition (Blauwet and Willick, 2012). The name "Paralympic Games was demonstrated that the Games happen" parallel to the Olympic Games (Willick and Lexell, 2014). Paralympic sports constitute human movement activities at the highest critical level of individual movement, actions, exercise, and behavior. In the Philippines, specifically in Negros Island it is called "Paralympic." In the history of sports participation, it started in the course of the American occupation. American soldiers delivered sports as part of their enjoyment time and in the end became phase of the education system under the Taft Commission who passed the Education Act No. 34 in 1901 to establish the Department of Instruction. The main purpose of the study is to assess personal training traits, training competence, motivation, and performance level of paralympic athletes. Specifically, the study aims to answer the following questions: (1) Does personal training traits (X1) directly correlates the performance level of paralympic athletes (Y)? (2) Does training competence (X2) directly correlates the performance level of paralympic athletes (Y)? (3) Does motivation (X3) directly correlates the performance

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level of paralympic athletes (Y)? (4) Does personal training traits (X1) directly correlate the training competence (X2)? (5) Does training competence (X2) directly correlates the motivation (X3)? and (6) Does personal training traits (X1) directly correlates the motivation (X3) of paralympic athletes?

RESEARCH METHODS

The method used in this research was multiple correlational and path analysis (Wrigth, 2016). It refers to a calculation of moment correlation inside and within variables, for example, covariances or correlations, implied by a set of simultaneous linear regression equations – one type of structural equation model. It is a measure of how well a given variable can be predicted the usage of a linear characteristic of a set of different variables. These methods were appropriate because the study involved determining the status of the personal training traits, training competence, and motivation on the sports performance of paralympic athletes. The bound variable (Y) sports performance of paralympic athletes and the free variables are X1 (personal training traits), X2 (training competence), and X3 (motivation). The constellation of the study is shown in Table 1. In this study, the total respondents with parents' approval are 105 paralympic athletes composed of more than 10% of the total population of paralympic athletes in Negros Island, Philippines. The constellation of the research is shown in Figure 1.

Using the multiple correlational designs, the researcher aims to determine the influence between the independent variables of the study such as personal training traits, training competence, motivation and sports performance of paralympic athletes. Further, this research aims to predict a direct influence impact of the independent variables to the dependent variables which is sports performance based on the rank received by the athletes during the 18th paralympic.

Table 1: Cronbach alpha coefficients of the variables

Variables	Alpha	Standardized item alpha
Personality training traits	0.937	0.954
Training competence	0.962	0.967
Sports motivation	0.984	0.985

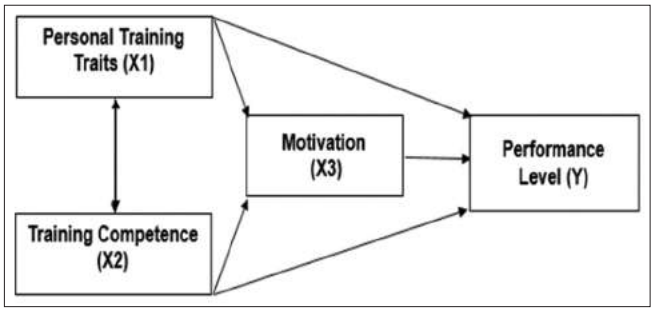

Figure 1: Research model

All data were treated with utmost confidentiality. The Special Education teachers/coaches also served as assistants to assist the respondents in answering the questionnaire during the conduct of the study. Specifically, they assist in reading the questionnaire to paralympic athletes.

RESULTS AND DISCUSSION

Result of path analysis is shown in Table 2 where regression weights are obtained. It is evident from the result that personal training traits (X1) have no direct influence on performance (Y) with the $\beta = 0.310$, $P < 0.01$. Likewise, personal training traits (X1) have no direct influence training competence (X2) ($\beta = 0.008$, $P < 0.01$). Personal training traits (X1) have no direct influence on motivation (X3) ($\beta = 0.026$, $P < 0.05$). Meanwhile, training competence (X2) has direct influence on performance (Y) with the $\beta = 0.580$, $P < 0.01$. On the other hand, motivation (X3) has direct influence on sports performance (Y) ($\beta = 1.773$, $P < 0.01$). Moreover, training competence (X2) has direct influence on motivation (X3) ($\beta = 0.306$, $P < 0.01$). Finally, Figure 4.25 shows the generated model from the analysis of data.

Hypothesis 1: Personal Training Traits (X1) have No Positive Direct Correlation on the Performance (Y) of Paralympic Athletes

Inevitably, personal training traits (X1) as a component in sports performance (Y). Parks-Leduc (2015) stressed that personality traits and personal values are important psychological characteristics, serving as important predictors of many outcomes like sports performance but it has no direct effect on the sports performance. As cited by Bäckmand *et al*. (2001), athletes have been classified into a total of five athlete groups (endurance, power/combat, power/individual, team, and shooting) and one reference group. Athletes differ from non-athletes in some personality characteristics and depression. According to Glazier (2017), performance (Y) is considered to be ruled by a range of interacting physiological, biomechanical, and psychological variables, among others but not the personality of an individual. The paralympic athletes do not just focus on their personal training traits (X1) but rather integrate it to other knowledge and areas in sports. This validates the result of this study which personal training traits (X1) have no positive direct influence and not solely predicts sports performance (Y).

Nia (2010) confirms this result based on their investigation which states that no significant difference was found between the two groups of neuroticism, extraversion, and openness. It can be concluded that athletes' personality traits and values are different from individual and team sports performance. Kahrović *et al*. (2014) confirmed the result and stressed that before any major sporting events, athletes are normally very tense, which has a negative effect on their success. Even though

Table 2: Standardized regression weights of variables

Path	Estimate	SE	CR	*P*
X1 Personal training traits – Performance Y	0.310	0.255	1.215	0.224
X2 Training competence – Performance Y	0.580	0.211	2.746	0.006
X3 Motivation – Performance Y	1.773	0.204	8.680	0.000
X1 Personal training traits – X2 training competence	−0.008	0.124	0.64	0.494
X2 Training Competence – Motivation X3	0.306	0.097	3.159	0.002
X1 Personal training traits – Motivation X3	−0.026	0.123	-0.209	0.834

they are "well prepared," they do no longer gain the favored results from sports. It often occurs that talented athletes do not succeed in their sports activities profession no matter correct stipulations for work, talent, hard work, and the expert work of their coaches. Merzaei (2013) confirms the result using the stepwise regression analysis their study indicated that from among the personality components, only conscientiousness has positive significant correlation with sports performance. The result, also, indicated that conscientiousness was the sole predictor to sports performance.

This only shows that personal training traits (X1) are not the only factor that predicts the performance (Y) of paralympic athletes but rather contributory and to be unified in different areas to have a better individual or team performance (Y).

Hypothesis 2: Training Competence (X2) has a Positive Direct Correlation on Performance (Y)

Based on the result presented, it does support H2. Therefore, training competence (X2) has positive direct correlation on performance (Y) ($\beta = 0.580$, $P > 0.01$). All people possess their own individual training competence and needs. Training competence is important for paralympic athletes and individuals with disabilities. Training variation and periodization are widely recognized as crucial to optimizing training responses. Bangsbo (2006) stressed that the performance of a top-class athlete can be accelerated with the aid of appropriate training. However, for persons with mental retardation, an appropriate level of physical training is critical, due to the fact their disabling condition itself may also intrude with their things to do like their potential to go successfully. This result may support the present investigation in relation to the training competence of paralympic athletes or athletes with disability. Practical suggestions are offered in this article to address these considerations and apply periodization in physical training design for different phases of physical preparation for team sports athletes (Gamble, 2006).

Hypothesis 3: Motivation (X3) has a Positive Direct Correlation on Performance (Y)

The data analysis confirms the H3. Therefore, motivation (X3) has a strong positive direct correlation on sports performance of paralympic athletes (Y) ($\beta = 1.773$, $P < 0.01$). The result coincides with the study conducted by Karaba-Jakovljević (2007) which states that a positive social environment may influence individual participation in sports. Feedback indicates that sports competition experiences in the environment inspire the athlete for a better or results of the performance. The study of Eisenberger (2003) supports the result of this investigation that rewards for conventional performance decrease intrinsic motivation and creativity. Achieving high level of performance (Y) usually depends on a driving force for paralympic athletes to excel. Sports psychologists state that this driving force is associated on how motivation (X3) helps person to achieve a certain goal. It is for this why a wide range of techniques is used by coaches to check overall performance stage and to improve coaching practices and monitor athletic progression towards peak performance (Hanson, 2014). Competition, success, and social gratification cause work valuing among coaches. Thus, increasing intrinsic motivation to work and to improve their performance (Y). Moreover, government officials should appreciate the roles of paralympic athletes in the community and must provide value of the contributions made in molding athletes that give pride and strategic identity to the institution and the community and country as a whole. Extrinsic motivation will provide them a drive to function higher in their precise field. Results suggest that athletic departments should focus on improving their performance (Y) to the organization to retain them. It is in this premise, that motivation (X3) among paralympic athletes should be nurtured to encourage better participation and enhanced performance (Y). Extrinsic motivation contributes largely to enjoyment whereas intrinsic motivation influences one's commitment. Undoubtedly, an athlete has personal mission of developing his performance (Y) stemmed by means of an intrinsic motivation.

Hypothesis 4: Personal Training Traits (X1) have a Positive Direct Correlation on Training Competence (X2)

Analysis of results on the variables personal training traits (X1) and training competence (X2) does not prove H4. Personal training traits (X1) have no positive direct correlation on training competence (X3) ($\beta = 0.008$, $P < 0.001$). Duque as cited by Powell (2011) stressed on the capacity of an individual to perform the duties of day-by-day existence depends on the level of performance of a range of physiological parameters, among which are strength, flexibility, endurance, and others. A good design training process will improve the performance

Table 3: Recapitulation of hypothesis testing results on the sports performance of paralympic athletes on their personal training traits, training competence, and motivation

Hypothesis	r	Sig.	Decision	Information
Personal training traits (X1) on the sports performance (Y) of paralympic athlete	0.224	0.001<0.005	H_o is rejected H_i is accepted	Have no positive correlation
Training competence (X2) and sports performance (Y) of paralympic athletes	0.006	0.001<0.005	H_o is accepted H_i is rejected	Have a positive correlation
Motivation (X3) and sports performance (Y) of paralympic athletes	0.000	0.001<0.005	H_o is accepted H_i is rejected	Have a positive correlation
Personal training traits (X1) has no positive direct effect on training competency (X2)	0.494	0.001<0.005	H_o is rejected H_i is accepted	Have no positive correlation
Training competence (X2) has a positive direct effect on motivation (X3)	0.002	0.001<0.005	H_o is accepted H_i is rejected	Have a positive correlation
Personal training traits (X1) has no positive direct effect on motivation (X3)	0.834	0.001<0.005	H_o is rejected H_i is accepted	Have no positive correlation

level of athletes during competition. It needs a sufficient level of performance and to act synergistically and synchronously to make sure the realization of a desirable physical work even at a stage of athletic performance. The study of Selk (2009) supports the result of this study that athletes who have negative self-talk will generally experience poor performance; conversely, when athletes keep their minds focused on positive performance cues, they are more likely to experience success. Meanwhile, Hanrahan (2015) study opposes the results and provides practical recommendations for psychologists working with athletes with disabilities. Minor modifications are potentially needed when teaching psychological skills to athletes with physical disabilities. Fewer variations that may additionally be predicted are required in in phrases of the content material of psychological training capabilities for athletes with sensory impairments (e.g., individuals who Bompa (2009) enumerated an experiment conducted by which focused on the effects of maximal strength training as emphasis on neural adaptations on performance of trained athletes).

Furthermore, Bompa stressed that this sort of instruction is designed to strengthen techniques that take gain of the technical and physical competencies of the athlete to improve chances of success in competition. Preparing a player with theoretical knowledge about the training measures and the sport advances the likelihood that the player will make worthy personal selections and approach the training process with a powerful focus Blumenstein (2015) presented that paralympic athletes' personality, their preparation, and their sports results are the main concern for training. Furthermore, he stressed that during the past 20 years researchers and practitioners have targeted on psychological skills application for athletes with disabilities. Training is considered to be an organized activity aimed at imparting knowledge and information to improve the athlete's performance or to help paralympic athletes to attain the required level of knowledge or skills.

Are blind are able to use imagery) that allows them to function physical activities better.

Hypothesis 5: Training Competency (X2) has a Positive Direct Correlation on Motivation (X3)

Outcome of analysis of the investigated variables on training competency (X2) and motivation (X3) infers a strong positive direct correlation on motivation (X3) ($\beta = 0.306$, $P > 0.001$). Howland (2006) supports the result of this investigation by encouraging coaches who desire to maximize overall performance through concentrated attention should begin by helping athletes become more aware of their arousal levels, which can be controlled through psychological skills such as relaxation, visualization, goal setting, positive self-talk, focusing, and refocusing.

According to their level of self-determination, Deci and Ryan (1985) intrinsic motivation is the most determined level of motivation which refers to participating in an activity because of interest and enjoyment. The next level of motivation is extrinsic which refers to taking part in an endeavor because of a goal distinct from the activity itself and is conceptualized according to behavioral regulations. Moreover, motivation is influenced by variables such as age, gender, level of motor proficiency. and country wide culture. Schemas as cited by Kleinman (2012) are the primary building blocks or units of knowledge. In relation to physical overall performance, this theory permits an athlete to recall and modify one's conduct or overall performance and pay attention on the key information to foresee a better outcome of his sports events during the competition. Furthermore, Vanlandewijck (2006) stressed to focus on the function of sports science in the enhancement and improvement of the paralympic games and sports specifically for athletes with disabilities and to inspire their participation to gain exercise benefits that will help them improve their fitness level.

Hypothesis 6: Personal Training Traits (X1) have a Positive Direct Correlation on Motivation (X3)

On testing the sixth hypothesis on whether personal training traits (X1) have no direct correlation on motivation (X3), results indicate that personal training traits (X1) have no direct influence on motivation ($\beta = 0.07$, $P > 0.001$). Intrinsic motivation is clearly associated with greater exercise participation. Nia (2010) supports the result of the study that the personality in the individual and team sports of athletes scored substantially greater on agreeableness and sociotropy than did the individual sports activities athletes. No significant difference was found between the two groups on neuroticism, extraversion, and openness. Thus, athletes' personality traits are different for individual and team sports. Meanwhile, Parks-Leduc (2015) supports the result that personality traits and personal values are essential psychological characteristics, serving as important predictors of many outcomes. Commonly, it is primarily based cognitive traits that are more strongly related to values and more emotionally based traits are less strongly related to values. Thus, controlling for personal scale use tendencies in values is advisable. Reisz *et al*. (2013) asserted that trait and motive concepts are extensively used in the description and evaluation of individual differences in personality, but relatively little work has examined how these personality units relate to one another. The study revealed that relations between self-generated, idiographic goals, and the Big Five personality trait dimension and in terms of goals one's perceived personality traits or facilitate long term and not easily attained outcomes. Achievement goal theory is a social-cognitive framework, which may also help to understand the motivational techniques of and across training and competition. However, Reigel's Self Care Theory (2008) states on how a person will manage himself/herself. This comes when an individual faces undesirable chronic decision. He/she will react on it and make crucial response to the situation. The model shows that concepts such as self-awareness, social awareness, self-management, and relationship management are predictors of performance.

CONCLUSION

Training competence is essential to ensure better performance among paralympic athletes. However, it is not the only measure in winning a competition. Personality training traits (X1) are important but it has no contributory relations to achieve high sports performance in a competition of paralympic athletes during the 2018 competition. One is anticipated to train and to develop one's skills, and fuelled by his or her interest (motivation). The present investigation explored on the interrelated factors such as personal training traits (X1), training competence (X2), and motivation (X3) in relation to sports performance of paralympic athletes. The research aims to determine a direct correlation of the independent variables such as personal training traits (X1), training competence (X2), and motivation (X3) to the dependent variable sports performance (Y) measured based on the individual ranking/standing in the paralympic during AY 2017–2018, in Negros Island, Philippines. Path analysis was used to represent the relationship of the variables of the study and results were treated using multiple regression. Training competence (X2) and motivation (X3) have a positive correlation on sports performance, while personal training traits (X1) have no positive correlation on sports performance.

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Research Article

Recently situations on the selection and training processes of national athletes in Vietnam

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ABSTRACT

The aims of this research were determine the selection and training processes of national athletes in Vietnam and identify the currently situations of training process and competitions of national athletes in Vietnam. The research was used mix methods design, beginning with a qualitative phase using semi-structured interviews and it was followed by a quantitative phase using the questionnaire survey. The conclusion of this research determined the current of the selection and training processes of national athletes. Then, these processes are followed the standard of the selection and training processes of other countries including three stages: Preparation for the fundamental, training to train, and training to complete. Finally, this research found out the management and training way of the Vietnam Government for national athletes, training years in national level of athletes, the participating frequency of national athletes in the domestic competitions and international competitions, the perception of athletes about their future career, and their opinions about injuries.

Keywords: National athletes, Selection process, Training process

INTRODUCTION

The development of high-performance and professional sports plays an important role in the sport development of the Vietnamese country (Decision No. 223/QĐ-TTg, February 22, 2019). In recent years, the selection and training process of athletes has dramatically changed, but there are still many defects to quickly overcome (Burlot *et al*., 2016). Therefore, this research evaluated the recently situations of the selection process, the results of selection processes, training time after being selection, as well as the circumstances, conditions of training and competition, and the expectation of athletes to overcome the weaknesses and promote the strengths for Vietnamese sport high performances to quickly be get in the stage of the sport competitions of the continents and the world (Hai, 2015).

Research Objectives

The research objectives of the study were as follows:

1. Determine the selection and training processes of national athletes in Vietnam
2. Identify the currently situations of training process and competitions of national athletes.

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RESEARCH METHODOLOGY

This study utilized a mixed method design, beginning with a qualitative phase using semi-structured interviews. This was followed by a quantitative phase using the questionnaire survey.

Qualitative Study

Participants

The six experts have worked and experienced in government sport organizations. Participants were again recruited using purposive sampling.

Procedures

A semi-structured interview protocol guided the interview (Willig, 2014).

Quantitative Study

Participants

Two hundred and ninety-one athletes who are training in the national sport centers around Vietnam completed the quantitative survey.

Instrument

The researcher developed a questionnaire based on the previous literature and the reliability was 0.85 (Cronbach's alpha coefficient) (Ary *et al*., 2006).

Analysis

The quantitative data were analyzed through descriptive statistics including frequency, mean, and standard deviation.

Research Findings

The organizations participate in the athlete's selection and training processes in Vietnam

The semi-structure interview revealed that the sport organizations are currently in the selection and training of talented athletes. There are six sport organizations under the Ministry of Culture, Sports and Tourism which are as follows: Bac Ninh Sport University, Hanoi National Sport Training Center, Ho Chi Minh City National Sport Training Center, Danang National Sport Training Center, Can Tho National Sport Training Center, and the Institute of Sports Science and Sports. Furthermore, 27 National Sports Federations/ Associations and 01 social sport organization are Vietnam Olympic Committee. In addition, there are so many sport centers around Vietnam which have supported in the selection and training processes, they are Sport Training Center in Hanoi City, Sport Training Center in Da Nang City, Sport Training Center in Ho Chi Minh City, Sport Training Center in Hai Phong City, Sport Training Center in Can Tho City, People's Army Sport Training Center, People's Police Sport Training Center, and University of Culture, Sports and Tourism, three sport colleges which have managed by provinces and cities, and more than 1100 sport training centers, sports clubs, and athletic sport schools in 63 provinces in the whole of country.

Besides, the selection and training processes of sport talents run through the sports movement in schools where there can find the children who have talents and good skills in sports to training in the sport centers.

Processes of the athlete's selection and training

The semi-structure interview found that the selection and training processes of talented athletes are made in three following stages:

Stage 1: Preparation for the fundamental

It starts from the age of primary school (in some sports maybe it can start earlier, for example, gymnastics and figure skating can be selected and trained from 4 to 5 years old). Training in this period is only an estimation, the training session is built mainly in the form of general physical training with the widespread use of comprehensive physical education. Children are challenged in many different sports and guided by physical educators who guide and train them in the appropriate practices. This stage usually spends 1–2 years. This stage will be finished and started to next stage children can show which sport he/she has skills and interested in.

Stage 2: Training to train

This stage sets the foundation for future success of athletes, it starts in the initial of specialization training which follows the general training. In this period, athletes are train in the specialization with multidisciplines. Then, in the period of the initial of the specialization training, sport skills are increased training gradually. At the end of the initial of specialization training, the training needs to follow the guidelines of the training in high performances. This period spends 3–4 years.

Stage 3: Training to complete

This is the most flourishing stage for sports training, it gives access to the pinnacle of talent for every athlete. In this period, all the professional regulations of sports training are clearly revealed, the training process has a full line of deep specialization, fitness, technical and tactical training, and professional psychology significantly increased and dominated. The total volume and intensity increased at a high rate and reached the maximum level for each athlete (usually in the first half of this period). At this stage, talented athletes will be recruited into the field of high-performance sports, continuing the path of perfecting talents. Those who cannot enter the team can maintain the maximum achievement trend to the extent permitted. The training to complete stage is divided into two periods: The age of "high performance" in which most sports are aged 18–22, 22–26, and in some other sports of the age maybe higher at the time of maintaining achievement.

Stages 1 and 2 of the selection and training processes of talented sports athletes are carried out at the Sport Training Centers and the local sport schools in around the country. At present, there are about 20,000 young athletes practicing and competing at local sport training centers and sport schools. These organizations are responsible for selecting, training, and providing talented young athletes for national sport training centers.

In the third stage, when the young athletes with special sport talents have been recruited and he/she can play the sport that he/she interested and has good skills in competitions, he/she can be selected and train in one of four National Sport Training Centers and the Bac Ninh Sport University. These organizations are responsible for training themes athletes of the national team which directly serve for international competitions.

In 2017, the Sport Authority of Vietnam convened a national training of 2104 athletes including 847 youth athletes to prepare for the attendance in the 29th SEA Games 2017 in the Malaysia, Asian Indoor and Martial Arts Games 2017 in Turkmenistan, and other international sports competitions and tournaments.

Besides, the athletes of 32 key sports which identified in Vietnam sports development strategy are regularly trained and focused all year.

The currently situations of training process and competitions of national athletes

The quantitative findings have showed that through a questionnaire survey to 291 national athletes who have been training at Bac Ninh Sport University, Hanoi National Sport Training Center, and Danang National Sport Training Center, the results showed that athletes who have talents for sports training were 39.5%, the interested in sports were 56.5%, play sports due to family circumstances were 2%, and because of sports idols were 2%. Besides, Figure 1 shows that athletes have participated in the training of national level for less than 5 years were 52%, for over 5 years were 40%, and over 10 years were 8%.

Next, the results revealed that these 291 athletes got the achievement from international competitions with 20.2% of gold medal, 8.2% of silver medal, and 4.8% of bronze medal. Besides, the Sport Training Center supported athletes participate each year in sport knowledge classes: 33% of 1 time, 23.7% of 2 times, 6.3% of 3 times, and 37% of more than 3 times. Moreover, athletes have been selected in domestic competitions for 1 time was 20.3%, 2 times were 19%, 3 times were 26.5%, and 34.2% were many times [Figure 2].

Furthermore, Figure 3 reveals that athletes were selected in international competitions for 1 time with 27.5%, 2 times with 6.9%, 3 times with 1.7%, more than 3 times with 8.6%, and never with 55.3%.

The results in Figure 4 found that athlete's perceptions for the sport facilities and equipment with 63% replied that the facilities and equipment meet the training requirements, there needs to equipped better with 34.3%, and there have no facilities and equipment meet the training requirements with 2.7%.

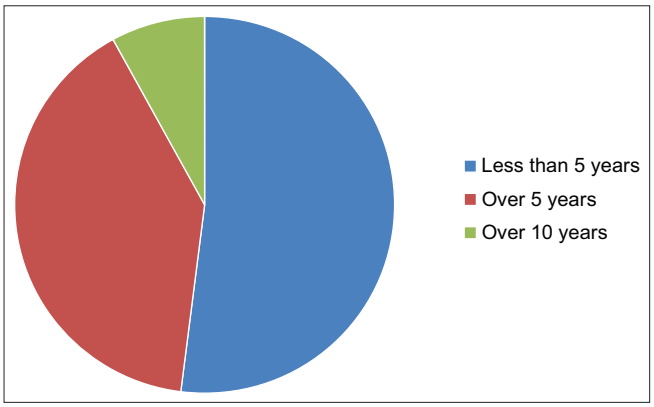

Figure 1: Training years in the national level of talented athletes (n = 291)

Moreover, Figure 5 shows that the management and training way were excellent rate with 62%, good rate with 23%, and average with 15%.

Then, athlete said that they felt optimism about their future career during the training time in the national sport centers with 50%, 42% do not think much about their future career, and 8% do not think anything.

Figure 7 stated that athletes do not scare about injuries with 23%, but percentage of scare is 70%, and do not think about that 6%.

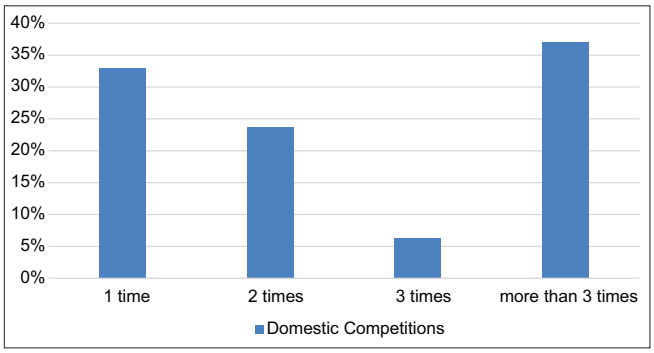

Figure 2: The participating frequency in domestic competitions of national athletes (n = 291)

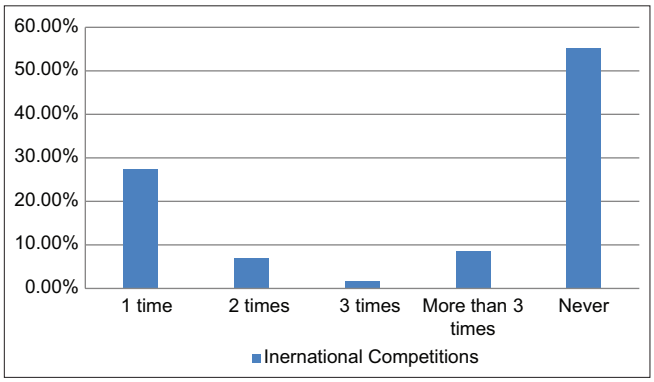

Figure 3: The participating frequency in international competitions of national athletes (n = 291)

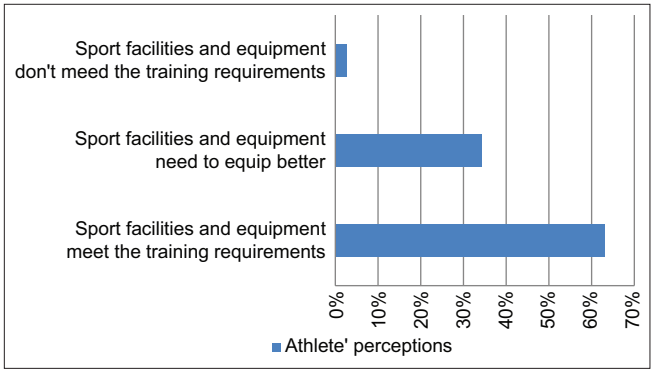

Figure 4: Athlete's perceptions for the sport facilities and equipment (n = 291)

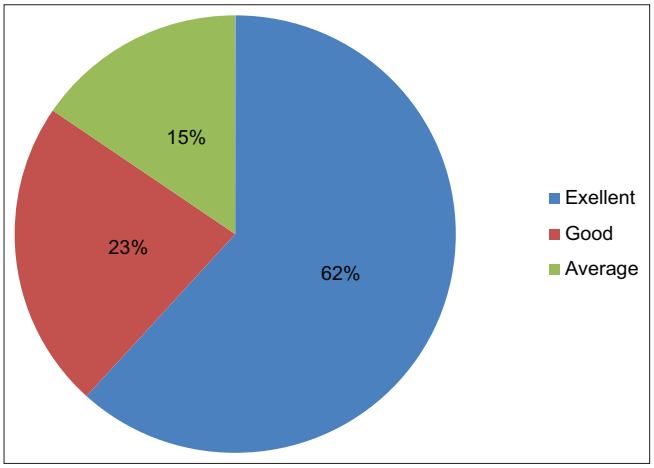

Figure 5: The management and training way for national athletes (n = 291)

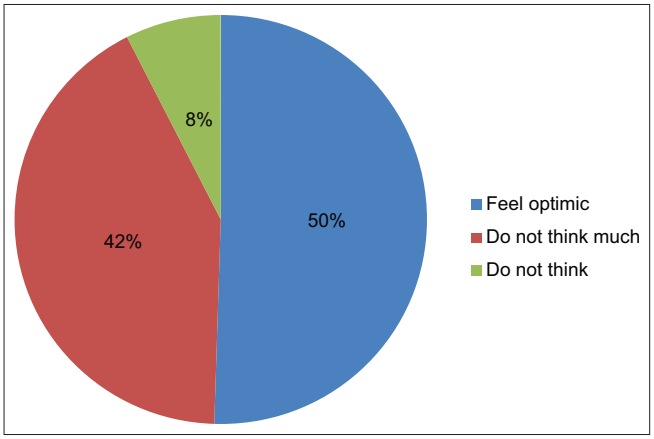

Figure 6: Athlete's opinions about their future career (n = 291)

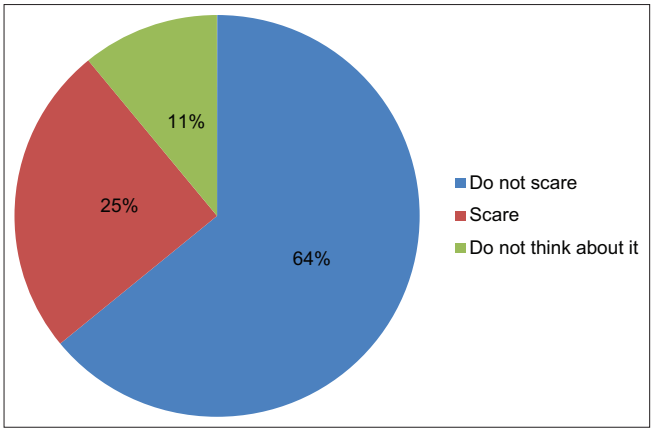

Figure 7: Athlete's opinions about injuries (n = 291)

CONCLUSIONS

The conclusion of this research determined the current of the selection and training processes of national athletes. Moreover, these processes are followed the standard of the selection and training processes of other countries including three stages: Preparation for the fundamental, training to train, and training to complete. Finally, this research found out the management and training way of the Vietnam Government, the perception of athletes about their future career, and their opinions about injuries.

RECOMMENDATIONS

Talented athletes want to have more time in education; more recovery treatments, more cares about the athlete's lives, increased wages because there is a currently comparison to prices, and external costs, the wages of national athletes are very low, they are looking forward to receiving money on time, have more training facilities and equipment to practice. Besides, the government should to give them more opportunities to study during the tournaments. Furthermore, it should have better meals with more nutrition, better accommodations, living, and competition practices. There needs to bring athletes to more international tournaments to get more experiences and also needs to plan a long-term training in the domestic and abroad to improve their skills.

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Research Article

Students' learning style in relation to service P.E. performance

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INTRODUCTION

The idea that people learn differently is venerable and probably had its origin with the ancient Greeks (Wratcher *et al*., 1997). Educators have, for many years, noticed that some students prefer certain methods of learning more than others. These dispositions, referred to as learning styles, form a student's unique learning preference and aid teachers in the planning of small group and individualized instruction. Learning styles, as defined by Grasha (1996), are the "personal qualities that influence a student's ability to acquire information, to interact with peers and the teacher, and otherwise participate in learning experiences." Blackmore (1996) suggested that one of the first things educators can do to aid the learning process is to simply be aware that there are diverse learning styles in the student population. There are probably as many ways to "teach" as there are to learn. Perhaps, the most important thing is to be aware that people do not all see the world in the same way. They may have very different preferences than you for how, when, where, and how often to learn.

METHODOLOGY

Research Design

This study employs the descriptive-correlational methods of research. The descriptive-correlational type of study tried to describe the respondents in terms of age, gender, academic status, religion, course, learning style, and performance.

Research Sampling

The target number of samples (n) was 925 as derived from the total population of 5507 using the Slovin's formula. The 925 samples were divided into 337 males and 588 females using ratio and proportion. The 925 samples were determined through stratified random sampling procedure and further segregated into 85 P.E. 1 samples of 50 females and 35 males, 318 P.E. 2 samples of 205 females and 113 males, 241 P.E. 3 samples of 150 females and 91 males, and 281 P.E. 4 samples composed of 183 females and 98 males. However, the 925 samples were determined still through ratio and proportion and selected and distributed to every section by simple random sampling method.

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Research Instruments

The questionnaire was of two parts. Part I gathered information on the demographic profile of the respondents to include the age, gender, academic status, religion, course, and their performances in the written and practical of the course. Part II will be questionnaire that will be answered and will assess the learning style of the respondents. The VARK Learning Styles Questionnaire developed by Victoria Chislett will be used to. This is a standardized questionnaire that will classify the students learning styles into visual, auditory, or kinesthetic. The questionnaire consists of 16-item questions with four choices representing the four styles of learning.

Statistical Tools

For the descriptive data of the study, the frequency and percentage distribution were used. For the relationships, the moment product for correlation coefficients or Pearson r and the Chi-square was utilized.

Research Setting

The study was conducted in the College of Sports, Physical Education and Recreation, Mindanao State University, Marawi City.

Respondents of the Study

The population of the study was the service physical education (SPE) enrollees of the Mindanao State University, Marawi

City, and officially enrolled during the second semester of academic year 2013–2014 as based from SPE records. Using the enrollment as point of reference, the total population size was 5507 segregated into: 511 enrollees for PE 1 (211 for men and 304 for women), 1888 enrollees for PE 2 (669 for men and 1219 for women), 1432 enrollees for PE 3 (554 for men and 888 for women), and 1676 enrollees for PE 4 (584 for men and 1092 for women).

Data Gathering

In gathering the data for this study, certain procedures were followed. A letter request was sent to the Dean through the Chairman of the Department of SPE of the College of SPEAR of the Mindanao State University, Main Campus will be made requesting for the lists of students enrolled in P. E. courses the 2nd semester, academic year 2013–2014.

RESULTS AND DISCUSSION

Based on the statistical results of the study, the following findings are revealed.

Five hundred and eighty-five or 63.2% are in the age range of 15–18 years old. Majority or 588 out of 925 of the respondents were female; majority of 374 or 40.4% out of 925 respondents are in tuition privilege status; that 55.2% or 511 out of 925 of the respondents were Islam believers while 44.8% or 414 out of 925 of them non-Muslim; that 92.8% or 766 out of 925 of the respondents were Bachelor of Science (BS) degree pursuers; that out of 925 respondents, highest percentage of 29.0% with a frequency of 268 have visual learning styles; that majority of the respondents with the highest percentage of 33.1% with a frequency of 306 were in the range of 1.50–1.75 in their practical examination; that highest percentage of 28.6% with a frequency of 265 was in the range of 1.0–1.25 or excellent in their written examination. That there were no significant relationships among the moderating variables of age, gender, academic status, religion, and course with their respective $P = 0.272$, 0.188, and 0.355 to independent variable of learning styles. There is a significant relationship between the moderating variables of gender, academic status, and the independent variable of learning style.

That the moderating variables of age ($P = 0.184$), academic status ($P = 0.385$), religion ($P = 0.784$), and course ($P = 869$) are not significantly related to written examination performance as the dependent variable. The moderating variables of gender are significantly related to written exam performance. That practical examination as the dependent variable is not significantly related to learning style as the independent variable. That written examination as the dependent variable is significantly related to learning style as the independent variable.

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Research Article

Active lifestyle through yogic posture

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ABSTRACT

The purpose of the present study of the researcher was to discuss the physical postures of yoga, which is also called yogic asanas. Yoga is a discipline based on an extremely fine science, which focuses on bringing harmony between body and mind. It is an art and science of active lifestyle. It leads to a perfect harmony between body and mind, man and nature, individual consciousness, and universal consciousness. Yogic postures help to build up psycho-physiological health, emotional harmony, manage daily stress, anxiety, and its outcomes. For the purpose of maintaining of "active lifestyle" with awareness in our daily life, we can practice various yogic postures or asanas, Pranayama, Dhyana or meditation, and relaxation postures. In our social life, yoga is easily accessible where age, religion, caste, and gender are not barriers for the purpose of individual benefits, human benefits, and also for the nation benefits. Through yogic postures, one can develop flexibility, improve fitness levels, increase strength, and united his or her body, mind, and soul and enjoy inner peace. It has used as a preventive aspect as well as curative aspect in our social life and now yoga is international trend and has gained a tremendous popularity in the world.

Keywords: Active lifestyle, Health benefit, Lifestyle, Spiritual aspect, Yogic posture

INTRODUCTION

With advancement of age in maintaining our "active lifestyle" in various ways, yogic postures are widely practiced for the purpose of physically, psychologically, and spiritually wellbeing. The word "lifestyle" of a particular individual is the living conditions, behavior, and habits that are typically of an individual's life. Therefore, "active lifestyle" is a way of life that integrates physical activity into our daily routines to do our work with a healthy environment. The term "yoga" in the western word after denotes a modern form of hatha yoga and yoga as exercise, consisting largely of the postures called as asanas (Ali Akhter *et al.,* 2020). The word "yoga" originates from Sanskrit and means "to join, to unite." Yoga exercises have a holistic effect and bring body mind, consciousness, and soul into balance. In this way, yoga assists us in managing with everyday demands, problems, and worries. The ancient Rishis investigated the global laws, the laws of nature and the elements, life on earth, and the powers and energies at work in the universe both in the external world and on the spiritual level. Human being is made up of three components – body, mind, and soul corresponding these three needs health, knowledge, and inner peace. Yoga is a practical philosophy involving every aspect of an individual being. It teaches the evolution of the persons by the development of self-discipline and self-awareness. Anyone irrespective of age, health circumstances of life, and religion can practice of yoga (Patel, 2020). Joshi *et al*. (1992) reported that pranayama leads to an increase in breath-holding time and decrease respiration rate. It is also believed that practice of Kumbhaka (breath retention) in the most of pranayama enhances concentration and reduces anxiety. Khumar *et al*. (1993) examined the effectiveness of shavasana as a therapeutic technique to reducing depression. Fifty female university students were diagnosed with severe depression; 25 were subjected to 30 sessions of shavasana and 25 served as controls. It was revealed that shavasana was an effective technique for reducing depression and continuation of the treatment for a longer period resulted in a significant positive increase. Research suggests that yoga participation and mastery can improve the degree of exercise self-usefulness, and perhaps, lead to attachment in a physical activity program and its attendant benefits (Oleshansky, 2004). Postures using the body are called

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asanas; breathing techniques, combining inhalation, exhalation, and suspension are called Pranayama (Raub, 2002). Traditional hatha yoga is a form of high-moderate physical activity that incorporates relaxation, breathing exercises, and various physical postures (Nayak and Shankar, 2004).

IMPORTANCE OF YOGA IN OUR DAILY LIFE

Taking this new shape with the body can lead you to learn how to take a new shape with the mind. "If practice correctly, yoga postures break down the psychological, emotional, physical, energetic, and psychic obstacles that inhibit us from growing," Stryker says. Yoga also teaches us how to make better decisions. It is necessary to spare some time for yogic postures for the awareness, for the fitness, and for our daily working life to fulfill our purpose without fatigue. Hence, it is important to include yoga in daily life as it helps in controlling a person's body, mind, and soul. And together, it brings the physical and mental discipline which is better for the body and mind.

CONTROLLING OF INDIVIDUAL BODY, MIND, AND SOUL

The art of practicing of yogic postures helps in controlling an individual's body, mind, and soul. It brings together physical and mental disciplines to achieve a peaceful body and mind; it helps manage stress and anxiety and keeps our relaxing. It also helps in increasing flexibility, muscle strength, and body tone. It improves respiration, energy, and vitality. Practicing of yogic postures might seem like just stretching, but it can do much more for your body from the way you feel look and move. Yogic postures build strength, flexibility, and confidence. Regular practice of yogic postures can help lose weight, relieve stress, improving immunity, and maintain a healthier active lifestyle. Yoga is not a religion; it is a way of living that aims toward a healthy mind in a healthy body. Man is a physical, mental, and spiritual being; yoga helps promote a balanced development of all the three. Yogic exercises recharge the body with global energy and facilitate: Through the practice of yogic postures, one can develop self-healing, with greater awareness, better relationships, and fulfillment of perfect balance and harmony. Yogic asanas help to remove negative blocks from the mind and toxins from the body and it's also helps in attention, focus, and concentration, especially important for children.

PREVENTIVE AND CURATIVE ASPECT OF YOGIC POSTURE

To compare with other games and exercises which provide only muscular and cardiovascular fitness, yogic postures give an all-round development. Yogic postures are not only deals with this broad aspect of health but also deals with other aspects such as healing of injury and psychological disorders and provide curative treatment of many diseases. Yogic postures are a universal remedy for one who sincerely wants to seek it. Due to the modern lifestyle, man is suffering from various postural deformities and diseases as obesity, diabetes, hypertension, anxiety, depression, constipation, and also our daily life problems. Hence, yogic postures are one of the best physical and mental exercises from which anyone could get the best mental and physical balance; yoga is a practical science and it is an open to us to know the benefits of yoga, one should practice it. We really want some boost either mental or physical or positive thoughts and it will be achieved through yoga, only yoga gives us all round fitness, weight loss, stress relief inner peace, improve immunity, living with greater awareness, better relationships, increased energy, better flexibility, and posture not only this but also yoga postures give us physically, mentally positiveness. There is also yoga therapy, which uses yoga to help specific medical conditions.

In this modern world, our environment is fighting for survival and we humans suffer from more and more physical and psychological stress, we cannot always control them but can learn how to face them and to this end yogic postures is as good an invention it has even been. The aim of yoga is physical, mental, and spiritual health.

LIFESTYLE THROUGH YOGIC ASANAS

Physically inactive individual may find it especially difficult to adopt and maintain an active lifestyle because baseline physical activity leads significantly predict initiation and attachment to physical activity. Yogic postures help to develop a greater understanding of our self, the purpose of life, and our relationship to God. On the spiritual path, yoga leads us to supreme knowledge and eternal bliss in the union of the individual self with the universal self. Yoga is that supreme global principle. It is the light of life, the universal creative consciousness that is always awake and never sleep; that always was, always is, and always will be. Postures using the body are called asanas; breathing techniques, combining inhalation, exhalation, and suspension are called Pranayama. The most important benefit of yoga is physical and mental therapy, the very essence of yoga lies in attaining mental peace, improved concentration power, and a relaxed state of living.

YOGA IS EASILY ACCESSIBLE FOR HEALTHY BENEFITS

A physical yoga practice will give us a fully body workout but it is low impact movement. When done with correct form and alignment, it does not put any pressure on your joints. This makes yoga accessible to a large range of individuals coming from all walks of life. Yoga is customizable, if we

want to lead an active lifestyle, we can easily adapt a practice to contest your endurance and strength. There are various types of yoga practices but they all encourage a body and mind connection. Yoga has many proven health benefits which have been shown to decrease stress, anxiety, and inflammation. Studies have also revealed that it can improve heart health and fight depression.

YOGA HELPS FOR WEIGHT LOSS

Yoga can increase mindfulness as we become more acutely aware of our own body. Public can become more aware of how much they are eating and make better food choices. That's why the cardio benefits and relaxation from a regular yogic postures practice, in union with a rational diet, can effectively aid in weight loss. Yoga reduces the risks of injury when practiced safely and with a credible teacher; the risk of injury in yoga is significantly less in comparison to other forms of exercise.

YOGA INCREASES FLEXIBILITY AND FITNESS

If we practice regularly in a morning or evening session, no doubted it can promote to develop the increase the flexibility and the fitness level of an individual. On the other hand, it can help to prevent injury and also help with muscle recovery post-workout, yogic postures help improve flexibility, works our core muscles and it allows us to perform cardio-centric exercises in a way which is not as obviously taking as other forms of cardio training. If we want to improve our strength which consists of lots of planks, press ups, and arm balances, strength is required by our body to satisfy all day activities appropriately. Especially, young students need to us of strength as they are overloaded with many tasks. Therefore, yoga helps in building our strength and provides our power. Practice of yogic postures can promote flexibility because the stretching postures allow scar tissues to break down more gently without inhibiting movement as it heals.

CONCLUSION

On the basis of the present study, the following conclusions were drawn as:

The present study was confined to the "active lifestyle" through yogic postures for the purpose of individual well-being.

For maintaining an active lifestyle, we can practice various forms of yoga asanas as Bhujangasana, Dhanurasana, Sarvangasana, shavasana, and Makarasana and also pranayama which is connected each other of body, mind, and spiritual domains.

The small word "yoga" has widely meaning in our daily life as well as social life which can be used as preventive as well as curative aspect.

As a preventive aspect of yoga, we can physically practice with correctly and rightly alignment in the various form of yoga which easily accessible in our daily life.

As a curative aspect of yoga, we can use of various asanas for the treatment of different diseases as tonsil would be cure with the practice of Sarvangasana posture.

Now in our social life, yoga is international trend and through which an individual can achieve a higher quality education as a social status.

And in the end but not the least that yoga postures have many valid benefits as promote flexibility, increases fitness levels, reduces various injuries, reduces stress and anxiety, connected with body, mind, and soul, and also helps us to inner peace.

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Research Article

Anaerobic capacity and lower limb strength reference variables of taekwondo athletes

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ABSTRACT

Purpose: The aim of this study was to update the validity of the taekwondo anaerobic round kick test in 30 s and 45 s compared with the 30 s Wingate anaerobic test as a standard, and the squat jump and countermovement jump tests reliability analysis of the kicking tests, respectively. **Subject:** Seven male taekwondo students (20.9 ± 1.5 years) and eight junior male taekwondo athletes (16.6 ± 1.6 years) participated in the study. **Method:** All subjects perform 30 s Wingate test on dynamometer bike, jump on the sensor force plate, and round kick on kick bag in 30 s and 45 s. **Results:** The result showed that there was a correlation between a 30 s round kick and a 45 s round kick with the Wingate test to assess anaerobic power with the correlation from 0.85 to 0.95 in students, and from 0.6 and 0.76 in junior athletes. The significant correlation is confirmed that specific taekwondo tests were able effectively to access athlete's anaerobic capacity without a dynamometer bike to perform the Wingate test. Moreover, the squat jump and countermovement jump tests have good reference values when compared to kick frequency at 30 s and 45 s compared to power jump variable (PJ). **Conclusion:** In addition, the squat jump test and countermovement jump test have a good reference value when compared to 30 s kicks (correlation from 0.61 to 0.84 in adolescent athletes and from 0.58 to 0.75 in young athletes). Overall, the findings of the current study support the simultaneous possibility of the 30 s round kick test and 45 s round kick test to determine the taekwondo athlete's anaerobic ability as well as using the jump test to evaluate strength in lower limbs are closely related to the ability to perform kicks in taekwondo.

Keywords: Anaerobic, Power, Strength, Taekwondo

INTRODUCTION

Taekwondo is a martial art that originated in Korea and has been an official Olympic sport since 2000. It can be seen that taekwondo is one of the most systematic and scientific martial arts in the world (Taekwondo world, 2018). From a physical perspective, anaerobic and anaerobic endurance, strength, muscle strength, flexibility, speed, and motor coordination represent important components of the motor qualities of taekwondo players, it has a close relationship with success in competition (Bridge *et al*., 2014; Chaabene *et al*., 2018). In particular, taekwondo athletes need to have a high level of anaerobic capacity, especially in the lower limbs strength, to perform multiple fast and strong chains of attacks and counter-attacks (Bouhlel *et al*., 2006) with a short recover time (Bridge *et al*., 2014). Bridge *et al*. (2014) published a report claiming that these qualified athletes will benefit from success in top competitions. Recently, a number of taekwondo-related studies have focused on the development of specific tests that meet the specific needs of this martial art (Araujo *et al*., 2017; Chaabene *et al*., 2018; Rocha *et al*. the, 2016a, b; Tayech *et al*., 2018). Against this background and as part of anaerobic power rating in taekwondo athletes, Tayech *et al*. (2018) recently studied on the reliability and feasibility of the sphere stone test to test the taekwondo anaerobic (Anaerobic Taekwondo Kick Test – ATKT) ability. Some of authors have shown that the technical and physiological stress characteristics of the ATKT can be compared to a taekwondo match on the ring. In fact, the ATKT is designed to evaluate anaerobic power, while also to determine absolute and relative peak power (Peak Power – PP) and average power (AP), as well as the index fatigue (FI). Furthermore, TAIKT showed clear efficacy when

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compared to the track-based anaerobic run test (Tayech *et al*., 2018). Regarding these results, Tayech *et al*. (2018) argued that the advantage of using TAIKT to measure the gas power of taekwondo athletes is that it allows to perform movements associated with taekwondo competition, such as kicking such as ring technique in chains of attacks and counter-attacks. Similarly, Bridge *et al*. (2014) asserted that taekwondo athletes need to have good anaerobic capacity to properly distribute strength as well as the need for energy in competition. And so far, there is no clear evidence of this correlation in Vietnamese athletes.

The Wingate test (WanT) has proven to be a reliable tool for evaluating anaerobic performance and how well athletes are performing (Bar-Or, 1987). Furthermore, this test is the most common method for assessing the maximum anaerobic strength and capacity of taekwondo athletes (Bridge *et al*., 2014). However, so far, there are still relatively little data regarding peak power and anaerobic power of Vietnamese taekwondo athletes using WAnT. Likewise, jump tests (e.g., Abalakov, squat jump-SJ, countermovement jump-CMJ) are often used to assess lower limb anaerobic strength on taekwondo athletes (Bridge *et al*., 2014; Chaabene *et al*., 2018). Indeed, significant correlations have been reported between tests (e.g., SJ, CMJ) and taekwondo's movement (e.g., frequency, force, velocity, and strength of kicks) (Rocha and partners, 2016a; Sant'Ana *et al*., 2014). As mentioned above, the need to correlate this test with the WanT was needed to verify its reliability.

METHODS

Subjects

Seven male taekwondo students (20.9 ± 1.5 years) and eight male junior athletes (16.6 ± 1.7 years) participated in this study [Table 1].

Tests Protocol

Wingate anaerobic test – WAnT is a test that assesses an individual's anaerobic capacity by pedaling on a dynamometer for 30 s (Driss and Vandewalle, 2013). The dynamometer has a frictional friction belt (Monark 894 E Peak Bike, Weight Ergometer, Vansbro, Sweden, Software Version 2.22) and is connected to a computer. Participants were acquainted before the official proceeding and data collection (Attia *et al*., 2014; Hachana *et al*., 2012), which included three trials in 30 s to increase external resistance (25, 50, and 75% load) and an active break time in 30 s each (pedal without resistance at 60 rpm). WAnT starts from the time when the installation of the official load is achieved and maintained continuously (7.5% of the participant's body mass) (Attia *et al*., 2014; Bar-Or, 1987; Hachana *et al*., 2012). During the test, the athlete was instructed how to accelerate from a sitting position to avoid the effects of changing positions and pedal with maximum effort. Three indicators of peak power – PP (highest 5 second power), average AP power (average power during testing), and fatigue power decline – FI (reducing PP to power minimum) calculated according to an accepted procedure (Bar-Or, 1987).

Table 1: Characteristics of taekwondo players

		Age (years)	Body height (cm)	Body mass (kg)	BMI
Students (n=7)	Mean	20.9	167.0	57.7	20.7
	SD	1.5	5.6	7.0	2.0
Junior athletes (n=8)	Mean	16.6	174.7	61.3	20.0
	SD	1.7	9.2	11.8	3.0

Athletes performed two tests of squat jump-SJ and countermovement jump-CMJ. Before starting, athletes do a 15 min warm-up that includes sprinting, jumping (Chaouachi *et al*., 2010) and stretching (Chaouachi *et al*., 2017). After 5 min of rest, the official test will be entered. For each jump test, 3 times are made, with a 60 s break between reps. Best time will be recorded for analysis. Athletes get 3 min break for two tests of SJ and CMJ. Athletes do not use hands to create momentum, hands on hips fixed throughout the exercise. A force plate system from Kistler Company (Germany) is connected to a computer to measure the time to fly in the air and the surface plate contact from which the jump height can be calculated.

A continuously kicking into the mid-range racquet for 30 s and 45 s were made. Both tests are counted for the number of attempts kick. Athletes allowed rest 5 min between two trials. It can be called another name as Anaerobic Taekwondo Kick Test – ATKT 30 s or ATKT 45 s. Performers are asked to warm-up, kick test from 3 s to 5 s, and get a complete rest before starting the official test.

Statistics

Descriptive statistics and Pearson correlation to examine the relationship between the tests with the statistical significance at the threshold $P < 0.05$. Use unpaired Student's t-test to compare between two subject groups.

RESULTS AND DISCUSSION

The purpose of this study was to evaluate the concurrent efficacy of the ATKT using WAnT as the standard test and verify that the ATKT was similar when using WanT to access two taekwondo groups or not [Table 2].

Any technique that wants to score points in taekwondo must meet speed and strength (Roosen and Pain, 2006). Several studies have attempted to evaluate the force of action using measuring systems with Newtons force (Falcó *et al*., 2011; Sullivan *et al*., 2009) but others are in kilograms of force (Chiu *et al*., 2007) or in joules (Del Vecchio *et al*., 2011) and also in units of gravity acceleration (g) (Sant Ana *et al*., 2014).

Furthermore, electronic body guards used in official taekwondo matches record the impact with joules. Del Vecchio *et al*. (2011) have published data recorded absorption by electronic armor protecting the body in taekwondo competitions ranging from 211 ± 34 joules in athletes under 51 kg to 262 ± 49 joules in adult 67–78 kg athletes.

However, in practice, it is possible to use ball kick techniques with high repetition frequency to form skills, tricks, and increase speed to achieve force efficiency when colliding with target. In this study, we used blow frequency to quantify sphere kicks and calculated whether the level correlates with WanT results. In modern sport, most national athletes are judged by WanT, although the nature of the technique differs between sports, the performance on the dynamometer is quite familiar. Except for some specific sports where the upper body and arms are dominant, the manual pedal can be used in a standing position, instead of cycling with the usual foot. It is advisable to prove that some pedagogical tests are closest to the competitive technique and still measure some qualities, and test the continuous bipedal kick in taekwondo for a time of 30 s or 45 s should also be encouraged. Data in Table 2 show that both 30 s and 45 s kick tests have correlated with RPP peak power and anaerobic RAP power.

The student group correlated a very high 0.85–0.95, while the athlete group correlated an average of 0.6–0.76. Fatigue index (FI) was related to athlete group, but no evidence was found in the student group. It is possible that the WanT performance of the student group is quite different at maximum PP peak power and lowest PP peak power, which leads to very low correlation.

In addition, there is evidence that there is a strong correlation between the two round kick test with the squat jump-SJ (r = 0.78 for the 30 s kick and r = 0.69 for the 45 s kick) in the student group, correlating the average in this group for the CMJ (r = 0.58 at 30 s kick and r = 0.54 at 45 s kick). For the group of athletes, the correlation was only average for the 30 s kick and SJ with jump height-JH (r = 0.54) and power jump-PJ (r = 0.68), however, the correlation value was high between the 30 s kick and CMJ with jump height-JH (r = 0.84) and jump power-PJ (r = 0.87). Average correlation value (r = 0.57) in the 45 s kick and power jump-PJ in the CMJ test.

Thus, using the kicks in the martial arts hall with a time of 30 s or 45 s calculating the frequency of execution can predict the athlete's anaerobic power and jump ability, which is common in taekwondo matches that are moving, jumping, and swinging. However, if possible, it is advisable to use modern equipment to accurately assess how their abilities are accumulated through each training period such as WanT or SJ and CMJ through ergometer bike or force plate.

Table 2: Correlation between kick performance and jump power and anaerobic power

		WanT			SJ		CMJ	
		RPP (W/kg)	RAP (W/kg)	FI	JH (cm)	PJ (W/kg)	JH (cm)	PJ (W/kg)
Students (*n*=7)	30 s kick	0.85	0.95	0.03	0.24	0.78	0.36	0.58
	45 s kick	0.93	0.89	0.13	0.13	0.69	0.27	0.54
Junior athletes (*n*=8)	30 s kick	0.60	0.65	0.55	-0.01	0.12	0.89	0.84
	45 s kick	0.69	0.76	0.52	0.51	0.68	0.29	0.57

WanT: Wingate anaerobic test; SJ: Squat jump; CMJ: Countermovement jump; RPP: Relative peak power; RAP: Relative anaerobic power; FI: Fatigue index; JH: Jump height; PJ: Power jump; PP: Peak power

Table 3: Performance of kick, WanT, and power jump

		WanT			SJ		CMJ		30 s kick	45 s kick
		RPP (W/kg)	RAP (W/kg)	FI	JH (cm)	PJ (W/kg)	JH (cm)	PJ (W/kg)		
Students	*n*=7	10.6	8.4	36.8	47.4	23.5	44.0	28.8	64.3	95.9
		1.3	0.5	12.7	6.0	1.9	1.9	3.1	3.8	4.3
Junior athletes	*n*=8	13.0	13.4	28.6	54.1	23.0	47.9	30.3	59.6	87.8
		2.0	2.6	9.5	5.9	2.6	2.7	2.8	3.2	4.1

Table 4: Comparison of performance between student group and athletes group.

	WanT			SJ		CMJ		30 s kick	45 s kick
	RPP (W/kg)	RAP (W/kg)	FI	JH (cm)	PJ (W/kg)	JH (cm)	PJ (W/kg)		
T	2.847	5.654	1.426	2.230	0.423	3.468	1.023	2.635	4.416
P-value	0.013	0.000	0.182	0.044	0.679	0.004	0.327	0.022	0.001

Looking at the parameters in Table 3, it can be seen that the student group, despite having a larger age and higher in 30 s kick and 45 s kick records, but other indicators performed on laboratory equipment seemed lower. It can be seen that with the advantageous height, the group of athletes that have the advantage for jumping and bounce movements is higher in SJ test (54.1 cm vs. 47.4 cm) and better in CMJ test (47.9 cm compared to 44.0 cm). WanT anaerobic capacity in athletes group was better than the student group with $P < 0.05$. Although FI was different, not statistically significant with $P = 0.182$.

Exploiting training information shows that athletes systematically exercise 6 days/week, 2 sessions/day, and regularly exercise with tools and weights, so they can explain higher test performance in student group and statistically significant with $P < 0.05$. The jump power was not significantly higher and the difference was not statistically significant with $P = 0.6679$ (PJ in SJ test) and $P = 0.327$ (PJ in CMJ test) [Table 4].

CONCLUSION

The study results show that 30 s kick and 45 s kick have correlation with WAnT, especially RPP and RAP indicators, so these both pedagogical tests are considered as specific taekwondo professional tests to evaluate anaerobic fitness of taekwondo athletes. The study also shows the importance of muscle strength in these two pedagogical tests when there is evidence of the relationship between SJ and CMJ in the PJ index and kick frequency. A key point in this study is to measure exercise effort and it has created a series of modalities that can assist in the evaluation of anaerobic training of taekwondo athletes.

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Review Article

Assessment of the reliability of the banking tests based on the results of the submission for specialized students in Physical Education Department, University of Education, Thai Nguyen University

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ABSTRACT

Reliability is an important criterion in evaluating a test. Periodically evaluating the reliability of testing methods is a requirement of training program accreditation. The assessment of the reliability of the entire bank of tests which includes multiple forms such as multiple choice, essays, oral presentations, and practices is a difficult problem. The article proposes to assess the reliability of the bank of examination questions for students majoring of Physical Education Department in University of Education – Thai Nguyen University by statistical method based on the final examination results.

Keywords: Assessment, Reliability, Examination question bank, Physical education major.

RATIONALE

Assessment is a very important stage in the teaching process; it is a tool for teachers to evaluate the learners' absorption level, thereby adjusting the knowledge provided to learners in accordance with the next level collection. For a test, four important criteria to be met are validity, reliability, feasibility, and distinction. In the training program, accreditation criteria attached to the Decision No. 474/decided by Thai Nguyen University, dated May 22, 2012, criterion 4.4 stipulates "The reliability and validity of the assessment methods evaluation period."

Reliability of a test is the consistency where a test consistently accurately evaluates an object at different times Harrison. Reliability is a must of examination questions, tests to accurately assess learners' learning results. Confidence can be increased by adding more uniform questions (increasing the length of the examination) or increasing the distinction of questions.[1]

Until now, there are many studies on the reliability of the tests. However, there are no studies to mention the reliability of essay examinations, oral examinations, and practice tests. As required by the training program accreditation criteria, the unit that develops and operates the training program must regularly verify the reliability of the testing methods. At the University of Education – Thai Nguyen University, in the form of essay examination, each test, examination questions are randomly taken by the testing laboratory and education quality assurance department by a computer software from a bank of examination questions developed by the faculties and departments of the university. The number of examination questions depends on the number of candidates, ensuring that each examination has two examination questions. Therefore, it is difficult to evaluate the entire bank of essay questions, due to being randomly selected, some questions are used repeatedly but some questions have not been selected once after many exams. Statistically, we found that, after 5 times of organizing

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examinations for the modules, about 70% of the questions in the examination bank were used. Therefore, we propose to use statistical methods, analyzing examination results to assess the reliability of examination question banks of all modules being taught to major students of students physical education (public education) at university of education.

SELECTING METHODS FOR ASSESSMENT OF RELIABILITY OF TEST BANKS

Twice Test Method Used to Determine the Reliability of a Multiple-choice Test

This method was proposed by Henning (1987) and Shohamy (1985), according to this method, a test is tested twice for the same student in a period of not more than 2 weeks, provided the learner does not review again. The reliability of the test in this case is calculated simply as follows:

$$r_{tt}=R_{1,2}$$

In which:

r_{tt}: Test reliability.
$R_{1,2}$: Correlation between the results of two tests on the same subject.

However, this method is not objective enough because it is not sure that the learner does not review between two tests.[2]

Method of Dividing the Test to Calculate the Reliability of the Test

In this method, the test is divided into two equal parts, for example, one full even sentence, one whole odd sentence and the test is conducted on the same object. After marking each section separately, the correlation of the results was compared.

The more similar scores for the two sections, the more valuable the test is. The Spearman formula is used to calculate the correlation coefficient:[3]

$$R_{tt}=\frac{2R_{AB}}{1+R_{AB}} \quad (1)$$

In which:

R_{tt}: Is the reliability coefficient by the split method.
R_{AB}: Is the correlation coefficient between the scores of the two test parts.

To calculate the correlation coefficient between the two parts of the test (R_{AB}), one can use the formula:

$$R_{AB}=1-\frac{6\sum D^2}{n(n^2-1)} \quad (2)$$

Inside:

R_{AB}: Is the Spearman correlation coefficient
D: The difference in scores of the two test sections
n: Number of tests

If R_{AB}:

- + (0.8–1.0) good correlation (high confidence)
- + (0.6–0.8) moderate correlation (medium confidence)
- + (0.4–0.6) poor correlation (low confidence)
- + (0.2–0.4) the correlation is very poor (very low confidence).

However, both Bachman (1990) and Henning (1987) argued that the split reliability may not yield accurate results because the confidence may vary depending on the test layout.[4]

Kuder–Richardson 20's Formula for Calculating Test Reliability

To overcome the weaknesses, Henning (1987) gave some formulas for calculating reliability:

$$R_{tt}=\frac{n}{n-1}\left(\frac{S_t^2-\sum S_i^2}{S_t^2}\right) \quad (3)$$

Inside:

R_{tt}: Reliability
n: Number of questions in the test
S_t^2: Square of the standard deviation (SD)
$\sum S_t^2$: The total score difference of all questions.

Kuder–Richardson's Formula 21 for Calculating Test Reliability

However, Kuder–Richardson's 20 formulas are difficult to calculate. In the absence of calculating the difference in scores for each question, the following formula[5] is recommended:

$$R_{tt}=1-\frac{\bar{x}-(K-\bar{x})}{K(SD)^2} \quad (4)$$

Inside:

$\bar{x}$: Average score (Mean)
$(SD)^2$: Square of the standard deviation (SD)
K: Number of questions in the test

Bachman (1990) argues that fundamentally, although the above two formulas are calculated differently, they all give the same results because the difference of the score is equal to the standard deviation. Henning (1987) stated that the test

Table 1: Summary of general data for 2 school years

No.	School year	Semester	No. of subjects	No. students examined	Type of questions			
					Writing	Answering	Practicing	Multiple choice on computer
1	2016–2017	Semester 1	48	836	21	10	11	6
2		Semester II	51	1178	29	12	5	5
3		Summer Semester	26	733	12	5	7	3
4	2017–2018	Semester I	65	1857	20	7	29	9
5		Semester II	41	1235	12	4	22	3
6		Summer Semester	35	979	12	4	14	5
Total			266	6.818				

reliability is in the range from 0 to 1 with the higher the value the more reliable the test is.

RESULTS OF ANALYSIS

To partially assess the reliability of the final examination questions for students majoring in physical education of Thai Nguyen University of Education recent years, the authors analyzed and evaluated the results of the final examination section of the past 2 school years (school year 2016–2017; 2017–2018) by statistical method with all modules in those 2 school years and comparing the scores of the modules at different times.

Analytical Method

The selected data are all the results of the final examinations of the 2 academic years 2016–2017 and 2017–2018, compiled on the basis of the academic transcripts, including 31 courses with 528 students taking examinations. The modules with the same name are taught in two different courses as a basis for comparison. Data were entered into Excel software, processed by MATLAB software.[6] Descriptive statistical indicators are calculated including: Number of tests, average score, standard deviation, and the number of test scores in the two margins of the score range is from 0–1 and 9–10. The rating levels under the equivalent credit system include F (<4); D (4–5.4); C (5.5–6.9); B (7.0–8.4); and A (score 8.5 or above) are calculated as the basis for assessing the concentration of the result domain of each module.

The authors analyzed the test results of the modules and considered whether to ensure that the distribution of the scores is relatively balanced between the assessment levels with the recommendation of the average score should be in Clause 5.5 with a standard deviation of between 1.5 and 1.8. This result domain is equivalent to about 60% of the test with the equivalent from product D to product B, ensuring student classification.

Table 2: Summary of modules with the highest and lowest GPA

No.	School year	Semester	Average score		Note
			Highest	Lowest	
1	2016–2017	Semester I	8.84	3.11	
2		Semester II	8.38	3.46	
3	2017–2018	Semester I	8.65	3.23	
4		Semester II	8.35	2.83	

With a total of 266 sessions, 6818 examinations including oral, multiple-choice essay examinations and practices, the module with the highest number of examinations is the physical education module with 1857 examinations. The highest and lowest GPA in the two school years 2016–2017; 2017–2018; the lowest GPA of each semester is shown in Table 2;

Analyzing Each Semester, Dividing the Average Score into three Ranges, We Have the Following Specific Data

Through the above analysis, data table show that the number of modules with average scores from 5.60 to 9.0 always accounts for a high percentage compared to the average from 5.0 to 5.59. This average also shows that currently the number of units with a too low or too high GPA is always a large proportion, creating an imbalance between grades in many modules.

Analysis Based on the Number of Examination Scores that Are Too Low or High

The report summarizes the data of the modules with the number of examinations with too low scores (0–1) and too high (9–10) scores.

From the table above, it shows that the Basic principles of Marxism – Leninism; Sports Physiology; Sports Measurement and Education subject have a high number of 0–1 examinations and are repeatable over the years. Sports History subject has a score of 9–10 with too many cards 174/345 (50.43%). Analyze

Table 3: Results of analysis of average scores for each specific range

No.	School year	Semester	Average score from 0 to 4.98	Average score from 5.0 to 5.59	Average score from 5.60 to 9.0	Total
1	2016–2017	Semester I	13	6	29	48
2		Semester II	15	9	27	51
3		Summer Semester	5	4	17	26
Total			33	19	73	125
4	2017–2018	Semester I	12	13	40	65
5		Semester II	11	7	23	41
6		Summer Semester	18	3	14	35
Total			41	23	77	141

Table 4: Summary of modules with the lowest score (0–1) and highest (9–10) scores

No.	School year	Semester	Number of test score 0–1 and 9–10		Note
			Lowest 0–1	Highest 9–10	
1	2016–2017	Semester I	135/328 – (41.15%) Specialized English	31/276 (11.23%) Method and Theory Physical Education	
2		Semester II	143/368 – (38.85%) Marxist Officials – Lenin 30/364 – (8.24%) Sports Medicine	76/363 – (20.9%) Theory of Statistic	
3	2017–2018	Semester I	131/414 – (31.6%) Physical Education Measurement	174/345 – (50.43%) Physical Education – History	
4		Semester II	129/277 – (46.57%) Education	22/216 – (10.18%) Physical Education – Psychology	

Unit: Number of examinations

Table 5: Analysis table of standard deviation

No.	School year	Semester	Standard deviation 0–1.49	Standard deviation 1.5–1.8	Standard deviation over 1.81	Total
1	2016–2017	Semester I	29	23	50	102
2		Semester II	35	28	46	109
3		Summer Semester	16	8	37	61
Total			80	59	133	260
4	2017–2018	Semester I	45	28	66	139
5		Semester II	37	21	30	88
6		Summer Semester	28	16	34	78
Total			110	65	130	305

from the standard deviation of modules. From the statistical points, the authors analyzed the standard deviation of test scores for each module, as follows:

The above analysis shows that, in both school years, the number of modules with standard deviation from 1.5 to 1.8 always accounts for a much smaller percentage than the other two groups of degrees. The standard deviation of 1.81 or higher is always twice as much as the set group with a standard deviation of 1.5–1.8. Through the results, we also realize that there is a large difference in the value of each evaluation time compared with the average value.

CONCLUSION

Analyzing and evaluating examination questions – testing is a very necessary thing but still gets little attention in many places. As a result, later examinations often repeat the mistakes

of previous examinations. The analysis and evaluation of questions will help us better understand the quality of the examination and the quality of the students. However, the complexity of the analysis, assessment of questions is highly dependent on the question format used in the examination.

In fact, it has been very difficult to analyze and evaluate essay questions. It is very difficult to assess the difficulty of these questions, it is difficult to identify ambiguous essays to eliminate or correct them. Meanwhile, with multiple-choice questions, there are quite a few softwares to analyze and evaluate. As a result, multiple-choice questions are regularly improved, removing or correcting unclear questions, improving the reliability, and validity of examination questions – testing.

Due to not paying attention to examination analysis, there is no pre-test so some examinations – testing is too easy or too difficult for students' ability. The problem is too easy, leading to the results of students doing too well, so they are criticized by society for chasing achievements, not reflecting the ability of students. Difficult topics lead to poor students' homework results, so they are criticized by society for their low quality of education. However, assessing the quality of education, by looking only at the scores, is a very inaccurate assessment because the score depends a lot on the difficulty of the test and the subjectivity of the examiner. It is not possible to compare results of two different examinations when examination papers are of different difficulty levels. The same examination but given by different people also leads to differences.

An overall assessment of the reliability of bank end-of-course examinations.

Through the analysis of the special scores, the average score and the standard deviation compared to the average of the modules in the 2 school years show that many modules have too low or too high test scores, deviations. There is a large gap in the standard compared to the average score.

RECOMMENDATIONS

To improve the accuracy of this method, it is necessary to conduct analysis of examination results after each examination and much comparative analysis will ensure the reliability and accuracy of examination question bank, main.

Subjects in the department must seriously implement the activities of periodic review and bank assessment of examination questions, to draw out strengths and weaknesses, problems to be overcome in the stage of banking construction questions, and test questions.

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Research Article

A comparative study on physical structure and physical performance of power lifters

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ABSTRACT

The present study was executed to correlate the physical structure of power lifters and its relationship with physical performance. For this, 132 (66 state and 66 national level) power lifters were selected randomly during state and national weight lifting championships. Various body measurements including linear measurements, diameters, circumferences, and skin folds were taken by following the standard technique of Tanner *et al*. (1969). Somatotype was studied with the help of Heath and Carter method (1967). The mean, standard deviation, and independent Student's "*t*" test were computed to find out the significant difference between physique of state and national level power lifters. Coefficient of correlation was computed to find the relationship of somatotype to physical performance in power lifting. It was analyzed that national level power lifters have significantly high rate of mesomorphy, low values of endomorphy and ectomorphy rating than state level power lifters. They also perform significantly better in standing vertical Jump, maximum strength. It is concluded that endo-mesomorph type of body and explosive strength are better indicator of one's competition performance in power lifting.

INTRODUCTION

Power lifting is power involving sport. It is considered as the show of strength began to get favorable recognition and popularity all over the world. Many researchers (Tappen, 1950; Tanner, 1964; Carter, 1970; de Gray *et al*., 1974; Ward *et al*., 1979; Orvanova, 1984; Rose and Ward, 1984; Verma *et al*., 1985) have concluded that apart from the technical and physiological characteristics, the body structure and physical performance play a significant role in the degree of efficiency and the level of success in weight lifting. Studies in the sports of lifting have shown positive relationship between the structure and function (Alnoso, 1980; Chovanova, 1983; Carter, 1984; Orvanova *et al*., 1984; Katch *et al*., 1986; Stepnica, 1986; Rajni, 1994; Sodhi and Sidhu, 1994; Kanupriya *et al*., 2007). The analysis of performance and its relation to physique would discriminate the best of two contributing factors toward the competition performance.

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MATERIALS AND METHODS

One hundred and thirty-two power lifters comprising state (n = 66) and national level (n = 66) of different weight categories were taken as the subjects. Power lifters of all the weight categories were combined to form pooled group. Each subject has been measured anthropometrically by following the technique of Tanner *et al*. (1969). Somatotype was assessed using the method of Heath and Carter (1967). The mean, standard deviation, and independent Student's "*t*" test were used to find out the significant difference between physique and performance of two groups. Coefficient of correlation was computed to find the relationship of somatotype to performance. The data were analyzed with the SPSS computerized package.

RESULTS AND DISCUSSION

Table 1 shows the results of somatotype components of state and national group of power lifters. The mean values of endomorphy component for state and national group are 3.22 and 3.59, respectively, and the difference is non-significant.

Table 1: Mean values and standard deviations of various components of somatotype of state and national level power lifters

Components	State level (*n*=66)		National level (*n*=66)		"*t*" value
	Mean	SD	Mean	SD	
Endomorphy	3.22	0.69	3.59	0.81	1.32
Mesomorphy	4.56	0.80	5.14	0.80	4.10**
Ectomorphy	1.19	0.64	0.56	1.05	0.40

*Significant at 0.01 level

The mean values of mesomorphy component of weight lifters of state and national groups are 4.56 and 5.14, respectively. The high significant difference was observed ($t = 4.10$, $P < 0.01$). Similarly, the mean values of ectomorphy component for power lifters of state group are highest 0.64 and the lowest 0.56 for national group, however, the difference was non-significant.

The result on high mean values for endomorphic and mesomorphic component and lower values in ectomorphic component in higher representation group is in agreement with the finding of Stepnica (1986) in which he concluded that the lifters were supposed to have high mesomorphic component for strength training.

The mean values of various physical performance tests of state and national power lifters groups are presented in Table 2. The average values of 50 m dash for state and national group are 7.38 and 7.27 s, respectively. The mean values of standing vertical jump for state level power lifters are lowest 60.12 and the highest 63.08 for national group. It is evident that power lifters having national participation to their credit were found to possess significantly ($P < 0.05$) high values of SVJ than their counterparts. The best 1 RM each of bench press, squat, and dead lift for each subject were added together to give the score of total weight lifted as test of maximum strength. The mean values for maximum strength for state and national group are 502.86 kg and 517.61 kg, respectively.

Finding supports the statement of Orvanova (1984) who stated that weight lifters require very strong muscular frame. This makes them capable of applying greater dynamic strength and applying strength of static nature where weights were momentarily held in certain position during and at the finish of the lift.

The coefficient of correlation between various somatotype components with physical performance of power lifters is presented in Table 3. It is evident from the table that the endomorphy has shown negative correlation with speed and SVJ and significantly positive correlation with maximum strength, snatch, and clean and jerk. Mesomorphy component

Table 2: Mean values and standard deviations of various physical performance tests of state and national level power lifters

Tests	State level (*n*=66)		National level (*n*=66)		"*t*" value
	Mean	SD	Mean	SD	
50 m dash (s)	7.38	0.06	7.27	0.40	1.08
Standing vertical jump (in)	60.12	6.09	63.08	5.26	2.98*
Maximum strength (kg)	502.86	89.03	517.61	74.64	1.03

*Significant at 0.05 level

Table 3: The value of correlation of coefficient of somatotype to physical performance

Component	Physical performance		
	Speed	SVJ	Max. strength
Endomorphy	−0.17*	−0.09	0.18*
Mesomorphy	0.47**	0.51**	0.63**
Ectomorphy	0.12	0.19*	0.11

*Significant at 0.05 level. **Significant at 0.01 level

depicts high positive correlation with all the physical performance tests ($P < 0.05$), whereas ectomorphy has significantly positive correlation with SVJ only. It may be seen that speed, SVJ, and maximum strength as a test of performance are more a function of mesomorphic component.

CONCLUSION

On the basis of findings of this study, it may be concluded that the physique of power lifter is more a function of his physical performance, and consequently, his physical performance status is a better indicator of his competition performance. Efforts to be made to select only those individuals who have endo-mesomorph type of body and better physical performance ability as required by this iron game. Further, the test of speed, explosive power, and maximum strength used in this study seemed to be valid for predicting the performance of the power lifters.

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Review Article

Effect of training methods on physical fitness and physiological variables of kabaddi players among high school students of Warangal district

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ABSTRACT

The purpose of the study is to find out whether or not any significant difference found on physical fitness and physiological variables of kabaddi players in relation to their circuit training. The study was formulated based on the simple random sampling. The samples were collected from the 50 kabaddi players of Government Boys High School, Warangal, in the age group of 12–15 years which were considered for the study. Fifty kabaddi players have been selected for the study and they have undergone circuit training for 45 days. The pre-test was taken, and then, the post-test was administrated after the systematic training of circuit training. The following test was administrated on kabaddi players which are physical fitness variables that are speed and agility. Physiological variables pulse rate and breathing holding time. Moreover, it is finally concluded that circuit training have yielded significant differences on the physical fitness and physiological variables of high school kabaddi players it have scientifically proved better that the kabaddi players have major role to prove their physical fitness in the performance of the game the physical fitness variables, namely, speed, explosive power, agility, and endurance.

Keywords: Circuit training, Endurance, Physical fitness

INTRODUCTION

Circuit training is an excellent means to improve endurance, speed, and strength. Circuit training involves 6–12 exercise stations with exercises for various muscle groups of the abdomen, back, legs, and arms arranged in a circle. Circuit training is based on the principle of easy to severe, simple to complicated, and general to specific exercises. In addition to endurance, speed, and strength, circuit training can also help develop resistance power with the help of a partner. Circuit training is a type of exercise also known as interval training. It combines resistance exercise with aerobic exercise that is performed in intervals. Circuit training gyms have stations set up in an alternating fashion from a resistance machine to a jogging platform or bike for cardio exercise. This type of exercise can be done outside of a circuit training gym by simply alternating between resistance and cardiovascular exercise.

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Physical fitness is a multifaceted continuum extending from birth to death, affected by physical activity; it ranges from optimal activities in all aspects of life through high and low levels of different physical fitness to serve disease and dysfunction. A fit nation can be economically progressive if the citizens have sufficient capacity to work efficiently and gain in productivity. Hence, health must be regarded as a normal and primary need of the community. It is a primary factor it helps the growth and development of the body. An optimum growth is important for efficient existence in a biologically adverse and economically competitive world. Health is a basic need for the development of physical skills, agility, strength, and endurance necessary to execute the daily routine work. Health is required to plan a daily program of healthful physical activities so that people develop vitality and skills for an efficient and economic adult life.

Physiology

Human physiology is the science of the mechanical, physical, and biochemical functions of humans in good health, their organs, and the cells of which they are composed. The principal level of focus of physiology is at the level of organs and systems. Most aspects of human physiology are closely homologous to corresponding aspects of animal physiology, and animal experimentation has provided much of the foundation of physiological knowledge.

Significance of the Study

The various actions in kabaddi are so fast that it is difficult to justify the performance of a player without analyzing them. It is also essential to ascertain development of players in various factors affecting performance. The top most teams in national or international have come up because they have evaluated performance of their players in training and competitions and worked hard to reach world level through long-term systematic and scientific training. This study is to analysis the effect of circuit training on physical fitness and physiological variables on kabaddi players.

Objectives of the Study

The purpose of the study is to find out whether or not any significant difference found on physical fitness and physiological variables of kabaddi players in relation to their circuit training.

Hypothesis

- There may not be any significant difference on pre-test and post-test of physical fitness variable, that is, speed of kabaddi players in relation to their circuit training
- There may not be any significant difference on pre-test and post-test of physical fitness variable, that is, agility of kabaddi players in relation to their circuit training
- There may not be any significant difference on pre-test and post-test of physiological variable, that is, pulse rate of kabaddi players in relation to their circuit training
- There may not be any significant difference on pre-test and post-test of physiological variable, that is, breathing holding of kabaddi players in relation to their circuit training.

Design of the Study

The study has focused the following experimental design.

Sample of the Study

The study was formulated based on the simple random sampling. The samples were collected from the 50 kabaddi players of Government Boys High School, Warangal, in the age group of 12–15 years which were considered for the study.

Sample of the study

Category of the subjects	Number of subjects
Kabaddi players	50

Tools Used

The following physical fitness and physiological parameters were administrated on high school kabaddi players after systematic training of circuit training.

- Physical fitness variables
- Speed and agility
- Physiological variables
- The Harvard step test (pulse rate – 1 min), breath holding time (1 min).

Data Collection Procedure

Fifty kabaddi players have been selected for the study and they have undergone circuit training for 45 days. The pre-test was taken, and then, the post-test was administrated after the systematic training of circuit training. The following test was administrated on kabaddi players which are physical fitness variables that are speed and agility. Physiological variables pulse rate and breathing holding time.

There were six stations in the circuit training program. In the first station, high knee action was performed, pushups in the

Table 1: Mean values, SD, df, *"t"* value, and *P* value between pre-test and post-test of kabaddi players in relation to their speed

Subjects	*n*	Mean	S.D.	df	"*t*" ratio	*P*-value
Pre-test	50	8.74	0.5188	98	3.067	0.00
Post-test	50	11.02	0.5842			

Table 2: Mean values, SD, df, *"t"* value, and *P* value between pre-test and post-test of Kabaddi players in relation to their agility

Subjects	*n*	Mean	S.D.	df	"*t*" ratio	*P*-value
Pre-test	50	9.36	1.212	98	4.23	1.563
Post-test	50	10.26	1.865			

Table 3: Mean values, SD, df, *"t"* value, and *P* value between pre-test and post-test of kabaddi players in relation to their pulse rate

Subjects	*n*	Mean	S.D.	df	"*t*" ratio	*P*-value
Pre-test	50	101.88	1.36	98	2.461	0.00
Post-test	50	126.56	2.12			

Table 4: Mean values, SD, df, *"t"* value, and *P* value between pre-test and post-test of kabaddi players in relation to their breathing holding time

Subjects	*n*	Mean	S.D.	df	"*t*" ratio	*P*-value
Pre-test	50	34.98	3.79	98	2.682	0.01
Post-test	50	32.67	1.62			

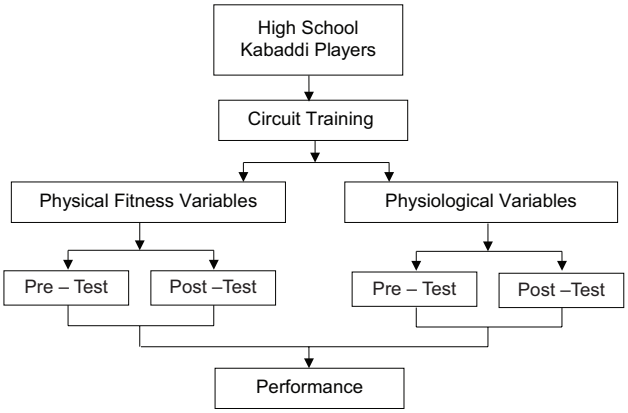

Figure 1

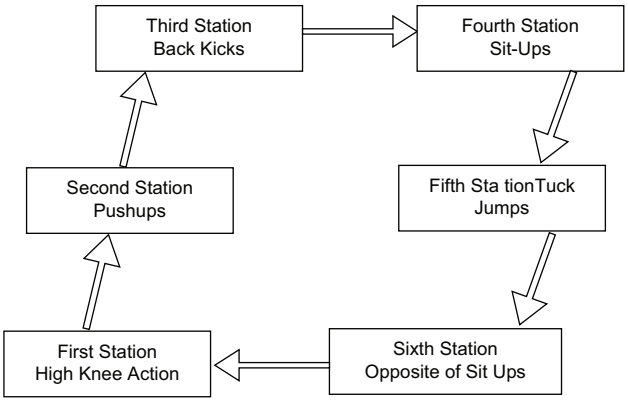

Figure 2

second station, back kicks in the third station, sit ups in the fourth station, tuck jumps in the fifth station, and opposite of sit ups in the sixth station. Pre-test was conducted in the selected physical and physiological variables. After 6 weeks of training program, post-tests were conducted. The training program was scheduled from 3:30 pm to 4:30 pm on all week days.

CONCLUSION

Moreover, it is finally concluded that circuit training have yielded significant differences on the physical fitness and physiological variables of high school kabaddi players it have scientifically proved better that the kabaddi players have major role to prove their physical fitness in the performance of the game the physical fitness variables, namely, speed, explosive power, agility, and endurance. In the present scenario, the tactical standards in kabaddi game have been playing a significant role in the creeping performance of the modern game of kabaddi.

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Research Article

An analytical study on physical fitness variables among junior national kabaddi and kho-kho players of Telangana state

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ABSTRACT

The subjects of the study were in the age group between 18 and 20 years, 50 junior national kabaddi players and junior national kho-kho players of Ranga Reddy district were considered. The study is delimited for the Ranga Reddy district. The researcher has collected the data separately for kabaddi players and kho-kho players. The subjects were tested in three categories of physical fitness, that is, speed (50 yard dash), endurance (Cooper test 12 min run/walk), and agility (4 × 10 m shuttle run). Physical fitness is the ability to perform vigorous physical activity. It is not measured in terms of achieving specific motor skills, but rather it is assessed in terms of muscle strength, endurance, and flexibility.

Keywords: Physical activity, Physical fitness, Strength

INTRODUCTION

Physical fitness test total fitness can be defined by how well the body performs in each one of the components of physical fitness test as a whole. Some components of physical fitness test are often used in our school systems, health clubs, and fitness centers to gauge how good a shape we are truly in. Physical fitness test throughout the 20th century, scientific evidence emerged demonstrating the usefulness of strength training and aerobic exercise in maintaining overall health, and more agencies began to incorporate standardized physical fitness test. They are commonly employed in educational institutions as part of the physical education curriculum, in medicine as part of diagnostic testing and as eligibility requirements in fields that focus on physical ability such as military or police. A physical fitness test is a test designed to measure physical strength, agility, and endurance.

Significance of the Study

The study will throw some light on the different physical fitness tests of junior national kabaddi and kho-kho players. The results further help coaches, physical directors, and teaching faculty in assessment of the player's ability to take part in different activities. At last, this provides the physical education teachers. Physical directors and coaches for the purpose of guidance and counseling the individuals and classifying them and placing them in different sports and also suggest constructive steps.

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Hypotheses

1. It is hypothesized that there might be a significant difference between junior national kabaddi players and kho-kho players with regard speed
2. It is hypothesized that there might be a significant difference between junior national kabaddi players and kho-kho players with regard endurance
3. It is hypothesized that there might be a significant difference between junior national kabaddi players and kho-kho players with regard agility.

Data Collection Procedure

The subjects of the study were in the age group between 18 and 20 years, 50 junior national kabaddi players and junior national kho-kho players of Ranga Reddy district were considered. The study is delimited for the Ranga Reddy district. The researcher has collected the data separately for kabaddi players and kho-kho players. The subjects were tested in three categories of physical fitness, that is, speed (50 yard dash), endurance (Cooper test 12 min run/walk), and agility (4 × 10 m shuttle run).

RESULTS AND DISCUSSION

Table 1: Significant difference between junior national kabaddi players and kho-kho players in relation to their speed is presented

Subjects	*n*	Mean	SD	df	*t*-value	*P*-value
Kabaddi players	50	9.01	0.989	98	3.053	1.658
Kho-kho players	50	11.66	1.276			

Table 2: Significant difference between junior national kabaddi players and kho-kho players in relation to their agility is presented

Subjects	*n*	Mean	SD	df	*t*-value	*P*-value
Kabaddi players	50	9.36	1.212	98	4.23	1.563
Kho-kho players	50	10.26	1.865			

Table 3: Significant difference between junior national kabaddi players and kho-kho players in relation to their endurance is presented

Subjects	*n*	Mean	SD	df	*t*-value	*P*-value
Kabaddi players	50	2016	296.76	98	4.01	0.01
Kho-kho players	50	2264	238.62			

CONCLUSION

Physical fitness is the ability to perform vigorous physical activity. It is not measured in terms of achieving specific motor skills, but rather it is assessed in terms of muscle strength, endurance, and flexibility. The circulatory and respiratory systems are also involved because of their role in supplying muscles with blood and oxygen.

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Research Article

A comparative study on selected psychomotor abilities among baseball pitchers and cricket fast bowlers of Hyderabad district

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ABSTRACT

The study is to determine the comparative study on selected psychomotor abilities among baseball pitchers and cricket fast bowlers of Hyderabad district. The study was conducted on 100 subjects which were 50 baseball pitchers and 50 cricket fast bowlers in the age group of 18–22 years. Statistically analysis Student's t-test for independent data was used to assess the between-group differences. The level of $P \leq 0.05$ was considered statistically significant. The results of baseball pitcher and cricket fast bowler with regard to the variable selected psychomotor abilities.

Keywords: Baseball, Cricket, Psychomotor abilities

INTRODUCTION

Cricket and baseball are the best-known members of a family of related bat-and-ball games. Despite their similarities, the two sports also have many differences in play and in strategy. Even though cricket is one of the oldest organized sports, there are very few studies on the physical demands of the game. Batting and bowling are intermittent in nature with the demands placed on the players being dictated by the type of match being played. Due to this stop-start nature of cricket and baseball, accurate assessments are often difficult and as such, research is sparse and as a consequence, there are few scientifically sound training programs for cricketers. In fact, the idea that cricketers need to be well trained is a relatively new one.

Exercises in all forms of life change the atmosphere, attitude, and bring the performances into excellent rhythm to enhance of better performances on and off the field. No doubt physical fitness, especially aqua aerobics and aerobic dances, keeps the better performances on the board. Baseball players have to have of good strength in their arms to pitch and throwing to the bases. A batter needs lots of strength to hits the ball to the home run. The batter needs to connect the pitcher pitching the ball to hit a home run. Basically, one needs to have good reflexes; good vision of eye builds up good flexibility and reflection. The research on the physiological demands of bowling is sparse with the only studies available being those which included some physiological measures when assessing other aspects of these games. A key element of fast bowling is ball release speed or peak bowling speed (V-peak). Ball release speed in fast bowlers is influenced by various anthropometric, morphological, and kinematic factors. For example, higher ball release speeds in senior bowlers have been attributed to longer limb lengths and higher approach speeds than in junior bowlers.

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Objective of the Study

The study is to determine the comparative study on selected psychomotor abilities among baseball pitchers and cricket fast bowlers of Hyderabad district.

Hypothesis

There may not be any significant difference among baseball pitchers and cricket fast bowlers of Hyderabad district in relation to selected psychomotor abilities.

MATERIALS AND METHODS

The study was conducted on 100 subjects which were 50 baseball pitchers and 50 cricket fast bowlers in the age group of 18–22 years. Statistically analysis Student's *t*-test for independent data was used to assess the between-group differences. The level of $P \leq 0.05$ was considered statistically significant [Tables 1 and 2].

RESULTS AND DISCUSSION

The results pertaining to significant difference, if any, between baseball pitcher and cricket fast bowler were assessed using the Student's *t*-test and the results are presented below.

Table 3 shows the mean standard deviation, standard error of the mean, *t*-value, and *P*-value of baseball pitcher and cricket fast bowler.

Findings of the Study

The results of baseball pitcher and cricket fast bowler with regard to the variable selected psychomotor abilities. The descriptive statistics show the mean and SD values of cricket fast bowler on the subvariable speed as 4.23 and 0.18, respectively. However, baseball pitcher had mean and SD values as 4.49 and 0.22, respectively. The mean difference and standard error difference of mean were 0.05 and 0.06, respectively. The *t*-value 3.42 as shown in the table above was found statistically significant ($P < 0.05$). It has been observed that cricket fast bowler has demonstrated significantly better on speed than the baseball pitcher.

Table 1: Sample of the study

Name of the category	Number of subjects
Baseball pitchers	50
Cricket fast bowlers	50
Total	100

Table 2: Selection of variables

Variables	Tests	Criterion measure
Speed	30 m dash	Recorded to the nearest 1/100th s
Strength	Push ups	Total number of push-ups performed
Agility	Illinois agility test	Recorded to the nearest 1/100th s
Cardiovascular endurance	800 m run	Recorded to the nearest minutes/seconds
Static balance	Stork balance stand test	Recorded to the nearest 1/100th s

The descriptive statistics show the mean and SD values of cricket fast bowler on the subvariable strength as 24.9 and 3.26, respectively. However, baseball pitcher had mean and SD values as 25.67 and 2.66, respectively. The mean difference and standard error difference of mean were 0.84 and 0.674, respectively. The *t*-value 0.674 as shown in the table above was found statistically insignificant ($P > 0.05$). It has been observed that baseball pitcher has exhibited better on strength than the cricket fast bowler.

The descriptive statistics show the mean and SD values of cricket fast bowler on the subvariable agility as 15.4 and 0.36, respectively. However, baseball pitcher had mean and SD values as 15.81 and 0.31, respectively. The mean difference and standard error difference of mean were 0.09 and 0.08, respectively. The *t*-value 3.65 as shown in the table above was found statistically significant ($P < 0.05$). It has been observed that cricket fast bowler has demonstrated significantly better on agility than the baseball pitcher.

The descriptive statistics show the mean and SD values of cricket fast bowler on the subvariable cardiovascular endurance as 3.11 and 0.17, respectively. However, baseball pitcher had mean and SD values as 3.25 and 0.11, respectively. The mean difference and standard error difference of mean were 0.04 and 0.03, respectively. The *t*-value 2.59 as shown in the table above was found statistically significant ($P < 0.05$). It has been observed that cricket fast bowler has demonstrated significantly better on cardiovascular endurance than the baseball pitcher.

The descriptive statistics show the mean and SD values of cricket fast bowler on the subvariable static balance as 25.07

Table 3: The mean standard deviation, standard error of the mean, *t*-value, and *P* value of baseball pitcher and cricket fast bowler

Variables	Mean		SD		SEM	*t*-value		*P*-value
	Pitcher		Fast bowler		Pitcher	Fast bowler		Pitcher
Speed	4.23	4.49	0.18	0.22	0.05	0.06	3.42	0.0019
Strength	24.9	25.67	3.26	2.66	0.84	0.69	0.674	0.5055
Agility	15.4	15.81	0.36	0.31	0.09	0.08	3.65	0.0010
Cardiovascular endurance	3.11	3.25	0.17	0.11	0.04	0.03	2.59	0.0152
Static balance	25.07	25.93	1.98	2.43	0.51	0.63	1.07	0.2939

*Significant at 0.05 level degree of freedom=28

and 1.98, respectively. However, baseball pitcher had mean and SD values as 25.93 and 2.43, respectively. The mean difference and standard error difference of mean were 0.51 and 0.63, respectively. The *t*-value 1.07 as shown in the table above was found statistically insignificant ($P > 0.05$). It has been observed that baseball pitcher has shown better static balance than the cricket fast bowler.

CONCLUSION

It is concluded from the above findings that the significant difference was found in the speed ability – 30 m sprint test, the cricket fast bowler group had better speed in comparison to the baseball pitcher group. Because fast bowler does not have the luxury of standing in one spot to deliver the ball. Fast bowlers run in, on average, 25 yards (22 m) every delivery. The insignificant difference was found in the strength ability – push up test, the baseball pitcher had better shoulder strength in comparison to the cricket fast bowler. While comparing the mean value of strength, it was found that pitcher has better shoulder strength as compared to fast bowler. The outcome of results might be due to the pitcher makes every pitch until a point where the coach replaces the tiring pitcher with a relief pitcher and a succession of pitchers may come into the game in sequence until it ends. Pitcher uses their full arm strength in the practice and competition while pitching resulting which pitcher had perform better on the pushups, while comparing the mean of fast bowler. In cricket, multiple bowlers begin the game, with those not actively bowling spending time as fielders. Bowlers alternate bowling over's of six balls each, moving to fielding positions to rest before returning to bowl again later in the game. The significant difference was found in the agility – Illinois agility test, the cricket fast bowler group had better agility in comparison to the baseball pitcher group. The significant difference was found in the cardiovascular endurance – 800 m run test, the cricket fast bowler group had better cardiovascular endurance in comparison to the baseball pitcher group. Fast bowlers run in, on average, 25 yards (22 m) every delivery. In a day, where a bowler sends down 15 over's (with 6 balls in each over), they have run 2250 yards (1980 m). Moreover, it is not just a jog; either every ounce of energy the bowler has goes into each delivery. The insignificant difference was found in the static balance – stork balance stand test, the baseball pitcher had better body balance in comparison to the cricket fast bowler.

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Research Article

Attitude of Banjara community girls and their parents toward participation in physical education and sports activities

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ABSTRACT

The main purpose of the study was to examine the attitude of Banjara community girls and their parents toward participation in physical education and sports activities. This is an analytical descriptive type of study. For the present study, 20 high schools were selected randomly from Aurangabad district. From each school, 10 Banjara community girls and their parents were selected. In this study, attitude of Banjara community girls and their parents toward physical education and sports activities were measured by self-developed questionnaire. After analysis, it is observed that there is a significant difference between the attitude of Banjara community girls and parents toward physical education and sports, because mean of parents is 82.22 which is greater than mean of Banjara community girls is 72.14 and there mean difference is 9.09. Standard deviation of parents is 9.23 and the S.D of girls is 13.02 and their combine standard error is 2.9. The value of calculated "*t*" is 3.14, which is shown greater than tabulated "*t*" (1.97) at 0.05 level of confidence. This is the indication that there is a significant difference between Banjara community girls and parents. Thus, it shows that the attitude of parents is more positive toward physical education and sports than their daughter.

INTRODUCTION

The position of Banjara community girls in tribal society context is heavily discussed issue, especially in contemporary world. It is very much understandable that Banjara community does not separate men and women in terms of gender role. Infect Banjara community gives vital significance to education for both men and women. Turning the significance of sports and physical activities in Banjara community, it is pertinent to note that Banjara community considers sports and leisure activities as a significant element of human life, health is view as one of the greatest blessing in Banjara community context.

A study conducted by Knop, P.D. shows that the role of young Banjara community girls in West Europe and sports is a challenging circumstance which required getting more consideration, particularly in the school. However, the research has explored that a number of girls have positive approach regarding sports. Nevertheless, Banjara community girls sports participation level is below average to compare with other adolescents. The researcher assumes that this diversion is mainly due to the community constraints concerning female sports participation. Banjara community schools have argued that Banjara community does not obstruct females participation in sport and physical education, rather impose some specific rules which are required to be followed while doing such physical activities. The research is offered on the basis of the argument that if school system adopts some principles and makes new rules to facilitated those students that are having community obligation. Then, it would encourage the students at the one hand and would develop understanding between the teacher and students on the other. Consequently, it is necessary to interpret the attitude of Banjara community girls and their parents toward physical education and sports.

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Purpose of the Study

The main purpose of the study was to examine the attitude of Banjara community girls and their parents toward participation physical education and sports activities. The allied purposes were stated as below.

1. It was to find out the attitude of Banjara community girls students toward physical education and sports
2. It was to find out the attitude of Banjara community parents toward physical education and sports
3. It was to find out the difference of attitude of Banjara community girls and their parents toward physical education and sports.

METHODOLOGY

This is an analytical descriptive type of study. For the present study, 20 high schools were selected randomly from Aurangabad district. From each school, 10 Banjara community girls and their parents were selected. Age of girls students was ranged between 13 and 16 years. In this study, attitude of Banjara community girls and their parents toward physical education and sports were measured by self-developed questionnaire. All versions were scored on the 5-point Likert scale. All the items were given a score of 5 for strongly agree, 4 for agree, 3 for undecided, 2 for disagree, and 1 for strongly disagree for assertive questions. Whereas for negative question, it is starts from 1 score and finish with 5 score. The sum of these scores gives the attitude score for the subjects.

Analysis of the Data

The statistical analysis of the data gathered to know the attitude of Banjara community girls students and their parents toward physical education and sports is given below.

Table 1 reveals that Banjara community girls students strongly agree 102.22 rating score, for agree, it is 96, for undecided, it is 2, for disagree, it is 5, and for strongly disagree, it is zero.

Table 1: Banjara community girl's students, attitude toward physical education, and sports in terms importance of academic developmental under the heading curriculum, planning of sports participation

Agreement	Fo	Fe	χ^2
Strongly agree	102.22	42.25	2.86
Agree	96	42.25	1.94
Undecided	2	42.25	0.95
Disagree	5	42.25	0.72
Strongly disagree	0	42.25	1
Total		χ^2	7.47

Df=4, *t*=9.488, *P*=0.05

The total χ^2 for above given statement is 7.47 and the table value of χ^2 at 4 degree of freedom and 0.05 level of significance is 9.488. Thus, the obtained χ^2 is lesser than the table of χ^2, it is concluded that the five frequencies differ from each other.

Table 2 reveals that Banjara community girls students strongly agree 85.72 rating score, for agree, it is 80.81, for undecided, it is 19.71, for disagree, it is 10.52, and for strongly disagree, it is 0.12.

The total χ^2 for above given statement is 4.06 and the table value of χ^2 at 4 degree of freedom and 0.05 level of significance is 9.488. Thus, the obtained χ^2 is lesser than the table of χ^2, it is concluded that the five frequencies differ from each other.

Table 3 reveals that Banjara community girls students strongly agree 68 rating score, for agree, it is 107, for undecided, it is 17.5, for disagree, it is 10.1, and for strongly disagree, it is 0.

The total χ^2 for above given statement is 5.84 and the table value of χ^2 at 4 degree of freedom and 0.05 level of significance is 9.488. Thus the obtained χ^2 is lesser than the table of χ^2, it is concluded that the five frequencies differ from each other.

Table 2: Banjara community girl's students, attitude toward physical education and sports in terms importance of social development under heading of socially adjusted behavior, team work, and gaining social status

Agreement	Fo	Fe	χ^2
Strongly agree	85.72	37.54	1.34
Agree	80.81	37.54	1.14
Undecided	19.71	37.54	0.25
Disagree	10.52	37.54	0.45
Strongly disagree	0.12	37.54	0.88
Total		χ^2	4.06

Df=4, *t*=9.488, *P*=0.05

Table 3: Banjara community girl's students, attitude toward physical education, and sports in terms importance of leadership qualities inculcating through participation in games and sports

Agreement	Fo	Fe	χ^2
Strongly agree	68	39.42	0.45
Agree	107	39.42	3.12
Undecided	17.5	39.42	0.34
Disagree	10.1	39.42	0.93
Strongly disagree	0	39.42	1
Total		χ^2	5.84

Df=4, t=9.488, *P*=0.05

Table 4 reveals that Banjara community girls students strongly agree 67.66 rating score, for agree, it is 67.21, for undecided, it is 17, for disagree, it is 15.55, and for strongly disagree, it is 8.24.

The total χ^2 for above given statement is 3.15 and the table value of χ^2 at 4 degree of freedom and 0.05 level of significance is 9.488. Thus, the obtained χ^2 is lesser than the table of χ^2, it is concluded that the five frequencies differ from each other.

Table 5 reveals that Banjara community parents strongly agree 148 rating score, for agree, it is 42.5, for undecided, it is 0, for disagree, it is 6.7, and for strongly disagree, it is 45.

The total χ^2 for above given statement is 6.55 and the table value of χ^2 at 4 degree of freedom and 0.05 level of significance is 9.488. Thus, the obtained χ^2 is lesser than the table of χ^2, it is concluded that the five frequencies differ from each other they have same attitude.

Table 6 reveals that parents strongly agree 118 rating score, for agree, it is 78.9, for undecided, it is 20.7, for disagree, it is 0, and for strongly disagree, it is 0.33.

The total χ^2 for above given statement is 5.8 and the table value of χ^2 at 4 degree of freedom and 0.05 level of significance is 9.488. Thus, the obtained χ^2 is lesser than the table of χ^2, it is concluded that the five frequencies differ from each other.

Table 4: Banjara community girl's students, attitude toward physical education, and sports in terms of mental development

Agreement	Fo	Fe	χ^2
Strongly agree	67.66	34.22	0.96
Agree	67.21	34.22	0.91
Undecided	17	34.22	0.34
Disagree	15.55	34.22	0.29
Strongly disagree	8.24	34.22	0.52
Total		χ^2	3.15

Df=4, t=9.488, P=0.05

Table 5: Banjara community parents, attitude toward physical education, and sports in terms importance of academic developmental under the heading, curriculum, and planning of sports participation

Agreement	Fo	Fe	χ^2
Strongly agree	148	47.42	4.49
Agree	42.5	47.42	0.11
Undecided	0	47.42	1
Disagree	6.7	47.42	0.74
Strongly disagree	45	47.42	0.21
Total		χ^2	6.55

Df = 4, t = 9.488, P = 0.05

Table 7 reveals that parents strongly agree 180 rating score, for agree, it is 70, for undecided, it is 0, for disagree, it is 0, and for strongly disagree, it is 0.

The total χ^2 for above given statement is 12.6 and the table value of χ^2 at 4 degree of freedom and 0.05 level of significance is 9.488. Thus, the obtained χ^2 is lesser than the table of χ^2, it is concluded that the five frequencies differ from each other.

Table 8 reveals that Banjara community parents strongly agree 55 rating score, for agree, it is 74.5, for undecided, it is 3.7, for disagree, it is 6.6, and for strongly disagree, it is 53.2.

Table 6: Banjara community parents, attitude toward physical education, and sports in terms importance of social development under heading of socially adjusted behavior, team work, and gaining social status

Agreement	Fo	Fe	χ^2
Strongly agree	118	42.8	2.77
Agree	78.9	42.8	0.78
Undecided	20.7	42.8	0.27
Disagree	0	42.8	1
Strongly disagree	0.33	42.8	0.98
Total		χ^2	5.8

Df=4, t=9.488, P=0.05

Table 7: Banjara community parents, attitude toward physical education, and sports in terms importance of leadership qualities inculcating through participation in games and sports

Agreement	Fo	Fe	χ^2
Strongly agree	180	42.9	9.46
Agree	70	42.9	0.16
Undecided	0	42.9	1
Disagree	0	42.9	1
Strongly disagree	0	42.9	1
Total		χ^2	12.6

Df=4, t=9.488, P=0.05

Table 8: Banjara community parents, attitude toward physical education, and sports in terms of mental development

Agreement	Fo	Fe	χ^2
Strongly agree	55	36.4	0.13
Agree	74.5	36.4	0.83
Undecided	3.7	36.4	0.87
Disagree	6.6	36.4	0.84
Strongly disagree	53.2	36.4	0.22
Total		χ^2	2.89

Df=4, t=9.488, P=0.05

Table 9: Banjara community girls students and their parents attitude toward physical education and sports

Group	Mean	S.D.	S.E.	M.D.	D.F.	Calculated "*t*" value	Tabulated "*t*" value
Girls	72.14	13.02	2.9	9.09	78	3.14	1.97
Parents	82.22	9.23					

Level of significance=0.05, tabulated "*t*" 0.05 (78)=1.97

The total χ^2 for above given statement is 2.89 and the table value of χ^2 at 4 degree of freedom and 0.05 level of significance is 9.488. Thus, the obtained χ^2 is lesser than the table of χ^2, it is concluded that the five frequencies differ from each other.

Table 9 reveals that there is a significant difference between the attitude of Banjara community girls and parents toward physical education and sports, because mean of parents is 82.22 which is greater than mean of Banjara community girls is 72.14 and there mean difference is 9.09. Standard deviation of parents is 9.23 and the S.D of girls is 13.02 and their combine standard error is 2.9.

The value of calculated "*t*" is 3.14, which is shown greater than tabulated "*t*" (1.97) at 0.05 level of confidence, this is the indication that there is a significant difference between Banjara community girls and parents.

Thus, it shows that the attitude of parents is more positive toward physical education and sports than their daughter.

CONCLUSION

1. The attitude of the school-going Banjara community girls toward physical education and sports was found positive
2. The attitude of the parents toward participating physical education and sports activities was found highly positive
3. There was a significant difference between girls and parents. It shows that the parent's attitude was more positive toward participation physical education and sports activities than their daughter.

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Review Article

The role of information and communication technologies in the development of physical education teaching and learning methods for students and challenges emerging during coronavirus pandemic

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ABSTRACT

Coronavirus outbreak has caused widespread changes in lifestyle and various fields and education field are no exception to this rule. Meanwhile, need for specialist in ministry of education in these corona days and the procedure of structural changes in education at higher levels have held force the necessity of implementing technology in education more than before and it has initiated. And in this regard pursued "stay home and doing physical activity" and "teach exercise at home in social media" launched for students. Disconnection between educational elements, disappearance of the affective humanistic atmosphere of learning is one of the facing challenges of changing common and traditional methods of education to education through technology with an innovative scientific approach which has created a major scientific gap among physical education teachers and students. This article majorly proposes various tools and methods to improve current physical education system through information and communication technology and facing challenges of changing common and traditional methods to technological education and eventually it presents suggestions to benefit multimedia technology with the aim of decrease in educational quality downfall and maintaining the least required balance between educational elements.

Keywords: Coronavirus, Long distance education, Pandemic, Physical education

INTRODUCTION

Spread of COVID-19 virus has bursted worldwide and it has affected nearly all countries and regions (Anderson *et al*., 2020; Day *et al*., 2021; Fauci *et al*., 2020). This outbreak was first recognized in December 2019 in Wuhan, China (Dong *et al*., 2020). Countries worldwide warned people to take responsive care of themselves. General responsive care included continually washing hands, wearing facial masks, observing physical distance and avoiding crowds and collective gatherings, traveling, sports and recreational activities in clubs and indoor sports halls, limitations on going to workplaces, schools, and universities (Sintema, 2020). Furthermore, stay home strategy was considered as a necessary act to flatten the curve and control the transmission of the disease (Organization, 2020).

Regarding widespread pandemic of the virus, there has been no exact pattern on how this virus will act in the future based on being newfound and unprecedented, coronavirus has not been studied regarding its effect on governments and society in terms of various aspects such as political, social, cultural, economic, and education and training (Atkeson, 2020;

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McKibbin and Fernando, 2020) and an independent influence which studies "Corona crisis problems and presenting its opportunities" has not been observed. This process includes moving toward online and long-distance education at schools, colleges, and universities worldwide which may perform the greatest unplanned educational test (Dhawan, 2020).

The COVID-19 pandemic has caused the biggest disorder in educational systems in human history which has affected more than 1.6 billion learners in more than 200 countries (Pokhrel and Chhetri, 2021). The closure of schools, institutions, and other learning environments has influenced more than 94% of the world student population. This pandemic has made wide changes in all aspects of our lives. There is the fear of losing in-school training in 2021 and even longer. Therefore, need for using online education system and performing technological educational system instead of traditional educational system seems necessary (Subedi, Nayaju, Subedi, Shah, and Shah, 2020).

Nowadays, the issue of education quality and effective educational systems is one of the great challenges of the ministry of education and development decision-makers in each country (Collings, Gerrard, and Garrill, 2018). Physical education and sports are one of the most important issues in education system of each country. The necessity of using information and communication technologies (ICT) to simplify teaching, learning, and education in the field of sports and physical education seems necessary. Since school closure and staying of students at home with the aim of helping to stop disease spread chain, threaten risks such as inactivity, lack of physical activity, obesity, and lack of motivation, undoubtedly, it is necessary to consider physical activities regarding its positive effect on physical and mental health and safety system improvement. Unless, it will cause more complicated and harder problems such as depression, early puberty, stress, and anxiety among them (Petrie *et al*., 2020).

Most of the problems that ICT is facing in the country including lack of cultural content, lack of skilled labor force, not knowing foreign languages, low motivation and spirit of exploration, lack of intention to work and attempt and in brief, decline in abilities in life skills are due to inability of traditional education system in meeting the changing society's requirements.

Those countries which are able to adapt to rapid changes in the world and are equipped to features derived from new environmental conditions and have access, production, and using modern information ability have assigned remarkable successes especially in the 21st century. The motto "computer for all, internet for all" and "electronic government" have attracted many of the institutions to become an information society (Bayir and Keser, 2009).

According to the presented information, this question arises that whether use of ICT influences the effectiveness of physical education teaching and learning methods for students during corona pandemic. Based on the importance of research, the present study has provided an opportunity to introduce education, learning, and teaching regarding the chance that COVID-19 spread has provided for us. Therefore, the purpose of this study is presenting a comprehensive report on the role of ICT in COVID-19 pandemic period for students and challenges ahead and showing the desired way.

TECHNOLOGY IN EDUCATION

Nowadays, the importance of education which is in confirmation with individual and society needs is felt more than ever because, the world which is interrelated to communication networks, requires a labor force who knows how to use technology as a tool for improving creativity and efficiency. There has been a lot of discussion on implying IT in education and generally IT has been considered as a technical tool for improving education level. One of the most important issues in education is physical education and sports. Need for improving ICT in physical education field seems essential to facilitate learning (Doucet *et al*., 2020). Meanwhile in these days during corona, the ministry of education has emphasized public and warm-up exercises at home, and in this way, it establishes and proceeds "Stay physically active during self-quarantine" and "exercise at home in social media" campaigns. Integrating IT and education are more likely in its early stages because teachers emphasize on improving basic skills. Accordingly, it is better that education with the help of IT is started from elementary levels. For improving IT efficiency in various subjects, the content of programs that are in TV channels should be compatible with educational purposes and efficient in terms of teaching and learning. To success in this important field, the first step is providing software and hardware possibilities. More important is training teachers with high quality who can use IT with high skill and confidence. In training professional labor force and applying information and communication technology, priority should be given to training computer software designers about general subjects and also training program writers specialized in information and communication technology. Improving expertizing power in these two areas is necessary for both public and private sectors to design and apply the content which is proportional to information technology for main subjects of each educational grade so that applying communication and information are interweaved with the curriculum of all educational levels and information and education technology workrooms created with the facilities of connecting to worldwide web in all elementary, guidance, and high school levels and learning computer and internet should be included in curriculum from elementary levels. One of the issues that information technology advocates present is that, it provides the same educational opportunities for various

social classes, especially deprived classes. The experience of countries has shown that this does not always happen and if the government does not invest in the access of deprived classes to information technology classes, the so-called digital gap will gradually increase.

INVESTIGATING IT EFFICIENCY ON IMPROVING PHYSICAL EDUCATION

Wherever technology is at the service of school learning purposes to cause effective learning, are teachers are the only people who apply IT techniques in academic schematization based on requirements and students learning techniques and in sensitive occasions. As IT is maturing, its perspectives should be drawn by educational authorities, its goals should be determined to assign curriculum. About a year ago through widespread researches, it had been indicated that training teachers at schools are scientifically one of the most important issues that can be used in improving technology in sports (Deryakulu *et al*., 2010). Teachers should pass through many filters to acquire science and use up to date methods for sports and exercises. Research findings about physical education teachers' views on integrating technology with physical education have reported different results comparing their positive or negative attitudes on technology. On the one hand, some examples present positive views on using technology, and on the other hand, some other examples indicate that some teachers are against using technologies particularly in physical education and sport (Papastergiou, 2010). Therefore, it may be told that those teachers who are more skilled at IT programs are more interested in using technology in sports. A group of teachers consider technology as reckless, ineffective, and unnecessary, because they think of sports as a physical act beyond using technology; and on the other hands, most of them think that through using technology, optimal techniques could be obtained to do physical movements.

Teachers think of computer and technology in sports and physical education as conflicting with general rules. According to them using computers, stops optimal physical movements and prevents student progress and it is against class exercise programs, however, in current era, this acclaim does not have scientific basis. Evidences indicate that whenever teachers apply their knowledge on subject matter and student learning method, IT use would have the most direct effect on student progress.

TEACHERS' BELIEF IN APPLYING INFORMATION TECHNOLOGY

Teachers believe in what they choose in applying IT. Few number of teachers believe in wide use of IT sources. This distrust affects subject presentation. Most of the teacher are still afraid of some technology forms and this causes not applying IT in teaching.

Studies show that the most effective IT use is that teacher and software programs challenge student thought and this happens with students taking part in class discussing through interaction and cooperation and/or students working with computers, both individual and group. If the teacher has the skill to organize students based on their IT-related activities, class and individual performance of students can be parallel effective.

THE CONCEPT OF EDUCATIONAL TECHNOLOGY

Educational technology means the systematic method of designing, performing, and assessment of the whole teaching and learning process which is regulated and performed based on determined purposes or through using learning psychology and communication science findings and applying various sources including humanistic and non-humanistic. Through analyzing the above-mentioned definition, we learn that educational technology is a systematic method, that is, educational process elements gather together with a special scheme and act based on a logical connection and reaction to acquire a determined goal and as a unit (Papastergiou, 2010). The aim of this method (educational technology) is to obtain more efficient education; that is, to improve the quality and quantity of learning. Required sources are chosen based on educational purposes and course content which may include human, tools, or both of them.

TECHNOLOGY AND PHYSICAL EDUCATION

Education system has started its activity through technology with correspondence training courses by mail and has emphasized the different media usage in education. After the changes in technology and invention of media such as slides, films, radio, television, video, mobile phone, and by means of satellites, computers, internet, and e-mail have improved training. The aforementioned by combining the education system could present a training with the same quality or even sometimes with a higher quality than common training in various fields which are presented both theoretically and practically (Kamsin, 2005).

In the following. we would discuss the tools that can be used to acquire technology in sports. Although, these technologies are in the minority, could be optimally used in physical education (Ebner and Schiefner, 2009).

SMALL LAPTOPS OR TABLETS

Are easy to carry and could be used in every place without need to a small outlet. Small computers in which we can record sports programs and use them.

LCD VIDEO PROJECTORS

They could be set up at schools and show sports programs and timing along with correct images of performing movements on them.

ACOUSTIC FACILITIES

These facilities could be used in sports programs like gymnastics and different types of dances and rhythmic movements including ballet to show balance and order in movements to athletes with a definite and fixed rhythm.

PEDOMETER

A device which we can measure the number of steps regarding time and students can measure their physical activity rate.

MANUALS (MOBILE PHONES, GPS, ETC.)

By installing certain software on these devices, we can have different types of sporting move direction, the amount of consumed calories, and the amount of body water and other facilities anywhere and anytime.

These are just some simple instances of applying technology and computer in line with optimizing sporting move in schools and educational places (Zhu *et al*., 2016) which will be a great help for sports teachers and coaches in pandemic situations.

One of the useful programs which can be used in pandemic situations is presenting a comprehensive program for students so that at the beginning of the year, a general table is entered to the computer and during the school year the amount of activities, sport programs, student's amount of progress, each student's favorite sports, and their movement calculation is recorded in this program.

During this process, students can enter this program with their own password and bring up their questions with their teachers. At the end of the school year, a general procedure of a student activity and his/her amount of progress can be acquired which is, in turn, a strength point in technology progress in physical education.

All of these programs and methods and technologies are subject to training teachers and coaches. Digital media should be able to train teachers and coaches and can introduce correct way of using these facilities. Students should acquire their primary experiences with an experienced coach and teacher and take part, touch, and understand digital media and its use uppermost (Stanescu *et al*., 2011).

DIVIDING REGIONS WITH COLOR CODING IN CORONA PANDEMIC

Dividing regions with colors are not so much important regarding corona virus and determining colors for declaration of coronavirus depends on people behavior. If people observe it, we will definitely move toward white and green situation in which we will celebrate the carnival of end of corona.

For region division three colors, green, orange, and red, and sometimes four colors green, yellow, orange, and red are used. American illness control center has discussed three main factors in the epidemic; first is the number of new cases per 100,000 in the past 14 days, second is the percentage of positive tests in the past 14 days, and third is the number of self-reports. The first two factors are more important and more common. For each color, some proceedings should be taken to properly manage epidemic.

In general, three scenarios are considered for school conditions to pandemic situation through color coding:

1. Red situation in which remarkable number of population are positive, schools are closed and education and teaching is done as online
2. Orange situation in which a limited number of population is positive, and in recent days, no increase in number has reported, schools are open but education is done synthetically (home and school)
3. Green situation which is desirable and no positive results are reported. Schools are open observing various educational protocols such as using facial masks and observing social distance.

EMERGING CHALLENGES

Nowadays, computer games have been replaced sports among students which can encounter society with obesity and lack of movement, with coronavirus pandemic and incompleteness of education in most areas, especially physical education and sports. Students have been careless of the importance of sports.

Challenges which have been recognized considering electronic education include accessibility, economical ability, flexibility, education and teaching methods, teacher and student computer

knowledge, life-time learning realization, and educational policies (Murgatrotd, 2020).

The thing which has shown off in corona pandemic situation, transformation from common to technological education in most of the fields, especially physical education as a serious challenge for education planners and policy-makers is mainly disconnection between education elements and decay of educational humanistic – affective environment and not feeling existential essence of learners (Day, 2015). Although some experts believe that using new techniques especially computer and new informing channels cause changes in interaction between learners and teachers. However, until acquiring these interactive connecting things (at least in developing countries including Iran), it seems that this challenge may be worrying. In technological-based education (online training) like in-school training, connection principle among education elements is an important and accepted principle but this interaction is of unadjacent kind which is established through media and as indirect. Garrison believes that quality and entirety of industrial education stages depend on reciprocal improved relation and if educational technologies cannot cause the interaction between elements, the decline is toward old correspondence education. Porter (1994) considers comprehensive preparation and adaptation of traditional education and environmental education strategies as a prerequisite for effective learning in technological education environment.

Sending videos and restrictions from the side of students' families or the high cost of downloading videos, as well as the low speed of the internet connection are another problem that physical education teachers face them and they are unfortunately struggling with it. Another challenge is that, although in the shadow of skills improvement in the 21st century, the use of digital media and computers has increased and will continue to increase. The issue of financing in education and budget deficit is one of the obstacles that application of information technology in education is facing. Unfortunately, using computer methods in sports are still in minority, and experts are trying to expand and popularize it in the education system.

On the other hand, social distancing and restrictive movement policies have disrupted traditional teaching methods. Reopening schools after reduction of restrictions are another challenge in which many new standards would be operated.

THE SOLUTION AHEAD

After years of extensive research, IT scientists and planners have come up with many applications that have emerged and can update accurate scientific information and plan the movements and exercises for each week or each day for the teachers. These programs can properly plan and provide teachers with students' mobility, calorie intake, correct execution of movements in physical education, number and frequency of each movement in terms of various body parts, respiration, inhalation and exhalation, and of course timing. Teachers can use positively developed frameworks to achieve the best possible sports and muscle techniques. With the help of technology and computer, it is possible to engage in physical activities as much as possible, and with proper timing, planned, healthy and scientific movements through using computers and computer knowledge, it is possible to help students to live a healthy life. The goal is for students and, of course, teachers to move toward specific skills in sports.

CONCLUSION

The outbreak of the coronavirus and the crises caused by its biological, political, economic, sporting, and global dimensions, which have challenged massive interactions and exchanges, show that threats to public health and human security are an important part of the security problem.

The experience to be learned from COVID-19 pandemic disease is that teachers and students should focus on using a variety of online learning tools. After the COVID-19 epidemic, whenever normal classes start to happen, teachers and learners should be encouraged to continue using such online tools to enhance teaching and learning. ICT describes types of tools and technology resources that are used to produce, distribute, store, and manage information and knowledge (Majoka *et al*., 2013).

Innovation in teaching methods and the use of ICT in the educational system lead to the development of students' participatory learning, strengthens the spirit of search and research, combining IT with education, providing the basis for education and lifelong learning. If this experiment shows that online learning is as successful as traditional face-to-face training, campus face-to-face training will be reduced with the loss of regional campuses, campus construction projects, and classroom limitations. Alternatively, if this test fails, the status quo is likely to resume.

SUGGESTIONS

Maintaining the motivation of sports is one of the priorities of physical education teachers and in this regard, with the coordination of school principals and with the aim of creating motivation and healthy competition, activists in this field should be continuously honored in these corona days.

Although the cooperation and interaction of students with sports teachers are very low, teachers should not give up and in these days of quarantine and teach each session with the implementation of new ideas in cyberspace with a specific

theme such as sports nutrition, sports health, sports skills training on quarantine, exercise in the apartment space, how to warm up, and much more.

The importance and value of physical education and sport start from the community, family, and school. For this purpose, students should be understood in such a way that physical education and sport, like other lessons, are very important and a part of their healthy life and lifestyle. Because giving priority to the health and body of students is one of the important needs that should be considered in these corona days.

In the absence of a positive sports culture in families, the efforts of physical education teachers will also be fruitless, so the lack of attention of families will demotivate students and ultimately make sports and health as worthless.

Due to the close relationship that exists between sport teachers and the students and the students pay more attention to their sport teachers, as a result, the sport teachers can have the greatest impact on the development of these goals with proper planning and behavior.

Offering interest-free loans to underprivileged students as a grant to buy a laptop or tablet and providing high-speed and free internet to students and teachers are another suggestion of the present research.

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Research Article

Exercise for homemakers

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ABSTRACT

Regular exercise is the key to relieve stress and to promote good physical and mental health. Women who juggle between personal and professional responsibilities often fall short of time to pay attention to their fitness. However, importance should be given to fitness from an early age itself to live a healthy and longer life. Routine exercises can help us treat health issues and can even avoid them; all we just need to do is take out 20–30 min a day for ourself. We might not be able to hit the gym regularly or step out for a daily jog or walk, but we need not worry. There are some exercises that we can do at home without any equipment. The best at-home workouts do not necessarily require a ton of equipment – or any equipment – other than your own bodyweight. That's good news for many exercisers who may not have dumbbells, kettlebells, resistance bands, or other equipment at home, especially after the closures of gyms and fitness studios (and the recommendations to practice social distancing) due to the new coronavirus. If you do not have a lot of equipment, at-home bodyweight workouts are clutch and allow you to keep up your fitness routine. You might think your options are limited if you do not have a whole rack of equipment at your disposal, but that's definitely not the case. You can use bodyweight exercises to work nearly every muscle in your body, from your quads (squats) to your butt (glute bridges) to your chest (you can do a push-up!) to your core (plank variations).

INTRODUCTION

You do not need a fancy gym membership or expensive exercise equipment to get you in amazing shape. The best workouts can oftentimes be done right in your home and use your bodyweight to work practically every muscle in the body. Whether you set up an exercise mat and resistance bands in the corner of your bedroom or have a larger area to break a sweat, you do not need much space or equipment to get moving.

However, regular exercise is not just about looking good and building strength; it's also beneficial for immunity and can help flush bacteria out of the lungs and airways. Plus, staying active is necessary to maintaining a healthy mindset, especially if you are working remotely.

For people who have a home gym, working out can be simple, but for those of us used to training in a studio, we have to get a little creative. "If you're home without any equipment, your body is your own machine! Work it," says corrective exercise specialist Tatiana Lampa.

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An effective fitness program has five components, all of which you can do at home:

- A warm-up
- A cardiovascular (aerobic) workout
- Resistance (strength-building) exercises
- Flexibility moves
- A cool down.

A warm-up could be an easy walk outside or on a treadmill or a slow pace on a stationary bike. For the cardiovascular portion, walk or pedal faster, do step aerobics with a video, or jump rope – whatever you enjoy that gets your heart rate up. The resistance portion can be as simple as squats, push-ups, and abdominal crunches. Or you could work with small dumbbells, a weight bar, or tubing.

JOGGING IN A STATIONARY POSITION

It's simple, accessible, gets the heart rate up, and is a great way to warm-up for more intense exercise. It's high impact, which may

tax the joints, and it can be boring. Because there's no forward motion, it is not as intense as jogging outside. Variations: Press the arms overhead, high knees, butt kicks, wide knees.

1. As a Warm Up: Start by marching in place, then slowly change that to a jog to prepare your body for more strenuous exercise
2. In a cardio circuit: Alternate jogging in place with other cardio exercises, such as marching, jogging, jumping rope, and step touches. Do each for 30–60 s, repeating the circuit for 10–30 min
3. As an active break: Try jogging in place when you need an active break at work or at home.

HIGH KNEE JOGGING

Jogging in place is great, but if you want to add intensity, try lifting the knees high as you run. Bring your knees up to the hips if you can and you'll engage the core as well as the quads and the hip flexors.

1. While jogging in place, lift the knees high each time you jog
2. Try lifting the knees to hip level if you can, keeping the core tight to protect the back
3. To make it even harder, hold the hands at hip level and try to touch your knees to your hands each time you jog. Bring the knees up toward the hands, rather than bringing the hands down to the knees
4. You can also add intensity by pushing the arms overhead
5. Repeat for 30 s to as many minutes as you can. You can also do this exercise in a cardio circuit.

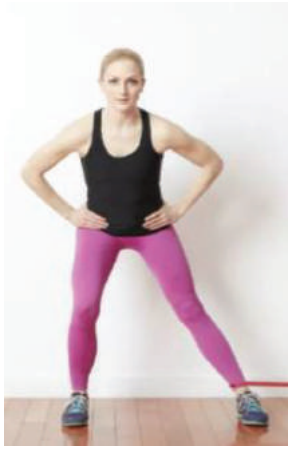
STRAIGHT LEG KICKS

Straight leg kicks get your heart rate up while challenging your flexibility and balance. The key is to keep your torso upright and try bringing your legs as high as you can.

1. Begin with your feet together and both hands straight out to your sides
2. Lift your right leg to hip level or higher, keeping your knee slightly bent if you need
3. At the same time, circle your right arm around and down, as though you're trying to touch your right toes. (If you can't, that's okay)
4. Lower your right leg and lift your left leg to hip level, reaching toward your toes with your left hand
5. Continue going as fast as you can, adding a jump for more intensity, if desired. Making your arms big will increase intensity too
6. Complete one to three sets of eight to 16 reps.

WIDE SIDE STEPS

Wide side steps, also known as puddle jumpers, are a cardio exercise that is low in impact but high in intensity. High-intensity exercise improves insulin sensitivity, reduces your abdominal fat, and has positive effects on your cholesterol levels.



1. To begin this move, push off your right foot and step out with your left foot as wide as you can, as though you're trying to avoid a puddle. Your arms are wide
2. After your left foot hits the floor, step your right foot to the left and quickly touch it to the floor, then push off your left foot to take a wide step in the other direction
3. You can make this a more difficult exercise by adding a band if you want
4. To increase your intensity, increase your speed and see how wide you can step. Adding big arm movements help too. Repeat for 30–60 s.

LOW IMPACT JUMPING JACK

If you can't do traditional jumping jacks, or find that they cause you pain, do not worry. These low-impact jumping jacks are perfect for getting your heart rate up without stressing your joints.

1. Step your right foot out to the side as you swing your right arm up and overhead, reaching as high as you can
2. Step your right foot back in and then step to the other side with your left foot, swinging your left arm overhead
3. Continue alternating sides, moving as quickly as you can without jumping
4. To make this low-impact exercise harder, deepen your lunge, do the movement faster, and add more arm movement
5. Repeat for 30–60 s.

TOE TAPS WITH JUMPS

Toe taps are great for adding intensity and improving agility. If you've never tried this move, take your time and ease into it with slow taps without the jump. If you feel discomfort or pain, avoid this exercise. Keep in mind that you can do this without a step or the lowest step on a staircase.

1. Stand facing a step or platform
2. Touch the right toe to the step, jump up and switch the feet in mid-air, touching the left toe to the step
3. Continue alternating toe taps as quickly and safely as you can for 30–60 s.

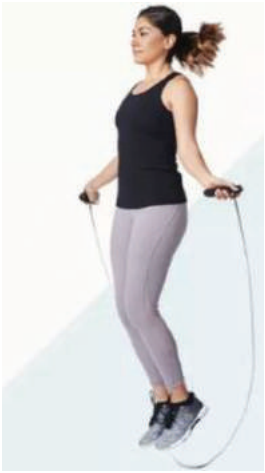
SQUAT

A squat is a movement we do all day, getting up and down from chairs, in and out of cars, and more. Practicing this move with good form will help you build strength in the hips, glutes, and thighs.

1. Stand in front of a chair with feet about shoulder-width apart
2. Bend the knees. Send the hips back and the arms straight out in front of you to balance
3. Sit all the way down. As soon as you make contact with the chair, stand back up
4. Try to stand up without rocking back or using momentum. Instead, put the weight on your heels and push into the floor to stand up
5. Perform 12 reps.

JUMPING ROPE

An affordable and compact piece of exercise equipment, the jump rope is a perfect staple for any home gym or gym bag. This small but mighty pick can completely transform your workout. Jumping rope is a great way to lose weight and burn fat and calories while having fun. Most people think of jumping rope as a sport for children, but it has many benefits for adults as well, especially for individuals over the age of 40.



1. Turning a rope with handles repeatedly while jumping over it and (optional) chanting rhymes
2. It's great cardio, burning about 220 calories in 20 min. Jump ropes are inexpensive, travel well, require no special skills, and can be used anywhere you have space
3. Jumping rope is high impact and requires practice. It looks easy, but beginners may get tripped up. For the best results, turn the rope with the wrists, not the arms, and land softly. Only jump high enough to clear the rope.

When it comes to the benefits of jumping rope, the advantages are vast. Jumping rope increases your natural endorphins, which puts you in a good mood and increases your energy. What most people do not realize is that jumping rope will actually burn more fat and calories than running, swimming, or biking. It not only puts your cardiovascular system to use, but also helps to build muscle strength, improve coordination, and even boost metabolism.

SIDE LEG LIFT

This move improves your balance as well as strengthening both legs. The standing leg has to use more stabilizer muscles to keep you balanced, while you build strength in the hips and glutes with the lifting leg.

1. Stand sideways to a chair or wall for support and wrap a resistance band around your ankles (optional). Or you can use light ankle weights (1–5 pounds)
2. Shift the weight into the right leg and lift the left leg out to the side, foot flexed and hips, knees, and feet in alignment and feet parallel
3. Try to lift the leg without tilting at the torso. Hold the torso upright as you lift the leg a few inches off the ground
4. Lower back down. Do 12 reps on each leg.

BASIC BRIDGE

Basic bridges are often used as glute exercises, but they can also be used to help open up the hips. This is how to do them to really target the hip flexors:

1. Lie on your back on an exercise mat or soft surface. Keep your hands at your sides and your knees bent
2. Raise your hips. Your shoulders and feet should be flat on the floor, creating a straight line from your knees to your shoulders
3. When you reach the top of this stretch, lift one foot off the floor at a time. This causes the hips to flex
4. Hold for 20–30 s. Then, switch to the other side.

Before starting your workout, do a warm-up routine for at least 5–10 min. This can include brisk walking, jogging on the spot, or movements that work your legs, arms, and other major muscle groups. Once your muscles are warmed up and ready to move, you can start by doing a series of exercises. You do not need any equipment for these types of exercises, except an exercise mat if the floor is too hard. With each of these exercises, use smooth, steady, and controlled movements.

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Research Article

The effects of Kinesio Tape on a spasmed muscle in the hamstrings

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ABSTRACT

The purpose of this study was to determine the effectiveness of Kinesio Tape on the varsity athletes of Mindanao State University-Iligan Institute of Technology, Integrated Developmental School, Philippines, on their spasmed muscles in the hamstring. This study employed the descriptive-correlational type of research. It consisted of 60 basketball and volleyball men and women varsity athletes. An adapted questionnaire from Wagner (2015) with a Likert scale (1–5-point scale) format was used to rate the spasmed muscle in the hamstring without the Kinesio Tape. The scale questionnaire developed by Renner (2012) was used to measure the effectiveness of the Kinesio Tape on the athletes spasmed muscle in the hamstring. Means and standard deviations are computed to summarize the responses to the Likert-type questionnaires. Frequency and percentage were used to assess the descriptive data. Weighted mean was used to determine the effect of Kinesio Tape on the spasmed muscle in the hamstring while sign test was used to determine the significant difference of their experience before and after the application of the Kinesio Tape among the varsity athletes. The result shows that the Kinesio Tape was found to have a good effect on the spasmed hamstring muscles of the varsity athletes. The Kinesio Tape was also found to have a highly significant change in all aspects: Effectiveness, manageability, daily living, athletic performance, general perception, and pain, except for comfort on the application of Kinesio Tape among the varsity athletes.

Keywords: Effectiveness, hamstring, Kinesio Tape, muscle spasm

INTRODUCTION

Kinesio Taping (KT) is a therapeutic taping technique developed by Dr. Kenzo Kase in Japan more than 25 years ago. It is widely used in the field of rehabilitation as both means of treatment and of prevention of sports-related injuries and allows for unrestricted range of motion (ROM). It is also theorized to reduce the time for recovery from injury by decreasing pain and inflammation. The tape is typically applied over and around muscles to prevent overcontraction. It is used to support the fascia, muscles, and joints while offering unrestricted ROM.

KT has also shown to affect the lower trunk ROMs and found through evaluation of the scores that trunk flexion was the only one that showed significant signs of improvement. Kinesio Tape does exhibit some therapeutic benefits. The benefits of Kinesio Tape with ROM may be due to decreases in pain, therefore, allowing the patient to increase ROM. The proposed study would eliminate the pain quotient and investigate ROM in isolation (Renner, 2012).

The researchers have observed that national athletes are commonly seen using Kinesio Tape but our local athletes are not familiar with this therapeutic taping. In line with this, the researchers are led to undertake a study on the effectiveness of the KT on the muscle spasm on the hamstring of local high school varsity athletes who were not exposed in the use of the Kinesio Tape.

The purpose of this study was to determine the effectiveness of Kinesio Tape on the varsity athletes of Mindanao State University-Iligan Institute of Technology, Integrated Developmental School (MSU-IIT, IDS) on their spasmed muscles in the hamstring.

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METHODOLOGY

In this study, descriptive analysis was performed on determining the respondents' demographic profile and their evaluation of the use of KT. The researchers also employed the descriptive-correlational research in determining the effectiveness, before and after the application of the KT on the spasmed muscle of the athletes. The population of this study were 30 men and 30 women athletes of the basketball and volleyball varsity teams of MSU-IIT, IDS located at Andres Bonifacio Ave., Iligan City. Frequencies and percentages were used to describe the demographic profile of the respondents in this study. The same statistics was also obtained for the responses to the questionnaires on muscle spasm and the use of the Kinesio Tape. Sign test was used to determine the significant difference of their experience before and after the application of the Kinesio Tape among the varsity athletes. For the researchers to obtain information from both the men and women athletes of each team, purposive sampling was employed. A total of 60 athletes of the basketball and volleyball varsity teams were selected as respondents of the study, the number equally divided among the different subpopulations identified by gender and sport. The questionnaire is the principal type of instrument used in this study. First questionnaire is an adapted questionnaire from Wagner, 2015, with a Likert scale (1–5-point scale) format to rate their spasmed muscle in the hamstring without the Kinesio Tape. Second questionnaire is a standardized instrument from Renner, 2012, with a Likert scale (1–5-point scale) format where participants can rate their experience on the following aspects:

(1) Kinesio Tape effectiveness, (2) Kinesio Tape manageability, (3) comfort, (4) effect on activities of daily living, (5) effect on activity or athletic performance, and (6) general perception of Kinesio Tape. Before the varsity athletes, demographic profile questionnaires were distributed to the respondents, permission letter was first given to the school principal. After the permission was granted, the researcher then personally forwarded the letter to the coaches of the basketball and volleyball varsity teams. The researchers gave an orientation to the athletes on the proper conduct of the study then distributed the demographic profile template to accomplish. After the athletes finished answering, the researchers proceeded to conduct the training exercises for the hamstring for 1 h. The athletes were instructed to come back the next day to see if they gained some spasmed muscles. Most of the athletes immediately gained a spasmed muscle and were asked to answer the pre-application of Kinesio Tape on the varsity athlete's questionnaire to determine how extensively they feel about their pain. The researchers then applied the Kinesio Tape and proceeded back to the training. The athletes who have not yet developed spasmed muscles continued in the training until they felt pain. The respondents wore the Kinesio Tape for 1 week after which the researchers gave the effect on the application of Kinesio Tape in the spasmed hamstring muscle questionnaire about the effectiveness of the Kinesio Tape on their spasmed muscle in the hamstring.

RESULTS AND DISCUSSION

Demographic Statistics

The demographic statistics of the study population comprised 60 varsity players with 30 women and 30 men in basketball and volleyball team in MSU-IIT. The result on the current study based on their age, range from 13 to 17 years with 16 as the modal age which means the greatest number of respondents was aged 16 years old.

Test Results on the Application of Kinesio Tape among the Varsity Athletes

The distribution of the values used for the interpretation of the resulting means is shown in the scale below:

1–8.0	Very poor
1.81–2.6	Poor
2.61–3.4	Average
3.40–4.2	Good
4.21–5.0	Exceptional

Table 1 shows the respondents evaluation on the application of the Kinesio Tape on the spasmed hamstring muscle. Most of the athletes said that the effectiveness of the tape was good. Majority of the population said that the tape has an average effect in terms of manageability. It has a good effect in terms of comfort according to the athletes. The Kinesio Tape has a good effect on their activities in their daily living as mentioned by the

Table 1: Respondents' evaluation on the application of Kinesio Tape on the spasmed hamstring muscle

	1	2	3	4	5	Mean	SD	Interpretation
	Poor	Average	Good	Exceptional	Poor			
Effectiveness	1	6	20	26	7	3.53	0.89	Good
Manageability	1	8	42	9	0	2.98	0.60	Average
Comfort	0	7	13	26	14	3.78	0.94	Good
Effect on activities of daily living	2	4	20	29	5	3.52	0.87	Good
Effect on activity or athletic performance	1	3	20	24	12	3.72	0.90	Good
General perception	0	3	14	29	14	3.90	0.82	Good

participants. Furthermore, it has good effect on their activity or athletic performance. In general, they had a good perception of the effect of the Kinesio Tape on their spasmed hamstring.

Table 2 shows the motion/effectiveness before and after the application of Kinesio Tape on their spasmed hamstring muscle from average to good.

Table 3 shows the respondents' stability/manageability before and after the application of Kinesio Tape on their spasmed hamstring muscle which is on the average level.

Table 2: Frequency distribution on motion/ effectiveness

	Pre-test	Post-test
1	1	1
2	8	6
3	28	20
4	18	26
5	5	7
Mean	3.30	3.53
SD	0.87	0.89
Interpretation	Average	Good

Table 3: Frequency distribution on stability/ manageability

	Pre-test	Post-test
1	2	1
2	22	8
3	21	42
4	9	9
5	6	0
Mean	2.92	2.98
SD	1.03	0.60
Interpretation	Average	Average

Table 4: Result for significant change from pre-test to post-test for effectiveness, comfort, manageability, daily living, athletic performance, general perception, and pain

	Sign test		Conclusion
	Statistic	*P*-value	
Effectiveness	−3.792	0.000	Highly significant
Comfort	−0.791	0.429	Not significant
Manageability	−3.536	0.000	Highly significant
Daily living	−4.070	0.000	Highly significant
Athletic performance	−4.575	0.000	Highly significant
General perception	−4.668	0.000	Highly significant
Pain	−7.212	0.000	Highly significant

Sign Test Result for Significant Change from Pre-test to Post-test for Effectiveness, Comfort, Manageability, Daily Living, Athletic Performance, General Perception, and Pain

Results show that at $\alpha = 0.05$, the change from pre-test to post-test is highly significant for effectiveness, manageability, daily living, athletic performance, general perception, and pain. It is not significant, however, for comfort. This means that the use of the Kinesio Tape influences the athlete in all aspects except for comfort. The result of the study is related to the study of Renner (2012). They concluded that even through pain did not return to initial status, reports of stability have improved with the use of Kinesio Tape. In this study, stability is defined in terms of manageability, where there is a significant change from pre-test to post-test.

CONCLUSION

Based on the findings, the Kinesio Tape was found to have a good effect on the spasmed hamstring muscles of the varsity athletes and was also found to have a highly significant change in all aspects except for comfort on the application of Kinesio Tape among the MSU-IIT IDS varsity athletes.

Recommendations

Coaches must be given in-service training specifically in taping spasmed muscles or injuries and must have an anatomical background to easily determine the athletes pain. Furthermore, coaches and school administrator should provide Kinesio Tape for their students for availability in case of pain and injury. Since this study is confined to varsity athletes, it is recommended that future researchers undertake similar study in other sports and verify if variables identified as significant would still hold through. Finally, future researchers might use an inclinometer or other instruments to determine the effect of Kinesio Tape on the ROM of the athletes.

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Research Article

Effect of 12 weeks fitness training on the selected hematological parameters: A case study

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ABSTRACT

The study has been conducted to provide some base line data how laboratory tests might help the coaches for scientific training of athletes which can improve their health as well as performance. The basic idea behind this research is to determine how certain kind of training sessions can influence the hematological parameters of athletes. The present study included sixty young male athletes with 18–20 years of age perusing their Bachelor of Veterinary Science and Animal Husbandry at NTR College of Veterinary Science, Gannavaram, Andhra Pradesh. These sixty subjects were randomly divided into two groups of thirty each; named control and experimental group. To investigate the changes in selected hematological variables of the experimental group a systematic 12 weeks fitness training program was adapted regularly. The physical fitness and hematological variables selected in this study were speed, agility, endurance, hemoglobin (Hb), packed cell volume (PCV), platelet count, red blood cell (RBC), white blood cell (WBC), platelets count and hematological indices mean corpuscular volume (MCV), mean corpuscular Hb (MCH). and mean corpuscular Hb concentration (MCHC). It was observed that Hb, PCV, RBC, platelet count, MCV. and MCH were significantly reduced in experimental group after 12 weeks of fitness training program. On the contrary significantly increased values of WBC and MCHC were observed. No significant change was observed in MCHC.

Keywords: Athletes, Fitness, Hematological, Training, Variables

INTRODUCTION

This study has been conducted to provide some base line data how laboratory tests might help the coaches for scientific training of athletes which can improve their health as well as performance. The basic idea behind this research is to determine how certain kind of training sessions can influence the hematological parameters of athletes. So far no published work is available in this aspect and hence, the results of this prospective study, would help to understand the physiology of fitness training to the athletes with reference to the hematological profile. The physiologic stress influenced by prolonged and intensive physical activity is reflected in temporary yet important changes in hematological parameters. Regular monitoring of these hematological parameters in athletes during their practice sessions will be helpful for detecting possible iron deficiency anemia or other health problems, in addition it might also useful to plan a systematic training program for the athletes. The constancy of hematological status of athletes is one of the important factors to determine optimal exercise performance of the athletes, particularly in endurance sports.

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MATERIALS AND METHODS

The present study included sixty young male athletes with 18–20 years of age perusing their Bachelor of Veterinary Science and Animal Husbandry at NTR College of Veterinary Science, Gannavaram, Andhra Pradesh. These sixty subjects were randomly divided into two groups of thirty each; named control and experimental group. To investigate the changes in selected hematological variables of the experimental group a systematic 12 weeks physical fitness training program was adapted regularly. The physical fitness and hematological variables selected in this study were speed, agility, endurance, hemoglobin (Hb), packed cell volume (PCV) (Hct), platelet count, red blood

cell (RBC) count, white blood cell (WBC) count, platelets count and hematological indices mean corpuscular volume (MCV), mean corpuscular Hb (MCH) and mean corpuscular Hb concentration (MCHC). The data collected were statistically analyzed using paired sample statistics, paired differences, and *t*-ratios. For our interpretation pre- and post-test, values were compared both in the control and experimental group.

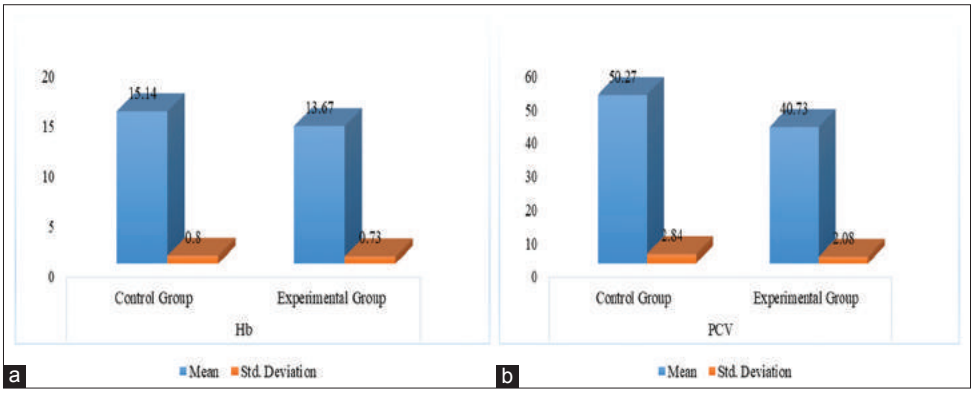
Physical Fitness Training Program

For the next 6 weeks same schedule was followed, but the intensity and the repetitions of the exercises were increased.

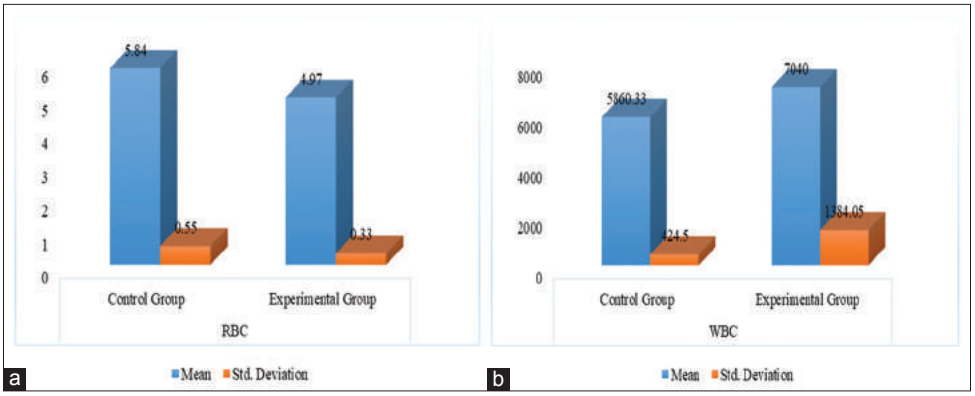
RESULTS

The Mean ± SE of hematological variables observed in the data are presented in Tables 1 and 2. A significantly decreased ($P < 0.05$) Hb concentration in post-test in the experimental group was observed [Table 1 and Figure 1]. A significantly decreased ($P < 0.05$) PCV values in post-test in the experimental group were observed [Table 1 and Figure 1]. A significantly decreased ($P < 0.05$) RBC count was observed in post-test experimental group [Table 1 and Figure 2]. A significantly increased ($P < 0.05$) WBC count was observed in post-test experimental group [Table 1 and Figure 2]. A significantly decreased ($P < 0.05$) platelet count was observed in post-test experimental group [Table 2 and Figure 3]. A significantly decreased ($P < 0.05$) MCV was observed in post-test experimental group [Table 2 and Figure 3]. A significantly decreased ($P < 0.05$) MCH was observed in post-test experimental group [Table 2 and Figure 4]. Significantly increased MCHC concentration was observed in the post-test of experimental group compared to post-test in control [Table 2 and Figure 4].

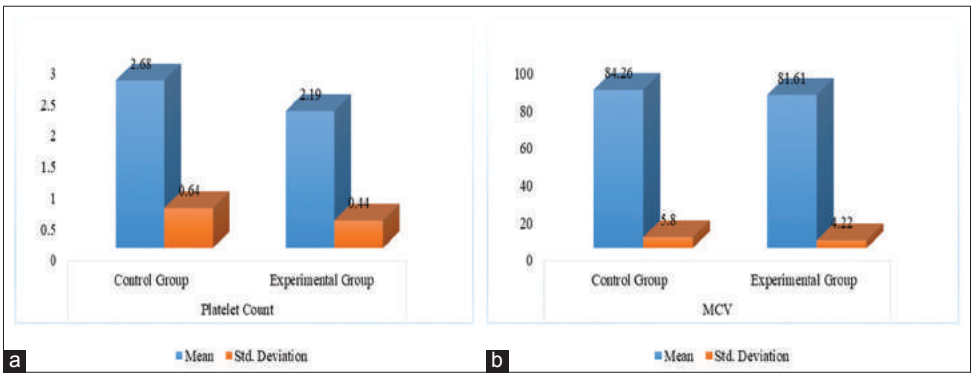
Day	Component	Warm-up	Duration	Exercises	Duration	Warm-down	Duration
Day 1	Endurance	Exercises	15 min	Running/aerobic exercises/aerobic dance	60 min	Static stretching	30 min
Day 2	Rest						
Day 3	Speed	Exercises	15 min	20 mts run- 5 repetitions	60 min	Static stretching	30 min
				1 min recovery			
				40 mts run- 5 repetitions			
				1 min recovery			
				60 mts run- 5 repetitions			
				Total 3 sets in between the set 2 min recovery			
Day 4	Agility	Exercises	15 min	8–12 stations (exercise)	60 min	Static stretching	30 min
				Each exercises 45 s duration			
				Recovery between the stations (exercises) is 30 s			
				Total 3 sets, between the set 2 min rest			
				1. Zigzag run			
				2. Shuttle run			
				3. Figure of 8			
				4. Change the direction			
				5. Ladder drills			
				6. T-run			
				7. Lateral run			
				8. Dot drill			
				9. Small hurdle jump			
				10. Potato run			
				11. Push up and forward run			
				12. Burfee and side run			
				13. Cross in front			
				14. 2 in and 2 out			
				15. Nine box drills			
				16. Leaner hop			
Day 5	Endurance	Exercises		Running/aerobic exercises/aerobic dance			
Day 6	Rest						



Figures 1: (a and b) The post-test hemoglobin and packed cell volume values in control verses experimental group



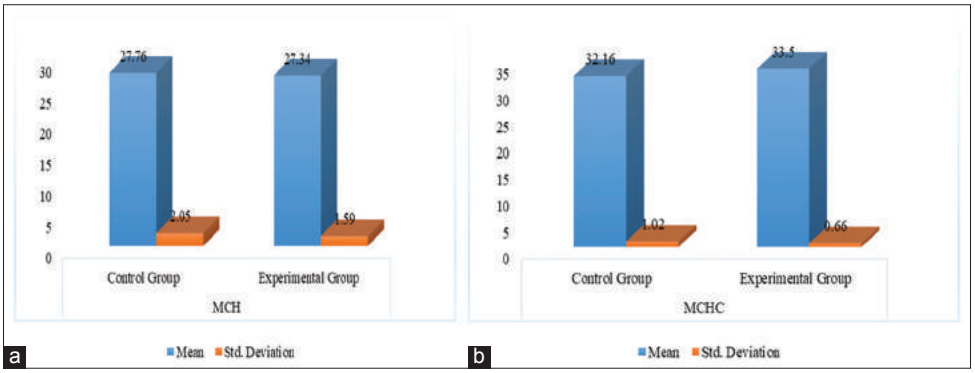
Figures 2: (a and b) The post-test red blood cell, white blood cell values in control verses experimental group



Figures 3: (a and b) The post-test platelet and mean corpuscular volume values in control verses experimental group

DISCUSSION

Specific laboratory tests improve the athletic performance (Lippi *et al*., 2012). Biochemical and hematological screening tests help the coaches to identify risk factors in athletes' (Lombardo *et al*., 2019). Continuous monitoring of an athlete allows intervening promptly and to develop adequate training as well nutritional programs so as to prevent conditions like anemia (Mennitti *et al*., 2020). The data of our present study also suggest that athletes need constant monitoring to avoid the emergence of severe pathologies. Hb content indicates the availability of iron for the process of erythropoiesis. The reduced concentration in our study represents the distribution of hypochromic cells. Either anemia or a decrease in the Hb concentrations is often observed in healthy individuals after various intensities of fitness training (Koike *et al*., 2005). The reduced PCV values in our study might be the training that induced hemodilution due to plasma volume expansion, which improves cardiac output and reduces blood viscosity. All these are compensatory mechanisms adapted by the body thereby optimizing microcirculation and to improve oxygen supply to the working group of muscles (Mairbäurl, 2013). In



Figures 4: (a and b) The post-test mean corpuscular hemoglobin, mean corpuscular hemoglobin concentration values in control verses experimental group

Table 1: The changes in post training hematological variables of control versus experimental groups

Parameters	Mean	Std. error	*P*-value
Hb			
Control post-test	15.14	0.15	0.000*
Experimental post-test	13.67	0.13	
PCV			
Control post-test	50.27	0.52	0.000*
Experimental post-test	40.73	0.38	
RBC			
Control post-test	5.84	0.10	0.000*
Experimental post-test	4.97	0.06	
WBC			
Control post-test	5860.33	77.50	0.000*
Experimental post-test	7040.00	252.69	
Platelet count			
Control post-test	2.68	0.12	0.001*
Experimental post-test	2.19	0.08	

Hb: Hemoglobin, PCV: Packed cell volume, RBC: Red blood cell, WBC: White blood cell

Table 2: The changes in post training hematological indices of control versus experimental group

Parameters	Mean	Std. error	*P*-value
MCV			
Control post-test	84.26	1.06	0.048
Experimental post-test	81.61	0.77	
MCH			
Control post-test	27.76	0.37	0.378
Experimental post-test	27.34	0.29	
MCHC			
Control post-test	32.16	0.19	0.000*
Experimental post-test	33.50	0.12	

MCV: Mean corpuscular volume, MCH: Mean corpuscular hemoglobin, MCHC: Mean corpuscular hemoglobin concentration

sports athletes who perform intense exercise program, Hb and PCV values decrease and this has been recognized as anemia (Londeann *et al*., 1978). This might be also the reason for the decreased PCV in our experimental group.

The increase in plasma volume post-training and the increased plasma volume in highly trained athletes (Hagberg *et al*., 1998; Sawka *et al*., 2000; Heinicke *et al*., 2001; Schumancher *et al*., 2002) is likely caused by aldosterone dependent renal Na^+ reabsorption, and by water retention stimulated by elevated antidiuretic hormone in compensation for the water loss during individual training sessions. As a result of this, there is a relative decrease in RBC, Hb, and PCV and this has been recognized as anemia (Londeann *et al*., 1978).

In this study, it has been observed that the WBCs count was increased. The increase in WBCs is explained by the margination of WBCs along the blood vessel walls in circulation. In other words in exercise blood stream increases and circulation becomes faster, that way WBCs that are on vessel walls join in blood stream and WBCs quantity increases in the blood (Singel and Stamler, 2005). The more stress accompanies the exercise, the more the WBCs increases. Especially in intense exercises, the increase is more obvious. Many studies has indicated that intense exercise increases WBC concentration and apart from intensity of the exercise, condition state of the athlete is also significant in this increase (Ibis *et al*., 1997) indicated that intense training sessions might increase the WBC concentration.

As all the hematological parameters need not always be markers of exercise, the effects of exercise might not have been reflected in changes in MCV and MCH. In addition, secondary hematological indices might not be affected by fitness training as in our study. The probable reason for the increased MCHC might be due to the release of the RBC from spleen or also due

to the increase in oxygen consumption. Either of the reasons mentioned may be a result of high tissue demand causing erythrocyte stimulating factor release (Kibler, 1964).

These findings have shown that the continuous monitoring of an athlete allows intervening promptly and developing adequate training and nutritional programs in order to prevent conditions such as anemia. These data suggest that athletes need constant monitoring to avoid the emergence of severe pathologies.

CONCLUSION

Hematological parameters improve athletic performance and also helps develop fitness based intervention programs in sports performance. From this study, it is evident that hematological study for fitness training program generated base line data and is markers of the same. However, all the parameters cannot be reliable factors as there are hematological indices which are derived variables. Hence, it is necessary to take into consideration other factors such as physiological and biochemical responses of the athletes which would be more informative and strengthen our study.

Furthermore, it might be essential to extend the training program further to arrive at our expected hypothesis. All these might be possible reasons to not to arrive at a straight away conclusion of the study conducted. Hence, we can conclude that hematological study is essential to know the health status of the athletes and these combined with physiological and biochemical responses would be much more informative and reliable. Furthermore, aerobic based fitness training program might have resulted in much consistent results.

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Research Article

Research on sustainability characteristics of 16–18-year-old male road cyclist in Ho Chi Minh City

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ABSTRACT

Road cycling is endurance sport need a long time working, so an energy consumption for athletes is very big and closely related to their record. The athlete must have good endurance to cycle a 100 km race. If the endurance is not good enough, he will cycle to finish slowly or could not make a sprint before finishing, etc. The research provides information on endurance characteristics of male road cyclists in Ho Chi Minh city through professional exercises (cycling test in 20 min) dealing with anaerobic-aerobic-anaerobic-anaerobic … anaerobic. Thereby, the coaches have exercises in accordance with the above characteristics.

Keywords: Athlete, Ho Chi Minh city, Road cycling, Technical endurance

INTRODUCTION

In sport, endurance is the ability to sustain a certain intensity over a longer period of time and to recover as soon as possible. Other meaning is that endurance is the body's ability to fight fatigue during an athlete's activity. Endurance guarantees athletes to exercise with the best intensity (speed, duration of competition, and use of force) for extended periods of time.

Like other sports, cycling requires athletes to have quality of endurance. With a long distance as 10 km, if the endurance is not good enough, athletes will cycle to finish slowly or could not make a sprint before finishing, etc.

From the perspective of biomedical, scientists based on the ability of athletes to provide energy from anaerobic and aerobic quantities to classify the anaerobic, aerobic, or the anaerobic mix endurance.

As far as the specific motor characteristics of each type of sport concerned, scientists classify endurance into two categories: Technical endurance and general endurance.

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General endurance is the ability to move on a long-term duration. This motor capacity depends mainly on the maximum oxygen absorption capacity and the oxygen supply capacity of the circulatory and respiratory system. Therefore, general strength is understood in a narrow sense that is aerobic resistance. Moreover, technical endurance is particular endurance specific to each type of sport. In cycling, it is the ability to provide aerobic energy for long periods of time and anaerobic dissolution capacity to power the phase of speed breakthrough (attack) or perform a sprint before reaching to the finish.

To implement the strategy, there are some stages which the cyclists have to overtake their opponents or sprint to the finish with maximum motor intensity, so the power supply must be big and transforming depended on the speed. Thus, in terms of sports physiology, technical endurance in cycling is combined anaerobic and aerobic endurance.

With the above characteristics, the case study presents research on the technical endurance characteristics of male road cyclists in Ho Chi Minh city.

The research aims to assess the technical endurance of male road cyclists in Ho Chi Minh city through 20 min cycling elite exercises and test in the laboratory. The result will help coaches

choose appropriate exercises to develop technical endurance for male road cyclists.

RESEARCH METHODS

Analysis and document synthesis, pedagogical examination, biomedical examination, and statistical mathematic.

The research process was conducted on 20 male road cyclists 16–18 years old in Ho Chi Minh city with the following devices: (1) Gas analyzer: It is a device fitted with an oxygen sensor (Oxysensor) that analyzes the concentration of oxygen gas and other components of the breathing gas; (2) Swedish MONARK 839 Monark Ergomedic 839E Electronic Test Cycle with Bruce regimen installed for athletes to perform; (3) Cortex Metamax 3B system of Germany; and (4) computer installed data analysis software, cable connecting the dynamometer to the computer, polar chest belt captures the heart rate signal.

RESULTS AND DISCUSSION

Technical Endurance Assessment for Road Cyclists in Ho Chi Minh City through the 20 min Cycling Test

In the study case, we assessed the technical endurance of 20 athletes performing a 20 min cycling exercise. This is a simulation exercise for a bicycle race including the basic stages: Warm-up, movement, and recovery. During the moving stage, the test is performed like a short road – demonstrated that the technical features of standing cycling time trials including maintaining speed, accelerating past the opponent, maintaining at high speed, and sprinting to the finish. The test process goes through the following three steps:

Step 1 (Static): Athletes sit on a bicycle with his feet touching the ground for 1 min.

Step 2 (Implementation): Athletes perform exercises through three stages: Warm-up, movement, and recovery.

Warm-up stage was carried out through 5 min of cycling with a speed of 30–35 km/h.

Moving stage was divided into four phases:

Phase 1: From the 6th min to the 9th min, cycling steadily but increasing speed to 40–45 km/h in 4 min.

Phase 2: Speeding over the opponent, execution time in 1 min, speed 55–60 km/h.

Phase 3: Maintaining speed at 45–50 km/h, execution time in 4 min.

Phase 4: Reaching to the finish line, at full speed (sprint).

Recovery: Cycling freely for 5 min at speed of 15–20 km/h.

Step 3 (relax): Athletes stop cycling, take off the body devices, and print the results on the screen.

During the above process, Cosmed devise was used to monitor the technical professional endurance developments of the cyclist during the exercise [Figure 1], the results are shown in Table 1 and Item 1.

To evaluate the technical endurance, the research based on the following physiological indicators:

VO_2 max (ml/ph): Maximal oxygen consumption.

VCO_2max (ml/ph): Maximal carbon dioxide output.

VO_2max/kg (ml/ph/Kg): Comparative oxygen consumption.

Rf (lần/ph): Respiratory frequency.

VT (volume tidal): Tidal volume (lít).

VE (exhaled ventilation): Exhalation valve (l/ph).

HR (heart rate): Heart rate (ck/ph).

VO_2/HR (O_2 pulse): The ratio between oxygen consumption (VO2) and HR defines the oxygen pulse (systolic).

EE: Energy efficiency kcal/ph.

V: Respiratory ratio. $V = \frac{VCO_2}{VO_2}$

Table 1's result shows that:

Warm-up stage

At the speed of 30–35 km/h, the lung function of gas exchange increased slightly, average VE reached 35.69 ± 3.45 liters/min, heart rate also increased slightly HR average HR = 134.3 ± 13.1 times/min, VCO2 = 1199 ml/ph, VO2 = 1323.3 ml/ph, and the respiratory quotient R <1. Functional indicators such as VT, VE, HR, and VO2/HR are in the aerobic energy metabolic domain.

At the beginning, the athletes warm-up in 5 min at a cycling speed of 30–35 km/h. At this stage, the athlete's body begins to move, but due to the moderate intensity of the motor, the physiological indicators of oxygen transport in the lungs and circulation increase slowly, enough oxygen is supplied for

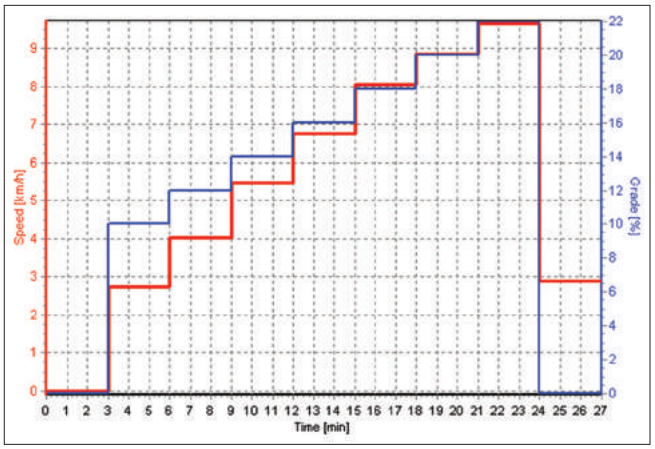

Figure 1: Maximum exercise procedure according to Bruce's protocol

Table 1: Synthesize the evolution of physiological indicators to assess the endurance of 16–18-year-old male road athletes cycling in 20 min

Stage (minute)	Phase (speed)		Rf (l/ph)	VT (lít)	VE (lít/ph)	VO2 (ml/ph)	VCO2 (ml/ph)	VO2/kg (ml/ph/kg)	R	HR (l/ph)	VO2/HR (ml/md)	EEm (kcal/ph)
Static		$\bar{x}$ ±S	24.41±2.18	0.6±0.04	13.9±1.32	342.69±33.7	314.6±30.5	5.65±0.55	0.88±0.07	95.06±9.4	3.65±0.34	1.69±0.15
Warm-up (5')	30–35 km/h	$\bar{x}$ ±S	33.68±3.2	1.08±0.9	35.69±3.45	1323.3±130.4	1199±108	23.3±2.31	0.9±0.08	134.3±13.1	9.93±0.95	6.51±0.63
Movement (10')	1 (40–45 km/h)	$\bar{x}$ ±S	41.39±3.89	1.43±0.13	58.17±5.41	1691.9±158.7	1676±16.3	29.8±2.87	0.99±0.09	156.9±14.9	10.9±1.02	8.5±0.81
	2 (Speed up)	$\bar{x}$ ±S	83.66±8.1	1.92±0.15	103.71±10.2	2582±25.6	3247±31.6	43.6±4.53	1.64±0.15	186.4±18.5	15.4±1.5	13.2±1.28
	3 (45–50 km/h)	$\bar{x}$ ±S	49.31±4.54	1.49±0.14	71.57±6.8	2286±21.5	2279±22.4	34.3±3.3	1±0.9	171.5±16.8	11.5±1.08	10.2±0.97
	4 (Sprint)	$\bar{x}$ ±S	88.17±8.2	1.96±0.18	115.5±12.5	2732.2±261	3676±35.8	44.5±4.75	1.7±0.16	191.4±18.9	14.8±1.53	15.4±1.52
Recovery (5')	15 – 20 km/h	$\bar{x}$ ±S	32.8±3.02	0.96±0.09	30.03±2.9	591.28±57.6	656.6±65.2	10.3±1.01	1.12±0.11	128.6±12.3	4.6±0.45	3.05±0.3

the reactions oxidation in cells. The respiratory quotient R <1 (VCO2 = 1199 ml/ph, VO2 = 1323.3 ml/ph) shows that in this period the energy supply for the active athlete is mainly aerobic.

Moving stage

Physiological changes change quite complicatedly with each phase of movement.

Phase 1: The amount of movement in this phase is higher than the starting phase (cycling speed 40–45 km/h), so the functional index of oxygen transport of the respiratory system and circulation in this phase is higher than the warming up. However, the respiratory quotient R <1 (VCO2 = 1676 ml/ph, VO2 = 1691.9 ml / ph) proves that the energy supply for athletes is mainly from aerobic energy sources. HR = 156.9 ± 14.9 beats/min, VE = 58.17 ± 5.41 l/min.

Phase 2: In 1 min, to speed up to overcome the opponent, the speed must be reached from 55 to 60 km/h. The evolution of energy metabolism at this stage is different from Stage 1: VCO2 = 3247 ml/ph, VO2 = 2582 ml/ph, the index R> 1 (R = 1.64 ± 0.15) proves the energy used for cyclist in accelerating, overcoming opponents are enhanced from anaerobic energy sources. In this accelerated phase, the parameters of respiratory function and circulation are increased with the intensity of motor. Respiratory rate, heart rate increased, but not as high as the intensity of the motion. HR heart rate = 186.4 ± 18.5 times/min, VE = 103.71 ± 10.2 (l/min).

Phase 3: In this phase, the energy supplied to the athlete is returned to the aerobic metabolic domain because VCO2 = 2279 ml/ph, VO2 = 2286 ml/ph, R = 1 ± 0.09. However, the oxygen transport functions of the spiratory and circulatory organs remained at a high level. The volume of circulating air doubled compared to the starting stage VE = 71.57 ± 6.8 (l/min), the pulse oxygen index also increased much higher than the starting phase VO2/HR = 11.5 ± 1.08 (times/pulse).

The last phase, athletes reach to the finish in 1 min, accelerating at maximum sprint speed. Respiratory ratio R increases R = 1.7 ± 0.16. The functional indicators such as VT, VE, HR, and VO2/HR are in the anaerobic energy metabolic domain. In this phase, the heart rate is highest to HR = 191.4 ± 18.9 times/min. High volume of emitted CO2 VCO2 = 3676 ± 35.8 ml/min (before sprinting VCO2 = 2279 ± 22.4 ml / min). Energy supply for athletes movement also increases EE = 15.4 ± 1.52 kcal/min.

Starting in the active phase, athletes increase their cycling speed to 40–45 km/h. With greater motor intensity, athletes still maintain in the aerobic metabolic region with R <1 (VCO2 = 1676 ml/ph, VO2 = 1691.9 ml/ph). This proves that the research team has a good foundation on aerobic endurance, so the respiratory, circulatory, and metabolic functions increase to adapt to a higher amount of new motor. With a time of 1 min,

accelerate to overtake the opponent, the speed is reached in the range of 55–60 km/h. When the amount of near-maximum movement increases suddenly, the aerobic energy supply is insufficient to supply, the athlete's body must quickly replenish from the anaerobic energy source to energize the high-intensity activities. However, the parameters of respiratory function and circulation did not increase with the intensity of the motor. Due to the short duration, with the maximum or sub-maximal motor intensity, the energy supplied in this phase is enhanced mainly by anaerobic energy, the respiratory rate R = 1.64 >1 (VCO2 = 3247 ml/ph, VO2 = 2582 ml/min). Rightly after the acceleration passing the opponent, the cyclists must maintain a high speed to be able to split the top. For high speed and stability at the next stage, the oxygen transport function of the respiratory and circulatory organs remains high to provide oxygen to compensate for the nourishing volume in the previous accelerating phase. The energy source for athletes returns to the aerobic energy domain, with the respiratory factor R = 1 (VCO2 = 2279 ml/ph, VO2 = 2286 ml/ph). The sprinting phase to the finish like the acceleration phase, but with extreme intensity, athletes must continue to mobilize a huge amount of energy from the maximum anaerobic source to withdraw to the destination at maximum speed. Increased respiratory rate R = 1.7 >1 (VCO2 = 3676 ml/ph, VO2 = 2732.2 ml/ph).

Recovery stage

After finishing, the physiological changes of the athlete remained at a high level, but shortly thereafter these functions decreased very rapidly to the initial steady state. Stable breathing rate, decreased pulmonary ventilation VE = 30.3 ± 2.9 (l/min), heart rate decreased HR = 128.6 ± 12.3, energy consumption decreased EE = 3.05 ± 0.3 kcal/min. But VCO2 = 656.6 ml/ph, VO2 = 591.28 ml/ph, the respiratory quotient R is still high R = 1.12 ± 0.11 >1.

Rightly after reaching the finish, the changes in physiological function remained high. Overload volume increases, so to repay the overload the functions of oxygen carrying of the circulatory and respiratory systems, the heart rate can be close to or reach 100% of the maximum heart rate. Respiratory rate also goes up 60 times/min. Depending on the training level of each athlete, the repayment time is slow or fast. In elite athletes, the repayment time is very fast, some athletes could complete after only 5 min, but some others could not even in 15 min.

The evolution of the physiological function in the evaluation of endurance through the volume of O_2 and CO_2 of the 16–18-year-old male road cyclist when performing the 20 min cycling test is shown in Figure 1.

Broken line: Oxygen volume; solid line: Carbon dioxide volume

The analysis of Table 1 and Figure 2 shows the physiological development of the athletes through the 20 min cycling test: The aerobic and anaerobic energy supply for the athletes changes continuously throughout the country road. Therefore, an athlete with good training skills, in addition to good aerobic ability to maintain high speed on the road, they must also have good anaerobic ability to perform the acceleration phase or sprint to the finish.

Comparison of Physiological Indices Assessing Endurance in the Laboratory (Maximum Test) and 20 min Cycling Test (Sprinting to the Finish) of the 16–18-year-old Male Road Cyclists in Ho Chi Minh City [Table 2 and Figure 3]

The results in Table 2 show that, during the sprint to the finish, athletes have mobilized the maximum of the functional organs in the body to provide energy to achieve the highest speed in the shortest time, so most of the time physiological number reached over 90% and exceeded 100% of maximum physical capacity in the laboratory (VE = 93.9%, VO2 = 99.1%, HR = 101%, VCO2

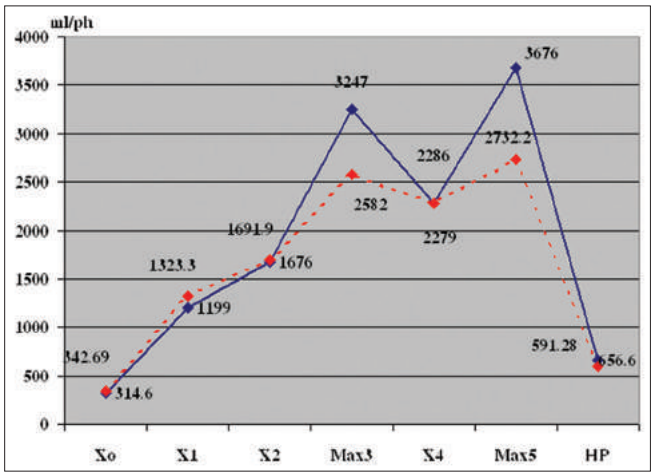

Figure 2: The evolution of the physiological function in the evaluation of endurance through the volume of O_2 and CO_2 of the 16–18-year-old male road cyclist when performing the 20 min cycling test. Xo: Static at the beginning, X1: Warm-up, X2: Increase speed, Max3: Speed up, X4: Maintain high speed, Max5: Sprint to finish, HP: Recovery

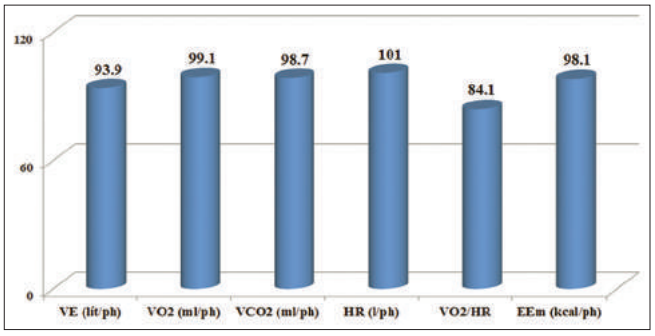

Figure 3: Percentage of the 20 min cycling test (sprint to the finish) compared to the maximum test in the laboratory of the 16–18-year-old road cyclists in Ho Chi Minh city

Image 1: Athletes are doing a 20 min cycling exercise

Table 2: Comparison of the physiological indicators of laboratories (maximum test) and 20 min cycling test (sprint to finish) of 16–18-year-old male road cyclists

S. No.	Indicator	Maximum physical activity		
		Laboratory (1)	20 min cycling test (2)	Ratio % (2)/(1)
1	VE (l/ph)	123	115.5	93.9
2	VO_2 (ml/ph)	2758	2732.2	99.1
3	VCO_2 (ml/ph)	3723	3676	98.7
4	HR (l/ph)	189	191.4	101
5	VO_2/HR	17.6	14.8	84.1
6	EEm (kcal/ph)	15.2	15.1	98.1

= 98.7%, and EE = 98.1%). The 20 min cycling test has shown that the technical performance of the athlete when performing the test is nearly equivalent to the maximum test in the laboratory. Therefore, the mobilization of the level of functional organs in the athlete's body when performing the test compared to the maximum capacity of physical activity in the laboratory will accurately assess each aspect of the athlete's capacity, thereby helping the coach to adjust the training lesson plan accordingly.

CONCLUSION

The distinctive feature of the road cycling is that the technical endurance of the athlete on the road continuously changes with the speed of the cyclists: Starting the race to reach high speed, athletes must mobilize energy from the anaerobic source; next to maintain the speed, the athlete is energized by the aerobic source; during the race, there are distances that cyclists have to attack, break through or pass through hilly or steep terrain, they need to increase energy from anaerobic sources;… and finally, when sprinting to the finish with great motor intensity, the athlete must increase the anaerobic energy source to reach the highest speed.

During the sprint to the finish, athletes have maximized the functional organs in the body to provide energy to achieve the highest speed in the shortest time, most of the physiological indicators reach over 90% and exceed 100% of maximum physical capacity in the laboratory (VE = 93.9%; VO2 = 99.1%; HR = 101%; VCO2 = 98.7%; and EE = 98.1%).

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Research Article

Effect of yogasana and pranayama on selected cardiorespiratory parameters of middle-aged men

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ABSTRACT

During exercise, oxygen consumption (VO_2) can increase by a factor of more than 10. This leads to a large increase in the production of oxidants and results in damage that contributes to muscular fatigue during and after exercise. Yoga, a form of physical activity, has many health benefits. The study was designed to find out the influence of yogasana and pranayama on the selected cardiorespiratory parameters of middle-aged men. Sixty middle-aged male subjects were randomly selected from different walks of life and their age ranged between 40 and 50 years. They were divided into three groups, namely, yogasanas group, pranayama group, and control group, consisting of 20 subjects in each. The selected yogasana group was given 8 yogasanas and pranayama group was given 5 exercises for 12 weeks. The control group was not exposed to any treatments and was strictly under control. Selected cardiorespiratory parameters, resting heart rate, and maximal VO_2 (VO_2 max) were tested before and after the experimental treatment from all three groups. The differences between the initial and final scores were considered as the effect of asanas and pranayama's on the selected cardiorespiratory parameters. Analysis of covariance results proved asanas and pranayama's can beneficially alter cardiorespiratory parameters such as resting pulse rate and VO_2 max. It was concluded middle-age men can practice yogasanas and pranayama for improving and maintaining their cardiorespiratory health.

Keywords: Asana, Cardiorespiratory parameters, Maximal oxygen consumption, Pranayama, Resting pulse rate

INTRODUCTION

Cardiorespiratory fitness (aerobic fitness or "cardio") is the ability of the heart to pump stronger and more efficiently and the muscles to use oxygen more efficiently. As one gets more aerobically fit, the heart will pump more blood and oxygen with each beat (this is called "stroke volume") and the muscles will extract (or consume) more oxygen. For instance, if one has 100 oxygen molecules floating around in the bloodstream, a conditioned muscle might consume 75 molecules, whereas a deconditioned muscle might only consume 30, or even fewer than that. Regular exercise makes these systems more efficient by enlarging the heart muscle, enabling more blood to be pumped with each stroke, and increasing the number of small arteries in trained skeletal muscles, which supply more blood to working muscles. Individuals that spend a lot of time doing cardiovascular-type training have more efficient hearts that are capable of delivering greater amounts of nourishment to working tissues with less stress placed on their tickers. In addition to having a greater amount of working capacity, regular aerobic-type training can help prevent certain diseases and disorders that can impair an individual's cardiovascular system. Thus, the benefits of cardiorespiratory fitness include reduction in blood pressure, increased high-density lipoprotein cholesterol, decreased total cholesterol, decreased body fat stores, increased aerobic work capacity, decreased symptoms of anxiety and stress, and increased heart function.

Middle-aged adults often show visible signs of aging such as loss of skin elasticity and graying of the hair. Physical fitness usually wanes, with a 5–10 kg (10–20 lb) accumulation of body fat, reduction in aerobic performance, and a decrease in maximal heart rate. Strength and flexibility also decrease

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Table 1: Results on calculation of ANCOVA

Calculation of ANCOVA on resting heart rate								
	Asanas group	Pranayama group	Control group	Source of variance	Sum of squares	df	Mean squares	Obtained F
Pre-test mean	72.25	74.55	72.95	Between	55.60	2	27.80	1.05
				Within	1509.65	57	26.49	
Post-test mean	70.05	71.30	72.85	Between	78.70	2	39.35	2.07
				Within	1083.70	57	19.01	
Adjusted post-test mean	70.86	70.25	73.09	Between	89.06	2	44.53	25.21*
				Within	98.91	56	1.77	
Mean diff	–2.20	–3.25	–0.10					
Calculation of ANCOVA on VO_2 max								
Pre-test mean	14.56	14.10	15.69	Between	26.60	2	13.30	0.01
				Within	68830.63	57	1207.55	
Post-test mean	18.30	16.45	15.70	Between	71.86	2	35.93	0.03
				Within	76013.55	57	1333.57	
Adjusted post-test mean	18.53	17.16	14.75	Between	146.71	2	73.36	7.34*
				Within	559.81	56	10.00	
Mean diff	3.74	2.35	0.01					

Required F (0.05,2.7)=3.15, *Significant, ANCOVA: Analysis of covariance, VO2 max: Maximal oxygen consumption

Table 2: Scheffe's *post-hoc* analysis results

Post-hoc analysis for resting heart rate				
Asanas group	Pranayama group	Control group	Mean difference	Reqd. C.I
70.86	70.25		0.61	1.06
70.86		73.09	–2.23	1.06
	70.25	73.09	–2.84	1.06
Post-hoc analysis for VO_2 max				
18.53	17.16		1.37	2.51
18.53		14.75	3.78*	2.51
	17.16	14.75	2.41	2.51

*Significant

throughout middle age. However, people age at different rates and there can be significant differences between individuals of the same age. Yearly mortality begins to increase more noticeably from age 40 onward, mainly due to age-related health problems such as heart disease and cancer. However, the majority of middle-age people in industrialized nations can expect to live into old age. Life expectancy in developing countries is much lower and the risk of death at all ages is higher mainly due to cardiorespiratory fitness problems.

During exercise, oxygen consumption (VO_2) can increase by a factor of more than 10. This leads to a large increase in the production of oxidants and results in damage that contributes to muscular fatigue during and after exercise. The inflammatory response that occurs after strenuous exercise is also associated with oxidative stress, especially in the 24 h after an exercise session (Tan *et al*. 2000).

Yogic techniques are known to improve one's overall performance. Pranayama is known to be a part of yogic techniques. Pathanjali in its yoga sutra describes-Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyan, and Samadhi as eight angas (parts) of yoga (Yoga Sutra of Pathanjali, cited by Christopher, 2008). Among them, in the present materialistic world, the third and fourth part, Pranayama and Asana (Postures), are considered as very important parts and prescribed by modern medicine too.

Researches have proved that the beneficial effects of different yogasanas and pranayama are well-reported and have sound scientific basis (Raghuraj *et al*., 1998: Bhattacharya *et al*., 2002). Different types of pranayama produce different physiological responses in normal young volunteers (Raghuraj *et al*., 1998; Bhattacharya *et al*., 2002; Madanmohan *et al*., 2005). Breathing exercises are reported to influence cardiorespiratory and autonomic functions (Srivastav *et al*., 2005) and also help in reducing the scores of anxiety (Brown and Gerbarg 2005) and stress (Bhattacharya *et al*., 2002). However, there was dearth of research to find out the effect of yogasanas and pranayama exercises on lipid profiles and the resultant effect on antioxidant status in young healthy individuals.

The present study was designed to find out the influence of yogasana and pranayama exercises on selected cardiorespiratory parameters of middle-aged men.

METHODS

To achieve the purpose, 60 middle-aged male subjects were randomly selected from different walks of life and their age ranged between 40 and 50 years. The selected subjects were divided into three groups, namely, yogasanas group, pranayama group, and control group, consisting of 20 subjects in each. The selected yogasana group was given Padmasana, Dhanurasana, Bhujangasana, Vajrasana, Matsyasana, Paschimottanasana, Ardha Chakrasana, and Sarvangasana for 12 weeks. The pranayama group was given Nadi Shodhana (Alternate Nostril Breathing), Sama Vritti Pranayama (Equal Breathing), Bhastrika Pranayama (Bellow Breath), Ujjayi Pranayama (Ocean Breath), and Kapalabhati Pranayama (Skull Shining Breath) for 12 weeks. The control group was not exposed to any treatments and was strictly under control. Selected cardiorespiratory parameters, resting heart rate, and maximal VO_2 (VO_2 max) were tested before and after the experimental treatment from all three groups. The differences between the initial and final scores were considered as the effect of asanas and pranayama's on the selected cardiorespiratory parameters. The collected data were analyzed through analysis of covariance (ANCOVA) and if significant differences were recorded, *post-hoc* test using Scheffe's Confidence Interval test was done to compare the differences between paired means.

ASANAS

Padmasana

Dhanurasana

RESULTS

The obtained results proved that 12 weeks yogasanas and pranayama treatments have been significantly moderated the

Vajrasana

Matsyasana

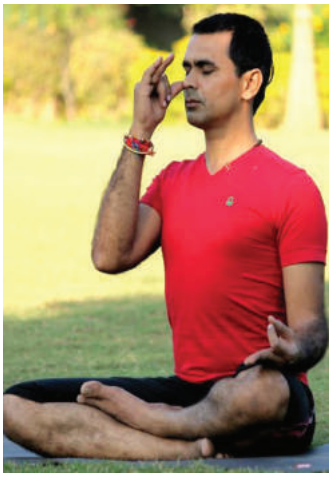
Paschimottanasana

Ardha Chakrasana

Sarvangasana

Bhastrika Pranayama

PRANAYAMA



Nadi Shodhana

Kapalabhati

Bhujangasana

resting pulse rate and VO_2 max ($P < 0.05$) as the obtained F values were greater than the required F value of 3.15 to be significant. The *post-hoc* analysis proved that the paired mean differences between asanas group and control group, pranayama group and control group were significant on resting pulse rate, and asanas and control group on VO_2 max.

DISCUSSION

The interventional programs, namely 12 weeks asanas and pranayama's proved that cardiorespiratory parameters such as resting pulse rate and VO_2 max can be significantly altered. There is strong evidence that one of the adaptations resulting from yogasana and pranayama exercise is a strengthening of the body's antioxidant defenses, particularly the glutathione system, to regulate the increased oxidative stress (Leeuwenburgh *et al*., 1994). The findings of this study that asanas and pranayama would significantly regulate resting pulse rate and VO_2 max is in agreement with the findings of (Bhattacharya *et al*., 2002), who reported that the practice of yoga was found to be associated with significant influence on cardiorespiratory parameters.

CONCLUSIONS

The findings of this study proved that yogasanas and pranayama contributed for beneficial influence of cardiorespiratory variables among middle-aged men. In the future, researches on similar other profiles can be included to get more accurate influences of yogasana and pranayama.

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Research Article

A comparative study of speed among kabaddi and kho-kho players of KVM College of Physical Education, Kulkacherla, Osmania University

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ABSTRACT

The purpose of the present study was to find out the speed among kabaddi and kho-kho players of KVM College of Physical Education, Kulkacherla, Osmania University. The sample for the present study consists of 20 male B.Ped students out of which 10 are kabaddi players and 10 kho-kho players. Fifty meter run test is conducted to determine the speed. This study shows that kho-kho players are having better speed compare to kabaddi players of KVM College of Physical Education.

Keywords: Kabaddi, Kho-Kho, Speed etc.

INTRODUCTION

Sports participation has shown important contributions to be healthy, wealthy, and productive. Physical literacy plays an important role on individual and social wellness. At present, different competitions making the world unite and showing integrity and inclusive growth even though there are so many gaps in health and physical activity promotion among countries. Indians need to be imposing strong physical literacy and sports participation policy for every individual right from childhood to senior citizens then only can expect medals in international levels.

Physical fitness is generally achieved through exercise, correct nutrition, and enough rest. It is an important part of life. Different games provided to do the body activities, differently. Kabaddi and kho-kho players are equally conductive to developing physical abilities among the players.

Speed and resistance training depends on adenosine triphosphate (ATP) and ATP-creatine phosphate systems (6–15 s).

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Dharmesh and Kasundra (2020) studied a comparative study of speed and endurance among kho-kho and kabaddi players. Speed and endurance are very important physical ability for performance in kho-kho and kabaddi. Kho-kho is very similar to kabaddi. The purpose of the present study was to compare the speed and endurance among kho-kho and kabaddi players. For the present study, 40 male kho-kho and kabaddi players of Shree CC High School, Dist. Surendranagar (Gujarat), 20 kho-kho players and 20 kabaddi players between the age group of 13 and 15 years. The independent *t*-test was employed and found significant difference at 0.05 level of significance in speed and endurance. The 30 M for speed and 12 min Cooper test were used for endurance to assess the results. This study shows that kabaddi players are having good speed and kho-kho players are having good aerobic endurance.

METHODS

The purpose of the present study was to find out the speed among male kabaddi and male kho-kho players of KVM College of Physical Education, Kulkacherla, Osmania University. The sample for the present study consists of 20 male B.Ped students out of which 10 are kabaddi players and 10 kho-kho players. Fifty meter run test is conducted to determine the speed.

Table 1: Mean values and independent samples test of 50 m run between kho-kho players and kabaddi players of KVM College of Physical Education, Kulkacherla, Osmania University

Variables	Group	Mean	SD	*t*	Sig (two tailed)
50 m run	Kabaddi players	7.24	0.227	11.93	0.000
	Kho-kho players	6.61	0.339		

*Significant at 0.05 level

RESULTS

This study shows that kho-kho players are having better speed compare to the kabaddi players in 50 m run.

In Table 1, the mean values of kabaddi players are 7.24 and kho-kho players are 6.61. The average mean of kho-kho players is lesser than the kabaddi players. The standard deviation of kabaddi players is 0.227 and kho-kho players is 0.339 and t is 11.93 and sig. (two tailed) is 0.000.

CONCLUSION

1. It is concluded that kho-kho players are having better speed compare to kabaddi players
2. Conditioning exercises play a major role for the improvement of speed among kabaddi and kho-kho players.

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 kabaddi and kho-kho
3. Fitness 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 kabaddi and kho-kho players.

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Research Article

Comparison of speed among fast bowlers and batsman of Adikavi Nannaya University cricket players

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ABSTRACT

The purpose of the present study was to find out the speed among fast bowlers and batsman in cricket of Adikavi Nannaya University, Rajahmundry, Andhra Pradesh. The sample for the present study consists of 20 male fast bowlers and 20 male batsman of Adikavi Nannaya University cricket players age about 19–22 years. To assess the speed, the 50 m run test was conducted among fast bowlers and batsman. It was found that fast bowlers are having good speed compare to the batsman. Hence, it is also concluded that fast bowlers required more speed compared to batsman to bowl fast in cricket. It is recommended that the speed training must be given to fast bowlers and batsman in cricket.

Keywords: Batsman, Cricket, Fast bowlers

INTRODUCTION

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 10 batsmen are out, or a specified number of overs of six balls have been bowled, at which point the teams switch roles and the fielding team comes in to bat.

Dr. Pratap Singh Tiwari Retired/Director of Physical Education and Sports and Research Guide Department of Physical Education and Sports, Karnataka University, Dharwad (2016). The study was to analyze the relationship of general and specific cricket speed and physical tests, which included 20, leg strength and shoulder strength, to differentiate batsman with that of fast bowlers of Goa, total 50 cricket players were selected for the study and were examined accordingly further they were divided into two groups, batsman $n = 25$ and bowler $n = 25$, their age was above 18 and below 22 years of age. All the cricketers had competed at least at the state level and national level. Mean, standard deviation, and independent *t*-test were used. Significant level was set at 0.05 levels. Statistical investigation revealed that there is a difference among batsman and bowler in speed tests and strength test. It is recommended that these tests should be made fundamental tests in any physiological and physical assessment of cricket players.

Sanwan (2019) study has been designed to investigate the reaction time among fast bowlers, batsman, and wicket keepers in cricket who participated at interuniversity and national level in Haryana state. For accomplish the study, 20 male batsman, 20 male fast bowlers, and 20 male wicket keepers were randomly selected as sample. The age of all samples was ranged 19–22 year. Male sportspersons who participate at interuniversity level and national level were randomly selected as samples. To accomplish the study, reaction time test was used in the study. All samples were selected from the Haryana state. The obtained data were analyzed by applying one-way analysis of variance. The level of significance was

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set at 0.05. A significant difference was found between fast bowlers, batsman, and wicket keepers in their reaction time. Wicket keepers are having more reaction time in compression of fast bowlers and batsman.

METHODOLOGY

The purpose of the present study was to find out the speed among fast bowlers and batsman in cricket of Adikavi Nannaya University, Rajahmundry, Andhra Pradesh. The sample for the present study consists of 20 male fast bowlers and 20 male batsman of Adikavi Nannaya University cricket players age about 19–22 years. To assess the speed, the 50 m run test was conducted among fast bowlers and batsman.

Assessment of Performance

The objective of the study was to find out the speed between the fast bowlers and batsmen based on the study conducted the 50 m dash run. The three chances given to all the subjects (cricket players of Adikavi Nannaya University players) the best performance recorded of all the batsman and fast bowlers which help to find the speed condition ability among the batsman and fast bowlers.

50 m Dash Run or Sprints

The dash run helps to know the speed condition ability in the athlete also called as sprints race.

Purpose

To measure the speed.

Equipment required

Measurement tape to measure and mark the distance, non-slip floor to takeoff, whistle to start and cones for visible marking. Most important is stopwatch to record the performance.

Procedure

The subjects stand behind the starting line. The researchers before the start give the demonstration and explanation clearly so the subject performs well in manner. Subjects have to run with his maximum speed. The running start had been done in standing position, after the whistle they have to start the run up to 50 m. Subject got three chances in each chance the rest period 5 min, the best timing was recorded in his three attempts.

RESULTS AND DISCUSSION

This study shows that fast bowlers are having better speed compare to the batsman in 50 m run.

In Table 1, the mean values of 50 m run of fast bowlers are 7.11 and batsman are 7.59. The average mean of fast bowlers in 50 m run is lesser than the batsman.

Table 1: Mean values and independent samples test of 50 m run between fast bowlers and batsmen in cricket

Variables	Group	Mean	SD	*t*	*P*-value
50 m run	Fast bowlers	7.11	0.261	4.57	0.000
	Batsman	7.59	0.409		

*Significant at 0.05 level

In cricket, fast bowlers require speed to do fast bowling. It was found that fast bowlers are having good speed compare to compare to the batsman. Hence, it is also concluded that speed of running is very important bowling for fast bowlers.

CONCLUSION

1. It is concluded that fast bowlers are having better speed than batsman
2. Conditioning exercises play a major role for improvement of speed among cricketers
3. Sprint training is not all about running fast. It is important to have a good fitness base to build speed upon, 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 cricketers.

ACKNOWLEDGMENT

The authors sincerely thank to Adikavi Nannaya University, Department of Physical Education, for providing opportunity to carry out this study. Authors heartfully thank to Adikavi Nannaya University for special research grant and authors the authors would like to special appreciation to the young cricket players for their commitment and contribution as players in this research.

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Research Article

Sports injuries among goalkeepers in football and hockey in Telangana state – An analytical study

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ABSTRACT

The sample for the study consists of 20 male goalkeepers in football and 20 male hockey goalkeepers in the age group of 19–22 years. The data are collected through questionnaire at their practice session. It is concluded that goalkeepers in football, the lower extremities injuries are 45%, upper extremities injuries are 25%, head-and-neck injuries are 10%, and spine 20%. It is concluded that goalkeepers in hockey, the lower extremities injuries are 40%, upper extremities injuries are 30%, head-and-neck injuries are 15%, and spine 15%. This type of study is useful to coaches to give proper coaching for the development of motor qualities for the prevention of injuries among football and hockey goalkeepers.

Key words: Injuries, Lower extremities, Spine, Upper extremities

INTRODUCTION

Engaging in sports activities has numerous health benefits but also carries the risk of injury. At every age, sportspersons sustain a wide variety of soft tissue, bone, ligament, tendon, and nerve injuries caused by direct trauma or repetitive stress. Different sports are associated with different patterns and types of injuries, whereas age, gender, and type of activity influence the prevalence of injuries.

Although field hockey is classified as a non-contact sport, the high velocity of both ball and stick, and the relative lack of protective equipment (except goalkeepers), all contribute to the inherent dangers of participation in the field hockey. Rule, surface and equipment modifications, outdoor and indoor seasons, and better skilled and trained players have a chance of more injuries during the play.

The body regions and injuries, which selected in current study according to the survey in previous studies, were identified as head and face, shoulder region, elbow and forearm, back and abdominal muscles, pelvic and thigh area, knee region, leg region, and ankle and foot region.

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Dick *et al*. (2007) conducted a study that aimed to describe the epidemiology of hockey injuries and reported that the overall injury rate for games was 7.87% for the full length of the study. In addition, the most frequently occurring injuries from this study were lower leg injuries which accounted for 43% of injuries occurring during matches and 60% occurring during practices, which is a concerning fact. The study of Murtaugh, 2001, reported that the most frequently injured site of the body was the lower limb (51%), followed by the head/face (34%), upper limb (14%), and torso (1%). The most prevalent types of injuries were ankle sprains, followed by hand fractures and head/face injuries.

Badr and Gaballa (2015) examined injury patterns of Egyptian field hockey players and broadened the current base of knowledge by identifying the injury rates among different positions. Using interviews, 75 players from eight teams were surveyed. The participating players played in the Egyptian field hockey league and were professional players. The players were categorized according their playing positions as 8 goalkeepers,

26 defenders, 24 midfielders, and 17 strikers. The interview contained questions about observed and experienced injuries, cause of injuries, type of injuries, and region of occurrence. Descriptive statistics were derived using SPSS (19) and statistics used frequency method to determine the percentage of all collected data. The most body region exposed to injury is the pelvic and thigh region with 21% of the total injuries, the common injuries to hockey players in upper limb is low back pain and in lower limb is cramps of posterior thigh muscles. The goalkeepers were the lowest level of injuries in the current study, then come defenders and midfielders. The stickers were relatively near percentage to midfielders. The most conclusion in the current study was, an attention to adequate warming up and muscles stretching during training and prior matches are vital.

Jaine and Etal (2015) studied about the injuries in professional male soccer players in the Netherlands. A total of 286 injuries were recorded, affecting 62.7% of the players. The overall injury incidence was 6.2 injuries/1000 player-hours, 2.8 in training sessions, and 32.8 in matches. Most of the recorded injuries were acute (68.5%). About 8% of the injuries were classified as recurrent. Injuries were most likely to be located in the lower extremities (82.9%). Injury time loss ranged from 1 to 752 days, with a median of 8 days. Knee injuries had the greatest consequences in terms of days of absence from soccer play (on average, 45 days). The most common diagnosis was muscle/tendon injury of the lower extremities (32.9%).

METHODOLOGY

The sample for the study consists of 20 male goalkeepers in football and 20 male hockey goalkeepers in the age group of 19–22 years. The data are collected through questionnaire at their practice session.

RESEARCH INSTRUMENTS

Questionnaire forms were used to collect the data and were distributed to participants who regularly practice of hockey and football in Hyderabad at their practice session at different grounds.

The form included items on age, gender, length of practice, and injury diagnosis.

Lower extremities (ankle sprain, hamstring strain, quadriceps contusion [dead leg], groin strain, anterior cruciate ligament injuries, and collateral ligaments injury).

Upper extremities (dislocated shoulder and fractures in the hand).

Table 1: Percentage of injuries among goalkeepers in football

Lower extremities injuries (hamstring strain, knee ligament, ankle, Achilles tendon, shin bone, and meta tarsals)	UPPER extremities (rotator cuff, elbow injury, and fractures in hand)	Head and neck	Spine
45	25	10	20

Table 2: Percentage of injuries among goalkeepers in hockey

Lower extremities injuries	Upper extremities	Head and neck	Spine
40	30	15	15

Head and neck (cuts and bruises to the face or head).

Spine (back pain).

RESULTS AND DISCUSSION

It is concluded that goalkeepers in football, the lower extremities injuries are 45%, upper extremities injuries are 25%, head-and-neck injuries are 10%, and spine 20%.

It is concluded that goalkeepers in hockey, the lower extremities injuries are 40%, upper extremities injuries are 30%, head-and-neck injuries are 15%, and spine 15%.

RESEARCH RECOMMENDATIONS

Sufficient warm-up, proper technique, correct biomechanics, proper conditioning, optimizing balance, coordination, optimizing reaction times, optimal diet, adequate rest, and positive attitude will reduce the risk of injuries. Increase your flexibility by performing dynamic warm up before practice and competition followed by static stretching post-activity. Consult a coach or physical trainer to incorporate the conditioning programs during the practice.

The agility training is important for defenders and midfielders for avoid injuries, such as sprain ankle, tear of ligaments, and meniscus of the knee joint. Muscle strength training for lower limb attacker players is vital to avoid injuries during high speeds and sudden stops. Neuromuscular and balance training programs may reduce the risk of ankle injury. The correct choice of footwear is important in the prevention of overuse type running injuries. Hockey and football goalkeepers with a history of ankle sprains should partake in conditioning programs which include balance training exercises.

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Research Article

Comparison of speed among badminton players and table tennis players of university of horticultural sciences, Bagalkot

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ABSTRACT

The purpose of the study is to determine the speed among badminton players and table tennis players of University of Horticultural Sciences, Bagalkot. The sample for the study consists of *n* = 15 badminton players and *n* = 15 table tennis players. To assess the speed fitness, 50 m dash run test were used in the study. It is concluded that badminton players are having better speed condition ability compare to table tennis players.

Keywords: Badminton, Speed, Table tennis

INTRODUCTION

Dr. Vikrant Ramchandra Wankhede (2018) the main purpose of the study is to compare speed of movement and coordinative abilities of badminton and table tennis players. Researcher hypothesized that there might be significant differences in speed of movement and coordinative abilities of badminton and table tennis players. The study was delimited to 10 badminton and 10 table tennis players. The study was also delimited to inter-collegiate level male players S.G.B.A.U., Amravati. The age of the subjects ranged between 18 and 25 years. The present study was delimited to speed of movement and coordinative ability variables only. 10 badminton and 10 table tennis were selected as subjects who represented inter-collegiate tournaments and inter-university trials of S.G.B.A.U., Amravati using simple random sampling method. For collecting data, the researcher administrated 50-yard dash for speed of movement and measured in seconds, eye-hand coordination and eye-foot coordination tests used to measure the coordination ability and measured in seconds. To find out the significant difference's' test was employed on each variable independently. To test the hypothesis, the level of significance was set at 0.05 level of confidence. Badminton players are good in speed of movement and eye-hand coordination than TABLE TENNIS PLAYERS, but not in eye-food coordination.

TH Shyam Singh and H Surendra Sharma (2018), aim of the study was to compare the physical fitness variables (speed, endurance, agility, and flexibility) of 15/15 each badminton and lawn-tennis male players of manipur between the age group of 17–19 years. The data were analyzed by descriptive statistics and t-test. From the, it observed that there was no significant difference between badminton and lawn-tennis finding male players of different selected physical fitness variables.

Objective of the Study

The objective of the study is to determine the speed among badminton players and table tennis players of University of Horticultural Sciences, Bagalkot.

METHODOLOGY

The sample for the study consists *n* = 15 badminton players and *n* = 15 table tennis players. To assess the speed, 50 m dash run test were used in the study.

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Tools

Assessment of performance

The objective of the study to find out the speed between the badminton players and table tennis players based on the study conducted the 50 m dash run. The three chances given to all the subjects. The best performance recorded of all the badminton players and table tennis which help to find the speed condition ability among the badminton players and table tennis.

50 Meters Dash Run or Sprints

The dash run helps to know the speed condition ability in the athlete also called a sprints race.

Purpose

To measure the speed.

Equipment Required

Measurement tape to measure and mark the distance, non-slip floor to take off, Whistle to start, and cones for visible marking. Most important is stopwatch to record the performance

Procedure

The subjects stands behind the starting line. The researchers before the start give the demonstration and explanation clearly so the subject performs well in manner. Subjects have to run with his maximum speed. The running start had been done in standing position, after the whistle they have to start the run-up to 50 m. Subject got three chances in each chance the rest period 5 min, the best timing was recorded in his three attempts.

RESULTS AND DISCUSSION

Table 1 is showing mean standard deviation standard error and *t*-test of cardiorespiratory fitness of badminton and table tennis players.

In Table 1, the mean values of 50 M run of table tennis are 7.1400 and badminton players are 6.7333. The average mean of badminton players in 50 m run is lesser than the table tennis players.

It was found that badminton players are having good speed compare to table tennis players. Hence, it is also concluded that speed of running is very important for both badminton players and table tennis players.

Table 1: Comparison of statistical results among all groups of badminton and table tennis players in 50 m dash run

Variable	Group	mean	N	SD	St. Error mean	T value
50 m	Table tennis players	7.1400	15	0.48109	0.08783	12.125
	Badminton Players	6.7333	15	0.48162	0.08793	

*Significance at 0.05 levels

CONCLUSION

It is concluded that badminton players are having better speed condition ability compare to table tennis players.

Recommendations

1. Similar studies can be conducted on other games such as squash, female badminton, and table tennis players.
2. This study also helps the physical educators and coaches to improve their training regime to excel in badminton and table tennis players.

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Research Article

Effect of physical fitness and psychological factors on the performance of inter-university basketball players of Gulbarga University

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ABSTRACT

The game of basketball is additionally needing strength, speed, agility, and strength endurance. The purpose of the study was to find out the effect of physical fitness and psychological toughness on selected physical and psychological variables. Forty men basketball players were selected as subjects, at the age group of 18–23 the selected subjects were divided into 2 groups of 20 subjects each group. Experimental group I N-20 (physical fitness and psychology) and control group N-20 For this study, Group I experimental group and Group II acted as control group. The collected and analyzed statistically using *t*-test, in all the cases, the level of confidence is fixed at 0.05 for significance.

Keywords: Anxiety, Basketball, Physical, Psychological, Speed

INTRODUCTION

Sertaç Erciş Correspondence: Sertaç Erciş (2018) Faculty of Sport Sciences, Ataturk University, Erzurum, Turkey. The purpose of this study was to study the effects of physical fitness and mental hardness on the performance of elite basketball players in Turkey. The research included a population of 80 elite male athletes, and the size of the population and the sample size were equal and the method of selection was a purposeful one. The instruments consisted of physical fitness measurements. Goldberg General Health Questionnaire and hardiness questionnaire with components of challenge, control, trust, excitement, self-confidence, and commitment with the reliability of 0.88 and the exercise performance questionnaire were used to evaluate the performance and practice variables with a reliability of 0.82 which all of them were more than 0.78 in the preliminary design. Pearson correlation analysis and structural equations were used to answer the hypotheses. Physical fitness had affected psychological characteristics and performance. Since their importance is clear to everybody, we need to plan to enhance their psychological and mental health.

ShahinaSherani (2018) The aim of the study was to investigate and compare the sports motivation level and impact of psychology among under-19 school players and (U-25) senior basketball players belonging to the Ajmer district of Rajasthan state. A total number of 40 basketball female players were selected using a random sampling method, taken as the subjects for the study. For collecting data, the mental skill psychological questionnaire test was used as a test. Calculation was done according to the instructions given in the test manual of the checklist. Getting data to investigate the motivation level and performance changes between the school and college teams were statistically analyzed using two samples' t tests for the independent variables at 0.05 level of significance. The outcome of the study concluded that the senior basketball team was more psychologically strong and motivated because of their maturity level and experiences of the matches while playing the matches in the tournament as compare to school basketball team.

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METHODOLOGY

The high level of physical fitness and mental toughness comes from years of daily experience in a selected variety of physical fitness and autogenic training. Basketball players need physical practices to perform well in the games as well as mental toughness to control the emotions, self-concept anxiety, and aggression during the game, the condition of their muscles, strength, and endurance are essential to play. The game of basketball is additionally needing strength, speed, agility, and strength endurance. The purpose of the study was to find out the effect of physical fitness and psychological toughness on selected physical and psychological variables. Forty men basketball players were selected as subjects, at the age group of 18–23 the selected subjects were divided into 2 groups of 20 subjects each group. Experimental group I N-20 (physical fitness and psychology) and control group N-20 for this study group I experimental group and group II acted as control group. The collected and analyzed statistically using *t*-test, in all the cases the level of confidence.

Physical Fitness Variable (Speed)

There are many fitness components such as strength, agility, coordination, speed, and endurance; we give training for speed to improve the performance in basketball players. Speed is condition ability athlete has to cover maximum distance up on a short time.

Psychological Factor (Anxiety)

There are many factors such as arousal, anxiety, aggression, and stress, authors gone through the autogenic training to improve the performance in basketball players, mental toughness is very important to lead to win and improve performance.

Tools

50 m dash run or sprints

The dash run helps to know the speed condition ability in the athlete also called a sprints race.

Purpose

To measure the speed

Equipment Required

Measurement tape to measure and mark the distance, non-slip floor to take off, whistle to start, and cones for visible marking most important is stopwatch to record the performance

Procedure

The subjects stand behind the starting line. The researchers before the start give the demonstration and explanation clearly, so the subject performs well in manner. Subjects have to run with his maximum speed. The running start had been done in standing position, after the whistle they have to start the run up to 50 m. Subject got three chances in each chance the rest period 5 min, the best timing was recorded in his three attempts

Tool Anxiety (Psychological Factor)

The Standardized Sinha's comprehensive anxiety test was used for the study.

RESULTS AND DISCUSSION

In Table 1, the mean values of 50 m run of experimental group C pre-test 7.39 and post-test 7.12 and control group pre-test 7.67 and post-test 7.59 is the average mean of the experimental group in 50 m run is lesser than the control group.

It was found that the experimental group is having good speed compare to the control group. Hence, it is also concluded that speed of running is very important for basketball players to improve their performance.

Table 2 indicates that there was a significant difference between the experimental group and control group in the anxiety. The mean of the experimental group in anxiety is 24.58 compare to 28.23. Hence, the experimental group is having less anxiety compare to control group.

Table 1: This study shows that experimental group (physical fitness and psychology) are having better speed compared to the control group in 50 m run

Speed					
Variable	**Group**	**Mean**	**SD**	***t***	***P*-value**
PRE-TEST 50M RUN	Experimental	7.39	0.36	4.67	0.00
	Control	7.67	0.53		
POST-TEST 50M RUN	Variables Group	Mean	SDt *P* - value		
	50 M Run Experimental control	7.12	0.2614.5 70.000		
7.59	0.409				

*Significant at 0.05 level

Table 2: Graph showing comparison of anxiety between experimental group (physical fitness and psychology) and control group basketball players

Dimension	Group	Exp. Group	Control Group
Anxiety	Mean	24.58	28.23
	SD	2.28	1.99
	SE	0.19	0.16
	N	150	150

CONCLUSION

1. It is concluded that physical fitness training and mental training are very important to improve the performance of basketball players.
2. It is also concluded that not only basketball game but also plays a vital role in all game's sports.
3. It is also concluded that male as well female too required for physical and mental training to improve their performance.

Recommendations

1. Similar studies can be conducted on other games and events and among all.
2. This study also helps the physical educators and coaches to improve their training regime to excel in basketball players.

ACKNOWLEDGMENT

The authors sincerely thank Gulbarga University and GWFGC Kalburgi, Department of Physical Education, for providing an opportunity to carry out this study. Authors Heartfully thanks Guide for guiding during the research. The author would like to special appreciation to the young basketball players for their commitment and contribution as players in this research.

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Research Article

A comparative study of cardiovascular endurance of kabaddi and kho-kho players of Kakatiya University

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ABSTRACT

The purpose of this study was to compare the cardiovascular endurance of kabaddi and kho-kho female players of state and national level of Telangana state. A sample of *n* = 15 kabaddi women's players and *n* = 15 kho-kho women's players both the age groups of 18–25 years was purposively and randomly selected and compares their cardiovascular endurance. For examine cardiovascular endurance, the 12 mi run/walk test was used. That T value 2.35, which was significant level at 0.05. At last, result of the study was significant difference and was found between the kabaddi and kho-kho players of cardiovascular endurance.

Keywords: Cardiovascular endurance, Kabaddi, Kho-Kho players

INTRODUCTION

The main purpose of the present study was to compare the kabaddi and kho-kho female players on selected cardiovascular endurance. In comparing the kabaddi and kho-kho players who have obtained position participated in state and national level in their respective sports competition on selected physical such as cardiovascular endurance, the 12 min run/walk test between the players of kabaddi and kho-kho. The endurance requires the circulatory and respiratory systems to supply energy to the working muscles to support sustained physical activity. When most people talk about endurance, they are referring to aerobic endurance, which is often equated with cardiovascular fitness.

Cardio means heart and vascular represents veins and arteries. The name "Aerobic" is also used for "cardiovascular." Many empirical evidences suggest that by engaging in regular exercise and physical activity that improves the cardiovascular system (aerobic activity), individuals can reduce many risk factors associated with coronary heart disease. Cardiovascular endurance is ability of the heart and lungs to provide an adequate supply of oxygen to the body over an extended period of time. The safety precautions should always be adopted for the kabaddi and kho-kho training and competition for the safety of the players. The foundation of sportspersons starts from his initial developmental phase and goes up to high level. Endurance is a term widely used in sports and game and can mean many different things to many different people. In sports, it refers to an ability of an athlete to sustain prolonged exercise for minutes, hours, or even days. Endurance requires the circulatory and respiratory systems to supply energy to the working muscles to support sustained physical activity. The objective of endurance training is to develop the energy production systems to meet the demands of activity for as long as they are required.

The present study concentrated on the cardiovascular endurance of kabaddi and kho-kho female players. The age of players was 18–25 years. The total duration of both games is about 1 h and for the activity which is around 1 h. The endurance is very important consideration for the activity of more than 45 min. Therefore, cardiovascular endurance is most important factor while selecting the players of these games. The researcher compared the cardiovascular endurance of kabaddi and kho-kho players. In the present study, the 12 min run/walk test (Dr. Kenneth Cooper, 1968) was used for accessing

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Table 1: Comparison of mean on cardiovascular efficiency of kabaddi and kho-kho female players

Groups	Mean (mts)	SD	T ratio	T value
Kabaddi players	1910	181.63	2.35	1.96
Kho-kho players	2010	189.67		

Significant at 0.05 levels, t 0.05=1.96 (table value)

the cardiovascular endurance of kabaddi and kho-kho female players.

Hypothesis

- There is no significant difference between cardiovascular endurance of kabaddi and kho-kho female players.

METHODS

For the purpose of the study $n = 30$ players. Players $n = 15$ from the game of kabaddi and $n = 15$ players from the kho-kho have been selected on purposively and randomly basis who has won medal position in state and national level participated in Telangana. All the players were randomly practicing and competing in their respective sports competition. She explained and demonstrated them the 12 min run/walk test, which the subjects had to took so that the subjects form a mental prepare of test they were going to attempt. The researcher took the data of three players per day. First, the researchers gathered data from kabaddi players and then kho-kho players. After taken the data, the physical efficiency index applied as per 12 min run/walk test. At the last of every day, the researcher thanks the player for their cooperation. The research scholar also took the help of other research scholars, classmates, coaches, and other professional friends to record the data of different test items in a required manner.

Data Analysis

For the present study, the mean value, standard deviation, and "t"- test were applied to analyze the data, different steps in "t"-test were used in software and the final conclusion was drawn and it was also be compared with the significant value at 0.05 level of confidence.

RESULTS OF STUDY CARDIOVASCULAR EFFICIENCY

The above table indicates the mean difference of cardiovascular efficiency between kabaddi and kho-kho female players. The mean values of female kabaddi and kho-kho players in cardiovascular efficiency were cited as 1910 and 2010, respectively. The S.D. of female kabaddi and kho-kho players was calculated as 181.63 and 189.67, respectively. The "*t*"-test was calculated as 2.35 which was tested at the level of significant at 0.05 (table value 1.96) which showed that significant difference in mean values of female kabaddi and kho-kho players in cardiovascular efficiency was found and our hypothesis was accepted.

DISCUSSION

The significant difference was found in the 12 min run/walk test of cardiovascular endurance in relation to the kabaddi and kho-kho players. The kho-kho players group had better cardiovascular endurance, showing greater heart and lungs capacity than the kabaddi players group.

CONCLUSION

Kabaddi and kho-kho players' performance is depending on cardiovascular efficiency. The present study showed that cardiovascular efficiency of kho-kho players is better than the kabaddi players. Hence, the null hypothesis was rejected at 0.05 levels.

Recommendations

- The similar study may be conducted by taking others important variables which affects the performance of the kabaddi and kho-kho players along with others important physical variables
- The study may be undertaken by comparing the players of the other team individual sports competition and comparing the players belonging to different socioeconomic status, geographical conditions, and variation.

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Research Article

A Comparative study of strength and coordinative ability among school level male kabaddi and kho-kho players of district Warangal

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ABSTRACT

The purpose of the study was to compare the arm and shoulder strength, abdominal strength, and coordinative ability among male kabaddi and kho-kho players. To accomplish the study a sample 120 players, 60 players each of kabaddi and kho-kho, studying in Government Senior Secondary Schools of District Warangal of Telangana were selected as subjects. It was hypothesized that no significant difference would appear between the kabaddi and kho-kho player's w.r.t. selected physical fitness variables. Data were collected using selected test items of AAHPERD's physical fitness test battery. Mean, standard deviation, and T-test were used to analyze the data statistically. The level of significance was set at 0.05 level of confidence. The results showed a significant difference between the kabaddi and kho-kho player's w.r.t. physical fitness variables arm and shoulder strength and coordinative ability except abdominal strength where both kabaddi and kho-kho players performed similarly.

Keywords: Coordinative ability, Strength, Kabaddi, Kho-Kho

INTRODUCTION

Sport is as old as the human society, and it has achieved universal following in the modern times. It now enjoys popularity which strips out any other form of social activity. It has become an integral part of educational process. Millions of fans follow different sports events all over the world. Many participate in sports activities for the fun of it or for health, strength, and fitness. It is taking the shape of a profession to some with high skills, with ample financial benefits linked with high degree of popularity.

Each sports activity demands different types and levels of different physical abilities. When a particular sport possesses qualities, it contributes to the development of specific physical fitness. It is this specific fitness which makes it possible for a player to perform unusual and extraordinary movements with a very high standard of efficiency. Regular training leads to improve one's physical fitness which includes strength, speed, flexibility, endurance, and coordination. Coordination ability plays a very key role in all games and sports because when an athlete participants in game and sports, he has to bring about a series of changes in direction and movement at various parts of the body. The main objective of the study was set to compare the kabaddi and kho-kho player's w.r.t. selected physical fitness variables, that is, the arm and shoulder strength, abdominal strength, and coordinative ability.

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Hypothesis

It was hypothesized that no significant difference would appear between the kabaddi and kho-kho player's w.r.t. selected physical fitness variables.

Procedure

In the present investigation, a survey type of study has been conducted. In total, investigator selected a sample of 120 players by means of purposive random sampling from 10

schools of the Warangal district of Telangana, out of which he selected 12 kabaddi players each from the first five schools and 12 kho-kho players each from the other five schools. The subjects were boys of 10+1 and 10+2 classes of Government Senior Secondary Schools and were of 15–17 years age group only. Moreover, the present research was confined to only those players who had participated at zonal level school tournament of district Warangal. Data regarding selected physical fitness variables were collected using selected test items of AAHPERD's physical fitness test battery. Mean, standard deviation, and T-test were used to analyze the data statistically. The level of significance was set at 0.05 level of confidence.

RESULTS AND DISCUSSION

The mean, standard deviation, and "*t*" values of the investigated physical fitness variables of kabaddi and kho-kho players are given in Tables 1-5 and their analysis and interpretation follow them.

Table 1 reveals that the mean scores of arm and shoulder strength variable of the selected kabaddi and kho-kho players are 10.93 and 9.95, respectively, and the calculated "*t*"-value (3.09) for both the groups is higher than the table value at 0.01 level of significance. Thus, it is interpreted that the two groups differ significantly w.r.t. the variable arm and shoulder strength.

Table 1: Mean values, standard deviation, and "*t*" value of arm and shoulder strength variable of kabaddi and kho-kho players

	n	Mean	S.D.	S.E.M.	Mean difference	Df	*t*-value
Kabaddi	60	10.93	1.68	0.22	0.98	118	3.09*
Kho-kho	60	9.95	1.79	0.23			

*Significant at 0.01 level

Table 2: Mean values, standard deviation, and "*t*" value of abdominal strength variable of kabaddi and kho-kho players

	n	Mean	S.D.	S.E.M.	Mean difference	Df	*t*-value
Kabaddi	60	28.93	1.77	0.23	0.400	118	1.19
Kho-kho	60	29.33	1.90	0.25			

Not significant at 0.05 level

Table 3: Mean values, standard deviation, and "*t*" value of coordinative ability variable of kabaddi and kho-kho players

	n	Mean	S.D.	S.E.M.	Mean difference	Df	*t*-value
Kabaddi	60	11.12	0.22	2.86	0.111	118	3.09*
Kho-kho	60	11.01	0.17	2.18			

*Significant at 0.01 level

Hence, the formulated hypothesis for the kabaddi and kho-kho players' w.r.t. the variable arm and shoulder strength is rejected.

Table 2 reveals that the mean scores of abdominal strength variable of the selected kabaddi and kho-kho players are 28.93 and 29.33, respectively, and the calculated "*t*"-value (1.19) for both the groups is less than the table value at 0.05 level of significance. Thus, it is interpreted that the two groups do not differ significantly w.r.t. the variable abdominal strength.

Hence, the formulated hypothesis for the kabaddi and kho-kho players' w.r.t. the variable abdominal strength is accepted.

Table 3 reveals that the mean scores of coordinative ability variable of the selected kabaddi and kho-kho players are 11.12 and 11.01, respectively, and the calculated "*t*"-value (3.09) for both the groups is higher than the table value at 0.01 level of significance. Thus, it is interpreted that the two groups differ significantly w.r.t. the variable coordinative ability.

Hence, the formulated hypothesis for the kabaddi and kho-kho players' w.r.t. the variable coordinative ability is rejected.

CONCLUSION

Based on the analysis and interpretation of the data and within the limitations of the present investigation, the following conclusions are drawn:

The kabaddi players are better than kho-kho players when compared against the physical fitness variable arm and shoulder strength and coordinative ability.

The kabaddi and kho-kho players have same level of physical fitness when compared against the physical fitness variable abdominal strength.

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Nizam College Principal Prof. L. B. Laxmikanth Rathod (second from left) hands the professional membership certificate to Mohammed Shamsuddin and institution membership citation to Sports Village Hyderabad. Also seen in the picture are Dr Avinash Jaiswal, Vice-Principal, Nizam Collage (right) and Prof. Rajesh Kumar (left), Principal, College of Physical Education, who also heads the Association.

Fitness body welcomes Sports Village

In a one-of-its-kind recognition, the International Federation of Physical Education Fitness and Sports Science Association (IFPEFSSA) gave membership for the first time to an Indian sports promoter and his entity in Hyderabad on Thursday. At a function held in Nizam College, its Principal Prof. L. B. Laxmikanth Rathod, granted professional membership to Mohammed Shamsuddin and institution membership citation to Sports Village Hyderabad, of which Shamsuddin is the founder-CEO. Shamsuddin said that this was a doubly memorable day as his efforts and those of Sports Village were recognised by a prestigious world body like IFPEFSSA.