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Research Article

Physical education teachers' views toward flexible learning implementation in the new normal

Mark Anthony R. Dalipe, Niño C. Dominguez, Dale Ivan M. Manlangit

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ABSTRACT

The COVID-19 pandemic has altered the educational system in a rush of addressing the changing learning landscape. Physical education (PE) teachers change its role in teaching and learning process. Flexible PE classes require special preparation and operation to communicate and practice the values of PE well. There is a need to examine whether flexible PE classes are being held and conveying the values of PE appropriately. This study aims to collect the profiles of PE teachers teaching flexible learning practices in the new normal and views toward flexible learning implementation along students learning, faculty experience, coping strategies, and favorability. The faculty perceived several difficulties facing in flexible learning implementation during the new normal. In addition, the students are affected in terms of learning, grades, and attitude in the implementation of flexible learning. Despite these difficulties, faculties of higher education institution still find their way to manage to cope up with the demands of non-face-to-face education. It is recommended that PE teachers must learn to accept the challenges brought by COVID-19 pandemic and view flexible learning implementation as an interesting challenge for the betterment of teaching pedagogy.

Keywords: Coping strategies, Faculty experience, Favorability, Flexible learning, New normal, Students learning

INTRODUCTION

The World Health Organization (WHO) declared COVID-19 a global emergency on January 30th, 2020 and a global pandemic on March 11th, 2020. Currently, COVID-19 is affecting 219 countries and territories (WHO, 2021). In response to COVID-19, several countries have applied strict social distancing measures and a lockdown policy. In fact, COVID-19 pandemic has affected educational systems worldwide leading to the near-total closures of schools, universities, and colleges.

School closures and social isolation have affected all students, but particularly those living in poverty. Adding to the damage to their learning, a mental health crisis is emerging as many students have lost access to services that were offered by schools (Terada, 2020). In response to school closures, UNESCO recommended the use of distance learning programs and open educational applications and platforms that schools and teachers can use to reach learners remotely and limit

the disruption of education. Colleges have scrambled to find creative solutions to teaching students online, in person but socially distant or in a hybrid format.

Different countries worldwide have introduced various answers during the pandemic to continue the education process – the introduction of distance learning. These are online learning platforms such as Google, TV broadcasts, guidelines, resources, video lectures, and online channels were introduced (UNESCO, 2020). However, the implementation of e-learning is not always smooth and effective. During the COVID-19 outbreak, schools and universities have rapidly implemented e-learning. Therefore, schools that have limited or no experience with e-learning and schools that have not prepared e-learning resources experience difficulties, especially, when teachers do not understand how to use online applications (Zaharah and Kirilova, 2020).

Education is thus linked to a real current society and also to the perspective of a future better society (Osborne and Belmont, 2020). On today's situation, where flexible learning is implemented, it is really a challenge both for the teacher and the student to deal with the educational system present today.

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Flexible learning is a set of educational philosophies and system concerned with providing learners with increased choice, convenience, and personalization to suit the learner (Joan, 2013).

Flexible learning is the design and delivery of programs, courses, and learning interventions that address learners' unique needs in terms of place, pace, process, and products of learning. It involves the use of digital and non-digital technology and covers both face-to-face/in-person learning and out-of-classroom learning modes of delivery or a combination of modes of delivery. It ensures the continuity of inclusive and accessible education when the use of traditional modes of teaching is not feasible, as in the occurrence of national emergencies (CHED, 2020).

The Catanduanes State University (CSU) is implementing flexible learning by sending the students the learning materials in every course using any type online platform mainly, Google Classroom, and Messenger app.

Physical education (PE) is one of the mandated courses that the students must take. It was supported by several sections in the provisions of the 1987 Constitution of the Republic of the Philippines-Article XIV Education, Science and Technology, Arts, Culture, and Sports in Section 19 which stated that:

The State shall promote PE and encourage sports programs, league competitions, and amateur sports, including training for international competitions, to foster self-discipline, teamwork, and excellence for the development of a healthy and alert citizenry. All educational institutions shall undertake regular sports activities throughout the country in cooperation with athletic clubs and other sectors.

According to Jeong and So (2020), PE centers on physical activity and are clearly distinct from general knowledge-based subjects. Therefore, flexible PE classes require special preparation and operation to communicate and practice the values of PE well. Currently, as in-person school attendance and online classes are occurring in tandem around the world, there is a need to examine whether flexible PE classes are being held and conveying the values of PE appropriately.

Teachers, especially PE Teachers are facing these challenges too. Difficulties in conveying the value of sports in flexible PE classes remained in the modified technical practice. This value includes maintaining health through physical activities, cultivating community consciousness through physical activities with friends, and developing sports etiquette through sports participation. Students engaged in flexible PE classes often cannot secure enough space to effectively take part in physical activity and also have limited access to supplies and equipment needed to follow flexible PE classes. Thus, the

participants running the flexible PE classes used supplies that were readily available at home, which necessarily reduced the PE units that could be taught. This led to a shift in focus from competition, which is a major part of in-school PE, to health and physical activity challenges in online instruction (Jeong and So, 2020).

METHODS

The research was utilized the quantitative approach using a Likert scale questionnaire as the main tools in gathering data. According to Fraenkel *et al.* (2011), quantitative methods are considered capable of providing reliable, valid, objective, and generalizable findings. Moreover, questionnaires, one of the most widely used quantitative instruments, may be administered to a large number of participants. If the researcher collects data based on a representative sample of the population, generalizations can be made about the whole population.

The data were obtained from both primary and secondary sources. The primary sources of data are the respondents to the questionnaire that was administered. Seventeen conveniently chosen from the faculty members of the PE department of the CSU and responded to the survey questionnaire. This is the 100% of the total sampled population ($n = 17$) where the study was conducted. Some scholars regard 100% as the most acceptable response rate for small population.

RESULTS AND DISCUSSION

The majority of the faculty of PE are from 1 to 5 years (65%), 10 of them are females (59%), bachelor degree holder (88%), and instructor by rank (88%), and contractual (35%) were the employment status. The faculty was generally undecided whether they are in favor of flexible learning ($M = 2.94$). They were also undecided if online education is a viable alternative for learning ($M = 3.24$) and if the time commitment of developing flexible learning education is comparable to those in face-to-face classes ($M = 3.41$). In addition, faculties were undecided whether grades will be lower for students in flexible learning education ($M = 3.18$) and teaching online will have no impact on my face-to-face courses and instruction ($M = 2.47$). Finally, the faculties were undecided that there is no way for teachers to know if students did the reading in a flexible education classes ($M = 3.18$). On the other hand, the faculty agreed that student learns less in flexible learning courses ($M = 4.06$) that there is less student-teacher interaction in flexible learning environment ($M = 4.24$), that there is a high degree of depersonalization among students and teacher in flexible learning education ($M = 3.94$), that there is more academic dishonesty in flexible learning courses ($M = 4.24$), and the students' discussions in flexible learning courses will

seem impersonal and lack feeling compared to face-to-face classes ($M = 4.35$). They also agreed that the lectures cannot be replaced by technology tools ($M = 3.8$) that the technology of flexible education courses is difficult to manage and that good teaching principles will carry over from face-to-face to flexible learning courses ($M = 3.76$) and that planning schedule ahead of time to prepare everything for flexible learning ($M = 4.47$). Moreover, they strongly agreed that maximizing the use of available technology in preparing flexible learning materials ($M = 4.53$) and making sure that students will receive the lesson soft copy or hard copy ($M = 4.65$).

The study examined the perception regarding the PE teachers' views toward flexible learning in the CSU during the COVID-19 pandemic. This study highlighted that faculty members were generally unsure ($M = 2.9$) of flexible learning implementation.

Uncertainty of the response during the process is expected during the transition. According to Kurt Lewin's 3 Stage Change Model, transition during change is typically accompanied by feelings of hesitation and confusion (Palma *et al.*, 2021). The uncertain attitude of the faculty may possibly be due to the fact that, while faculty seem to have concerns about online teaching and learning to include but not limited to depersonalize the instruction and proliferation of academic dishonesty, faculties are left with less options as they are required to adopt the new normal of education (Moralista and Oducado, 2020).

However, faculties agreed ($M = 4.06$) that students learn less in flexible learning courses perhaps because there are barriers that affect the learning of the students and the teaching pedagogy of the faculties. Even among faculty in a leading university in online and distance education in the country, it is a fairly common problem that faculties resist and are indifferent to technology integration (Arinto, 2016).

Meanwhile, the hesitation of faculty toward flexible learning implementation may also be related to the fact the majority of the faculties are only <5 years in service and only few of the faculties have long teaching experience since the majority of the faculties are Bachelor's degree. Older faculty probably also with higher education, more teaching experience, and higher academic rank tended to be more in favor of online education (Moralista and Oducado, 2020).

This study also shows that the faculties are having difficulty in handling the technology tools during the flexible learning implementation. The faculties agree that the technology of flexible learning implementation is difficult to manage with the mean of 3.76. Same with the study noted that faculty expressed concerns about student success in online classes and expressed their need for technical support (Winco, and Ivancova, 2017).

Furthermore, a significant number of teachers in Macedonia disagreed with changing the traditional teaching method with e-learning (Xhaferi, and Farizi, 2018).

Surprisingly, faculties are also having strategies in coping the flexible learning implementation. They plan ahead of time to prepare everything for flexible teaching, they also maximize the use of available technology in preparing flexible learning materials, and also the faculties make sure that the students will receive the lesson, soft copy, or even hard copy.

The findings show that the problems and challenges associated with flexible learning must be addressed.

CONCLUSION

This study concluded that the faculties of PE mostly female with 1–5 years of teaching experience, bachelor's degree, instructor by rank, and contractual by employment status are mostly will agree or disagree in favor in flexible learning implementation.

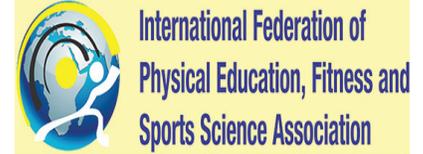
The faculty perceived several difficulties facing in flexible learning implementation during the new normal. Furthermore, the students are affected in terms of learning, grades, and attitude in the implementation of flexible learning. Besides, the faculties agree that their lectures cannot be replaced by technology tools with the mean of 3.82 and the faculties are undecided with the mean of 2.46 that the flexible learning or teaching online will have no impact on their face-to-face courses and instruction. Despite these difficulties, faculties of higher education institution still find their way to manage to cope up with the demands of non-face-to-face education. However, uncertainty defines the faculty perception toward flexible learning during the COVID-19 pandemic as they shift from traditional method of teaching to flexible teaching or non-traditional form of delivering instruction.

The researchers suggest to identify the barriers faced by the faculties of PE during the implementation of flexible learning. Furthermore, the faculty of PE must adapt to the new normal in the higher educational platform, the faculties must attend trainings or seminars for flexible learning implementation for the development and better learning of the students. The faculties of PE in the CSU must learn to accept the challenges brought by the COVID-19 pandemic and view flexible learning implementation as an interesting challenge for the betterment of teaching pedagogy.

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Research Article

Learning styles of bachelor of culture and arts education and bachelor of physical education students in new normal education

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ABSTRACT

Students have unique learning styles that require different approaches to teaching and learning. Understanding the learning styles of the students is crucial for educators to provide effective instruction and support. This research aimed to find the learning styles of Bachelor of Culture and Arts Education (BCAEd) and Bachelor of Physical Education (BPEd) students in new normal education academic year 2020–2021 of Catanduanes State University. Specifically, it will answer the profile in terms of gender, age, and year level/program and the learning styles do BCAEd and BPEd students exhibit in the new normal education. A research hypothesis that there is no significant difference in the learning styles of BPEd students and BCAEd students. It was concluded that BPEd and BCAEd students prefer kinesthetic learning style in the new normal education. Amidst the pandemic, students refer to the need for movement and realistic, situational examples when acquiring information. The researchers suggest for the teachers to cater kinesthetic learning style and create or give more realistic and situational examples to more understand the lesson. Other learning styles must also be addressed such as the visual, reading/writing, and auditory. There should be equity and equality in addressing the interests, conditions and level of abilities in this time of pandemic. Teachers' teaching strategies/approaches and students' learning style and preferred learning modalities should be aligned.

Key words: New normal, Learning styles, Physical education, Cultural education

INTRODUCTION

The World Health Organization defined coronavirus disease as an infectious disease caused by a newly discovered coronavirus. It spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes. The recent outbreak begun in Wuhan, a city in the Hubei province of China. Reports of the first COVID-19 cases started in December, 2019 (Kandola, 2020).

According to Li and Lalani (2020), the COVID-19 has resulted in schools shut all across the world affecting 1.2 billion children globally. As a result, education has changed dramatically, with distinctive rise of e-learning, whereby teaching is undertaken remotely and on digital platforms. Hamida and Kusuma (2020) stated that due to the current pandemic, there is a change in

the learning system and changing in learning styles. Sahu (2020) said that many teachers and students worldwide have been excited by the move of learning to online delivery mode.

Based from the study made by Navarosa and Fernando (2020), while the Philippines is fighting the challenge brought about by the COVID-19 pandemic, the Commission on Higher Education (CHED) and the Department of Education (DepEd) adopt and implement the flexible model of blended learning despite many oppositions. Unceasing students' concerns and teachers' outcry were in the limelight-exposing the disadvantages that these learning solutions are posing.

Memorandum Order No. 4 series of 2020 instructed the guidelines and implementation about flexible learning and teaching options, approaches, strategies, systems, and pedagogies and modalities in the higher education programs by all private and public Philippines HEIs (CHED, 2020).

Ragandang (2020) stated that in the Philippines especially in remote areas, the problem with internet speed exacerbates when

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traditional classes transition online. It ranked eleventh slowest in upload speed and 16th slowest in download speed among the 87 countries. He said that some schools in Mindanao have developed a spectrum of class modes to give students options for the upcoming semester: Face-to-face, online and home based, learning based on print-out modules.

According to Tria (2020), utilizing virtual classrooms or primary online educational platforms such as Zoom, Google Classroom, Messenger, Edmodo, Facebook, and Youtubecan be used to host the blended and distance learning.

This study focuses about how Bachelor of Physical Education (BPEd) and Bachelor of Culture and Arts Education (BCAEd) Students of Catanduanes State University were able to cope up with the ongoing challenges that all students are facing during these pandemic. The province does not have stable internet signal because of its changing weather which greatly affect the online classes and in disseminating information about the release and submission of modules. Students with a “traditional” mindset find it difficult to adapt with the current classroom situation. They have less chance to hear and ask during online classes as most of the time, the signal will get disconnected. There also times that they loss interest in learning as they are easily destructed with people inside, or outside the house.

CHED Memorandum Order No. 80 Series of 2017, Article IV Section 5 stated that the degree program shall be called BPEd. As a curricular subject, PE is aimed at physical literacy, which serves as the foundation for confident, enjoyable, and sustained participation in a wide range of physical activities. P.E also aims to optimize health through learning experiences aimed at the formation of physical activity and healthy eating habits, as well as dispositions.

In addition, BPEd is a four-year program aimed at equipping graduates with the competencies to meet the psychomotor, cognitive and affective needs of learners. It is allied with the exercise and sports sciences, life sciences, and the social sciences (i.e., philosophy, anthropology, history, and education).

CHED memorandum Order No. 82 Series of 2017, Article IV Section 5 stated that the degree program shall be called BCAEd. It is a field of specialization engaged (i) in clarifying the conceptual foundations of value-laden creative expressions such as visual arts, music, drama, and dance, (ii) in defining its relation to other disciplines of thought and action that address the fundamental question of what it means to creatively express the condition of being human in changing life-worlds, (iii) in analyzing the conditions and possibilities for crafting and asserting creative expressions of being human in diverse contexts, and (iv) in developing programs responsive to

local and global contexts of production, circulation, and consumption of creative expressions.

It aims to develop highly motivated, creative, and reflexive teachers in basic education equipped with knowledge, skills, and values in culture and arts education.

METHOD

The study utilized the descriptive qualitative type of research using questionnaire as the main tool in gathering data through online platforms. Descriptive qualitative type of research was utilized since this study assesses and identifies the learning styles of BCAEd and BPEd students in online education in this pandemic. Descriptive qualitative type of research according to Pacific Rim Intl J Nurs Res is an approach that is very useful when researchers want to know regarding events who were involved, what was involved, and where did things take place. The respondents was chosen through purposive sampling, a design based on choosing individuals as sample according to the purposes of the researcher as his control as stated by Bernaldez. The respondents in this research are the 101 BCAEd and BPEd students of Catanduanes State University College of Education.

RESULTS AND DISCUSSION

The following tables show the survey results regarding the learning styles of BPEd and BCAEd students’ 1st-year, 2nd-year, and 3rd year students’ preferred learning styles in Catanduanes State University College of Education. This part includes the profile of the students, the learning styles, and the preferred learning styles.

Figure 1 shows that there are more female BPEd and BCAEd students than male BPEd and BCAEd students. Among the BPEd and BCAEd students, 64% are female while only 36% are male. Looking at the respondents, there are 14 male BPEd students and 25 female BPEd students. Moreover, there are 11 male BCAEd student respondents and 19 female BCAEd student respondents. In total, there are 25 male student respondents while there are 44 female student respondents.

Figure 2 displays that BPEd and BCAEd students are generally of ages 18–22. Moreover, most of the students are 21 years old while only a few students are either 18 years old or 22 years old. Based on the BPEd student respondents, there are four 18 years old, eleven 19 years old, eight 20 years old, fourteen 21 years old, and two 22 years old. On the other hand, in the BCAEd student respondents, there are one 18 years old, seven 19 years old, twelve 20 years olds, seven 21 years old, and three 22 years old. In summary, 7% of the BPEd and BCAEd students

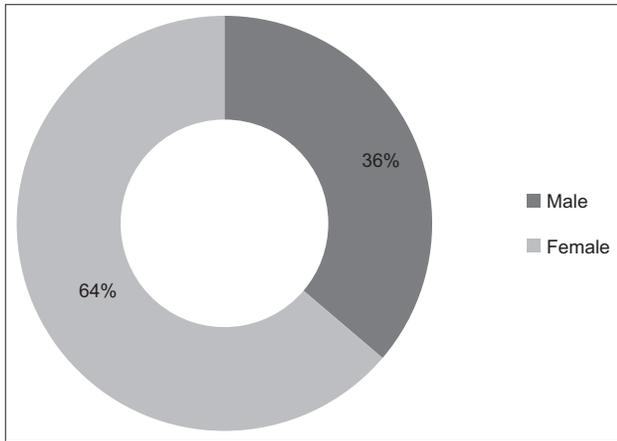


Figure 1: Profile based on gender

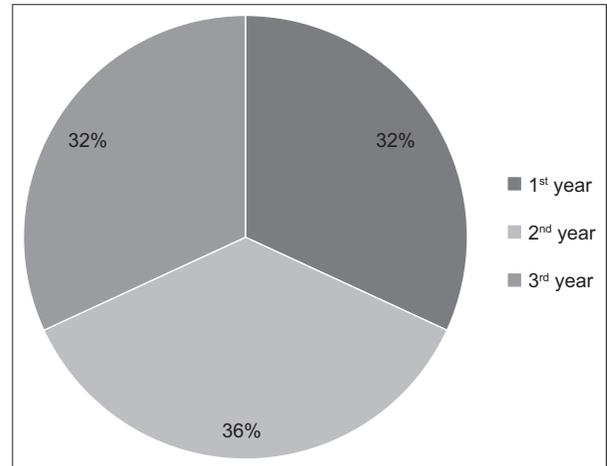


Figure 3: Profile based on year level

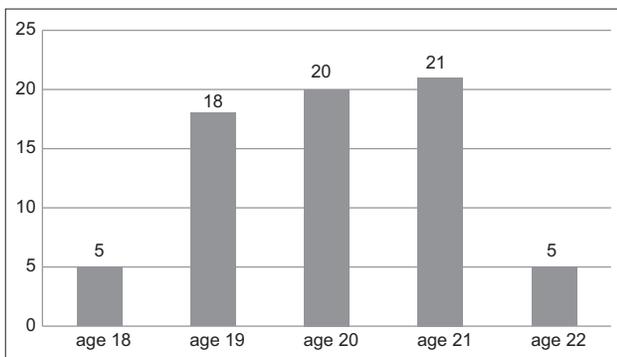


Figure 2: Profile based on age

are 18 years old, 26% are 19 years old, 29% are 20 years old, 31% are 21 years old, and 7% are 22 years old.

Figure 3 expresses that majority of the BPEd students and BCAEd students are in their 2nd year in college. Furthermore, in the BPEd and BCAEd programs, the number of 1st year students is equal to the number of 3rd year students. Breaking down the student respondents, there are 15 1st year BPEd students and seven 1st year BCAEd students, 11 2nd year BPEd students, and 14 BCAEd students, and 13 3rd year BPEd students and 9 3rd year BCAEd students. In total, among the student respondents, 22 are 1st year BPEd and BCAEd students, 25 are 2nd year BPEd and BCAEd students, and 22 are 3rd year BPEd and BCAEd students.

Looking at Figure 4, we can see that the number of BPEd students is greater than the number of BCAEd students. Among the BPEd and BCAEd students, 57% are BPEd students while 43% are BCAEd students. Furthermore, among the student respondents, 39 were BPEd students while 30 were BCAEd students.

Figure 5 illustrates that majority of the BPEd students lean toward the reading/writing learning style while most of the

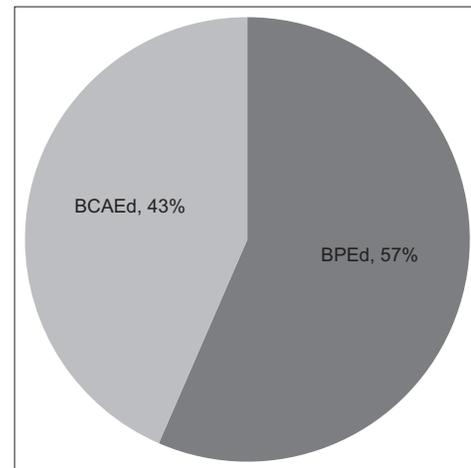


Figure 4: Profile based on program

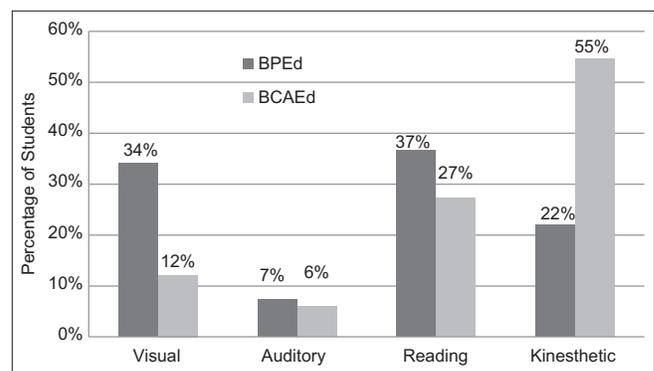


Figure 5: Primary learning styles of BPEd and BCAEd students

BCAEd students are inclined to the kinesthetic learning style. Furthermore, auditory learning style is the least preferred learning style by both BPEd students and BCAEd students. Breaking down the learning styles of BPEd students, 34% are visual learners, 7% are auditory learners, 37% prefer reading/writing, and 22% are kinesthetic learners. On the other hand,

Table 1: Hypothesis testing on learning styles of BPEd and BCAEd students

Variable	Statistical test used	Level of significance	Critical value	Value of the test statistic	p-value	Decision
Learning styles of BPEd students and BCAEd students	Chi-square (test of independence)	$\alpha=0.05$	7.8147	10.395	0.0155	Reject H_0

H_0 : There is no significant difference in the learning styles of BPEd students and BCAEd students.

H_a : There is a significant difference in the learning styles of BPEd students and BCAEd students.

among the BCAEd students, 12% are visual learners, 6% are auditory learners, 27% prefer reading/writing, and 55% are kinesthetic learners. In summary, 24% of BPEd and BCAEd students are visual learners, 7% are auditory learners, 32% prefer reading/writing, and 36% are kinesthetic learners. Therefore, most of the BPEd and BCAEd students lean toward the kinesthetic learning style.

Figure 6 shows that the kinesthetic learning style is the most frequently used learning style by the BPEd and BCAEd students while the auditory learning style is the least used learning style by the BPEd and BCAEd students. Based on the responses of the student respondents, BPEd and BCAEd students use the visual learning style 23% of the time, the auditory learning style 18% of the time, the reading/writing learning style 29% of the time, and the kinesthetic learning style 30% of the time.

Table 1 shows that Chi-square (test of independence) was used to test the learning styles of BPEd students and BCAEd students at the 0.05 level of significance. The computed value of the test statistic is 10.395 against the critical value of 7.8147. Moreover, the computed p - value is 0.0155 against the level of significance of 0.05. Since the value of the test statistic is more than the critical value, and the P-value is less than the level of significance, we reject the null hypothesis and therefore accept the research hypothesis (H_a). Hence, there is a significant difference in the learning styles of BPEd students and BCAEd students.

The study aimed to know what kind of learning styles do the BPEd and BCAEd prepared to use towards flexible learning in the Catanduanes State University during the COVID-19 pandemic using the VARK method developed by Neil Flemming an educational theorist.

BPEd and BCAEd program is more on performance based like performing any kind of sports, games, dances, singing and playing instruments, and many more. This situation is hard for them that is why they need more focus on their study. Based on the findings almost all of the students are prepared to use kinesthetic to learn and more of these are from the BCAEd.

According to Alkooheji and Al-Hattami (2018), it has become obvious that there are learning styles preferences, and they are, to an extent, affected by age, gender, and college affiliation.

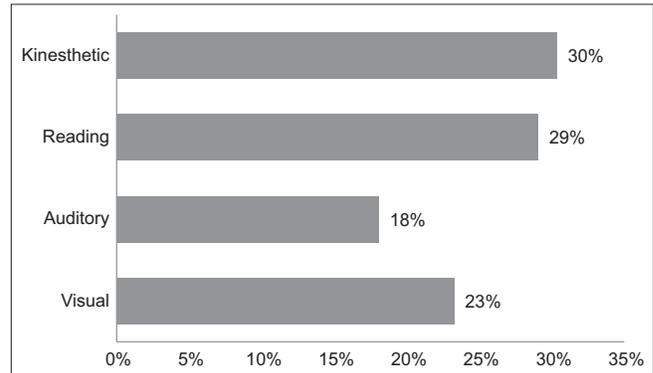


Figure 6: Learning styles used in coping up with distance learning

However, the major factor was an external one: the type of activity. Technology-related activity is better delivered visually, simple instructions, and interactions are preferred to be delivered orally (i.e., heard), long detailed instructions and steps are preferred to be delivered in writing. As for activities with social nature, auditory learning are preferred, while classroom-based and activities of academic nature other than technological nature and that require a party (either an instructor or a student) to deliver to the rest of the class a lesson, kinesthetic learning style is preferred.

CONCLUSION

This study concluded that BPEd and BCAEd students prefer kinesthetic learning style in the new normal education. Amid the pandemic, students refer to the need for movement and realistic, situational examples when acquiring information.

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Research Article

Effect of upper body plyometric training on explosive strength of arms

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ABSTRACT

The purpose of the study was to find out the effect of upper-body plyometric training on explosive strength of arms. To achieve this purpose of the study, 30 men students of IIT, Bombay, were selected as subjects. Their age ranged between 18 and 23 years. The selected subjects were divided into two equal groups of 15 each, namely, plyometric training group and controlled group. The experimental group did plyometric exercises such as wall chest pass, overhead forward throw, depth push-ups, and plyometric pull-ups and push-ups with hand clap for 3 days a week for 6 weeks whereas the control group maintained their daily routine activities and no special training was given to them. The following variable, namely, explosive strength was selected as criterion variable. To assess the explosive strength, the pre-test and post-test were conducted in shot put-back throw. This study shows that due to the plyometric exercise, there is a rapid improvement in explosive strength of experimental group and controlled group has less improvement due to general training. It is recommended that the upper body plyometric exercises are excellent to improve the explosive strength of arms.

Keywords: Explosive strength and shot put-back throw, Upper body plyometrics

INTRODUCTION

The sciences of sports training are relevant not only in performance of sports but also give equal importance to other areas such as physical fitness, leisure sports, and rehabilitation. Sports training aims at education and performance enhancement based on scientific principles through physical exercise. It is basic groundwork of sportsman for elite performance. The development of physical fitness includes organic functions and increasing the strength and stability of muscular-skeletal system (Hardayal Singh, 1991).

Plyometric training refers to exercises that enable a muscle to reach maximal strength in as short a time as possible (Baechle, 1994).

Explosive power is the ability to release the maximum muscular force in an explosive manner, in the shortest possible time (Hardayal Singh, 1991).

Statement of the Problem

Effect of upper body plyometric training on explosive strength of arms of athletes.

Purpose of the Study

The purpose of the study was to find out the effect of upper-body plyometric training on explosive strength of the arms of athletes.

Hypothesis

There would be a significant improvement on selected variable because of upper-body plyometric training.

METHODOLOGY

Selection of Subjects

The sample for the present study consists of 30 athletes of IIT BOMBAY out of which 15 are experimental group and 15 are controlled group with age range from 18 to 23 years.

Selection of Variable

- Dependent variable – Explosive strength of upper body.
- Independent variable – Plyometric training.

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Table 1: Analysis of “t”-ratio for pre-test and post-test of experimental and control group on shot overhead put-back throw

Variables	Group	Mean		SD		“t” Ratio
		Pre-test	Post-test	Pre-test	Post-test	
Shot-put overhead back throw	Control	8.00	7.96	0.922	0.977	0.183
	Experimental	9.18	9.96	1.69	1.826	8.00

Training Program and Experimental Procedure

The following upper-body plyometric exercises were given for 6 weeks to the experimental group while controlled were given general fitness training.

1. Wall chest pass
2. Overhead forward throw
3. Depth push-ups
4. Feet elevated plyo push-up
5. Push-ups with hand clap
6. Plyometric pull-ups
7. Underhand throws.

Collection of Data

To assess the explosive strength of arms of athletes, the pre-test and post-test were conducted in shot put overhead back throw.

Administration of the Test

Equipment required: Tape measure, landing area with grass or sand surface.

The athlete stands behind a line marked on the ground facing opposite to the throwing direction with feet shoulder width apart. Start with bending of the knees and swinging of the both arms move upward and attempts to overhead back throw as far as possible. Maximum three attempts were given.

RESULTS AND DISCUSSION

This study shows that due to the plyometric exercise, there is a rapid improvement of explosive strength of arms of experimental group and controlled group has less improvement in explosive strength due to the general fitness training.

Table 1 shows that the mean values of pre-test and post-test of control group of shotput back throw were 8.00 and 7.96, respectively. The obtain “t” value was less than the

required table value of 1.75 for the significant at 0.05 level of confidence. The mean values of pre-test and post-test of experimental group of shotput back throw were 9.18 and 9.96, respectively. The obtain “t” value was 8.00. Since the obtained “t” value was greater than the required table value of 1.75 for the significant at 0.05 level of confidence, it was found statistically significant. The result of study showed that there was a significant difference between pre-test and post-test in shotput back throw.

CONCLUSION

- It is concluded that due to plyometric training, there is an improvement in the explosive strength of arms of athletes.

RECOMMENDATIONS

- It is recommended that coaches must include the upper body plyometric exercise in their training program to increase explosive strength of arms of athletes.
- Similar studies can be held on the athletes of other level also.
- Similar studies can be conducted in different age groups.
- This study is helpful to coaches to plan coaching program to improve motor abilities of athletes.

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Research Article

An analytical study on core strength training and anaerobic training on developing speed and leg explosive power among university male Kho-Kho players in Telangana region

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ABSTRACT

The purpose of this study was to find out an analytical study on core strength training and anaerobic training on developing speed and leg explosive power among university male Kho-Kho players in Telangana region. The research scholar has randomly selected 90 university male students from three various colleges in Telangana state was selected as subjects and their age ranged between 22 and 26 years. The subjects were equally divided into three equal groups: Experimental group 1, 2 and control group. Moreover, the researcher took pre-test data and then gave a core strength and anaerobic training 3 days per week and each session consisted of 1 h for 12 weeks. The pre-test and post-test data were collected pre-training and immediately after the training. The speed and leg explosive power were measured by administering by standardized test items such as 50 m run and vertical jump tests, respectively. These data were statistically recorded and examined by appropriate tests. The level of significance as fixed at 0.05 level. The analysis of the data concluded that there is a significant effect of core strength and anaerobic training on experimental groups 1, 2 than the control group in relation to speed and leg explosive power of the university students of Telangana region.

Keywords: Core strength training, Speed and leg explosive power

INTRODUCTION

Core strength training and core exercises are an important part of a well-rounded fitness program. Aside from occasional sit ups and pushups, however, core exercises are often neglected. Still, it pays to get your core muscles – the muscles around your trunk and pelvis – in better shape. Read on to find out why core exercises improve your balance and stability core exercises train the muscles in your pelvis, lower back, hips, and abdomen to work in harmony. This leads to better balance and stability, whether on the playing field or in daily activities. In fact, most sports and other physical activities depend on stable core muscles. Core exercises can help tone your abs want more-defined abdominal muscles? Core exercises are important. Although it takes aerobic activity to burn abdominal fat, core exercises can strengthen and tone the underlying muscles.

Anaerobic training and anaerobic exercise are a type of exercise that breaks down glucose in the body without using oxygen; anaerobic means “without oxygen.” In practical terms, this means that anaerobic exercise is more intense, but shorter in duration than aerobic exercise.

Objectives

The objectives of this study were as follows:

- To assess the effect of core strength training and anaerobic training methods in developing speed among university male Kho-Kho players in Telangana region.
- To assess the effect of core strength training and anaerobic training methods in developing leg explosive power among university male Kho-Kho players in Telangana region.

Hypotheses

- It was hypothesized that there would be a significant effect of core strength training and anaerobic training on development of speed of among university male Kho-Kho players in Telangana region

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Table 1: ANCOVA results on effect of core strength training and anaerobic training compared with controls on speed (50 m RUN)

	Core strength training	Anaerobic training exercises	Control group	Source of variance	Sum of squares	Df	Mean squares	Obtained F
Pre-test mean	7.30	7.26	7.33	Between	0.08	2	0.04	1.45
				Within	2.48	87	0.03	
Post-test mean	7.10	7.12	7.31	Between	0.84	2	0.42	13.89*
				Within	2.63	87	0.03	
Adjusted post-test mean	7.10	7.15	7.28	Between	0.52	2	0.26	77.21*
				Within	0.29	86	0.00	
Mean diff	-0.20	-0.14	-0.02					

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

- *It was hypothesized that there would be a significant effect of core strength training and anaerobic training on development of leg explosive power of among university male Kho-Kho players in Telangana region.

METHODOLOGY

For the purpose of this study, 90 university male students were randomly selected as subjects from Sri Venkateshwara B.P.Ed. College, Vinayaka College of Physical Education, BVK College of Physical Education, Telangana state and their age ranged between 22 and 26 years. The 90 university male students divided into three equal groups 30 each, namely, experimental groups 1, 2 and control groups. Moreover, the experimental groups underwent for core strength training and anaerobic training 3 days per week on alternate days, that is, Monday, Wednesday, and Friday and each session consisted of 1 h for 12 weeks. The pre-test and post-test data were collected before training and immediately after the training. The speed and leg explosive power were measured by administering by standardized test items such as 50 m run and vertical jump tests, respectively. These data were statistically recorded and examined by appropriate tests. The level of significance as fixed at 0.05 level of confidence which was considered as appropriate.

RESULTS AND DISCUSSION

As shown in Table 1, the obtained pre-test means on speed on core strength training group was 7.30, anaerobic training group was 7.26, and control group was 7.33. The obtained pre-test F value was 1.45 and the required table F value was 3.10, which proved that there was no significant difference among initial scores of the subjects. The obtained post-test means on speed on core strength training group was 7.10, anaerobic training group was 7.12, and control group was 7.31. The obtained post-test F value was 13.89 and the required table F value was 3.10, which proved that there was significant difference among post-test scores of the subjects.

Table 2: Multiple comparisons of paired adjusted means and Scheffe's confidence interval test results on speed

Core strength training group	Means			Mean difference	Required. CI
	Anaerobic training group	Control group			
7.10	7.15			-0.06*	0.04
7.10		7.28		-0.18*	0.04
	7.15	7.28		-0.12*	0.04

*Significant

Taking into consideration of the pre-test means and post-test means adjusted post-test means were determined and analysis of covariance was done and the obtained F value 77.21 was greater than the required value of 3.10, and hence, it was accepted that there were significant differences among the treated groups. Since significant differences were recorded, the results were subjected to *post hoc* analysis using Scheffe's Confidence Interval test. The results are presented in Table 2.

The *post hoc* analysis of obtained ordered adjusted means proved that there was significant differences existed between core strength training group and control group (MD: -0.18). There was significant difference between anaerobic training group and control group (MD: -0.12). There was significant difference between treatment groups, namely, core strength training group and anaerobic training exercises group (MD: -0.06).

As shown in Table 3, the obtained pre-test means on leg explosive power on core strength training group was 58.30, anaerobic training group was 59.13, and control group was 57.63. The obtained pre-test F value was 0.54 and the required table F value was 3.10, which proved that there was no significant difference among initial scores of the subjects. The obtained post-test means on leg explosive power on core strength training group were 67.63, anaerobic training group was 63.30, and control group was 58.37. The obtained post-test

Table 3: ANCOVA results on effect of core strength training and anaerobic training compared with controls on leg explosive power (vertical jump)

	Core strength training	Anaerobic training	Control group	Source of variance	Sum of squares	Df	Mean squares	Obtained F
Pre-test mean	58.30	59.13	57.63	Between	33.89	2	16.94	0.54
				Within	2706.73	87	31.11	
Post-test mean	67.63	63.30	58.37	Between	1289.87	2	644.93	14.57*
				Within	3850.23	87	44.26	
Adjusted post-test mean	67.68	62.71	58.92	Between	1155.85	2	577.92	21.76*
				Within	2283.76	86	26.56	
Mean diff	9.33	4.17	0.73					

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

Table 4: Multiple comparisons of paired adjusted means and scheffe's confidence interval test results on leg explosive power

Core strength training group	Means			Required CI
	Anaerobic training group	Control group	Mean difference	
67.68	62.71		4.97*	3.34
67.68		58.92	8.76*	3.34
	62.71	58.92	3.79*	3.34

*Significant

F value was 14.57 and the required table F value was 3.10, which proved that there was significant difference among post-test scores of the subjects.

Taking into consideration of the pre-test means and post-test means adjusted post-test means were determined and analysis of covariance was done and the obtained F value 21.76 was greater than the required value of 3.10, and hence, it was accepted that there was significant differences among the treated groups. Since significant differences were recorded, the results were subjected to *post hoc* analysis using Scheffe's confidence interval test. The results are presented in Table 4.

The *post hoc* analysis of obtained ordered adjusted means proved that there was significant differences existed between core strength training group and control group (MD: 8.76). There was significant difference between anaerobic training group and control group (MD: 3.79). There was significant difference between treatment groups, namely, core strength training group and anaerobic training exercises group (MD: 4.97).

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Research Article

Effect of interval training on development of leg explosive power and abdominal strength of tribal students of Telangana state

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ABSTRACT

The purpose of this study was to find out the effect of interval training on leg explosive power and abdominal strength of tribal students of Telangana state. The research scholar has randomly selected 60 tribal male students from Manuguru, Telangana state, which was selected as subjects, and their ages ranged between 18 and 22 years. The subjects were equally divided into two equal groups experimental group and control group. Moreover, the researcher took pre-test data and then gave an interval training 3 days per week and each session consisted of 1 h for 12 weeks. The pre-test and post-test data were collected pre-training and immediately after the training. The leg explosive power and abdominal strength were measured by administering by standardized test items such as standing broad jump and bent knee sit-ups tests, respectively. These data were statistically recorded and examined by appropriate tests. The level of significance is fixed at 0.05 level. The analysis of the data concluded that there is a significant effect of interval training on the experimental group than the control group in relation to leg explosive power and abdominal strength of the tribal students of Telangana State.

Keywords: Abdominal strength, Interval training, Leg explosive power

INTRODUCTION

Interval training is a type of training exercise that involves a series of high-intensity workouts interspersed with rest or relief periods. The high-intensity periods are typically at or close to anaerobic exercise, while the recovery periods involve activity of lower intensity. Interval training may benefit exercisers by allowing them to burn more calories in a shorter period, and by improving aerobic capability at a faster rate when compared with continuous-intensity exercise.

Strength is the force exerted by the important muscle group of the body in one maximal contraction. Strength is the ability of the muscle to exert force. Various sports differ in their requirements of strength for successful performance. Muscular efficiency including strength and endurance is essential to man. Every individual needs different levels

of strength as per the nature of their activities and their physical demand. The maximum strength of men and women is generally achieved between the age of 20–25 age and significantly higher strength levels can be maintained well into advanced age. Explosive power is defined as the capacity of the individual to release maximum force in the shortest period of time. Explosive power and successful sporting performance at elite levels of competition after depend heavily on the explosive leg power of the athletes involved. Vertical and horizontal jumping is its many different forms, which requires high levels of explosive muscular power.

Objectives

The objectives of this study were as follows:

- To find out the effect of interval training on the development of leg explosive power of tribal students of Telangana state
- To find out the effect of interval training on the development of abdominal strength of tribal students of Telangana state.

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Hypotheses

1. It was hypothesized that there would be a significant effect of interval training on the development of leg explosive power of tribal students of Telangana state
2. It was hypothesized that there would be a significant effect of interval training on the development of Abdominal strength of tribal students of Telangana state.

METHODOLOGY

For the purpose of this study, 60 tribal male students were randomly selected as subjects from TTWR Degree College and Government Degree College Manuguru, Telangana state, and their ages ranged between 18 and 22 years. The 60 tribal male students were divided into two equal groups 30 each, namely, experimental and control groups. Moreover, the experimental group underwent for interval training 3 days per week on alternate days, that is, Monday, Wednesday, and Friday and each session consisted of 1 h for 12 weeks. The pre-test and post-test data were collected before training and immediately after the training. The leg explosive power and abdominal strength were measured by administering by standardized test items such as standing broad jump and bent knee sit-ups tests, respectively. These data were statistically recorded and examined by appropriate tests. The level of significance was fixed at a 0.05 level of confidence which was considered as appropriate.

RESULTS AND DISCUSSION

From the above Table 1, leg explosive power (standing broad jump in centimeters) of the selected sample in the experimental group, pre-test mean was 192.37 with a 9.084 standard deviation and the post-test mean was 208.20 with a 16.336 standard

deviation. Here, the “*t*” calculated value is 9.381 which is greater than the table value of 2.045 at 29° of freedom with a 0.05 level of significance. It shows that there is a significant difference between pre-test and post-test. Similarly in the control group, pre-test mean was 188.77 with an 8.597 standard deviation and the post-test mean was 188.23 with a 7.587 standard deviation. Here, the “*t*” calculated value is 0.928 which is less than the table value of 2.045 at 29° of freedom with a 0.05 level of significance. It shows that there is no significant difference between pre-test and post-test, which means that there is no significant difference in the control group.

The above table clearly reveals that there is a significant effect of interval training on the development of physical fitness variable, leg explosive power (standing broad jump in centimeters) in the experimental group than the control group of tribal students of Telangana state, as shown in Figure 1.

The physical fitness variable of abdominal strength (Bent knee sit ups number of counts per minute) in the above Table 2 reveals that, in experimental group, pre-test mean was 35.00 with 3.373 standard deviation and post-test mean was 39.60 with 3.900 standard deviation. Here, the “*t*” calculated value is 8.885 which is greater than table value 2.045 at 29° of freedom with 0.05 level of significance. It shows that there is a significant difference between pre-test and post-test. Whereas in control group, pre-test mean was 34.30 with 2.395 standard deviation and post-test mean was 34.90 with 2.139 standard deviation. Here, the “*t*” calculated value is 1.557 which is less than table value 2.045 at 29° of freedom with 0.05 level of significance. It shows that there is no significance difference between pre-test to post-test.

From the above table, it clearly reveals that there is a significant effect of interval training on development of physical fitness

Table 1: Paired *t*-test is used to test the effectiveness of interval training in experimental group than control group on the development of physical fitness variable, leg explosive power (Standing broad jump in centimeters) of tribal students of Telangana state

Group	<i>n</i>	Pre-test		Post-test		Mean diff	<i>t</i> -value	<i>P</i> -value	Inference
		Mean	SD	Mean	SD				
Experimental Group	30	192.37	9.084	208.20	16.336	15.833	9.381	0.000	S*
Control Group	30	188.77	8.597	188.23	7.587	0.533	0.928	0.361	NS

Table value is 2.045 at 29 df with a 0.05 level of significance

Table 2: Paired *t*-test is used to test the effectiveness of interval training in the experimental group than the control group on the development of physical fitness variable, abdominal strength (Bent knee sit-ups number of counts per minute) of tribal students of Telangana state

Group	<i>n</i>	Pre-test		Post-test		Mean diff	<i>t</i> -value	df	<i>P</i> -value	Inference
		Mean	SD	Mean	SD					
Experimental Group	30	35.00	3.373	39.60	3.900	4.600	8.885	29	0.000	S*
Control Group	30	34.30	2.395	34.90	2.139	0.600	1.557	29	0.130	NS

Table value is 2.045 at 29 df with 0.05 level of significance

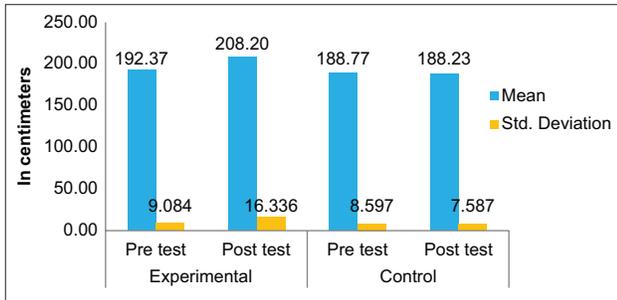


Figure 1: The effectiveness of interval training on the experimental group than the control group on the development of physical fitness variable, leg explosive power (Standing broad jump in centimeters) of tribal students of Telangana state

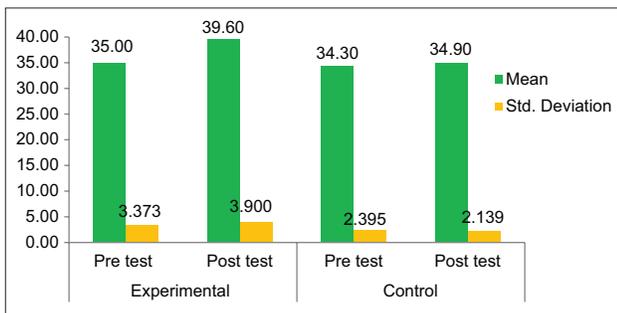


Figure 2: The effectiveness of interval training on experimental group than control group on development of physical fitness variable, abdominal strength (Bent knee sit ups number of counts per minute) of tribal students of Telangana state

variable, abdominal strength (Bent knee sit ups number of Counts per minute) on experimental group than control group of tribal students of Telangana state, as shown Figure 2.

CONCLUSION

The present study has revealed that the 12 weeks interval training program had shown a positive effect on physical fitness variables of tribal students of Telangana state. It was concluded that the results showed that 12 weeks of interval training significantly improved leg explosive power (Standing broad jump in centimeters) of tribal students of Telangana state. Moreover, it was concluded that the results showed that 12 weeks of interval training significantly improved abdominal strength (Bent knee sit ups number of counts per minute) of tribal students of Telangana state.

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Research Article

A comparative study on speed and endurance among kabaddi and kho kho players of KGBV schools in Hanumakonda district Telangana state

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ABSTRACT

The purpose of the study is to compare speed and endurance among kabaddi and kho kho players of KGBV Schools in Hanumakonda district. For this study, 30 girls kabaddi players and 30 girls kho kho players selected as subjects which were selected randomly from KGBV Schools in Hanumakonda District. Moreover, their age ranged from 12 years to 16 years. The statistical analysis of the results obtained from the collected data of kabaddi and kho kho players of KGBV Schools in Hanumakonda District to find out the statistical difference among kabaddi and kho kho players. The study under report has scientifically examined the physical fitness variables pertinent to speed and endurance. A trained individual is in a better state of physical fitness than the person who follows a sedentary, inactive life. It is concluded that the physical fitness plays a key role on the performance of the players. Physical activity can act as an antidote to some kinds of fatigue. Youngsters will be harmed through sustained exercise – if they are fit, their physical endurance is great and the exercise will be conducive to good health. The present study concluded that the kho kho players have higher speed and endurance than the kabaddi players of KGBV Schools in Hanumakonda district.

INTRODUCTION

Physical fitness is a multifaceted continuum extending from birth to death, affected by physical activity. Physical fitness is an important component of health. Physical fitness is the ability to function efficiently and effectively is to enjoy leisure, to be healthy, to resist disease and to cope with emergency situations. The importance of physical fitness is linked to a higher quality of life as well as academic achievements. It is well documented that regular physical activity in childhood and adolescence improve speed, strength, and endurance, Not only that but also health build, strong bones, muscles and control weights, reduce anxiety, stress, and increases self-esteem. Health-related components of physical fitness include body composition, cardio vascular fitness, flexibility, muscular endurance, and strength. Skill related components include agility, balance, coordination, power reaction time, and speed.

The relative importance of each of the components varies for each sport. Physical fitness is not only sport specific, it may

also be position specific, combined good health and physical development. The object of any program of physical fitness is to maximize any individual's health, speed, strength, endurance, and skill relative to age, sex, body build, and physiology. These ends can only be realized through conscientious regulation of exercise, rest, diet, and periodic medical examinations. Exercise should be regular and vigorous, but begun slowly and only gradually increased in strenuousness. Proper exercise methods include jogging, cycling and the use of body building machines. It is more important that periods of sleep be regular and restful than that they extend any fixed number of hours.

SIGNIFICANCE OF THE STUDY

The study is to determine the speed and endurance among kabaddi and kho kho players of KGBV Schools in Hanumakonda District, Telangana State.

HYPOTHESES

1. There may be a significant difference among kabaddi and kho kho players of KGBV Schools in relation to their speed.

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2. There may be a significant difference among kabaddi and kho kho players of KGBV Schools in relation to their endurance.

METHODOLOGY

For the purpose of the study, it was formulated based on the simple random sampling. The samples were collected from the girls 50 kabaddi players and 50 kho kho players from KGBV Schools in Hanumakonda District, Telangana State. Moreover, their age ranged from 12 years to 16 years.

S. No.	Category of the subjects	No. of subjects
1.	Kabaddi players	50
2.	Kho kho players	50

Criterion Measures

S. No.	Variables	Tests	Unit of measurement
1.	Speed	30 m run test	In seconds
2.	Endurance	Cooper's 12 min run or walk test	Distance covered in meters

Analysis and Interpretation of Data

The statistical analysis of the results obtained from the collected data of kabaddi and kho kho players of KGBV Schools in Hanumakonda district. In order to find out the statistical difference among kabaddi and kho kho players.

From the above Table 1, the mean values of kabaddi and kho kho players were 7.00 and 6.11, respectively. Moreover, the standard deviations of kabaddi and kho kho players were 0.46 and 0.34, respectively. Moreover, calculated "t" value is 2.601. It reveals that there was a significant difference among kabaddi and kho kho players in relation to speed.

From the above Table 2, the mean values of kabaddi and kho kho players were 2016 and 2264, respectively. Moreover, the standard deviations of kabaddi and kho kho players were 296.76 and 238.62, respectively. Moreover, calculated "t" value is 4.01. It reveals that there was a significant difference among kabaddi and kho kho players in relation to endurance.

CONCLUSION

The study under report has scientifically examined the physical fitness variables pertinent to speed and endurance. A trained

Table 1: The mean values, standard deviation, t value, and P value among kabaddi and kho kho players of KGBV Schools in Hanumakonda in relation to their Speed (30 meters run test)

S. No.	Subjects	n	Mean	SD	"t" ratio	P value
1.	Kabaddi players	50	7.00	0.46	2.601	0.01
2.	Kho kho players	50	6.11	0.34		

Table 2: The mean values, standard deviation, t value, and P value among kabaddi and kho kho players of KGBV Schools in Hanumakonda in relation to their Endurance (Cooper's 12 min run or walk test)

S. No.	Subjects	n	Mean	SD	"t" ratio	P value
1.	Kabaddi players	50	2016	296.76	4.01	0.01
2.	Kho kho players	50	2264	238.62		

individual is in a better state of physical fitness than the person who follows a sedentary, inactive life. It is concluded that the physical fitness plays a key role on the performance of the players. Physical activity can act as an antidote to some kinds of fatigue. Youngsters will be harmed through sustained exercise – if they are fit, their physical endurance is great and the exercise will be conducive to good health. The present study concluded that kho kho players have higher speed and endurance than the kabaddi players of KGBV Schools in Hanumakonda District Telangana State.

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Research Article

Effect of isotonic exercises on muscular strength among ZP high school boys of Jagtial district, Telangana state

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INTRODUCTION

The main tasks for any of coach to construct training program that will ensure continue progress. Strength and strength training for general health good posture and for preventing form injuries is usually overlook which, in the long we can avoid injury run can be harmful. Strength training is an important part to the most training programs and is often seen in many injury can be overcome rehabilitation. There are different types of school thoughts training can be utilized to increase muscular strength, and many of them are legitimate and effective. Resistance training is an important tool in the prevention and maintenance of health-related quality of life. Resistance training is the most effective method available for improving muscle strength.

Many of the physical activities of our daily life require muscular strength. Muscles support the skeleton and enable movement. Strong muscles in the legs, buttocks, back, abdomen, chest, and shoulder provide a person with the strength to stand up straight and maintain good posture. Strong muscles enable functional movements associated with everyone. Many sports and recreational activities require strength in particular muscle groups. Strength training can increase flexibility and range of motion among children. Muscular strength is component of physical fitness. Along with cardiovascular fitness, muscular endurance, flexibility and body composition, and muscular strength can be provide several health benefits. Muscular strength is recognized as an important component of health and it may be important for the performance of functional activities and quality of life. Muscular strength refers to the amount of force a muscle can produce and is usually measured by the maximum amount of force a muscle can produce in a single effort (maximal effort). The amount of muscle strength which

can be achieved depends on gender, age, and inherited physical attributes. While strong muscles are essential for any athletic endeavor, strong muscles can benefit everyone in some way.

Significance of the Study

The study may also profound a training methodology and loading procedure for the 14–16 years boys. The results may prove helpful to establish training system for the 14–16 years boys.

Objectives of the Study

The objectives of the study are as follows:

1. To find out the development in muscular strength among the 14–16 years boys by using specific isotonic exercises.
2. To compare the rate of development of muscular strength among the 14–16 years boys by using specific isotonic exercises.
3. To understand various parameters of muscular strength, which will be beneficial for age group of 14–16 years boys.
4. To observe and evaluate, are isotonic exercises applicable and useful for 14–16 years boys.

Hypothesis

1. There would be a significant difference in the development of upper back muscles strength between experimental group and control group of 14–16 years boys.
2. There would be a significant difference in the development of lower back muscles strength between experimental group and control group of 14–16 years boys.

METHODOLOGY

In the present study, the researcher care was taken point the variables for health-related physical fitness aspects, that is, muscular strength. Which were not only relevant but also closely related to the purpose of this study Therefore, best on the literature evidence, correspondence with the expert and scholars own understanding as well as keeping the feasibility

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aspects. Following variables were selected for the purpose of this study.

Selection of Sample

The population of the study was for the all 14–16 years boys of Jagitial district. The sample of the study was randomly selected from ZP High Schools in Jagitial district. The total 120 subjects were selected for this study. Every subject was allotted with a group and a separate self contained form for test results. The tests were selected in the aspect of development. In development the researcher selected the standard test of muscular strength. The test was administrating individually under standard condition applicable for specific test and the time period required between two tests was amply considered.

S. No.	Group	Subjects
1	Experimental Group 1	40
2	Experimental Group 2	40
3	Control Group	40

Tests and Tools

Tests: Kraus weber muscular strength test.

Tools: Equipment needed for conducting the initial and final test of Kraus Weber test are the following (1) measuring tape, (2) pad and paper sheet, (3) stopwatch and pillow.

Analysis and Interpretation

Table 1 shows the computation of analysis of covariance for strength of upper back muscle test between experimental group 1, experimental group 2, and control group.

Table 1: Computation of analysis of covariance for strength of upper back muscle test between experimental groups

Means	EG 1	EG 2	Control group		s.s	df	m.s	f-value
Pre-test	3.60	3.92	4.02	Between	3.95	2	1.97	0.905
				With in	255.35	117	2.18	
Post-test	7.92	9.80	4.27	Between	631.51	2	315.75	131.40*
				With in	281.15	117	2.40	
Adjusted post-test	8.00	9.77	4.21	Between	643.30	2	321.65	147.14*
				With in	253.56	116	2.18	

Table 2: Computation of analysis of covariance for strength of lower back muscle test between experimental group

Means	EG 1	EG 2	Control group		s.s	df	m.s	f-value
Pre-test	4.47	4.85	4.07	Between	12.01	2	6.00	1.17
				With in	599.85	117	5.12	
Post-test	7.67	9.92	4.60	Between	571.65	2	285.82	114.07*
				With in	293.15	117	2.50	
Adjusted post-test	7.67	9.83	4.69	Between	521.74	2	260.87	117.45*
				With in	257.65	116	2.22	

DISCUSSIONS ON FINDINGS

The pre-test mean of experimental group-1, experimental group-2, and control group was 3.60, 3.92, and 4.02, respectively. The obtained f-value 0.905 for 2.117 degree of freedom was not significant at 0.05 level of significance. This confirms that there was no difference in the strength of upper back muscle of the boys of the said three groups at pre-test.

The post-test mean of experimental group-1, experimental group-2, and control group was 7.92, 9.80, and 4.27, respectively. The obtained f-value was 131.40. For 2.117 degree of freedom was significant at 0.05 level of significance. This confirms that significant difference exists in the strength of upper back muscle of the boys of the said three groups at post-test.

The adjusted post-test mean of experimental group-1, experimental group-2, and control group was 8.00, 9.77, and 4.21, respectively. The obtained f-value for adjusted post-test mean is 147.14 at 2.116 degree of freedom was significant at 0.05 level of significance. This confirms that significant difference exists in the adjusted post-test mean for strength of upper back muscle ability of the boys of the said three groups.

Table 2 shows the computation of analysis of covariance for strength of lower back muscle test between experimental group 1, experimental group 2, and control group.

The pre-test mean of experimental group-1, experimental group-2, and control group was 4.47, 4.85, and 4.07, respectively. The obtained f-value 1.17 for 2.117 degree of

freedom was not significant at 0.05 level of significance. This confirms that there was no difference in the strength of lower back muscle of the boys of the said three groups at pre-test.

The post-test mean of experimental group-1, experimental group-2, and control group was 7.67, 9.92, and 4.60, respectively. The obtained f-value was 114.07. For 2.117 degree of freedom was significant at 0.05 level of significance. This confirms that significant difference exists in the strength of lower back muscle of the boys of the said three groups at post-test.

The adjusted post-test mean of experimental group-1, experimental group-2, and control group was 7.67, 9.83, and 4.69, respectively. The obtained f-value for adjusted post-test mean was 117.45. At 2, 116 degree of freedom was significant at 0.05 level of significance. This confirms that significant difference exists in the adjusted post-test mean for strength of lower back muscle ability of the boys of the said three groups.

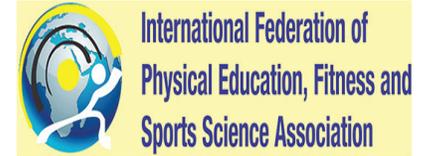
CONCLUSION

There would be significant difference between pre- and post-test of upper back muscle strength between experimental group and control group of 14–16 years boys. There is significant effects of theraband exercise on muscular strength with respect to development of strength upper back muscle among 14–16 years boys. There is significant effects of body weight exercise on muscular strength with respect to development of strength upper back muscle among 14–16 years boys. There would be significant difference between pre- and post-test of lower back muscle strength between experimental group and control group of 14–16 years boys. There is significant

effects of theraband exercise on muscular strength with respect to development of lower back muscle strength among 14–16 years boys. There is significant effects of body weight exercise on muscular strength with respect to development of lower back muscle strength among 14–16 years boys.

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Research Article

A medical, social, and spiritual perspective of healthy lifestyle in modern society

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ABSTRACT

Lifestyle describes a complex behavioral strategies and routines, attitudes, and values, norms assumed to individual or group to score as convenient in a social context. The importance of medical education in terms of healthy lifestyle is very well-recognized nowadays. Lifestyle medicine offers an important information about nutrition, physical activity, stress control, and social support systems. Lifestyle can be treated as an indicator of social attitudes and of the ideologies that are functioning in the social space. In aboriginal tribes, eating behaviors had a strong religious imprint referring directly to obtain favors from the gods as health, wealth, healing, and long life. Even if blatant promotion of a lifestyle can produce civilization, modeling behaviors, yet strongly promoting a lifestyle can become a subtle tool of manipulation and control. Following a healthy lifestyle, regardless of age, will have numerous health benefits, being proven that it reduces the risk of cardiovascular disease, decreases the incidence of obesity and diabetes, the risk of malignancy, psychiatric disorders, and cognitive dysfunction. The actual guidelines in preventive cardiovascular medicine provide the most important rules for physical training and healthy diet.

Keywords: Body, Health, Lifestyle, Nutrition, Physical activity

LIFESTYLE - RELEVANCE OF THE CONCEPT IN MODERN SOCIETY

Concept launched at the beginning of the 20th century, the lifestyle has been made a career in medical, sociological field, and beyond. It is considered both an indicator of social integration, quality of life, satisfaction level in the population, social status, or consumer needs. In fact, making lifestyle describes a complex behavioral strategies and routines, attitudes, and values, norms assumed to individual or group to score as convenient in a social context. Although lifestyle is used as a modern term, the extraordinary importance of behavioral habits, such as type and quality of food in medicine was highlighted even in the time of Hippocrates. Nowadays, the importance of medical education in terms of healthy lifestyle was recognized and, in 2010, Lianov and Johnson strongly recommended in the Journal of the American Medical Association physician education and training in lifestyle

medicine: “Physician educators at both the undergraduate and graduate medical education levels should consider incorporating the relevant lifestyle medicine competencies into education and training programs.” Other modern-day definitions of lifestyle medicine have been proposed:

- Egger, 2008: “The application of environmental, behavioral, medical, and motivational principles to the management of lifestyle-related health problems in a clinical setting”
- Dysinger, 2013: “Lifestyle medicine is the application of simple, natural healing approaches to chronic disease and prevention”
- The Lifestyle Medicine Competency Development Panel, 2013: “the evidence-based practice of helping individuals and families adopt and sustain healthy behaviors that affect health and the quality of life”
- Lifestyle medicine offers an important information about nutrition, physical activity, stress control, and social support systems
- Nutrition refers not only to natural and organic foods, but also especially adapted to particular illness or disease predispositions and dietary supplements

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- Physical activity refers to aerobic and anaerobic training, from mild to vigorous in intensity and should be adapted, supervised, and regular
- Behavioral modification technique and sociofamilial stress management, in an integrated mind–body medicine
- Avoidance of chronic exposure to radiation and to environmental contaminants found in air, food, or water.

Thus, today, diet and physical exercise must be understood not only as aspects of well-being but also, more important, as instruments for building health. Health should be viewed in a much broader perspective, not only medical but also social. According to the World Health Organization (WHO), definition of health is very ambitious and far-reaching: “Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (WHO 1946) [WHO, Preamble to the Constitution of the WHO, adopted by the International Health Conference, New York, 19–22 June, 1946, online at <http://www.who.int/about/definition/en/>]. In a sense closer to social objectives, Lennart Nordenfelt suggests a more cautious definition, based on the concept of ability and disability, more important in his vision, than the medical concepts of pain and suffering. As consequences of Nordenfelt’s interpretation of health, the definition could be differentiated according to a particular social context. Argued by other international studies, health is related to another important concept that of quality of life.

Recent investigations in Sweden indicated that health is for many people the most important aspect of the meaning of life. The respondents appreciated that “being in good health” is directly related to the quality of life, which is understood as “a multidimensional concept depending on several components rather than just one particular ingredient of well-being.” Concern for health and lifestyle can become exaggerated and some authors define these social trends as “healthism.” Robert Crawford and Greenhalgh and Wessely explain the term “healthism” as “an ideology where maintaining health and avoiding illness have become the supreme human values” or as “a modern cultural, mainly middle class, phenomenon, characterized by excessive health awareness and expectations.”

HEALTHY LIFESTYLE - A SOCIO-ANTHROPOLOGICAL AND SPIRITUAL APPROACH

Lifestyle can be treated as an indicator of social attitudes and of the ideologies that are functioning in the social space. Difficulty debated and disputed, today lifestyles make careers in fields different from those, in which it arose (the sociological and anthropological). It is found in market research and marketing strategy, in studies of physical training and education and occurs with a certain constancy in trials and medical research.

Commercial advertising abound with tips for healthy living, products on the market are designed to ensure the same, medical networks are accompanied by guidelines for a healthy lifestyle, service, and technology come to support a healthy lifestyle and all what is around us likely make part of a wider scenario of a lifestyle that ensures a carefree life, perfect health, and eternal youth. Medical research contains guidelines announced by lifestyle issues, in fact, a change of perspective on health. It is not only a purely biological fact but also a socio-human approach. However, what explain the formidable mobility and audience of the concept and it’s association with health? What are the social effects of a flashy promotion of lifestyle? Here are just two questions that can challenge the sociologist, the anthropologist, and the doctor. From a broader perspective would be two answers that could explain the marriage health - lifestyle.

The Presence of the Collective Imaginary Mythical Fantasy

At any time, the man has been concerned about its origins but was frequented by fantasies of immortality. The ideal of youth without old age and life without death is not only present in myths, legends, or stories, he is cloaked in modern scientific research. Among these, the medical field had the highest social level echo. Why? Because besides the miraculous pills and intervention techniques, attention has refocused on one aspect of our existence as far as it is ignored. It is the relationship of our body with the world that surrounds us. Healthy diet, organic food, movement and exercise, stress management, human relationships, hygiene, rest, and sleep are just a few examples. It is however a recent concern. It is found in all times and represent beyond an adaptive reaction, a man’s way to harmonize with the natural rhythms, or a gesture or behavior that mimics an old gesture, originating in “illo tempore.”

For example, eating behaviors in aboriginal tribes had a strong religious imprint referring directly to obtain favors from the gods as health, wealth, healing, and long life.

Recent findings on healthy lifestyles are actually attempts to scientifically conduct to a natural behavior that man has always felt a natural one, as compared with others and nature. The even set of practices and attitudes of contemporary man announces a certain nostalgia of origins. It is the original condition that assumes a certain position in relation to the universe. Outings, holidays, rural, and sea movement may be expressions of the unconscious needs to escape from the rhythm of modern life.

Perhaps not incidentally, current medical researchers are involving isolated populations that live by different rules and have their own forms of healing. In these circumstances, the new findings regarding a healthy lifestyle come to find their audience because come amid a knowledge and latent needs, unconsciously felt by each of us.

New Technology, Ideology, and Control of the Bodies

It would not be without interest to associate the current discourse on a healthy lifestyle with a number of ideological orientations. Relying on new technology and a number of scientific discoveries, they set in motion an entire bodies dominance mechanism. The issue of power and their subservience was brilliantly presented by Michel Foucault in the seventies. "This political investment of the body is linked by complex and reciprocal relations to the use of it by economic point of view; to a large extent, the body is invested with relations of power and domination, but in the quality of the force of production, the labor force is possible only if it is involved in a system of subjection (in which need is an organized political tool, calculated, and used with great careful). In this way, body becomes a useful force only if it is at the same time productive body and body subservient." Bodies control today by esthetic standards of health through education, and sports is promoting healthy lifestyle patterns. Everything putted in the service of the body seems to generate a perverse and contrary effect: consistency, control, and domination of it.

With scientific support and new technologies, state builds different mechanisms of domination over the body, gradually pulling it out from the jurisdiction of the Church. Fasting and abstinence forms from the ancient period turn to diets and healthy eating nowadays. The same happens with other behaviors and body techniques. In this context of domination and control of a number of scientific disciplines, dispute their authority over the body. Until now seems that medicine have gained enough advance in this dispute. However, his speech and his research are permanently shaped on the dominant ideological orientations. Noteworthy are the concessions, she makes to sociology, psychology, or anthropology. Thus, the "new physicality is entirely dominated by certain elite project to secure control bodies, mastered by the systematic use of technical devices."

Healthy lifestyles fall within the language and current practices thanks to a certain accessibility (lots of social groups can understand and approach the concept) and an excessive promotion. He becomes for many the perfect solution for good health, an outfit enviable secret key for social and personal success. It may be noted that we enter the body in a certain dynamic of practices, techniques, and social representations which can generate confidence and constraints. For example, progress in the field of hygiene leads to "simultaneous censorship of representation and practice consumption of psychoactive substances such as tobacco and alcohol."

Hence, blatant promotion of a lifestyle can produce civilization, modeling behaviors, and our attitudes in relation to ourselves and the world. Either it is the dream of any ideology, while

strongly promoting a lifestyle can become a subtle tool of manipulation and control.

In this social context, the church and its representatives can play an important role in the implementation of the educational measures in population. Some authors reported that persons, who are religiously active, defined, for example, in churches attendance, were healthier than others, less religiously. In this kind of people, they were noted indicators of superior health, such as a normal blood pressure or lipid profile.

This holistic approach that combine Biomedicine with traditional, complementary, and alternative medicine, having the purpose of improving the quality of life, received the term of integrative medicine. The spirituality is also useful in comprehensive approach of treating addiction, especially for alcohol dependence, or in particular social categories, such as teenagers or elderly people. Despite the known positive influence of religion and spirituality on teenager's lifestyle, modern life, and mixture of religious trends may drop the importance of religious component. Modern society has determined also the polarization of spiritual tendencies, some people choosing the path of atheism, whereas others are inclined to cultivate their religiosity. Since most young people are going through rapidly emotional changes, religion can be a support but can sometimes become a barrier to some expected transformations. Relationship between ethnic differences and the influence of religion can be more powerful revealed on young people. In addition, many young people reported high levels of stress perception in the period of high-school and college. Teaching students stress management should prevent social and family later problems.

Older people represent another vulnerable group to which barriers are otherwise active: Although spirituality is well represented, access to healthy lifestyle, or complex and integrative therapies is more difficult to implement because low-financial support.

HEALTHY LIFESTYLE - A MEDICAL PERSPECTIVE

Healthy Lifestyle - Importance in Preventive and Curative Medicine

Lifestyle is particularly important at any age, but it is built during childhood and adolescence. National and international discussions and publications are trying to define the components of lifestyle (Quality of life magazine, Social Psychology magazine, Annals of sociology and social work, etc.) and highlight the particularities of age. More broadly, lifestyle is the way a person or a wider group of people choose to live, this being referred to their economic, occupational level, and type of activities they practice during leisure. Lifestyle

can be healthy or unhealthy, in terms of diet, level of exercise, some habits, and mode of activity alternating with periods of relaxation. A healthy lifestyle is correlated with good health and a high perception of well-being, while an unhealthy lifestyle leads to depression and isolation. Unhealthy behaviors such as smoking, alcohol abuse, overeating, in combination with high levels of stress, lead short and long term to many diseases.

Building a healthy lifestyle, regardless of age, will have numerous health benefits, being proven that it reduces the risk of cardiovascular disease, decreases the incidence of obesity and diabetes, the risk of malignancy, psychiatric disorders, and cognitive dysfunction. Childhood and adolescence are critical periods for the development of personality and for building a lifestyle. These can put their mark on all subsequent development of the individual. Current studies share a number of negative behaviors on the lifestyle of adolescents: more than 30% of high school students spend more than 3 h/day watching television or playing computer games, over 60% of students do not reach a level of physical activity recommended for their age and this contributes to the early development of metabolic and cardiovascular diseases.

Studies have shown that low levels of physical activity leads to a number of diseases such as high levels of systolic and diastolic blood pressure, increased prevalence of overweight and obesity. Similarly, obesity is a consequence of irregular schedule of meals and sugary snacks from fast food. Health and social programs to improve lifestyle were addressed up to now, more to adult and elderly, neglecting the major changes that have affected the lives of children and adolescents in the past two decades, and the implementation of preventive initiatives in comprehensive lifestyle programs was sporadic and less substantiated by research conducted on our population.

Healthy lifestyle is many times efficient not only for prevention but even for treating many diseases, the most important being cardiometabolic categories, such as diabetes mellitus, atherosclerosis, hypertension, and dyslipidemia. This approach of disease in terms of lifestyle could be very cost-efficient, as demonstrated by Herman *et al.* They tested both lifestyle intervention and metformin against placebo intervention in the prevention of type 2 diabetes mellitus in patients with impaired glucose tolerance. Lifestyle delayed the onset of diabetes by 11 years and metformin treatment by 3 years, with fewer expenses in lifestyle strategy and they concluded that “lifestyle costs less and performs better.”

Medicine could better individualize the lifestyle programs for some diseases and for different age categories: women, children, teenagers, and elderly. For example, a subject now under debates is weight loss in the elderly people. In this age category, not only an excess of adipose tissue but also a very rapidly weight loss could contribute to physical frailty

syndrome. In general terms, weight loss is not dangerous when is slow and supervised and resulted from diet associated with physical exercises.

Adolescents represent another category with many perspectives and social issues, continuously increasing in the world today, where health and education are priorities. Unfortunately, both the educational and the health system do not always provide youth and adolescents fundamentals needed to build a healthy lifestyle. While medical research investigations have focused on adolescent perception about unhealthy behaviors (smoking and alcohol drinking, drug abuse, and fast-food alimentation), the social determinants of health were considered personal and parental economical and educational status, employment opportunities, emigration, or social exclusion. Current existing data describe worrying phenomena that develop within adolescents groups (obesity, lack of concentration, social isolation or negative social comportment, deviant behavior expressed as aggression, alcohol, tobacco, and other substances, etc.), generated by adopting an improper and unhealthy lifestyle.

Women health and lifestyle importance is very much related to some life periods such as pregnancy and menopause. Although older studies underlined some beneficial effects of estrogens for vascular system, these positive actions have been challenged by the results of the Women’s Health Initiative trial and the Million Women Study, which demonstrated an increase in cardiovascular risk and related adverse events. Evaluation, treatment, and changing in lifestyle are needed for controlling the important comorbidities associated with menopause: hypertension, dyslipidemia, obesity, diabetes mellitus and metabolic syndrome, sleeping disorders, depression, osteoporosis, and sexual dysfunction. All this perturbations should be holistic approached, in terms of traditional and alternative therapies.

Healthy Lifestyle - Modern Guidelines for Cardio-Metabolic Disease Prevention

In this field, European and American joint team researchers and physicians established evidence-based comprehensive guidelines. For example, in 2012, was updated, the European Guidelines on Cardiovascular Disease Prevention in Clinical Practice, which contain detailed recommendations for people in different risk categories, at different ages, with a special focus on patients with metabolic syndrome [28]. The guidelines start with strategies for risk estimation. At a population level, in the people without a previous established cardiovascular disease, the family doctors should use score diagram, based on age, gender, and some risk factors such as hypertension, smoking, and dyslipidemia. The authors suggested that total risk assessment should be offered during a consultation to physician if:

- The person asks for it;
- One or more risk factors such as smoking, overweight, or hyperlipidemia are known;
- There is a family history of premature cardiovascular disease or of major risk factors such as hyperlipidemia;
- There are symptoms suggestive of cardiovascular disease.

In 2012, the guidelines recommended also a brief evaluation of psychosocial risk factors that can contribute to increase the cardiovascular and metabolic risk: Low socioeconomic status, lack of social support, stress at work and in family life, depression, anxiety, hostility, and the type D personality. “These factors act as barriers to treatment adherence and efforts to improve lifestyle, as well as to promoting health and well-being in patients and populations” In addition, the psychobiological mechanisms have been identified to interfere with inflammation and endothelial dysfunction to promote the pathogenesis of cardiovascular disease. Other non-traditional risk factors as C-reactive protein, homocysteine, and lipoprotein-associated phospholipase 2, should be screened in case of high-risk patients.

The guidelines offer precise recommendations about the level of physical activity that should be encouraged and the principles of nutrition. “In healthy subjects, growing levels of both physical activity and cardio-respiratory fitness were associated with a significant reduction (20–30%) in risk of all-cause and cardiovascular mortality.”

For nutrition, are presented some key messages:

- Energy intake should be limited to the amount of energy needed to maintain (or obtain) a healthy weight (body mass index 25 kg/m²)
- If a person follow the rules for a healthy diet, no dietary supplements are needed
- The main characteristics of a healthy diet are saturated fatty acids should be replaced by polyunsaturated fatty acids, salt is reduced to <5 g/day, are recommended 200 g fruit, 200 g vegetables, and 30–45 g of fiber per day, consumption of alcohol should be limited at 20 g/day for men and 10 g/day for women.

CONCLUSION

Preventive medicine has gained new achievements in the recent years and was organized to formulate comprehensive guidelines on population and particular disease categories. Extension to social is becoming more evident, and there were individualized social risk factors that interact with those medical traditional. Health population programs must be more extensive, but it is important to target specific groups such as postmenopausal women, the elderly, and adolescents. Healthy lifestyle has to be learned in childhood and must

include all components related to diet, dietary supplements, rest and relaxation, stress management, and physical activity. Personalized lifestyle medicine will become the future of medicine to effectively prevent and treat disease, including using of modern technological advances.

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Research Article

Effect of yogic practices and interval training on selected biochemical variables among high school boys

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ABSTRACT

Yoga has a complete message for humanity. Interval training is to subject the body to repeat but short intermittent periods of reduced intensity. Interval training is advocated by many of the top coaches, trainers, and performers who have used it to advantage. The purpose of the study was to find out whether there is any significant improvement on the efficiency of the physiological and biochemical variables through selected asanas and interval training. The study was conducted on a total sample of 90 boys drawn randomly from 150 students of TSWR School, Jangaon, Warangal Dist, age was ranged from 12 to 15 years. Yogic practices and interval training had significantly improved the serum cholesterol. When the experimental group-I (yogic practices) was compared with control group, there was significant improvement in serum cholesterol. When the experimental group-II (Interval Training) was compared with control group, there was significant improvement serum cholesterol. When the experimental group-I was compared with experimental group-II, experimental group-I had no significant difference in biochemical variables, whereas experimental group-II had a significant difference in biochemical variables except W.B.C and R.B.C.

Keywords: Cholesterol, Interval training, Yoga

INTRODUCTION

In today's world, sport plays an important role in our lives. Not so long ago, it was the hobby of the idle rich. Today, millions of people under modern conditions participate in it, and sport has got woven into the fabric of modern life, providing a counter weight to the excessive comforts and indulgences of today.

Yoga

"Yoga has a complete message for humanity. It has a message for the human body, it has a message for the human mind, and it has also a message for the human soul. Intelligent and capable youth must come forth to carry this message to every individual not only in India but also in every other part of the world."

Interval Training

Interval training is to subject the body to repeat but short intermittent periods of reduced intensity. Interval training is advocated by many of the top coaches, trainers, and performers who have used it to advantage.

1. A specific distance that is repeated at given number of times.
2. A recovery period during which the athlete jogs slowly and relaxes.

Statement of the Problem

The purpose of the study was to find out whether there is any significant improvement on the efficiency of the physiological and biochemical variables through selected asanas and interval training.

Hypothesis

1. There may be significant differences in the way the selected biochemical variables respond to yogasanas.
2. There may be significant differences in the way the selected biochemical variables respond to interval training.
3. There may be significant differences on the responses of selected biochemical variables among yogic practices and interval training groups.

Significance of the Problem

1. The study might throw light on whether selected yogasanas and interval training might cause desirable changes on selected biochemical variables.
2. It would also be possible to find out whether any one-exercise program might have a marked difference over the

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other in bringing out changes in the selected biochemical variables.

Delimitations

1. The subjects were selected randomly from TSW Residential School (Boys), Jangaon, Warangal Dist.
2. The study was delimited to the age group ranging from 12 to 15 years.
3. The study was conducted on 90 boys only.
4. The following biochemical variables only were selected.

Biochemical Variables

1. Serum cholesterol
2. Red blood cells
3. White blood cells.

Pallavi (2022) studied that the yoga has a complete message for humanity. It has a message for the human body, it has a message for the human mind, and it has also a message for the human soul. Intelligent and capable youth must come forth to carry this message to every individual not only in India but also in every other part of the world. The purpose of the study was to find out whether there is any significant improvement on the efficiency of the physiological and biochemical variables through selected asanas and interval training.

METHODOLOGY

Sample and Design

To execute this investigation, the research scholar employed random sampling method. The study was conducted on a total sample of 90 boys drawn randomly from 150 students of TSWR School, Jangaon, Warangal Dist, age was ranged from 12 to 15 years. The pre- and post-tests design employing analysis of covariance technique was adopted.

Procedure

Experimentation-I

The selected ten Asanas training was given in 6 days a week except Sunday. The duration of the exercises was 20 min during the 1st month 30 min during the next month and 40 min during the 3rd month in the morning from 6:30 AM. to 7.10 AM.

Experimental-II

The interval training was practiced by the subjects 3 days per week over a period of 3 months. Before giving the interval training, the subjects were asked to warm up. The duration training schedule was 20 min during the 1st month 30 min during the 2nd month and 40 min during the 3rd month in the morning from 6:30 Am to 7:10 Am.

Criterion measures

The following criterion measures were chosen for testing the hypothesis.

1. Red blood cells, white blood cells, and serum cholesterol were measured through blood analysis.

Statistical Procedure

In this study, the analysis of covariance was used to analyze the results. The Scheff's *post hoc* test was used to analyze the means and differences between the means of the various groups.

CONCLUSIONS

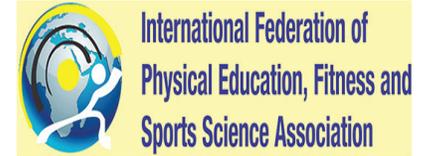
1. Yogic practices and interval training had significantly improved the serum cholesterol.
2. When the experimental group-I (yogic practices) was compared with control group, there was significant improvement in serum cholesterol.
3. When the experimental group-II (Interval Training) was compared with control group, there was significant improvement serum cholesterol.
4. When the experimental group-I was compared with experimental group-II, experimental group-I had no significant difference in biochemical variables whereas experimental group-II had a significant difference in biochemical variables except W.B.C and R.B.C.

RECOMMENDATIONS

1. Similar study can be conducted using other physiological and biochemical variables.
2. The study may also be conducted in asthmatic patients.
3. Similar study can be conducted separately for girls of different age groups.
4. It is recommended that yoga shall be made a compulsory part in the physical education program in schools and colleges.
5. Comparative studies on the effects of yogasanas and other training schedules on the variables used in the studies shall be conducted.
6. Studies to see the effect of yogasanas on psychophysiological and psychomotor variables shall also be conducted.
7. Similar studies may be conducted for other stages of yoga.
8. Similar studies may be conducted on state and national level players and athletes to find the effects.
9. It is recommended that similar studies may be conducted separately for men of different age groups.

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Research Article

Effectiveness of math on move-integrated motor skill program on developing numeracy skills in early childhood students

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ABSTRACT

This research study examined the effectiveness of the Math on Move (MoM) program, which integrated the learning of basic mathematical concepts with fundamental motor skill development in early childhood students at Sports Nursery, Pune, within the context of the National Education Policy (NEP) 2020 in India, emphasizing universal access to quality education and foundational literacy and numeracy. Using an action research methodology, the study followed a spiral model, and the intervention involved implementing the MoM program, incorporating physical activities and age-appropriate numeracy concepts. It was administered over an 8-week period, 6 days/week, with sessions focusing on warm-up, and numeracy concept through physical activities, practice, and cool-down. Thirty-one girls and 26 boys early childhood students participated in the intervention, and their numeracy skills were assessed through four knowledge tests conducted at different intervals. Data analysis indicated the positive impact of the MoM program on early childhood students' numeracy skills. The mean scores consistently increased throughout the intervention period. Analysis of variance analysis demonstrated significant differences between the mean scores of the numeracy tests, indicating the effectiveness of the program. *Post hoc* analysis further supported these findings, identifying specific significant differences between certain test pairs. MoM program proved to be effective in improving numeracy skills in early childhood students. By integrating physical activities with numeracy concepts, the program enhanced engagement, motivation, and conceptual understanding. These findings align with the objectives of the NEP 2020 in India. Future research should explore the long-term effects of such interventions and their impact on various aspects of numeracy skills to provide further insights into early childhood education practices.

Keywords: Early childhood education, Numeracy skills, Physical activity, Integrated curriculum, National Education Policy 2020

INTRODUCTION

Ministry of Education, Government of India announced its National Education Policy (NEP 2020) in August 2020. The policy has proposed a great number of reforms in education at all levels ranging from early childhood until higher and technical education. The policy ensures universal access, quality care and initiatives, and a new structure (PIB, 2022).

The NEP 2020 aims to move a child aged 5 years to a preparatory class (Balvatika) and will be taught by a qualified teacher using play-based strategies. The Preparatory Class shall employ novel play-based pedagogies mainly to focus on the development of all the domains of learning, and early literacy and numeracy (NEP, 2020, August).

This policy envisions a massive transformation in school education by providing high-quality education to all. The policy aims and aspires to universalize pre-primary education and provides a special emphasis on the attainment of foundational literacy and numeracy.

Ministry of Education has launched the National Initiative for Proficiency in Reading with Understanding and Numeracy (NIPUN) Bharat under the "Atma Nirbhar Bharat" campaign, for ensuring that every child in the country necessarily attains foundational literacy and numeracy by the end of grade 3 and not later than grade 5 by 2026-27 (NEP, 2020, August).

BACKGROUND AND RATIONALE

The act of playing is essential for the growth and development of the brain, body, and intellect of a child. The body becomes a tool for learning as a result of learning by doing, which increases the number of neural pathways in the brain and

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throughout the body. Therefore, it is pertinent to include activity-based teaching-learning.

Studying the effect of activity and numeracy-integrated curriculum on numeracy skill development in early childhood in India is important for several reasons. Early childhood is a critical period for cognitive and skill development, including numeracy skills. By understanding the impact of an integrated curriculum on numeracy development, educators and policymakers can make informed decisions regarding early childhood education in India, as has been made in the NEP 2020.

Numeracy skills are foundational for future academic success and are essential for everyday life. A strong numeracy foundation helps children understand concepts such as numbers, shapes, patterns, and measurements, which are integral to mathematics and other subjects. Developing numeracy skills at an early age can also foster critical thinking, problem-solving, and logical reasoning abilities. Integration of activities into the curriculum can enhance learning experiences for young children. Engaging in hands-on activities, manipulative play, and real-world applications of numeracy concepts can promote active learning and deeper understanding. Such an integrated approach can help children see the practical relevance of numeracy skills, making learning more meaningful and enjoyable.

Integrating physical activities into numeracy instruction can enhance student engagement and motivation. The use of movement and hands-on experiences appeals to young learners, making the learning process more enjoyable and stimulating (Dinehart and Manfra, 2013). Ramani and Siegler (2011) concluded that Physical activities provide concrete and tangible experiences that support children's conceptual understanding of numeracy concepts. Movement-based tasks allow children to explore and manipulate mathematical ideas in a practical context, facilitating deeper comprehension.

Other studies have maintained that physical activities involving spatial awareness, such as arranging objects or following movement patterns, can strengthen children spatial reasoning skills. These skills are closely linked to numeracy development, as they contribute to understanding spatial relationships and geometric concepts (Uttal *et al.*, 2013).

Jones and Verschaffel (2008) upheld the notion of integrating physical activities into numeracy instruction to promote problem-solving skills. Through movement-based tasks, children learn to analyze situations, make connections, and find solutions, fostering critical thinking and logical reasoning abilities.

It is important to conduct further research to specifically investigate the impact of physical activity based on fundamental

motor development integrated with numeracy curriculum on numeracy skill development in early childhood in India. Such research can help inform educational policies, curriculum design, and teaching practices to ensure optimal numeracy learning outcomes for young children in the Indian context. This work will substantiate the claims made in NEP 2020, and hence, it becomes essential to try out such interventions in the local settings.

PURPOSE OF THE RESEARCH

This study is an effort to find out the effectiveness of a specially designed program titled MoM, it integrates the learning of basic mathematical concepts and fundamental motor skill development of early childhood students enrolled at the Sports Nursery, Pune. The purpose of the study is to assess the impact of MoM in improving numeracy skills in early childhood students.

Hypothesis

H₁: "The implementation of the MoM-integrated math and physical activity program at sports nursery will significantly improve numeracy skills in early childhood students." The hypothesis was converted to a null hypothesis for the purpose of testing and concluding.

This hypothesis is based on the assumption that integrating math and physical activities in an educational program will have a positive impact on the numeracy skills of early childhood students. Overall, the hypothesis assumed that the combination of cognitive and motor skill integration, active learning, contextualized learning, and increased motivation and enjoyment will result in significant improvements in numeracy skills among early childhood students participating in the integrated math and physical activity program at sports nursery.

Methodology

The study relied on an action research methodology as it intended to try out a novel program MoM on the numeracy skills of early childhood students enrolled at Sports Nursery Pune. The intervention was carried out on a single group of EC students with similar demographic profiles.

Participants

The subject used in this study were all students of sports nursery aged between 3 and 5 years. Total 57 participants (31 girls and 26 boys) were included in this study. The average age of the participants was 3.51 ± 0.43 years. Parental consent was taken before the beginning of the intervention.

Research Design

One of the aims of action research is to improve the learning system to increase logical mathematics intelligence in early childhood (3–4 year old). Kemmis and McTaggart (1988)

developed a concept of Action Research. They proposed a spiral model comprising four steps: planning, action, observation, and reflection. It has two spiral shape cycles. If the first cycle has not been achieved, it will be continued to the next cycle so that research objectives are achieved. A similar approach was adopted in the present study. A preintervention assessment was conducted to establish a baseline measurement of the students' numeracy abilities.

Intervention

The researcher designed a systematic and specifically tailored program by incorporating physical activities and age-appropriate numeracy concepts that aligned with the study objectives. The program was administered for 8 weeks 6 days/week for an hour each.

The researcher consulted expert Math teachers for the age-appropriate numeracy concepts. The experts and NIPUN guidelines recommended 21 foundational arithmetic and numeracy concepts to be included in the program. Physical activities and math concepts were integrated to design the daily lesson plans. A single episode would comprise a warm-up and cool-down of 15 min and the MoM activity session of 45 min approximately. From the 48 sessions, four sessions were used for baseline and formative assessments at predetermined time intervals.

MoM session would include the introduction of a numeracy concept and a physical activity and tasks to be completed. In a single session, the same numeracy concept was learned by participating in three different motor tasks. Revision of each concept was conducted from time to time. Except for a couple of numeracy concepts, each concept was practiced and revised periodically, the more complex concepts were given more sessions, if needed. Ample opportunities for practice were provided during the session. During the cool-down period, the researcher checked for understanding and provided feedback. Comments and feedback from the participants were sought and changes/modifications in the tasks were made when needed. The active learning approach promoted engagement and knowledge retention among the participants. The researcher ensured of providing a dynamic and interactive environment. The participants were assessed four times during the 8 weeks using tests designed to measure the attainment of numeracy skills.

Measurements

The present study aimed to investigate the impact of MoM on the attainment of numeracy skills in early childhood students. The data collection comprised knowledge tests in a phased manner. The initial test was conducted to assess the baseline level of numeracy skills. The first test was 50 marks for 25 questions based on the total content of MoM-integrated program, that is, 21 concepts of numeracy. It comprises 50

questions based on foundational numeracy skills. It included the concepts such as same-different, big-small, tall-short, heavy-light, full-empty, more-less, near-far, top-bottom, inside-outside, complete-incomplete, on-under, front-behind, thick-thin, left-right, above-below, number recognition, number writing, addition, and subtraction. The test consisted of multiple choice, match the following, and true-false type of objective questions.

After an initial assessment, the program was administered and a formative assessment using a simple test based on the MoM content taught was conducted. Every 2 weeks, similar formative tests were conducted. The test scores of all the students were recorded. The test scores of students who participated regularly were considered for the analysis. The data of irregular students have not been included in the study.

Data Analysis

A total of 57 subjects from Sports Nursery, Pune, participated in the intervention. They were assessed for numeracy skills through four different knowledge tests. The attainment scores on the four tests were converted in percentage for the final data analysis. Primarily, the data were processed and analyzed using descriptive measures such as mean, SD, range, skewness, and kurtosis. This helped in understanding the nature of the group. To understand the effect of the MOM program on the numeracy skills of the EC students, the data were then subjected to inferential statistics. Analysis of variance (ANOVA) and Scheffe's *post hoc* analysis. This analysis helped in understanding the difference in the attainment of numeracy skills over the period of the intervention. The data analysis is presented in the further section.

RESULTS

Descriptive Statistics

The data collected on the numeracy tests were analyzed with the help of SPSS 21 software and subjected to rigorous analysis and its interpretation. The analysis is presented below.

Table 1 shows the descriptive analysis of the four numeracy test performances of the early childhood students who participated in the MOM (physical activity and numeracy skill-integrated program).

The mean on the four tests, that is, 45.89, 50.88, 61.75, and 64.39 is seen to have increased in each test. Based on the descriptive analysis, we can see that Test 4 has the highest mean and Test 1 has the lowest mean. Test 3 has the highest standard deviation, indicating greater variability in the scores. This can be ascertained from the standard deviation of 17.84 and range of 80, minimum score is 20, whereas maximum score is 100. The skewness and kurtosis values indicate that the distributions of the scores for all the tests are approximately

Table 1: Summary of descriptive analysis of numeracy test data

Variable	Range	Min	Max	Mean	SD	Skewness	Kurtosis
Test 1	76.00	12.00	88.00	45.89	17.60	0.28	-0.33
Test 2	60.00	20.00	80.00	50.88	16.51	0.05	-0.47
Test 3	80.00	20.00	100.00	61.75	17.84	-0.18	-0.24
Test 4	50.00	40.00	90.00	64.39	14.27	0.01	-0.70
N	57	57	57	57	57	57	57

symmetric and slightly flatter than a normal distribution. Test 1 has a skewness of 0.28, Test 2 has a skewness of 0.05, Test 3 has a skewness of -0.17, and Test 4 has a skewness of 0.01. All the skewness values are relatively small, suggesting that the distributions of the scores are approximately symmetric. Whereas, the kurtosis of each test is -0.33, -0.47, -0.24, and -0.70, respectively. All the kurtosis values are negative, suggesting that the distributions of the scores are slightly flatter than a normal distribution. The data were further subjected to analysis of difference in the four data sets.

Group Comparison

ANOVA is used to determine if there are any significant differences between the means of the subsequent numeracy test performances of the EC students participating in the MOM program.

The ANOVA tests the null hypothesis that there are no significant differences between the means of the groups. The “Between Groups” comparison provides information about the variability between the group means, while the “Within Groups” represents the variability within each group. F-value is the ratio of the mean square between groups to the mean square within groups. It is used to test the null hypothesis. In this case, F-value is 15.93.

To determine the significance of the results, *P*-value (Sig.) is seen. In this case, *p*-value is .00, which is less than the conventional significance level of .05. Therefore, we reject the null hypothesis and conclude that there are significant differences between the means of the groups.

In summary, based on the ANOVA results shown in Table 2, there is evidence to suggest that at least, one of the groups has a significantly different mean from the others.

The *post hoc* analysis in this case is performed using the Scheffe method, which compares the means of all possible pairs of groups after conducting an ANOVA.

From Table 3, it is seen that the mean difference between Test 1 and Test 2 is 4.98, with a standard error of 3.11. *P*-value of 0.47 shows that the result is not statistically significant. Test 1 when compared with Test 3 shows the mean difference of

Table 2: ANOVA showing difference in the subsequent numeracy tests

	Sum of squares	Df	Mean square	F	Sig.
Between groups	13195.56	3	4398.52	15.93	0.00
Within groups	61831.58	224	276.03		
Total	75027.14	227			

15.86, with a standard error of 3.11. The result is statistically significant ($P = 0.00$). A statistically significant difference in the means of Test 1 and Test 4 (18.49) is seen at 0.00 level.

The mean difference between Test 2 and Test 3 is -10.88, with a standard error of 3.11. The result is statistically significant ($P = 0.01$). It is also seen that the mean difference in the performance between Test 2 and Test 4 is -13.51, with a standard error of 3.11. The result is statistically significant ($P = 0.00$). Whereas, the mean difference in Test 3 and Test 4 is found to be -2.63, with a standard error of 3.11. The result is not statistically significant ($P = 0.87$).

Based on the *post hoc* analysis using the Scheffe method, it is concluded that the difference in the performance of Test 1 is not statistically different from Test 2. There is no significant difference in the performance of Test 3 and Test 4.

It is concluded that the performance on Test 1 is significantly different from that of Test 2 and Test 3. Moreover, the performance on Test 2 is significantly different from that of Test 3 and Test 4; therefore, the null hypothesis (H_0) is rejected.

DISCUSSION

The study on the effect of a physical activity-integrated math program on the numeracy skills of early childhood students provides valuable insights into the potential benefits of combining movement and mathematics instruction. Integrating physical activity into math instruction has been shown to enhance student engagement and motivation. The use of movement-based tasks and active learning strategies captures children’s attention and creates a more dynamic learning environment. In a study, Dinehart and Manfra (2013) examined the integration of movement and curriculum in a kindergarten

Table 3: Comparison in the mean performance of subsequent numeracy tests

Multiple comparisons	(I) Group	(J) Group	Mean difference (I-J)	Std. error	Sig.
Dependent variable: Test					
Scheffe	1	2	-4.98	3.11	0.47
		3	-15.86*	3.11	0.00
		4	-18.49*	3.11	0.00
	2	1	4.98	3.11	0.47
		3	-10.88*	3.11	0.01
		4	-13.51*	3.11	0.00
	3	1	15.85*	3.11	0.00
		2	10.87*	3.11	0.01
		4	-2.63	3.11	0.87
	4	1	18.49*	3.11	0.00
		2	13.52*	3.11	0.00
		3	2.63	3.11	0.87

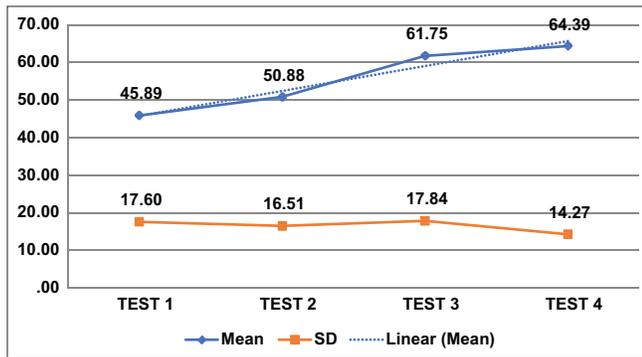


Figure 1: The difference in mean and standard deviation on the numeracy tests

classroom. The findings indicated that physical activity increased student engagement, motivation, and enjoyment of mathematics learning. The present study has similar observations, student engagement was high and motivation to participate was sustained throughout the intervention period.

Regular participation in the program enhanced conceptual understanding through concrete experiences of motor activities that support children’s conceptual understanding of mathematical concepts. Engaging in movement-based tasks allows students to explore and manipulate mathematical ideas in a tangible way, facilitating deeper comprehension. In a study by Ramani and Siegler (2011), low-income preschoolers engaged in movement-based activities to improve their numerical knowledge. The results showed that the intervention successfully reduced the gap in numerical knowledge between low- and middle-income children, highlighting the potential of integrating physical activities to enhance conceptual understanding.

Physical activities that involve spatial awareness, such as arranging objects or following movement patterns, can

strengthen children’s spatial reasoning skills. Spatial reasoning is closely related to numeracy development, as it contributes to understanding spatial relationships and geometric concepts. The current intervention program contained many activities based on spatial awareness. Research by Uttal *et al.* (2013) conducted a meta-analysis of training studies and found that spatial skills can be improved through various interventions, including those involving physical manipulatives. These findings suggest that integrating physical activities into math programs can positively impact spatial reasoning abilities, which are integral to numeracy skills.

The integrated approach creates a base to develop numeracy skills by improving problem-solving abilities. Movement-based tasks require children to analyze situations, make connections, and find solutions, fostering critical thinking and logical reasoning abilities. Jones and Verschaffel (2008) explored the integration of physical and virtual manipulatives in math instruction. Their findings suggested that combining physical activities with virtual manipulatives can enhance problem-solving skills by providing multiple avenues for students to explore mathematical concepts. Similar findings are seen in the present study. The present study was conducted on a single experimental group; hence, it becomes challenging to determine whether any observed improvements in numeracy skills were solely due to the MoM program or if other factors may have influenced the outcomes. In addition to this, the short duration of the program may not capture the long-term effects of the physical activity-integrated math program. Longitudinal studies that assess the sustainability of the program’s impact over time would provide more robust evidence.

Overall, the research findings indicate that integrating physical activities into math programs for early childhood students can have positive effects on numeracy development. The use

of movement-based tasks increases engagement, enhances conceptual understanding, develops spatial reasoning, and improves problem-solving abilities. However, it is important to note that further research is needed to explore the long-term effects of such interventions and their specific impact on different aspects of numeracy skills.

CONCLUSION

The MoM program has shown positive effects on the numeracy skills of early childhood students from Sports Nursery, Pune. The results have shown that integrating math concepts into motor activity enhanced student engagement, motivation, and concept attainment. Physical activities provide concrete and practical contexts for children to explore numeracy concepts, fostering deeper comprehension, and application of mathematical ideas.

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