COMPARATIVE STUDY OF HEALTH INDEX IN PUNE CITY AND PUNE RURAL COLLEGE'S

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ABSTRACT

This research is a comparative study of health indicators from Pune city and Pune rural colleges coming under Savitribai Phule University using survey method. Questionnaire prepared by World Health Organization was used to collect research information. from prospective sample selection, Pune city and Pune rural from 73 colleges. The information obtained from the questionnaire selected is by lottery method in simple random sample was compared between Pune city and Pune rural colleges, comparative study wasdone by T-Test, no.1 Health safety policies and environment, no. 2 diet-behavior, no.3 hygiene, no.4 mental health, no.5 physical education and other movement program,no.6 family and community involvement, no.7 Protective. After comparative study from Pune city and Pune rural colleges significant difference was found in some factor numbers while no significant deference was found in some factor number.

Research Method

Comparative research method used for protective health indicator Pune city and Pune rural college's coming under SPPU, Pune City 23 and Pune Rural 28 Colleges were selected as role models. The research materials used in the present research used a questionnaire developed by the World Health Organization and the US and Atlanta to find out why the college is a health indictor. Descriptive statistical tools called polymer ratio deviation in the mean to analyze the information collected by the viewer and this test used approximate spatial statistics to compare

Research problems

Lack of exercise,Unhealthy eating ,intake of Alcohol, Mental health and unhygienic Increase children's morbidity, poverty use of Tobacco increases child's weight, blood pressure, heart diseases, diabetes and because of unhygiene60-90% of children in developed countries are facing tooth problem. Increased donor support Globally It is found that 60% of the world's population does not exercise due to lack of participation in physical activities. It is also found to be a major cause of illness- health and surrounding environment, safety dietary behavior, hygiene, mental health, physical education and other physical activities, family programs and social participation, safety and protection all these factors need to be considered

Health indicators

1) Health, safety policies & Environment
2) Dietary behaviors
3) Hygiene
4) Mental Health
5) Physical Ed & Other Physical Activity Programs
6) Family Community Involvement
7) Protective Factors

Need and importance

1) The college management committee and the university need to know the health status of the college
2) Health and Environmental Safety in Colleges Dietary Conduct Hygiene Mental Health Physical education and other physical activity programs Family and social participation protection It is important to see if facilities are provided in the college.
3) Health and Environmental Safety in College Dietary Conduct Hygiene. How to facilitate mental health physical education and other physical activity programs protect family and social participation in college. It remains to be seen.
4) If the current status of the college is known and there is no facility as per the health vision, then it is recommended to the concerned management system to the students-parents Would be recommended.

5) This research will be useful to improve the program on college policy.
6) This research will help the college students to understand the shortcomings and strengths of health, so what activities should be implemented in the field of health and how to take care of it.

Functional interpretation

College Health Philosophy-The marks obtained through the Health Information Questionnaire will be the College Health Information Guide

Research Objectives

1) Completion of Health index Questionnaire as per the guidelines of the World Health Organization by the Head of the Principal Health Committee of the College and the Director of Physical Education
2) To compare the health viewers of Pune city and Pune rural college on the basis of the information obtained through the questionnaire

Hypothesis

Null Hypothesis

1) There will be no meaningful difference between health and environmental safety in Pune city and Pune rural college
2) There will be no meaningful difference between Dietary behaviors in Pune city and Pune rural college
3) There will be no meaningful difference between Mental health in Pune city and Pune rural college
4) There will be no meaningful difference between Physical education and other physical activity programs in Pune city and Pune rural college
5) There will be no meaningful difference between Family community Involvement in Pune city and Pune rural college
6) There will be no meaningful difference between Protective factors in Pune city and Pune rural college

Limits

1) The health indicator questionnaire taken for the research will be in English only.
2) Responders response to the questions in the questionnaire will be considered to be true.
3) The researcher will examine the current situation from year 2018to 2021so there will be the limit to this research.

Self-limitation

1) Savitribai Phule Pune University affiliated, this research will be limited to degree, education colleges only from Pune city and Pune rural.

Assumed

1) Institutional directors and Principals will give permission for this research
2) For this research, the Principal of the college, the head of the health committee and the director of physical education honestly fills in the questionnaire.

Research methods

The researcher will use the comparative study research method in this presented research paper.

Population

Colleges coming under SPPU, Head of Health Committee and Director of Physical Education, Principal from 34 colleges Pune city and 39 colleges from Pune rural which are affiliated to Pune University.

Sample

Colleges coming under SPPU, Head of Health Committee and Director of Physical Education, Principal from 24 colleges Pune city and 27 colleges from Pune rural which are affiliated to Pune University.

Descriptive statistics

Health indicator of the Director of Physical Education in Pune City and Pune Rural College's

College Type	Number	Average	Standard deviation	Standard deviation error
Pune City	24	146.0000	13.51971	2.75970
Pune Rural	27	119.5926	22.24904	4.28183

Table no.1It was found that the average number of grants for physical education directors and health observers in 24 colleges is (13.51971+) 146.00 The standard error of the 2.75970 Director of Physical Education in 27Pune Rural Colleges is (22.24904+)119.592and the standard error is .4.28183

Self-examination

	F valve	Significance	T value	Freedom quantity	Significance	Medium difference	Differences in quantity error
Assuming the same variance	7.880	.007	5.043	49	.001	26.40741	5.23689
Without assuming the same variance			5.184	43.585	.001	26.40741	5.09412

Table no. 2The Director of Physical Education in Pune City and Pune Rural Colleges has compared the differences in the marks of the health indicator using the self-examination tester. t value is 5.043 and it is meaningful at the significance level of 0.05 (0.001) i.e. This means that there is no significantly meaningful difference in the marks of the Director of Physical Education from Pune City and Pune Rural Colleges.

The Director of Physical Education from Pune City Colleges of Director of Physical Education is significantly superior to that of Pune Rural College's

Discussion

This research is a comparative study of health viewers of Pune City Pune Rural Colleges under Savitribai Phule Pune University Factor No. 2 Dietary behaviors, Factor No. 3 Hygiene, Factor No. 4 Mental Health ,Factor No.5 Physical Education and Other Movement Program, Factor No.6family and community involvement, after comparing the health indicators from Pune city and Pune rural colleges, significant difference was found in the college's health indicator, there was no significant difference in the numbers between factor no. 1 health safety and environment, to factor no. 7 protective.

Kate W and all(2009):- The purpose of this research is to examine the relationship between school health observers of university college students and the environment, diet, physical activity and weight in the area (N=19) So total 9.460 Health factors were applied to the students. Research analyzes came from university health factors and why goat factors these include vegetarian meals and fruit intake. How often do you do aerobics and strength exercises with a hammer. The findings found no correlation between the merits of the university health component and the toxic component question

Conclusion

This research paper is a comparative study colleges under SPPU, Pune City and Pune Rural College's. Health Observer Component No.2 Diet-behavior, no.4mental health,no.5 Physical Education and Other Movement Programs, no.7 Protective numbers in their marks significantly from Pune City Colleges While a significant difference was found in

the health indicator from Pune Rural Colleges. Health safety and environment component no.1, family and community involvement compound no.6no statistically significant difference was found in their quality of participation.

References

1. American Psychological Association. (2010). *The publication manual of the American Psychological Association* (6th Ed) Washington DC: Author. Retrieved July 25, 2010 from website http://en.wikipedia.org/wiki/APA style
2. Ananthakrishnan, S et al. (2001). *A Comprehensive study of morbidity in school age children.*Retrieved March 5, 2011, from website:http//nipccd.nic.in /report/srah.pdf.
3. Anderson et al (2007). *Nutrition service and beverages available at school: results from the School Health Policies and programs study 2006* Retrieved December 14, 2011, from website: http://www.asha/web.orgfile spublicJOSH_77_8_0_toole_p_500.pdf
4. Aubier, M.(2000). *Air Pollution and allergic asthma.* Retrieved June 14, 2012, from website: http://www.cdc.gov/nceh/asthma/fastsheets/asthma.htm.
5. Best,J.W and Khan, J.V.(2009) Research in education (10th ed), pearsoneducation, prentice hall.
6. Brener, N. (2011). Establishing a baseline measure of school wellness-related policies implement in a nationally representative sample of school districts Retrieved Feb, 2012, from website: http:/www.ncbi.nlm. fromöwebsite: http://www.ncbi.nlm.nih.gov/pubrned/17846461
7. Brener, N. et al. (2007). Health services: Results From the School Health Policies and Programs Study 2006. Retrieved December 14, 2011, from website: http:www.ashweb.org/files/publicJOSH_1007josh77_8_brener_p464.pdf.
8. Centres for Disease control and prevention. (2005).CDC Glossary for school health index factor. Retrieved May 10,2012, from website: http:www.cdc.gov/healthyyouth/shi/glossary.htm.
9. Centres for Disease control and prevention.(2006).CDC Glossary for school-based student health survey. Retrieved December 5,2011, from website http/www.cdc.gov/healthy youth /shi/pdff/ middlehigh.pdf.
10. Elsabe, D. (2006). Educator perception of school climate in primary school in the southern CAPE. Retrieved January 3, 2014, from website: http://dx.doi.org/10.4172/2161-0711.1000179
11. Emily Luis Cimino,E (2007) Factors Associated With School-Mental Health Services Delivered By School Psychologists.Retrieved February 15,2012, From Website :http://search.proquest.com/dissertation/docview304818031134E62347430D6259422accountid=61368
12. Evenson,K.(2009). National study of charges in community access to school physical activity facilities: the school health policies and programs study. Retrieved February 15, 2012, from website http://search.proquest.com/dissertations/docview897911412134CEA98792D42accountid=1368
13. Kansal, D,(2008).Textbook of applied measurement evaluation sports selection DVS publication, New Delhi, pp.303.304
14. Lalvani S. et al (2004) Suicide among children and adolescents in south Delhi Retrieved April 6, 2012, from website: http//nipccd.nic.in/report/srab.pdf.
15. Lee,S.et al (2007) Physical education and physical activity: results from the school Health policies and programs study 2006 Retrieved December 14, 2011, from website: http//www.ashweb.org/files/publicJOSH_josh77_lee_p_435.pdf.

16. School Health Foundation of India.(2011). School health. Retrieved June 14, 2012, from website: http//schoolhealth.in/ featured/helping-them-achieve-their-dreams.
17. School health policies and program study. (2007). SHPPS is a national survey periodically conducted to assess school health policies and programs at the state, district, and school and classroom levels. Retrieved November 20,2011, from website: http//www.cdc.govhealthyyouthshpps2006 .pdf.
18. School Sanitation and Hygiene Education in India: Investment in Building Children's Future. SSSE Global Symposium Construction is not enough" Delft, The Netherlands 2004 Jun 8-10 p.4 Available from:http://ddws.gov.in/POPUPS//SSHE_i n_ India_paper_2004.pdf.
19. Seeds,H.(1986).School health and youth health and youth health. Retrieved November 20,2011, from website: http://www.uwic.ac.uk/shss/dom/newweb/ Introtohealth/Other%20definitions.htm
20. WHO and UICEF.(2005). Child and adolescent injury prevention: global call to action.Retrieved February 1, 2012, from website:http://www.who.int/childadadoles centinjuryprevention/en/gsfs.pa.pd
21. World Health Organisation, Center for disease control and prevention.(2003). India-Haryana Global Youth Tobacco Survey (GYTS).Retrieved April 12.2011, from website: http://www.searo.who.int/Link Files/GYTS_India_Haryana.pdf.
22. World Health Organisation, (1999) Improving health through schools. Retrieved January 5,2011 from website:http//www.who.int/whwho/1999/e n/index.htm/.
23. World Health Organisation (2000).Global water supply and sanitation assessment.Retrieved June 24, 2012 from website:http://www.whoindia.orglink/files health_promotion_intro_framol.pdf.
24. Shirk,S.(2011).Effectivenes of presentation teaching and cooperative learning methods on asana performance in yoga April 2011
25. Shirke, S. (2014). Comparative study of school health index of high schools in pune city
26. Healthy youth. Retrieved March 9, 2011, from Wikipedia: http://www.healthdenefit.org.

A COMPARATIVE STUDY OF SELECTED PHYSICAL FITNESS VARIABLES BETWEEN CRICKET AND FOOTBALL PLAYERS OF DELHI

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ABSTRACT

The aim of the study was to compare the selected physical fitness variables between the Cricket and football Players of Delhi who constantly participated in Inter school sports tournaments. To achieve the motive of this study, One Hundred (N=100) (50 from cricket and 50 football) Male Players were selected randomly as subjects from various schools of Delhi. The subjects were selected in the age group of 14 to 19 years. Speed (50 m), Muscular endurance (bent knee sit-ups), Explosive strength (SBJ) and Flexibility (sit and reach test) were selected as the variables of Physical fitness, for this study. 'T' test was applied, and level of significance was set at 0.05 level. From the study, we found that there were significant differences between the Cricket and football Players of Delhi on speed, explosive strength and Flexibility. No significant difference exists on muscular endurance between the groups. Football Players of were superior in speed, stronger in explosive strength and more pliable in flexibility than the cricket Players of Delhi.

Keywords: *boys, cricket, football, and physical fitness.*

"Exercise not only changes your body, it changes your mind, your attitude and your mood".

I. Introduction:

Performance is being used to evaluate physical fitness, and performance is depending on a lot of aspects. Agility, Muscular Endurance, Speed, Flexibility, Power, Cardiorespiratory, Endurance and Muscular Strength, have always been the most frequently used Physical Fitness variables.

A sport has mass participation, as it draws individuals either for fun, physical exercise, or for work. Since the past, sports have been organized at competitive levels, but rivalry in every sports has now reached the greatest possible stage. Thousands of youth rising stars devote their precious years and power to these activities to achieve success.

Cricket and football are dynamic sports that demand intensive of training. Many studies have shown that unique fitness features are a significant cause of sports success. Scientist around the world are trying to find a common strategy for enhancing player's performance and exploring abilities as effectively as feasible. Because every other sport does have its personalspecified specifications, each playermust have certain physical fitness components.

A greater standard of aerobic and anaerobic fitness is required for team sport sportsmen to produce and retain fitness outcome throughout prolonged high intensities activities and to retrieve. An fascinating point to note is that cricketers play football to increase their endurance and levels of fitness in order to enhance performance.

There seem to be various factors that affect a sportsman's performance. There are four of them: physical, technical, psychological and tactical. Physical attributes are perhaps the most crucial between all of them. Physical activity has positive effects on physical, physiological, mental, sociocultural, and behavioural wellbeing on school going kids and teenagers.

Objective:

To compare the selected physical fitness variables between the players of Cricket and football of Delhi who constantly participated in Inter school sports tournaments organized by government and private sectors.

Hypothesis:

a. $\mathbf{H_{o1}}$:No significant difference exists on speed between the Cricket and football Players of Delhi.
b. $\mathbf{H_{o2}}$:No significant difference exists on muscular endurance between the Cricket and football Players of Delhi.
c. $\mathbf{H_{o3}}$:No significant difference exists on explosive strength between the Cricket and football Players of Delhi.
d. $\mathbf{H_{o4}}$:No significant difference exists on flexibility between the Cricket and football Players of Delhi.

II. Methodology:

To achieve the motive of this study, One Hundred (50 from cricket and 50 football) Male Players were chosen randomly as participants from numerous schools of Delhi. The participants were aged from 14 to 19 yrs. Before collecting the data, the participants were assembled at one place and informed about the motive, procedure and possible risks of the research study.

Criterion measures and Assessment Tools:

The following test items were selected to measure the physical fitness variables.

Table A-:

S.no	Variables	Test	Unit of measurement
1	Speed	50 m dash	Time in Sec's
2	Muscular endurance	Bent knee sit-ups	Time/Score
3	Explosive strength	Standing broad jump	Meter/Centimeter
4	Flexibility	Sit and reach test	Centimeters

Statistical Analysis:

The descriptive statistics and 't' test was utilized to observe the notable discrepancy between the players group. SPSS 24.0, was employed for this study, and the significance of level was fixed at .05.

III. Results of the study: The data analysis shows, mean, SD and 't' value on the selected physical fitness variables between the male players of cricket and football of Delhi. The results of the study are displayed in the below mentioned table.

Table-1:-Descriptive statistical analysis of selected physical fitness variables between the players.

S.No	Variables	Group (Players)	N	Mean	S.D	t-value	p-value
1.	SPEED	Cricket	50	7.30	0.50	3.752	0.0001*
		Football	50	6.95	0.42		
2	Muscular Endurance	Cricket	50	23.92	5.91	-0.709	0.480
		Football	50	24.70	5.06		
3	Explosive Strength	Cricket	50	1.83	0.23	-3.558	0.001*
		Football	50	1.99	0.21		
4.	Flexibility	Cricket	50	28.40	5.72	-2.799	0.006*
		Football	50	31.54	5.49		

*Significant at .05 level. 't' 0.05 (98) =1.984

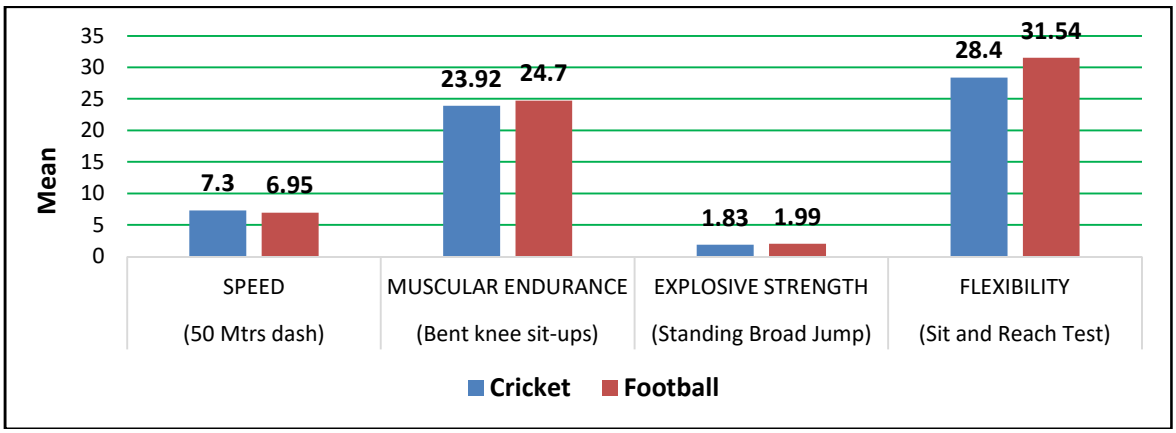

Figure-1:- Graphical representation of selected physical fitness variables between the players.

It seems from the **Table & Fig. no-1** that the mean value of speed for cricket and football players are 7.30 (± 0.50) and 6.95 (± 0.42). The computed't' value on speed is 3.752, which is greater than the tabulated value i.e. 1.984, and signifies towards highly significant discrepancy. Thus, the null hypothesis is refused in support of the alternative hypothesis at .05 level.

It seems from the **Table & Fig. no-1**that the mean value of muscular endurance for cricket and football players are 23.92 (± 5.91) and 24.70 (± 5.06). The computed 't' value on muscular endurance is -0.709, which is lesser than the tabulated value i.e. 1.984, and indicates towards insignificant difference. Thus, the null hypothesis is accepted at .05 Level.

It seems from the **Table & Fig. no-1**that the mean value of explosive strength for cricket and football players are 1.83 (± 0.23) and 1.99 (± 0.21). The computed't' value on explosive strength is -3.558, which is greater than the tabulated value i.e. 1.984, and signifies towards highly significant discrepancy. Thus, the null hypothesis is refused in support of the alternative hypothesis at .05 level.

It seems from the **Table & Fig. no-1**that the mean value of flexibility for cricket and football players are 28.40 (± 5.72) and 31.54 (± 5.49). The computed 't' value on flexibility is -2.799, which is greater than the tabulated value i.e. 1.984, and signifies towards significant discrepancy. Thus, the null hypothesis is refused in support of the alternative hypothesis at .05 level.

IV. Discussion of Findings: The primary motive of the research was "to compare the selected physical fitness variables between the Cricket and football Players of Delhi who actively participate in Inter school sports tournaments".

It is shown from results that scientifically noteworthy differences exists between the male Players of Cricket and football on the 'selected variables' i.e. Speed, explosive strength and flexibility. Many previous studies by (Charushila, 2020); (Begum, 2015); (Singh, 2014); (Kumar,2012);(Gaur and Nigam, 2011); (Sporis, 2011), (Barut, 2008); (Kaushik,2008); (Berg, 1995); (Dopsaj, 1994); (Prakash.1984) and (Chandrasheker,1981) also found a significant differences in their studies. (Mandrekar,2017) in his study on Cricket and football Players of goa, reported significant dissimilarity between the agility ,cardio-vascular endurance , speed and explosive strength and insignificant dissimilarity were observed on bent-knee sit-ups and pull-ups between the collegiate players of football and cricket.

In Another study, A research was conducted to compare the "physical fitness variables" of football (n-32) and cricket players (n-32), samples were taken from little flower school-Varanasi, age between 14-18 years. They have used 't' test to discover the difference among the groups. AAHPER youth physical fitness test was used and they found that there is a significant differences on speed, agility, explosive strength and cardio vascular endurance but, no significant differences discovered on muscular strength, and endurance respectively (Pathak and Rawat, 2010).

The result of this research clearly shows that no statistically significant discrepancy exists in muscular endurance between the male Players of Cricket and football. Previous studies by other researchers (Mandrekar, 2017);(Kohli, 2014); (Singh, 2014); (Meswaniya, 2012) and (Prakash.1984) also supported this study.

A number of recent research studies, (Prakash and Uppal, 2012); (Jagathesan and Ganeshkumar, 2013) and (Marshall et al., 2005),have shown that regular physical activities are beneficial for our young generation, and, physical activities should be encouraged in our society and educational institutional. It is clear from above mentioned points that for having a long and quality life, increased physical fitness or activity level is required (Vural et al., 2010).At present, recommendations for the general population are that all adults should perform at least forty to sixty minutes per day of balanced intensity physical movements (Driskell et al., 2005) and (WHO, 2015).

V. Conclusion: On the support of the conclusion of the research, and within limitation it is observed that:

- Statistically 'Highly significant differences' exists between the male Players of Cricket and football of Delhi on the selected variables 'Speed, Explosive strength and Flexibility'. Football players are faster, stronger, powerful, superior and more pliable (flexible) than the Cricket players.
- The findings of the research clearly indicates towards insignificant difference in Muscular endurance between the male Players of Cricket and football of Delhi (statistically insignificant).
- Furthermore, we would say that discrepancy in physical fitness variables between the male Players of Cricket and football of Delhi may be due to their home environment, food habits, active involvement in physical activities or exercises, daily lifestyle, skills, nature of game, movement's pattern, anthropometrical structures of players and educational environment.
- Furthermore, it can be added that different kind of games required different kind of fitness and skill level.

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References

1. AAHPERD (1980). AAHPER Youth Fitness Test Manual*,* Reston V.A: AAHPERD Publications.
2. Barut, C., Demirel, P., & Kiran, S. (2008). Evaluation of hand anthropometric measurements and grip strength in basketball, volleyball and handball players. International journal of experimental and clinical anatomy*, (*2), 55–59. DOI: 10.2399/ANA.08.055 31.
3. Begum, Dalia. (2015). A study on relationship between intelligence and motor fitness between school level cricketers and footballers. *International Journal of Scientific and Research Publications*, 5(7), 1-4.
4. Berg, K., & Latin, R.W. (1995). Comparison of physical and performance characteristics of NCAA Division I basketball and football players. Journal of strength and conditioning research, 9(1), 22–26.
5. Charushila, Atul Rukadikar. (2020). Comparative Study of Muscle Strength and Flexibility in Cricket, Football and Basketball Players. European Journal of Molecular & Clinical Medicine, 7(9), 3247-3255.
6. Chandrasheker, G. M. (1981). *A* Comparative Study of Selected Physical Fitness Components of Football and Basketball. Unpublished Master Thesis, Gwalior, Jiwaji University.
7. Clarke, H. Harrison.(1967). Application of Measurement of Health and Physical Education. Englewood Cliffs, New Jersey: Prentice Hall Inc.
8. Driskell, J. A., Kim, Y. N., and Goebel, K. J. (2005). Few differences found in the typical eating and physical activity habits of lower-level and upper-level university students. J Am Diet Assoc, 105: 798-801.
9. Dopsaj, M. (1994). Extent of flexibility among athletes in different sport games – soccer, volleyball, basketball, and handball. The scientific journal *FACTA* Universities, series Physical education, 1(1):51–60.
10. Gaur, SK., & Nigam, D. (2011). A Calculation of Motor Fitness Components of Inter-University cricket and Football Players. Research Journal of Humanities and Social Sciences, 2(4), 193–195.
11. Jagathesan, R. and Ganeshkumar, M. (2013). Construction of Norms for Skill Test in Kabaddi. *International Journal of Movement Education and Sports Sciences. Annual Refereed & Peer Reviewed Journal,* Vol.-I (1): 1-7.
12. Kansal, D. K.(1996). *Test and Measurement in Sports and Physical Education.* New Delhi: D. V. S. Publication.

13. Kaushik, Navjit. (2008). A Comparative Study of Agility, Explosive Strength and Speed of Movement of Cricket Wicketkeepers, Hockey Goalkeepers and Football Goalkeepers. Unpublished Master Thesis, Amravati, D. C. P. E.
14. Kohli, Keshav.(2014). A Comparative Study of Physical Fitness Variables of male Volleyball Players and Football Players. Research Journal of Physical Education Sciences, 2(1).
15. Kumar, Sanjay.(2012). Comparative Study of Selected Physical Fitness and Physiological Parameters of Inter-Collegiate Players Regard to Month of Birth.Unpublished Master Thesis, Amravati, D. C. P. E.
16. Mandrekar, Sahadev. (2017). A comparative study on selected physical fitness variables of inter collegiate cricket and football players of Goa. International Journal of Physiology, Nutrition and Physical Education, 2(1), 430-433.
17. Meswaniya, Nilesh. K. (2012). Comparison of Selected Physical Fitness Variables of School Level Softball and Cricket Players. *PARIPEX* - Indian journal of research, 1(9), 168-169.
18. Marshall, A.L., Smith, B.J., Bauman, A.E., and Kaur, S. (2005). Reliability and Validity of a Brief Physical Activity Assessment for use of Family Doctors. British Journal of Sports Medicine, Vol.39 (5): 294-297.
19. Pathak, Meenakshi., & Rawat, Amit. (2010). Comparison of Selected Physical Fitness Variables of School Level Football and Cricket Players. Human Kinetics: A Journal of Physical Education and Fitness, 1(II), 18-20.
20. Prakash, Gajendra.(1984).Comparison of Selected Physiological and Physical Fitness Factors of Soccer and Cricket Players.(Unpublished Master Thesis, Gwalior, Jiwaji University.
21. Prakash and Uppal. (2012). Construction of Physical Fitness Test for High School Boys: A Factor Analytic Approach. Asian Journal of Research in Social Science and Humanities, Vol.2 (8): 237-253.
22. Singh, N.A. (2014). Comparison of Selected Physical Fitness and Physiological Parameters of Footballers belonging to North-East and Other States. International Journal of Interdisciplinary and Multidisciplinary Studies, 1(5), 158-160.
23. Sporis, G., Vucetic, V., Jovanovic, M., Jukic, I., & Omrcen, D. (2011) Reliability and factorial validity of flexibility tests for team sports. J Strength Cond Res, 25(4), 1168–1176.
24. Uppal, A.K. (1992). Physical fitness-How to Develop. Delhi, India: Friends Publication.
25. Vural, O., Eler, S., and Atalay Guzel, N. (2010). The relation of physical activity level and life quality at sedentary profession. Spormetre Journal of Physical Education and Sport Science, VIII (2): 69-75.
26. WHO (2015). Physical activity: *WHO.* World Health Organization.

A STUDY ON ANTHROPOMETRIC VARIABLES OF CRICKET PLAYERS TO DEVELOP TALENT IDENTIFICATION MODEL FOR CRICKET

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ABSTRACT

Background: *Identification of talent is most important to enhance the sports performance and anthropometric variables plays vital role to identify talent. Very few studies have been conducted on talent identification in cricket. The main aim of the study is to identify anthropometric variables of cricket players for developing talent identification model.* ***Methods:*** *The study is a descriptive study. The convenient sampling method is used to select the subjects. Standard tools and test have been used to collect data of total 200 male cricket players of age (14-17 years).*
Results: *Results of the study showed that anthropometric variables are very important to develop talent identification model for cricket.* ***Conclusion:*** *On the basis of result, it is found that eight anthropometric variables should be taken instead of taking too much variables while identifying talent in cricket.*

Key words: *Anthropometric variable, factor analysis, talent identification, eigen value, variance*

Introduction

Identification of most talented individual of various fields has been taking place from its existence and sport was not exception to this. But, the approach and methods towards talent identification have been modernized throughout the years' especially due to ever increasing professionalism, competitiveness to win in various national and international level competitions, to economically use scarce but valuable resources, and broad scale commercialization of sports. Sports authority of the countries, sports organizations, physical educationists and coaches are always in search for identifying most talented and suggesting most objective and scientific criteria to address the issue in early childhood in different sports. Present study endeavors to focus on developing objective, scientific and parsimonious talent identification criteria in cricket based on anthropometrical variables.

Sport talent identification is the process of recognizing current participants with the potential to become elite players. It entails predicting performance over time by measuring physical, physiological, psychological and social attributes as well as technical abilities, either in isolation or in combination (Williams & Reilly, 2000). It is well generalized and published in various journals recently, that the sports events are mostly dependent on the Physique of an individual (Rico-Sanz, 1998). Some studies have suggested that anthropometrical variables are highly related to the performance of an individual (Bond, et al., 2015; Chaouachi, 2009; Sertić, et al., 2007). Higher level of competition can be classified on the basis of anthropometric profiles and specific physical characteristics of an individual (Claessens, et al., 1999).

Anthropometry deals with the measurement of an individual in terms of circumference, mass, skeletal diameter and length etc. Anthropometry is broadly used to classify an individual and to identify the talent for a particular sport. In recent years, numerous anthropometrical studies had suggested that anthropometric variables are very important in distinguishing the players among themselves. Anthropometric variables can play a key role in defining the players as per the requirement of different games. The result of these studies had shown that each sport has their own anthropometric requirements (Leone, 2002).

In this study, the researcher intended to find out the required anthropometric variables for cricketers to develop talent identification model.

Rationale of the Study

Sport talent identification is the process of recognizing current participants with the potential to become elite players. Anthropometry is broadly used to classify an individual and to identify the talent for a particular sport. So, it is very important to find out anthropometric variables required for cricketers. Hence, in the study, the researcher

tries to find out anthropometric variables to develop talent identification model for cricket.

Methods

The study is a descriptive study. The sample consists of 200 junior cricket players from ten different cricket academies (20 from each) of Nepal. The convenient sampling method is used to select the subjects. Standard tools and test were used to collect the data for selected 14 anthropometric variables.

Reliability and Validity: Reliability of the tests and Testers competency was evaluated together by test- retest method and result was obtained by Product Moment Correlation (Gogia 2002; Dubey 2006).

Before starting data collection, the researcher introduced himself and explained the purpose of the study to the players. Then researcher demonstrated the 14 test items of the research. Subjects were instructed to follow the activities for each test and the score was noted on the score card.

Statistical Analysis

Factor analysis was applied on the data obtained on junior cricket players to find out the factors and the variables with highest factor loading to develop a model. Factor analysis is used to measure latent/unobservable construct or constructs by focusing on large number of observable instances.

Results

Table 1 KMO and Bartlett's Test of sphericity for anthropometrical variables

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.810
Bartlett's Test of Sphericity	Approx. Chi-Square	2243.535
	Df	91
	Sig.	0.000

Table 1 has reported KMO value, along with Bartlett's test. The KMO value (.810) was found more than .05, hence it could be concluded that the sample size taken for the present study & for applying factor analysis was sufficient. If the value of KMO test found less than .05 than the null hypothesis might be rejected and the inference could be drawn that number of samples were not sufficient. Further Bartlett's test of sphericity revealed significance value (p value) .000 was significant at .05 level of significance, which concluded that the correlation matrix was different to identity matrix, which revealed factor analysis can be reliably done.

Table 2 Total Variance Explained by the Anthropometric Factors

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.167	44.049	44.049	6.167	44.049	44.049	5.924	42.318	42.318
2	2.069	14.777	58.826	2.069	14.777	58.826	2.260	16.140	58.458
3	1.750	12.499	71.326	1.750	12.499	71.326	1.801	12.868	71.326
4	.759	5.425	76.751						
5	.747	5.335	82.086						
6	.656	4.683	86.769						
7	.505	3.609	90.377						
8	.403	2.878	93.256						
9	.260	1.860	95.115						
10	.229	1.638	96.754						
11	.160	1.146	97.899						
12	.144	1.026	98.926						
13	.116	.831	99.757						
14	.034	.243	100.000						

Extraction Method: Principal Component Analysis. The table 2 consisted of four different sections i.e.

components(list of variables included in the study), second initial eigenvalues, third extraction sums of squared loadings and fourth rotation sums of squared loadings

Initial eigenvalues

Total: gives total variance accounted for by each factor was the first step to calculate the percentage of variance can be attributed to each factor.

Percentage of variance: the percentage of variance attributable to each factor can be explained, could be obtained by dividing eigenvalue with total number of factors.

Cumulative %: indicated sum of variance by adding to the previous factor ends up with 100% variance.

Extraction sums of squared loadings

Total: showed total variance after extraction.

Percentage of variance: it was the percentage of variance might be attributed to each extracted factor, was of greater significance. It ascertained only three factors were extracted on the basis of their contribution towards talent identification. It was clearly depicted in the table that eigenvalue for first three factors was more than one, hence might be retained in the model. The extracted factor one showed 44.049% of the total variance, factor 2 showed 14.777% and factor three shared 12.499% of the total variance explained. In total extracted three factors jointly explained 71.325% of the total variance.

Cumulative %: was a cumulative percentage of variance of factor after adding to the previous factor.

Rotation sums of squared loadings:

Total: Total variance/eigenvalues attributable to each factor after rotation.

Percentage of variance: was the percentage of variance attributable to each factor after rotation. After rotation the first factor explained 42.318%, second factor 16.140% and the third factor explained 12.868% of the total variance. Thus when three factors were taken together they explained 71.326% of the entire variance.

Cumulative %: indicated cumulative percentage of variance by adding to the previous factor after rotation.

Table 3 Component Matrix: Unrotated Factor Solution

	Component		
	1	2	3
Body weight	.880	-.018	-.328
Standing Height	.741	-.116	-.060
Arm Length	-.115	-.378	.782
Leg Length	.584	-.208	.462
Upper Arm Girth	.724	-.270	.385
Fore Arm Girth	.853	-.131	-.065
Thigh Girth	.902	-.251	.026
Calf Girth	.715	-.183	.292
Chest Girth	.892	-.120	-.209
Wrist Diameter	.313	.571	.401
Elbow Diameter	.169	.679	.399
Knee Diameter	.516	.597	-.113
Ankle Diameter	.461	.723	.120
Body Mass Index	.714	.022	-.430

Extraction Method: Principal Component Analysis.

Table 3 showed the loadings of fourteen different anthropometrical variables on the three extracted factors. The higher the value of factor loading would be, the more the factor might contributes to the variables. Here fourteen variables were divided into three factors according to the most important variable with similar response in factor 1 and simultaneously in factor 2 & 3. Since it resulted from unrotated factor solution, consequently some of the variables showed their contribution exceeding one factor, Hence this situation must be sorted out. To sort this problem factors was rotated using varimax rotation to get the final rotated solution.

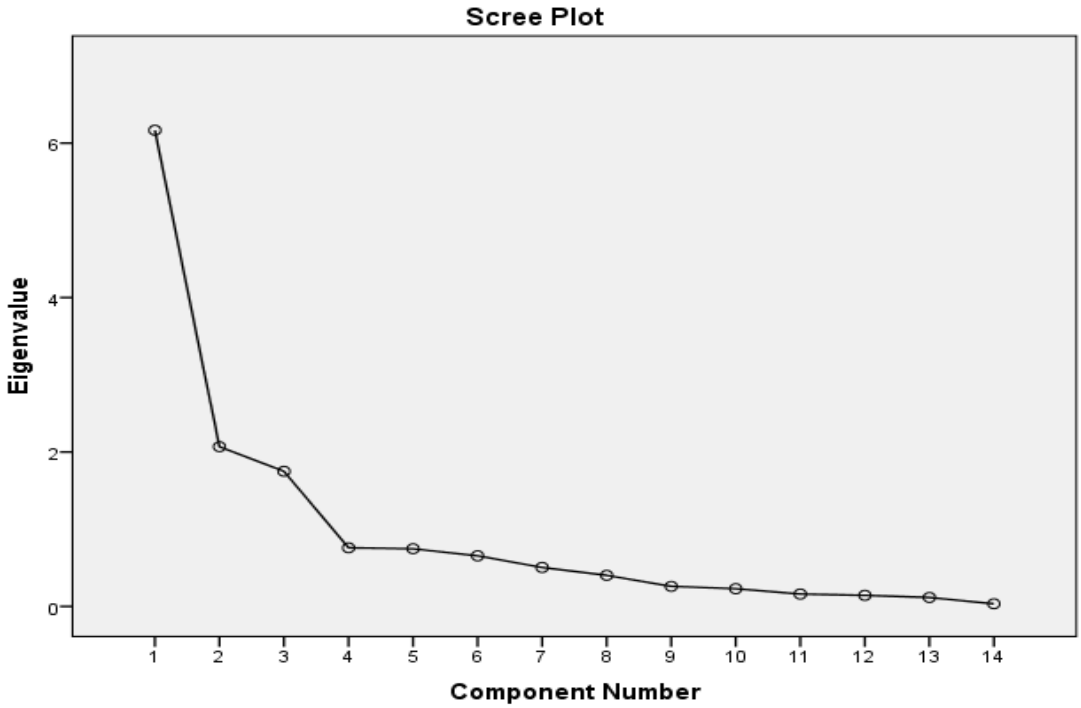

Figure 1 Scree Plot for anthropometric variables

Figure 1 showed eigenvalues for each of the anthropometrical variable taken in the present study plotted on y-axis against the factors on x-axis. Plot clearly showed only three factors were having eigenvalues more than 1 and thus were retained in the model. Note: curve starts flatten after factor three and also factor three onwards each factor has an eigenvalue of less than one. Thus only those factors could be retained which are having eigenvalue more than one.

Table 4 Rotated Component Matrix:Varimax Rotated Solution

	Component		
	1	**2**	**3**
Body weight	.881	.071	-.320
Standing Height	.750	.052	-.031
Arm Length	-.077	-.065	.871
Leg Length	.584	.132	.490
Upper Arm Girth	.739	.081	.439
Fore Arm Girth	.863	.063	-.033
Thigh Girth	.932	.004	.096
Calf Girth	.716	.121	.320
Chest Girth	.908	.028	-.171
Wrist Diameter	.144	.739	.139
Elbow Diameter	-.021	.799	.099
Knee Diameter	.369	.614	-.350
Ankle Diameter	.271	.802	-.183
Body Mass Index	.717	.027	-.424

Extraction Method: Principal Component Analysis.

Table 4 showed clear picture regarding explain ability of the factor by the variables correctly and facilitated the variable to appear in one factor. The variables were to be identified in three different factors on the basis this final rotated solution obtained, in the present problem investigator has identified the variables with loadings equals to or more than .75. Owing to this criterion variables were grouped in each of the three factors shown in

(Tables 5, 6 & 7). Hence in factor one five variables were selected body weight, standing height, fore arm girth, thigh girth and body mass index. Two variables elbow diameter and ankle diameter were selected into factor two whereas one variable arm length with loading of .871 was selected in factor three explained as below

.

Table 5 Factor 1: Circumference Factor

S. No.	Items	Loadings
1	Body Weight	.881
2	Fore Arm Girth	.863
3	Thigh Girth	.932
4	Chest Girth	.908
5	Standing Height	.750

The factor 1 in table 5 contained variables such as body weight, fore arm girth, thigh girth, chest girth and standing height respectively, that measure circumference of the different body parts hence named as "circumference factor". All the variables extracted in factor one were having higher loading on the factor ≥.75 thus extracted sufficient variance in explaining circumference factor satisfactorily.

Table: 6 Factor 2: skeletal diameter

S. No.	Items	Loadings
1	Elbow Diameter	.799
2	Ankle Diameter	.802

The factor 2 in table 6 contained variables elbow diameter and ankle diameter respectively that measures diameter of elbow and ankle hence can be named as "Skeletal diameter factor". Both the loaded variables showed significantly higher factor loading >..75 and thus extract sufficient variance in explaining the factor.

Table 7 Factor 3: Length Factor

S. No.	Items	Loadings
1	Leg Length	.871

The factor 3 in table 7 contained variable leg length that measures the length of leg hence can be named as "Length factor". Loaded variable showed significantly higher factor loading>..75 and thus extract sufficient variance in explaining the factor.

Table 8 Talent identification criteria based on anthropometrical factor

S. No.	Items	Loadings
1	Body weight	.881
2	Fore Arm Girth	.863
3	Thigh Girth	.932
4	Chest Girth	.908
5	Standing Height	.750
6	Elbow Diameter	.799
7	Ankle Diameter	.802
8	Leg Length	.871

The Table 8 gave criteria to identify talent in male youth cricket based on anthropometrical characteristics. Investigator had thoroughly studied and statistically analyzed, fourteen different anthropometrical variables and found eight variables were most important in explaining group characteristics based on anthropometrics, instead of studying too many

number of variables. The model so developed comprehensively included all different anthropometric measurements i.e. from general body measurement to circumference and skeletal diameter; these extracted variables explained 72.280% of the total variance in defining talent based on anthropometrical variables.

Discussion

Present research endeavor was focused to develop an objective and most parsimonious anthropometrical talent identification criteria in cricket. Investigator had thoroughly studied and statistically analyzed, fourteen different anthropometrical variables and found eight variables were most important in explaining group characteristics based on anthropometrics, instead of studying too many number of variables. The model so developed comprehensively included all different anthropometric measurements i.e. from general body measurement to circumference and skeletal diameter; these extracted variables explained 72.280% of the total variance in defining talent based on anthropometrical variables.

Application of factor analysis on different anthropometrical variables and as evident from scree plot in figure 1 revealed that three factors were having eigenvalue more than one, after which the curve started flattening sharply. So, only three factors could be extracted namely circumference, length, and skeletal diameter factor, based on correlation among the variables, explain ability of the factor and the loadings of the variable on the factor, after obtaining rotated component matrix solution by applying varimax rotational technique. Five variables body weight .881, standing height, fore arm girth .863, thigh girth .932 and chest girth .750 (Table 5), were having higher factor loadings ≥..750 in explaining the factor one, hence were clubbed into the "circumference factor". Further two variables elbow diameter .799 and ankle diameter .802 (Table 6), were having higher factor loadings ≥.7.99 in explaining the factor two, hence were clubbed into the "skeletal diameter factor". Single variable leg length .871 was extracted into factor three named as "length factor" (Table 7), was clubbed into "length factor", as was having eigenvalue ≥.8 and further explain the factor strongly. It was suggested to use these eight extracted variables for talent identification in cricket, while considering anthropometrical variables.

The result of the present study was in line with the study of Asteya (2015) a talent identification model to identify talent in squash and revealed anthropometric variables calf circumference, arm length and hip width were important to identify squash talent. In the same way(Bril 1980; Volkov & Filin 1983; Koley, Ayra-Petyan 1991; Bishop et al., 2016; Koley et al., 2012) found that anthropometric variables are important to identify talent. The present study also supports those studies. The developed model will help to identify talent in cricket.

Conclusion

Sport talent identification is the process of recognizing current participants with the potential to become elite players. Anthropometry is broadly used to classify an individual and to identify the talent for a particular sport. So, it is very important to find out anthropometric variables required for cricketers. From result of this study, it was found that anthropometric variables are very important to identify talent in cricket and eight variables included in the model (Body weight, standing height, fore arm girth, thigh girth, chest girth, elbow diameter, ankle diameter and leg length) explain 72.280% of the total variance in defining talent based on anthropometrical variables.

Limitations of the Study

The present study consist 200 subjects which is small sample size for generalizing the results. Hence, future study could be on a large sample size. In the present study, convenient sampling method was used which will limit the generalization

References

1. Bond, D., Goodson, L., Oxford, S. W., Nevill, A. M., & Duncan, M. J. (2015). The association between anthropometric variables, functional movement screen cores and 100 m free style swimming performance in youth swimmers. *Sports*, 3(1), 1-11.
2. Bril, M. S. (1980). Selection in sports games. *Physical culture and sport, Mascow.*
3. Chaouachi, A., Brughelli, M., Levin, G., Boudhina, N. B.B., Cronin, J., &Chamari, K. (2009). Anthropometric, physiological and performance characteristics of elite team-handball players. *Journal of Sports Science*, 27(2), 151-157.
4. Claessens, A. L., Lefevre, J., Beunen, G., &Malina, R. M. (1999). The contribution of anthropometric characteristics to performance scores in elite female gymnasts. *Journal of Sports Medicine and Physical Fitness*, 39(4), 355.
5. Koley, S. (2011). A studyof anthropometric profile of Indian inter-university male cricketers. *Journal of Human Sport and Exercise*, 6(2), 427-435.
6. Koley, S., Jha, S., &Sandhu, J. S. (2012). Study of back strength and its association with selected anthropometric and physical fitness variables in inter-university hockey players. *The Anthropologist*, 14(4), 359-363.
7. Leone, M., Lariviere, G., &Comtois, A. S. (2002). Discriminant analysis of anthropometric and biomotor variables among elite adolescent female athletes in four sports. *Journal of Sports Sciences*, 20(6), 443-449.
8. Ric-Sanz, J. (1998). Body composition and nutritional assessments in soccer. *International Journal of Sports Nutrition*, 8(2), 113-123.
9. Sertic, H., Segedi, I., &Zvan, M. (2007). Relations of certain anthropometric variables with throwing techniques performance quality in Judo. KinesiologiaSlovinica, 13(1), 48-60.
10. Volkov, V. M., &Filin, V. P. (1983). Selection in sports games. *Physical culture and sport, Mascow.*
11. Williams, A. M., & Reilly, T. (2000). Searching for the stars. Special Issue of the Journal of Sports Science, 18, 655-775.
12. Aateya, P. (2015). Talent identification model for quash players. *An Unpublished Thesis*. http:/ /hdl.handle.net/60603/290910.
13. Gogia, M. K. (2002). Development of a model for identification of talent for competitive swimming. *An Unpublished Thesis*. http:/ /hdl.handle.net/60603/2848.

EFFECT OF PARENT'S EDUCATION ON THEIR DAUGHTER'S HEALTH

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ABSTRACT

The main aspects of study draw the attention of parent's educational status, which shows their academic qualification and health of their daughters. The subjects were randomly selected 300 college students of Tonk district and their respective parents. There are two components used, first one is socio - economic status index and second one is physical fitness test. To collect the educational data of parents socio- economic status index was used and with the two test item physical fitness test was examined i.e. Body composition (sum of triceps and sub scapular skin test) and low back hamstring muscles skeletal function (modified sit and reach test) for the analysis of data chi- square test was considered to acknowledge the influence and Pearson's product moment correlation to get the relationship. The whole data shows that status of education did not have influence on the health of their daughter.

***Keywords**: Socio- Economic status, Educational qualification, physical fitness and health.*

Introduction

In the Modern Life Style its tough task to maintain the life cycle, we should physically healthy, mentally alert and socially sound. Fitness is compulsion for everyone who needs to lead up a comfortable and productive life. Fitness cannot be achieved easily. Modern people live in world of illusion where success is based on the psychological abilities. The development of human behaviour personality expressed their activity through inter- personal relationship between physical and psychological factor. Physical activity is integral fact and part of society with variation of nation, community, and group. Physical activity is a part of life from early to present for all people. It also responds by international influence and affects all culture of nation. On the demand of society we focused on the physical activity with collecting the scientific and psychological information about people. Relationships of society and sports influence each others. Sports and their performance present the trends and patterns of the society. The factor that affects the social health of Athletes is their family. For a sports person their family is first factors after the coach to encourage for sports. Sports play the role of safety- valve and developed right attitude for the ruling class, by nineteenth Century College going girls shown healthier relation with sports. Gymnastics and physical education become important part of the education programme. By the time eighteenth century soft beauty changed into beauty of "Perfect health and high spirit." By the begging of the twentieth century woman's started to take part in sports to be the mark of their "real emancipation."

The giant step of the Pierre De Coubertin, while reviving the Olympic Games defined "women have but one task that of crowing the winners with garlands." To make languages, art, science, and sports seems male oriented in the Indian society indicates a negative attitude. Women role in the sports participation is very low in India. Girls who want to go with the sports they are not allowed to do so by their parents or elders. Parents and society hold the view that nursing, rearing child, bearing is the role women have. In Indian society girls are only liability. Society has to confess that from primitive age to Modern era, women treated as second class citizens. Society pressure makes them submissive as compared to the male. Now a day's everyone has understood the importance of a physical fitness. It play important role in the participation of girls and boys both. It develops higher range of self-esteem. Sports can build positive image and self-confidence, which links to lower level of depression.

Material and methods

Participants: For the study 1000 subjects were selected randomly. Study subjects selected

5000 students and parents. Students from Tonk District College going girls were taken. Atmosphere of college campus is same for all but family background of students are different. They belong to different country, culture and community.

Measure: Physical fitness test was conducted for students and Socio-Economic status Index was completed by parents. Physical fitness test consist of two test item, Body composition (leanness/fatness) sum of triceps and sub-Musculoskeletal Function i.e. Bent Knee Sit-Ups(60Sec) and Sit and Reach Test.

Statistical Techniques: Chi Square method is used to assess the influence of educational status of the parents on health related physical fitness of daughter. Pearson's Product Moment Correlation method was used to know relationship of educations status of the parents and health related physical fitness of the daughter.

Results: As per the purpose of this study, to assess the influence of daughter's health related physical fitness to the educational status of their parents', the chi square (X2) method was used. To assess the relationship of daughter's health related physical fitness to the educational status of their parents', the Pearson's product moment correlation method was used. The results are presented in Table 1.1-1.6.

Table no. 1.1
Frequency distribution of educational status of parents v/s sit and reach ability of their daughters

Educational status of parents'	Sit and Reach Ability of Daughters					Total
	0-20 (Poor)	20-40 (Average)	40-60 (Good)	60-80 (Good)	80-100 (Excellent)	
0-5 (lower edu.)	44	6	7	1	1	56
5-10 (middle edu.)	234	32	29	5	5	305
10-15 (higher edu.)	106	14	12	4	0	136
Total	384	52	48	10	6	500

Table no. 1.2
Chi-sqaure-test

	Value	df	Asymp. Sig. (2-sided)
Pearson chi - square	3.543a	8	.896

Table no. 1.3
Correlation

	'r'	Std. Error	Approx.	Sig.
Pearson's R	-.032	.044	-.717	.474

The scores of the table 1.1 indicates that out of 305 students of several coursesin the university, whose parents' were having education upto middle level, 266 student's (234+32) sit & reach ability falls under the category of below average. Only 34 students (29+5) were having sit and reach ability falling under the category of very good, which is 11.1 %, which is not upto the remarkable level. The table 1.2 indicates that the chi-square value of respondents' sit & reach ability is not affected by their parents; educational status i.e. respondents' chi-square value is insignificant. The table 1.3 indicates that the Pearson's correlation value (R) also favours the result of chi-square test of independent.

Table no. 1.4
Frequency distribution of educational status of parents v/s sit and reach ability of their daughters:

Edu. Status of Parents'	Body Composition of Daughters					Total
	0-20 (Poor)	20-40 (Average)	40-60 (Good)	60-80 (Good)	80-100 (excellent)	
0-5 (Lower Edu.)	42	4	10	3	0	59
5-10 (Middle Edu.)	216	40	27	14	8	305
10-15 (Higher Edu.)	96	21	11	8	0	136
Total	356	65	48	25	8	500

Table 1.5

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Sqaure	11.653	8	.168

Table 1.6

		Value	Asymp. Std Error	Approx. Tb	Approx. Sig.
Interval by Interval	Pearson's R	-.025	.042	-.555	.579

The score of table 1.6 indicates that out of 305 students of several courses in the college, whose parents were having their education up to the middle level, 256 students (216+40) body composition falls under the category of below average. Only 41 students (27+14)were having body composition falling under the category of very good, which is 13.4%, which is not up to the remarkable level.

The table 1.6 indicates S that the x2 statistic value of the respondent's body composition is not affected by their parent's educational status i.e. respondent's X2 value is insignificant. The table 1.6 indicates S that the Pearson's Correlation value (R) also favours the results of X2 test of independent

Discussion

The data of the Chi-Square test indicates that the educational statue of the parents, which shows their academics qualification did not have any influence on the low-back hamstring musculoskeletal flexibility (Sit and Reach) ability. The findings also show that there was no significant relationship between Sit and reach ability and Body Composition. The result of the study is similar to the results of the study conducted by Yang Lin, Telama, Risto, Lauri, and Laakso (6).

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References

1. Bucher, Charles A. and Reade, Elevelyn,(1964), Physical Education and Health in the Elementary Schools,New York : The Mac Millian ; Inc ,p.22.
2. Campbell, Donald E. "Student Attitudes towards Physical Education." Research Quarterly 39 (October 1968):456-462.
3. C. Govardhan, P. Gopinathan Physical fitness and physiological difference among the sprinters long distance runner's jumpers and throwers of Telangana Universities International Journal Of Physical Education And Iron Games,Vol.6-No-3.(May 2019) 19-21.

4. Chorney .David William,(1996), "Attitude Towards Teaching Physical Education : A female Perspective , Unpublished thesis, University of Alberta, Edmonton, Alberta, p.1
5. Chung, Min-hau& Phillips, D. Allen(2002) "Relationship Between Attitude Toward Physical Education and Leisure-Time Exercise in High School Students", Physical Educator (Nov. 2003) Volume: 59, Pp. 126-138.
6. Clayton, Mary Leiter. "Who are Our Nations Future Teachers: A Study of the Self-concepts of Beginning Education Students?" Dissertation Abstracts International 51:12 (June 1991):4093A.
7. Daniel, Webb. "An Analysis of Students with Orthopedic Disabilities: Attitude toward General Physical Education." Dissertation Abstracts International 61:2 (August 2000): 546-547-A.
8. D. Maniazhagu Effects of low and moderate intensities of aquatic plyometric training combined with yogic practices on anaerobic capacity of junior athletes International Journal Of Physical Education And Iron Games,Vol.6-No-3.(May 2019) 26-29.
9. Drinkwater, Barbara L. "Development of an Attitude Inventory to Measure the Attitude of High School Girls Toward Physical Education As A Career for Women." Research Quarterly 31:4 (December 1960):575-580.
10. Dureja,Gaurav, Sukhbir Singh, "Self-Confidence and Decision making Between Psychology and Physical Education Students: A Comparative Study." Journal of Physical Education and Sports Management 2:6 (18 November 2011) 62-65.
11. R.Venkatesan Effects of moringa oleifera with aerobic training on total cholesterol, low density lipoprotein, and testosterone among college men athlete. International Journal Of Physical Education And Iron Games,Vol.6-No-3.(May 2019) 8-11.
12. Sona G. kumar Santhai, Helina Grace. Differentiation of aerobic exercises, diet modification and combined group on blood glucose level among women with NIDDM. International Journal Of Physical Education And Iron Games,Vol.6-No-3.(May 2019) 5-7.
13. Triandis, Harry C. Attitude and Attitude Change, New York: John Willy & Sons, Inc., 1971.
14. Vasishtha, K.K. Teacher Education in India. New Delhi: Concept Publishing Company, 1979.
15. Verma, J.P. A Text Book of Sports Statistics, Gwalior: Venus Publication, 2000.
16. Viswanathan. J , A. Ajith Effect of specific free throw skill training on selected biomechanical characteristics among school basketball players. International Journal Of Physical Education And Iron Games,Vol.6-No-3.(May 2019) 16-18.

SH. NARENDER SINGH SAINI DRONACHARYA AWARDEE AS A COACH IN DEVELOPMENT OF HOCKEY – A CASE STUDY

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ABSTRACT

In the present study, an attempt has been made to investigate the contribution of Sh. Narender Singh Saini Dronacharya Awardi in development of Hockey in Indian perspective. The objective of the study was to analysis the service of Sh. Narender Singh Saini as coach. To fulfil the desired objectives, coaching career of Sh. Narender Singh Saini was observed through various sources of data such as primary and secondary source available. For accomplish the study a total 138 individuals belongs to Sh. Narender Singh Saini directly or indirectly were selected as subjects. The subjects were persons, who analyze the working pattern and experience the knowledge of Sh. N.S. Saini during their coaching period. The coach-ability of Sh. N.S. Saini was assess through the questionnaire prepared under the supervision of field expert and concerned supervisor. While, various secondary source of information for instance, news papers, interview, were also taking into considerations to order the journey of Sh. Narender Singh Saini in a sequence. The obtained data were analyzed through percentage method and responses were illustrated with the help of suitable tables and diagrams. Sh. Narender singh Saini has a great passion for hockey and a very hard working, discipline, good learned man. Sh. Narender singh Saini is give respect and honors to people who work hard with honesty and great respect and love for all people. We find out that Sh. Narender Singh Saini has the high coaching potential and their all dimension of coaching are become reliable through number of respondents. We find out that all respondents (N = 138) believe that Sh. Narender Singh Saini has the high coaching potential and their all dimension of coaching are become reliable through number of respondents.

Key Words: *Dronacharya Award, Hockey, Coach*

Introduction

Hockey is a sport in which two teams play against each other by trying to manoeuvre a ball or a puck into the opponent's goal using a hockey stick. There are many types of hockey such as bandy, field hockey, ice hockey and rink hockey. In most of the world, the term hockey by itself refers to field hockey, while in Canada, the United States, Russia and most of Eastern and Northern Europe, the term usually refers to ice hockey[1].

India has the incredible Hockey history with 8 gold medals in Olympic games. In 1928, the team won its first Olympic gold medal. From 1928 to 1956, was the golden period for the Indian Hockey team. The Indian men's team remained unbeaten in the Olympic, gaining six medals in a row. The Indian team has won a total eight gold, one silver and two bronze in Olympic.[2] But due to origin of the new games, the Hockey lost his identity in Indian scenario and the game was very less popular among the youth. In that era, the responsibility of coaches to spread the Hockey among population was very high. At this time, Sh. Narender Singh Saini become very hard work as a coach to bring the Hockey at next level.

Objectives of the Study

- To identify the factors which affected his personality as a as a coach.

Methodology and Procedure

For accomplish the study a total 138 individuals belongs to Sh. Narender Singh Saini directly or indirectly were selected as subjects. The subjects were persons, who analyze the working pattern and experience the knowledge of Sh. N.S. Saini during their coaching period. The coach-ability of Sh. N.S. Saini was assess through the questionnaire prepared under the supervision of field expert and concerned supervisor. The obtained data were analyzed through percentage method and responses were illustrated with the help of suitable tables and diagrams.

Results of the Study

Table 1 Showing Responses in terms of Percentage of Coaching-ability

Statement	*Strongly Agree*	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*
He educates his hockey players about doping.	42.8	48.6	0.7	0	8
He is a committed professional.	45.7	42	10.9	0.7	0.7
His approach to sports is very scientific.	86.2	13.8			
He has natural ability of sporting talent.	99.3	0.7			
He emphasizes the use of modern techniques in coaching.	79	21			
He gives adequate freedom to players for new ideas.	83.3	16.7			
He encourages budding Hockey players in order to promote hockey.	99.3	0.7			
He keeps complete profiles/records of his trainees.	93.5	6.5			
He is always sincere to his efforts.	74.6	25.4			
As a coach, he treats all the players equally.	87.7	12.3			
His all-training sessions are inspiring.	55.8	44.2			
He knows how to impart proper training.	54.3	45.7			
He has the ability to nurture talent.	76.8	23.2			
His daily schedule of training is scientifically based.	97.8	2.2			
He is always ready to adopt good suggestions.	70.3	29	0.7		
His knowledge about positional play are clear.	76.8	23.2			
He possesses deep knowledge of his game.	62.3	37.7			
As a coach, he adopts different strategies.	63	37			

(N=138)

The table no 1 explore the responses of subjects in context of coaching ability of Sh. Narender Singh Saini. It was observed that there was total 18 statements regarding Coaching-ability and responses were taken into 5 Likert scale ranged from 1(strongly agree) to 5 (Strongly disagree). It was taking into notice that majority of respondents responds positively towards the statements. No negative responses were observed from the table given above

.

Table 2 Mean Profile of the Statements of Coaching-ability

Statement	*Mean and SD*
He educates his hockey players about doping.	1.82 (1.062)
He is a committed professional.	1.69 (0.753)
His approach to sports is very scientific.	1.14 (0.346)
He has natural ability of sporting talent.	1.01 (0.085)
He emphasizes the use of modern techniques in coaching.	1.21 (0.409)
He gives adequate freedom to players for new ideas.	1.17 (0.374)
He encourages budding Hockey players in order to promote hockey.	1.01 (0.085)
He keeps complete profiles/records of his trainees.	1.07 (0.248)
He is always sincere to his efforts.	1.25 (0.437)
As a coach, he treats all the players equally.	1.12 (0.424)
His all-training sessions are inspiring.	1.44 (0.498)
He knows how to impart proper training.	1.46 (0.500)
He has the ability to nurture talent.	1.23 (0.424)
His daily schedule of training is scientifically based.	1.30 (0.477)
He is always ready to adopt good suggestions.	1.02 (0.146)
His knowledge about positional play are clear.	1.33 (0.473)
He possesses deep knowledge of his game.	1.38(0.486)
As a coach, he adopts different strategies.	1.37 (0.484)

(N = 138)

The Table no 2 showing the tendency and pattern of responses in terms of arithmetic mean and standard deviation. It was taking into noticed that response were taken in 5 likert scale ranged from 1 strongly agree to 5 strongly disagree and mean score of each statement was not higher than 2, which indicate that all responses were fall between strongly agree to agree. It means that all respondents (N = 138) believe that Sh. Narender Singh Saini has the high coaching potential and their all dimension of coaching are become reliable through number of respondents.

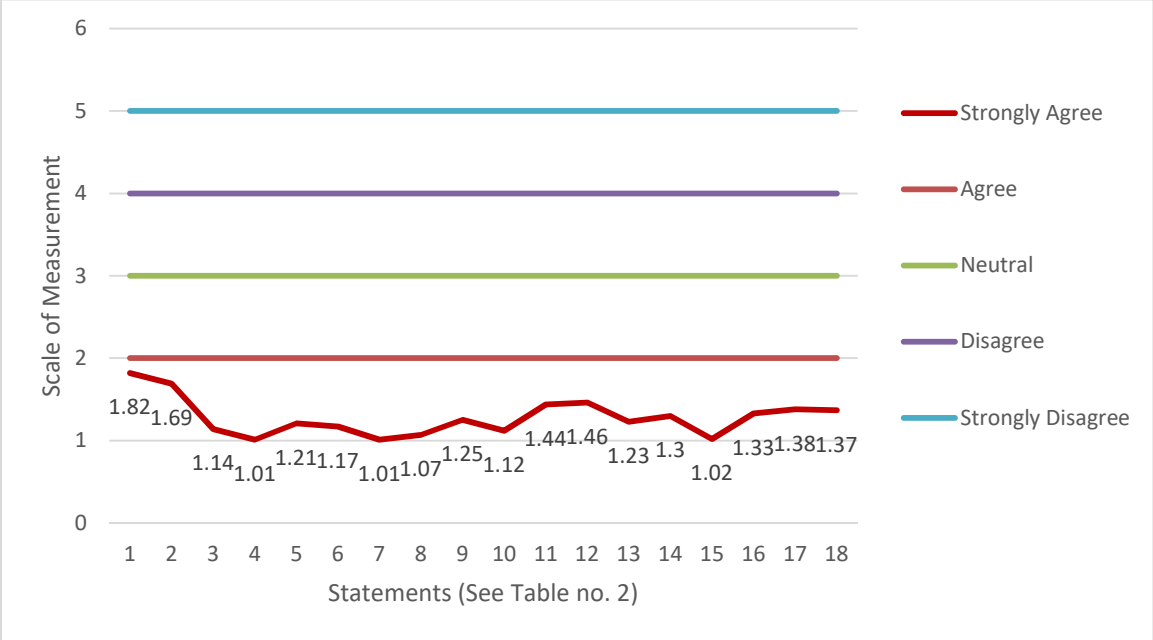

Figure 1 Showing Tendency of Obtained Responses for each statement in context of Coaching-ability

Conclusion of the Study

Narender Singh Saini was born in a middle class family on 17 October 1957. He was born in sainipura Rohtak. His father shree Ram Kishan Saini was a government employee. He was not much educated and that's why had to work really hard. He has a huge family and had to work entirely hard for livelihood. In locality and as well as family there was a great courage for hockey and he started playing hockey under supervision of his brothers. Due to bad condition of the house and in the absence of proper diet, he could not devote as much time to hockey as player as he should have.

He completed his one year diploma from NIS, Patiala in 1981-1982. In March 1983, he joined Haryana sports department in Jind. He worked there for three to four months and after that he was transferred to Safido. But here due to less work he was transferred to Mahendergarh. From Mahendergarh he was transferred to Kaballi village. In this village he was started girl's hockey center. He started coaching with great passion and hard work. After four year or so he started receiving good result. But his mind was aiming for something big. In 1987 he joined sports authority of India as a hockey coach by that time he had been transferred to sonipat. He was a bit disturbed by being transferred personally and that's why he made up his mind that he would region from Sonipat and at least he did so. After that he joined bariatu at Rachi in Bihar. He joined there under the national sports talent contest scheme of sports authority of india. Sports authority of India had initiated a scheme for the less than 12 age category. He joined there in sept 1987. In 2004 he was transferred to PNB hockey team which was situated in delhi. He worked with PNB team for seven years.

In 1998 he was appointed as the coach of Indian women hockey team. From 1998 to 2016, in the form of Indian women hockey team coach he worked with different age groups like U 19, U 21 and Indian senior team and also participated in different international competitions and Teams won medals as well.

His services as a coach are continuing even after his retirement with National Hockey Academy. He worked as a coach for around 35 years and many times he was honored for this. Under his supervision around 70 to 80 male and female players have represented India at different international events. Like in 1995 he was given the award of best coach of SAI by Sports Authority of India. After that Bihar Chief Minister Lalu Parsad Yadav awarded him with sports prize. In 2013 president of India honored him dronacharya award. Sh. N.S Saini has a great passion for hockey and a very hard working, discipline, good learned man. Sh. N.S Saini is give respect and honors to people who work hard with honesty and great respect and love for all people. We find out that Sh. Narender Singh Saini has the high coaching potential and their all dimension of coaching are become reliable through number of respondents.

References

[1] Liebeck, Elaine; Pollard, Helen, eds. (1994). The Oxford Paperback Dictionary (4th ed.). Oxford, England: Oxford University Press. ISBN 0-19-280012-4.

[2] "Hockey India". Archived from the original on 6 January 2015. Retrieved 7 January 2015.

[3] Sharma,G., Singh, G. (2016). An eminent athlete Dharam Singh Uppal: A case study. International Journal of Physical Education, Sports and Health 2016; 3(1): 344-346.

A COMPARATIVE STUDY ON PRE-COMPETITION ANXIETY LEVEL BETWEEN MALE AND FEMALE TABLE TENNIS PLAYERS

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ABSTRACT

Table tennis is a sport played by two or four players who hit a lightweight ball back and forth across a table divided by the net using a small bat. The sport required quick reactions and control over the mind and body. The pre-competition anxiety level of 25 male table tennis and 25 female table tennis players tested through Sports Competition Anxiety Test (SCAT). For testing the null Hypothesis (significance of the difference between means) the t-test have been used by the investigator. The t value is which is not significant at 0.01 level of confidence which indicates that there is no significant difference between the two groups, so that hypothesis, "There will not be any significant difference in pre-competition anxiety level between male table tennis and female table tennis players."

keywords: *Comparative study, competition, anxiety, table tennis, male, female*

Introduction

Anxiety plays a paramount role in sports. It is the challenge in sports participation that produces anxiety. Anxiety may be a helpful motivating energy or it may restrict with successful performance in sports events. The amount of anxiety also differs with a number of different conditions. Anxiety is likely to be greater in higher competitive sports than in relatively non-competitive sports because in competitive sports, participants are expected to win at all cost thus and great demands are made upon them to succeed. In modern competitive sports, badminton and table tennis has become one of the most popular games in the world and of all the major games. Performance anxiety is not exceptional in sports, as to some extent, fear of performance helps in achieving the desired concentration. However, the excess will lead to a rush of adrenaline termed anxiety.

With respect to gender, Martens and his collaborators (1990) rumored that girls exhibit higher psychological feature anxiety and lower confidence than men. During this, the kind of analysis work has been done on table tennis game players males and females associated with improving their performance, by comparison, their anxiety.

Materials &methods

In this descriptive research study, the survey method applied. A group of 25 male Table Tennis players and 25 female Table Tennis players were selected through the purposive sampling technique. Their ages were ranged from 18 to 28 years. The selected 50 subjects of Table Tennis male and female players were distributed for a pre-competition anxiety questionnaire for data collection. Data was collected from players using a Sports Competitive Anxiety Test - (SCAT) developed by (Martens et.al. 1990) consists of fifteen items which include 5 spurious items, 8 positive items and 2 negative items before the start of the match. Statistical Techniques used for the analysis of data to compare the data of selected psychological variable between level male and female Table Tennis players will be tested with 't' test.

Result

The data pertaining to the present study were collected on 25 male Table Tennis players and 25 female Table Tennis players; their ages will be ranging from 18 to 25 years. For testing the null Hypothesis (significance of the difference between means) the t-test have been used by the investigator.

Table no. 1 Descriptive Statistics of the pre - competition Anxiety test of Male & Female Table Tennis Players

Groups	Mean	SD	df	t- value	Significance
Pre competition anxiety of Male Table Tennis Players	17.84	3.06	48	0.85	P>0.05
Pre competition anxiety of Female Table Tennis Players	17.68	3.29			

Significance at 0.05 level, where df= 48, 'tab'= 2.01

Table 1 reveals that the mean scores of pre-competition anxiety of male Table Tennis players and pre-competition anxiety of female Table Tennis players are 17.84 and 17.68. The t value is 0.85 which is not significant at 0.05 level of confidence which indicates that there is no significant difference between the two groups. The same is also presented graphically.

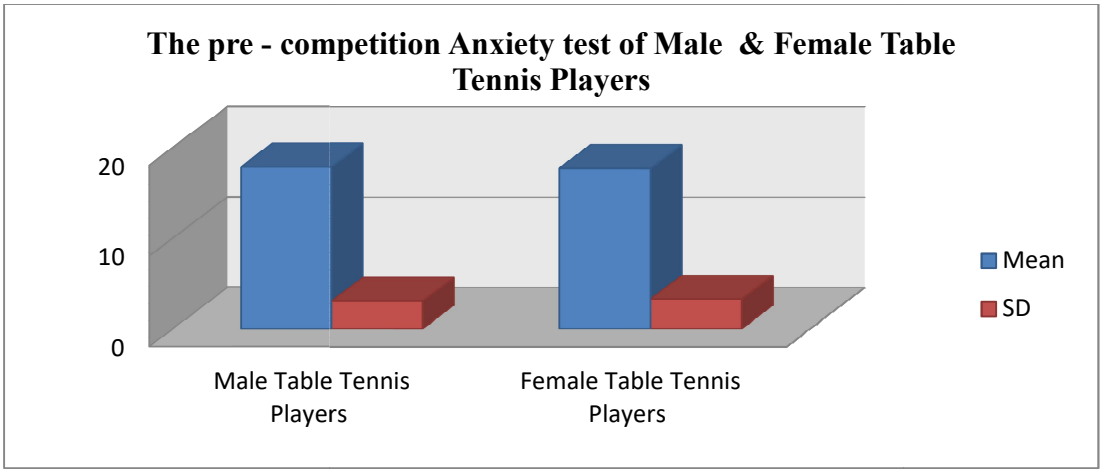

Figure 1 Comparison of Mean score between pre - competition anxiety test of male Table Tennis and female table tennis players.

The t value is which is not significant at 0.05 level of confidence which indicates that there is no significant difference between the two groups, so that hypothesis, *"There will not be any significant difference in pre-competition anxiety level between male Table Tennis and female Table Tennis players." is accepted.*

Discussion:

It is concluded that there is not any significant difference in pre-competition anxiety level between male Table Tennis and female Table Tennis players.

References

1. Best John (1978), "Research in Physical Education", New Delhi: Prentice Hall of India
2. Kamlesh, M.L (2006)" Methodology of Research in Physical Education & Sports", New Delhi, Metropolitan Book Co.
3. Kothari C.R.,(2008),"Research Methodology methods and Techniques" publication New Age International, New Delhi.
4. Kumar Sunil(2010) Table Tennis skills and rules Khel Sahitya Kendra, New Delhi.
5. NayakJayanta, Singh Priyanka (2015) fundamentals of Research Methodology SSOW, New Delhi .
6. RadziJamilah, Yousof&sarina, Zakaria Abdul (2013) pre-competition anxiety levels on individual and team sports athletes. International Conference on social science research ICSSR 2015 (E-ISBN 978-967-11768-1-8)

CORRELATION BETWEEN BODY MASS INDEX AND ACADEMIC ACHIEVEMENT OF PHYSICAL EDUCATION TRAINEES

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ABSTRACT

The numerous medical problems which medical science and Insurance Companies have shown great interest and concern on people is a dysfunctional body mass profile, especially the increased overweight and obesity problems on one side and underweight problems on the other side. The reason is that obese and underweight people have greater likelihood of being susceptible to premature death than those of normal (ideal) body weight (Grundy, 2004). In the United States, where medical underwriting of private health insurance is widespread, most Private Health Insurance providers use a particular Body Mass Index. The purpose of the study was to know the relationship between body mass index and academic achievement of physical education trainees belong to Kuvempu University. For achieving the purpose of the study thirty-six male post graduate physical education trainees from Kuvempu University were selected randomly. Body Mass Index (BMI) measured by using the Standing Height and Body Weight and Academic Achievement assessed with the help of Cumulative Grade Point Average (CGPA) of their master degree result declared by the university. To know the relationship between body mass index and academic achievement of physical education trainees Karl Pearson's co-efficient of correlation statistical technique was used at 0.05 level of significant. Data were analyzed by means of statistical package for social science (SPSS) 23rd version. This study revealed that standing height of the physical education trainees was positively influencing on their academic achievement and body weight and body mass index of the physical education trainees were negatively influencing on their academic achievement.

Keywords: *Standing height, Body weight, Body mass index, Academic achievement, Physical education trainees*

1. Introduction

The numerous medical problems which medical science and Insurance Companies have shown great interest and concern on people is a dysfunctional body mass profile, especially the increased overweight and obesity problems on one side and underweight problems on the other side. The reason is that obese and underweight people have greater likelihood of being susceptible to premature death than those of normal (ideal) body weight (Grundy, 2004). In the United States, where medical underwriting of private health insurance is widespread, most Private Health Insurance providers use a particular Body Mass Index.

(BMI) as a cut-off point in order to raise insurance rates (charges) to high risk patients, thereby reducing cost of insurance coverage to all other subscribers in a normal BMI (Johanson, 2009).

Public Health is interested, especially concerning body weight that are not normal on the International BMI classification chart. The unnecessary or excessive fats are associated with various diseases and these have caused serious concern to many governments (Halslam& James, 2005). From various studies, findings of risk factors from excessive body weight and obesity fall into two broad categories: Those attributed to the "effects" of increased fat-mass such as osteo-arthritis, obtrusive sleep apnea, social stigmatization (Sobal & Stunkard, 1989) and those attributed to the increased number of fat-cells such as diabetes (type 2), cancer, cardiovascular diseases, non-alcoholic fatty liver diseases (Bray, 2004). Increased body fat alters the body's response to insulin, potentially leading to "insulin resistance" and creates a proinflammatory and a prothrombotic states in the human body (Shoelson, Lee &Goldine, 2006). This condition is generally termed "Metabolic Syndrome X (MetS).

BMI (Body Mass Index) is the most appropriate simple indicator to measure the primary health or health risk by self (Kamalaja, 2013). BMI is a statistical calculation of weight according to height. It's a rough indicator of current health status and disease risk, based upon weight and degree of obesity. BMI is a rational display of body weight for both adults and children. One of the most widely accepted

tools for evaluating and monitoring the human health is body mass index (BMI). It can help us to determine our overall fitness and your risk of developing chronic diseases.BMI is a starting point to evaluate our health. The body mass index was defined as the proportion of height to weight. BMI, calculations are based on the assumption that weight should be approximate to height.

So as the primary indicator, BMI has an important tool for measuring primary health or health risk and in the academic achievement or performance if we discuss the previous research then we coming to know that BMI and Academic achievement are closely related. Like overweight and obese children are more likely to have poor academic performance. Studies performed in the United States (Datar et al., 2004), Western Europe (Mikkila et al., 2003), South America (Campos et al., 1996), and Asia (Mo-suwan et al., 1999), showed noteworthy and gloomy relations between childhood obesity and early academic results. However, the mechanism underlying the association between obesity and poor academic performance remains unclear. Few studies revealed that the cognitive abilities are influenced by BMI. Based on evidence from previous studies we can say that Obesity (BMI 30 and above) impacts student's academic performance negatively.

According to the National Institute of health and World Health Organization, overweight is defined as Body mass index between 25 and 29.9 kg/m2 and obesity as a BMI equal to or greater than 30. A BMI of 18 or lower indicates that a person is underweight. Due to increasing prevalence of obesity among Nigerian men and women, examines the sensitivity of the association between adolescent body weight, body mass index, body fat (nutritional status) and academic performance (to potential biases caused by unmeasured heterogeneity) of students with less discipline inferrals (i.e. with few or no disciplinary incidents), with high level of cardiovascular fitness measured as by walking/running test, good class attendance and little or low psychological stress. Studies have shown that the performance of adolescents in their various academic endeavours depends on a lot of factors. Kenneth H. Cooper in an attempt to study Texas students' fitness in relation to their academic performance, discovered that better performance are associated with high levels of fitness, healthy levels of cardiovascular fitness, fewer disciplinary incidents and better school attendance (Kenneth, 2004). The research also conducted with a view to having the National longitudinal study of adolescent health, the relationship between several measures of adolescent body weight and grade point average (GPA) using Pearson correlation coefficient produced consistent evidence of a negative relationship between body weight and academic performance for white females aged 16-24 while for white males and non-white females, little evidence of significant relationship between body weight and academic performance after controlling for unobserved heterogeneity (Hoffmann et al, 2006).These findings indicate that adolescent obesity may have adverse academic consequences for males and females thus, targeting obesity reduction policies which may not only improve health outcomes but also have a positive impact on improving their academic performance and human capital accumulation. Furthermore, those who were screened positive for weight preoccupation according to OBGYN news magazine were dissatisfied with their body size and reported that their weights and eating habits affected their worth and also interfered with their academic performance or social relationship (Sullivan and Michelle, 2005). Martha Holden (2008) in the study to see if there is correlation between BMI and academic achievement in mathematics of 450 students in Ohio achievement test, a statistically significant negative relationship was found and most importantly, a direct relation was obtained between students at risk for obesity and lower test performance (Mattha, 2009).

2. Methodology

The purpose of the study was to know the relationship between bodymass index and academic achievement of physical education trainees belong to Kuvempu University. For achieving the purpose of the study thirty-sixmale post graduate physical education trainees from Kuvempu Universitywere

selected randomly.Body Mass Index (BMI) measured by using the Standing Height and Body Weight and Academic Achievement assessed with the help of Cumulative Grade Point Average (CGPA) of their master degree result declared by the university.

3. Statistical Analysis

To know the relationship between body mass index and academic achievement of physical education trainees Karl Pearson's co-efficient of correlation statistical technique was usedat 0.05 level of significant. Data were analyzed by means of statistical package for social science (SPSS) 23rd version.

4. Results and Discussions

Table -1: Shows the Minimum, Maximum, Mean Value and Standard Deviation of Variables Selected for the Study

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Academic Achievement	36	6.01	7.50	6.93	0.33
Standing Height	36	1.59	1.78	1.70	0.05
Body Weight	36	52.00	101.00	67.25	10.09
Body Mass Index	36	18.47	31.88	23.38	3.58

The above table shows the minimum, maximum, mean value and standard deviation of variables selected for the study. It shows minimum, maximum, mean value and standard deviation of selected variable of academic achievement was 6.01, 7.50, 6.93 and 0.33, Standing height was 1.59, 1.78, 1.70 and 0.05, Body weight was 52.00, 101.00, 67.25 and 10.09, Body Mass Index was 18.47, 31.88, 23.38 and 3.58 respectively.

Table -2: Shows the Correlation between Standing Height and Academic Achievement of Physical Education Trainees

Variables		Academic Achievement
Standing height	Pearson Correlation	**0.681****
	Sig. (2-tailed)	0.000
	N	36

**. Correlation is significant at the 0.01 level (2-tailed).

The above table shows the correlation between standing height and academic achievement of physical education trainees. It indicates that the p-value between standing height and academic achievement was 0.000 which was lesser than the Alpha (α) value or significant value 0.01 (p=0.000<0.01). Hence, it can be concluded that null hypothesis rejected and formulated the alternative hypothesis that there was a significant relationship between standing height and academic achievement of physical education trainees. It can be concluded that standing height of the physical education trainees was positively influencing on their academic achievement.

Table -3: Shows the Correlation between Body Weight and Academic Achievement of Physical Education Trainees

Variables		Academic Achievement
Body Weight	Pearson Correlation	**-0.333***
	Sig. (2-tailed)	0.047
	N	36

*. Correlation is significant at the 0.05 level (2-tailed).

The above table shows the correlation between body weight and academic achievement of physical education trainees. It indicates that the p-value between body weight and academic achievement was 0.047 which was lesser than the Alpha (α) value or significant value 0.01

(p=0.047<0.05). Hence, it can be concluded that null hypothesis rejected and formulated the alternative hypothesis that there was a significant relationship between body weight and academic achievement of physical education trainees. It can be concluded that body weight of the physical education trainees was negatively influencing on their academic achievement.

Table -4: Shows the Correlation between Body Mass Index and Academic Achievement of Physical Education Trainees

Variables		Academic Achievement
Body Mass Index	Pearson Correlation	**-0.595****
	Sig. (2-tailed)	0.000
	N	36

**. Correlation is significant at the 0.01 level (2-tailed).

The above table shows the correlation between body mass index and academic achievement of physical education trainees. It indicates that the p-value between body mass index and academic achievement was 0.000 which was lesser than the Alpha (α) value or significant value 0.01 (p=0.000<0.01). Hence, it can be concluded that null hypothesis rejected and formulated the alternative hypothesis that there was a significant relationship between body mass index and academic achievement of physical education trainees. It can be concluded that body mass index of the physical education trainees was negatively influencing on their academic achievement.

5. Conclusion

In view of the finding and limitation of the study, the conclusions were drawn asstanding height of the physical education trainees was positively influencing on their academic achievement and body weight and body mass index of the physical education trainees were negatively influencing on their academic achievement.

6. Suggestions

On the basis of the study we can found that body weight and body mass index were negatively influencing on academic achievement of physical education trainees, So it can be suggested that, if the physical education trainees need to have a high academic achievement they try to have a ideal body weight as for their standing height.

References

1. Acham, H., Kikafunda, J. K., Oluka, S., Malde, M. K., &Tylleskar, T. (2008). Height, weight, body mass index and learning achievement in Kumi district, East of Uganda. Scientific Research and Essay, 3(1), 001-008.
2. Agarwal, S., Bhalla, P., Kaur, S., &Babbar, R. (2013). Effect of body mass index on physical self-concept, cognition & academic performance of first year medical students. Indian Journal of Medical Research, 138(4), 515-522.
3. Atare, U. F, &Nkangude A. T. (2014). Body Mass Index and Academic Performance of Undergraduate University Students. Asian Journal of Management Sciences & Education, 3(1), 105-112.
4. Abdelalim, A., Ajaj, N., Al-Tmimy, A., Alyousefi, M., Al-Rashaidan, S., Hammoud, M. S., & Al-Taiar, A. (2012). Childhood Obesity and AcademicAchievement among Male Students in Public Primary Schools in Kuwait. Medical Principles and Practice, 21, 14-19. doi:10.1159/000331792.
5. Babu, R., &Sunithapriya, A. K. (2017). A Cross-Sectional Study to Analyze the Association between Anthropometric Measurements and Academic Performance among I Year Indian Medical Students.

International Journal of Health Sciences and Research, 7(9), 62-67.

6. Kim, J. H., & So, W. Y. (2013). Association between Overweight/Obesity and Academic Performance in South Korean Adolescents. Central European Journal of Public Health, 21(4), 179-183.
7. Kristjansson, A. L., Sigfusdottir, I. D., &Allegrante, J. P. (2010). Health Behavior and Academic Achievement among Adolescents: The Relative Contribution of Dietary Habits, Physical Activity, Body Mass Index, and Self-Esteem. Health Education and Behavior, 37(1), 51-64.
8. Shi, H., & Li, C. (2018). Does weight status affect academic performance? Evidence from Australian children. Applied Economics, 50(29), 3156-3170.
9. Suraya, F., Meo, S. A., Almubarak, Z., &Alqaseem, Y. A. (2017). Effect of obesity on academic grades among Saudi female medical students at College of Medicine, King Saud University: Pilot study. Journal of Pakistan Medical Association, 67(8), 1266-1269.
10. Wu, N., Chen, Y., Yang, J., & Li, F. (2017). Childhood Obesity and Academic Performance: The Role of Working Memory. Frontiers in Psychology, 8(611), 1-7. doi:10.3389/fpsyg.2017.00611.

COMPARISON OF JOB SATISFACTION BETWEEN GULF PHYSICAL EDUCATION TEACHERS AND INDIAN PHYSICAL EDUCATION TEACHERS TOWARDS RAPPORT WITH STUDENTS

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ABSTRACT

The purpose of this research was "Comparison of job satisfaction between Gulf physical education teachers and Indian physical education teachers towards Rapport with students" For Present study, 240 Indian origin school physical education teachers working in private schools of India and Gulf Countries (120 from India and 120 from Gulf Countries) were selected randomly as subject for this study. The questionnaire was meant for measuring the job satisfaction of respective teachers. Teachers job satisfaction scale (TJSS) was developed and standardized by Dr. Meera Dixit. To measure satisfaction with different aspects of job, it contains 52 Likert type items which were divided over eight dimensions of job satisfaction. Each item was to be answered on a scale of five alternatives i.e. from strongly agree to strongly disagree. The data had been analyzed by using SPSS (Version 20) The statistical techniques employed for the analysis of data collected on all the variables were following: Descriptive Analysis: Means and standard deviations were calculated. Satisfaction level of Indian and Gulf Countries teachers were compared through independent sampling t-test and the level of significance was set at .05 level. Result shows that for (Rapport with Students) no significant difference was found among the opinion of Indian physical education teachers and Gulf physical education teachers as calculated value of 't' is less than tabulated value of 't', level of significance was tested at 0.05.

Keywords: *Job Satisfaction, Questionnaire, Rapport with Students, Physical education teachers, Gulf etc.*

Introduction

Job satisfaction is the state of mind concerning with type of the work and might be affected by earnings structure, quality of relationship with their Co-workers, quality of work Environment, degree of satisfaction of work, etc. Teachers in physical education play a vital role and are the men behind an organization's entire performance. They not only teach, but also direct and assist students in adjusting to different environments and learning important physical skills as well as providing the requisite skills for students as well as social and organizational growth.

Teaching has historically been a noble career but the teachers lack respect and public recognition in today's world. Physical education teachers, who are central to the formal education system, feel overloaded with extra work other than the main curriculum. They face a lot of problems, can be extra working hours, insufficient sports infrastructure and facilities, and needless documentation are silent barrier features. Teachers in physical education may not be gaining in value and popularity as opposed to the proportion in society's standards.

The managers or students of the community don't actively take their jobs and efforts. Physical fitness in the view of the general population is about playing football and wasting time and resources. A large segment of society argues that there are no social principles connected to physical education and that physical education instructors will only offer something positive to any company therefore, the notion of a perfect career is gone because the work problems and demands could not be satisfactorily handled. In a wide range of context and environment this adds to tension in their daily lives. Continuously stress will clearly cause problems in the physical education teacher's personal life and decrease the level of satisfaction in their job which eventually leads to poor teacher's performance.

continuous tension can lead burnout which is harmful to teacher's emotional health and can affect their classroom success and student experiences. The key reasons for burnout may be disappointment with pay, lack of managerial help and job pressure. Work may be considered a way of attaining personal aim. It is an important contributor to life satisfaction, a personal objective that could be worth achieving. Job satisfaction perceived as

a positive mental state derived from career performance and work experience. It is an emotional reaction arising from the relationship between work-related benefit and benefits from it. Job happiness is directly associated with employer's success and is influenced by a number of variables.

Material and method

Subjects

For Present study, 240 Indian origin school physical education teachers working in private schools of India and Gulf Countries (120 from India and 120 from Gulf Countries) were selected randomly as subject for this study.

Selection of Variables

The research scholar gleaned through the literature and also consulted experts in the area of physical education and psychology to meet the specific purpose of the study and its parametric needs. On the basis of related research studies, Job Satisfaction variable used for study which are as follow

1. Intrinsic aspect of Job
2. Salary, Service Condition and Promotional avenues
3. Physical facilities
4. Institutional Plans and policies
5. Satisfaction with Authorities
6. Satisfaction with social status and family welfare
7. relationship with students
8. rapport with co-workers

Rapport with student Q.No.-7,15,22,28,33 & 39(total 6 questions)

Q. 7-Students are respectful towards you.

Q.15-Teaching-learning activity goes on smoothly in your class.

Q.22-As a teacher you are liked by your pupils.

Q.28-Good relationship exists between teachers and students in your institution.

Q.33-You get proper opportunities to develop proper understanding with the parents of your pupils.

Q.39-You are able to help pupils in building their character and developing good study habits.

Criteria Measures

Description of Job Satisfaction Questionnaire

The questionnaire was meant for measuring the job satisfaction of respective teachers. Teachers job satisfaction scale (TJSS) was developed and standardized by Dr. Meera Dixit. To measure satisfaction with different aspects of job it contains 52 Likert type items which were divided over eight dimensions of job satisfaction. Each item was to be answered on a scale of five alternatives i.e. from strongly agree to strongly disagree. It could be administered individually and in a group. It was advisable that reply should be frank and sincere.

Reliability of the test

The reliability of the scale was determined by split-half method. The test was first divided into two equivalent halves, and the correlation calculated for these half tests. From the reliability of the half test, the self-correlation of the whole test was calculated by using spearman Brown Prophecy formula. Test-retest method also showed high reliability which is given in the following table

Table 1: Reliability of the test by split Half Method

N	R	Index of Reliability
100	.85	.92

Table 2: Reliability of Test by Test-retest Method

N	R	Index of Reliability
100	.75	.86

Validity of the Test

The validity of the test was established by establishing discrimination using item validity (discrimination value) by the person developed the test for each test item test by correlation method using Pearson's correlation. The items which were insignificant had dropped in final form. Initially there were 58 items of which 6 items had been deleted as they were not found to be discriminatory in item analysis.

Distribution of items in the final form is presented in table

Statistical technique

The data had been analyzed by using SPSS (Version 20) The statistical techniques employed for the analysis of data collected on all the variables were following:

Descriptive Analysis: Means and standard deviations were calculated and represented in tabular and graphicalform.

Satisfaction level of Indian and Gulf Countries teachers were compared through independent sampling t-test and the level of significance was set at .05 level.

Results & discussion

Table no. 3

Frequency Distribution of Responses of Gulf Physical Education Teachers and Indian Physical Education Teachers towards the Factor: -G **"Rapport with Students"**

	Country	Opinion	Frequency	Percentage
P.E. Teachers	Gulf	5 (Strongly Agree)	212	29.44
		4(Agree)	410	56.95
		3(Undecided)	61	8.47
		2(Disagree)	30	4.17
		1(Strongly Disagree)	7	0.97
		Total	720	100
	India	5 (Strongly Agree)	247	34.31
		4(Agree)	366	50.83
		3(Undecided)	57	7.92
		2(Disagree)	34	4.72
		1(Strongly Disagree)	16	2.22
		Total	720	100

Table no. 4

Comparison of Rapport with Students between Gulf Physical Education Teachers and Indian Physical Education Teachers

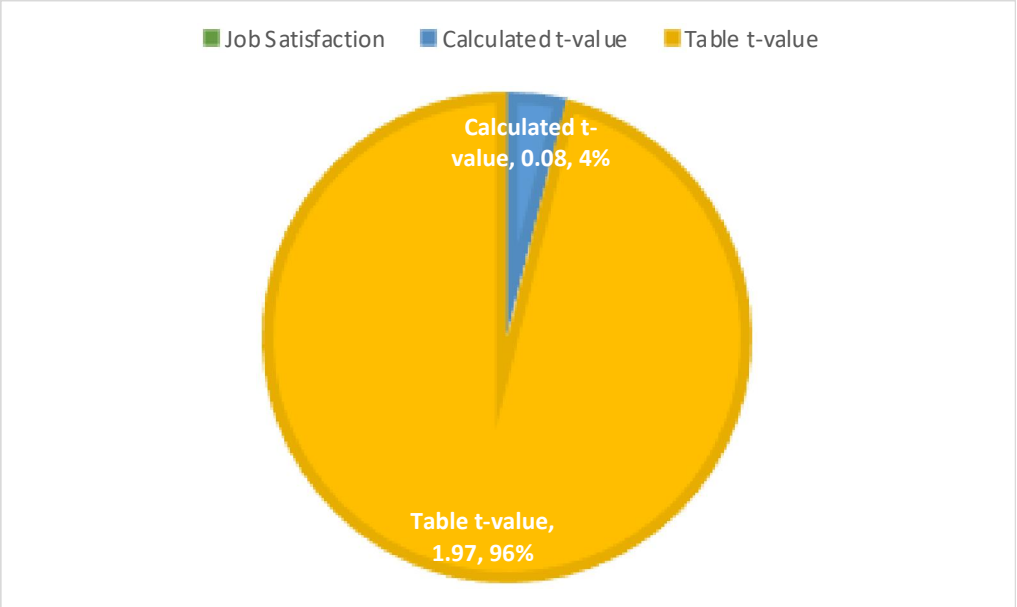
Variable	Group	Sample size	Mean	Standard Deviation	Calculated t-value	Tabulated t-value
Job Satisfaction	Gulf	120	24.58	2.77	.08	1.97
	India	120	24.61	3.04		

Interpretation

Table No. 3 indicates the frequency distribution of response of Indian physical education teachers and Gulf physical education teachers towards the Factor G(**Rapport with Students**), out of 120 Gulf physical education teacher, 622(212+410) teachers belongs to division of strongly agree and agree which is 86.39%(29.44+56.95) of the total, whereas out of 120 Indian physical education teacher, 613(247+366) teachers belongs to division of strongly agree and agree which is 85.14%(34.31+50.83) of the total. Out of 120 Gulf physical education teacher, 37(30+7) teachers belongs to division of disagree and strongly disagree which is 5.14%(4.17+.97) of the total, whereas out of 120 Indian physical education teacher, 50(34+16) teachers belongs to division of disagree and strongly disagree which is 6.94%(4.72+2.22) of the total.

Table 4 indicates that for (**Rapport with Students**) no substantial difference was found amid the opinion of Indian physical education teachers and Gulf physical education teachers as calculated value of t is less than tabulated value of t, level of significance was tested at 0.05.

Figure 1



Comparison of Job Satisfaction of Gulf Physical Education Teachers and Indian Physical Education Teachers towardsRapport with Students

Conclusion

From the result of the study it reveals that the factor G that is (Rapport with Students) which includes total 6 questions (7,15,22,28,33 &39). it was found that there is no substantial difference between physical education teachers of India and physical education teachers of Gulf in Rapport with Students. Result of Factor G-In totality result of Factor, G of Job Satisfaction i.e. **Rapport with students** shows insubstantial difference between Gulf Physical Education Teachers and Indian Physical Education Teachers.

References

1. Tiwari D, Tiwari U. (2020). Attitude of Principals, Teachers and Students of India and Thailand towards a Question- "If for any reason a few subjects have to be dropped from the school programme, Physical education should be one of the subjects dropped". International Journal of Fitness, Health, Physical Education & Iron Games, Volume: 7, No: 2, p: 21-26.
2. Tiwari D, Tiwari U. (2020). Attitude of Principals, Teachers and Students of India and Thailand towards a Question- "Physical Education activities provide no opportunities for learning to control the emotions". International Journal of Fitness, Health, Physical Education & Iron Games, Volume: 7, No: 2, p: 27-32.
3. Tiwari D, Tiwari U, (2011). A movement pattern of basketball jump shot as performed by Indian Basketball players. International Journal of sports and sciences & fitness, Vol.1 Issue 2, p172-176. 5p.
4. Elmagd MA, Tiwari U, Mossa AH, et al. (2018). Barriers of sports participation in higher education in the UAE. J Phys Ther Sports Med, 2(2):40-45.
5. Dr. Dixit, Meera. (1971). Technical Handbook for Job Satisfaction (Agra National psychological Corporation).
6. Engelhardt, M., & Bain, L. J. (1973). Some complete and censored sampling results for the Weibull or extreme-value distribution. Technimetrics.
7. Evans, C. E., & La Verne, N. L. (1950). My job contest (No. 1). Personnel Psychology.
8. Hill, M. D. (1983). Some factors affecting the job satisfaction of community college faculty in Pennsylvania. Community/Junior College Quarterly of Research and Practice.
9. Hoppock, R. (1935). Job satisfaction, Harper and Brothers, New York.
10. Lindgren, H. C., & Patton, G. M. (1958). Attitudes of high school and other teachers

toward children and current educational methodology. California Journal of Educational Research, 9, 80-85.
11. Locke, E. A., &Dunnette, M. D. (1976). Handbook of industrial and organizational psychology. Handbook of industrial and organizational psychology.
12. Luby, E. D., Cohen, B. D., Rosenbaum, G., Gottlieb, J. S., & Kelley, R. (1959). Study of a new schizophrenomimetic drug—sernyl. AMA Archives of Neurology & Psychiatry, 81(3), 363-369.
13. Mayo, E., Roethlisberger, F. J., & Dickson, W. J. (2008). The Human Relations Movement: Harvard Business School and the Hawthorne Experiments (1924-1933).
14. Morse, N. C. (1953). Satisfactions in the white-collar job.
15. Pestonjee, D. M., & Singh, A. P. (1977). Supervisory orientation and employees' morale. Journal of Occupational and Organizational Psychology, 50(2), 85-91.
16. Rev Planamootil Koshy. (1990) "A comparative study of job Satisfaction of teachers teaching in Denominational and Non-Denominational Schools in Thane Dist. MPhil, BU.
17. Rudd, W. G. A., & Wiseman, S. (1962). Sources of dissatisfaction among a group of teachers. British Journal of Educational Psychology, 32(P3), 275-291.
18. Statt, D. (2004). The Routledge Dictionary of business management, third edition, Routledge publishing, Detroit, p.78.
19. Suki, N.M., & Suki N.M. (2011). Job Satisfaction and Organizational commitment: The Effect of gender. International journal of psychology research, 6(5), 1-15.
20. Taylor, F. W. (1911). Shop management. McGraw-Hill.
21. Varoom, V.H. (1964). Work and motivation, John Wiley and Sons, New.

PHYSICAL ACTIVITY, MENTAL HEALTH AND QUALITY OF LIFE OF UNIVERSITY ATHLETES AMIDST PANDEMIC

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ABSTRACT

The purpose of this study was to determine the physical activity, quality of life and mental health in a state university in central Luzon, Philippines amidst pandemic. One hundred Seventy-six student athletes in participated in this study. The age ranges from 15-24 years, (M=21.7, SD=3.67. General Health Questionnaire-12, SF- 36 quality of life and International physical activity questionnaire were administered through group chat via Google form which is being forwarded in their group chat in Facebook. Unstructured Interviews were also done to verify the results of quantitative data and to further asses the experiences and challenges of athletes amidst the pandemic. Qualitative data revealed positive mind-set, family support, prayer and being productive emerges as were extremely important to athletes' strategies of coping the challenges of pandemic. Findings on this study will served as basis in the enhancement of policy interventions in sports program to meet identified needs of athletes in the new normal.

Keywords: *athlete, coping strategies, mental health, pandemic, quality of life*

1. Introduction

Considerable amount of studies were conducted about the importance of mental health into student athletes performance. (Jewett et al., 2021)giving specific recommendations like the use of protective factors and the use of multidisciplinary teams that will address the mental health and quality of life of student's athletes were needed to make athletes flourish in their field of sporting events.(Egan, 2019) (Pankow et al., 2021)l. An increase level of physical inactivity and mental health conditions has been identified lately among athletes while the emerging corona virus disease-2019 (COVID-19) pandemic has undoubtedly disrupted the physical activity (PA) and the quality of life of the athletes. University athletes are considered to be at a risk stage due to the effects of pandemic to sport programs

Recent evidence suggests that athletes may experience even greater levels of stress due to the challenges brought about by pandemic placed on them (Pons et al., 2020) (Ruppersberger et al., 2020)Physical activity (PA) is termed as movements produced by the body muscles with the expenditure of energy (World Health Organization, 2013). Research has also revealed PA to be linked with the numerous physical and psychological health advantages specifically in the prevention of cardiovascular disease. Moreover, physical activity has identified to be effective in the reduction of depression and anxiety symptoms. However, the PA or exercise impact on mental health among the student population has received a significantly less attention as compared to the other population.

Even within the mental health and PA domain, the variability in the intensity of PA has not been highlighted much. Few studies have examined the intensity of PA over mental health but have shown variability of results. Bouchard, Shephard, and Stephens (1994) stated that vigorous PA might have negative effects on mental health in the general population. Similarly, vigorous PA has been described inefficient in the management of anxiety among healthy population (Raglin, Wilson, & Galper, 2007). Moreover, Asztalos, Bourdeaudhuij, and Cardon (2009) indicated overall mental health did not significantly correlate with PA specifically for women. Furthermore, the results of the mentioned studies cannot be generalized specifically athletes due to the existing phenomenon known as Covid 19. Grob, Little, Wanner, and Wearing (1996) suggested that sociocultural framework might be the mediating variable for the influential phenomena of perceived control over health. As a result, interaction of physical activity, mental health, health locus of control and quality of life in university athletes inthe Philippines is considered as a good avenue to be examined.

Thus, the answer to the following questions in reference to the university athletes isseeked; 1) how the different intensities of PA related to mental health, physical health and quality of life? and 2) How mental health, physical health and quality of life of University athletes are affected by the pandemic?

Methods and materials

Research Design

Mixed method design was used because the researchers were interested in exploring the challenges and real experiences of the athletes as well as for determining the separate relationship of quality of life,mental health, physical health and physical activity amidst pandemic.

Participants

The total number of participants were 176 university students in Philippines (male=76, female=100),within the age range of 15-24, from five campuses in university in the Philippines:

Measures

Whoqol-Bref was used to measure QOL. It consists of 24 items to assess perception of quality of life in four domains, including physical health, psychological, social relationships and environment, and two items on overall QOL and general health. The domain scores were transformed into a linear scale between 0 and 100 following the scoring guidelines. A higher score indicated a better QOL.

International Physical Activity Questionnaire (IPAQ):IPAQ is a shortform questionnaire assessing the physical activity among the adults comprises ofseven questions. There are three specific types of exercise that IPAQ assess; vigorous-intensity exercise ,moderate-intensity exercise and walking.The questionnaire is structured in a way that the scores of three domains are computed separated and additionally IPAQ total is also calculated. Kurtze, Rangul and Hustved (2008) suggested IPAQ as a good measure for physical activity, as it holds strong and considerable association with VO2max, r = 0.41 ($p \leq 0.01$). Thethree (low, moderate and high) Categorization of PA correlated significantly withVO2 max(0.31$p \leq 0.01$).

Data Analysis

The data generated from the survey were analyzed using frequencies and percentage. Data were processed through SPSS software. The researchers aggregate data at the level of a theme. This links each theme to all of the text coded at its sub-themes, which makes it easier to see all of the interview data that supports the theme, even though the data is actually coded at the level of the sub-theme. Aggregating at the theme level also combines the number of sources (participant transcripts) and references (how many times the researcher coded text at a sub-theme within the theme).

The themes are named from the perspective of what the athlete might be seeking through their experience during the pandemic. Concepts from the disciplines of developmental, motivational, humanistic and transpersonal psychology are reflected in the choice of placing the athletes at the centre of experience as persons who intentionally seeks positive, life affirming growth experiences. It is important to note, however, that in accordance with the principles of IPA, which emphasize that themes must ‘emerge’ from the data, these concepts reflect an organizing principle that is strongly supported by the interview data, which guided the interpretation at all levels, from annotation to the construction of themes. In choosing names for the different themes, the issue of ‘face validity’ was considered—the themes must semantically relate to the sub-themes and the underlying data.

Table1:Demographicprofileoftheparticipants(n=176)

	F	%
Age		
15 Years old	1	0.66
16 Years old	17	8.61
17 Years old	37	18.54
18 Years old	25	24.50
19 Years old	34	17.22
20 Years old	30	15.23
21 Years old	13	6.62
22 Years old	11	5.30
23 Years old	5	2.61
24 Years old	1	0.66
Total	176	100.00
Gender		
Male	76	24%
Female	100	76%
Total	176	100.00

Procedure

In gathering data for the study,consent and approval from the school administrator and the respondents was obtained.Consent from the parents was also obtained for the student at hleteth at is below 18years old. Then,data gathering was conducted. Distribution and retrieval of questionnaires from the respondents was personally conducted by there searcher to ensure the high retrieval rate of the questionnaires and also, to ensure that the respondents fully understand the questions and the purpose of the study. Encoding of the responses from the questionnaires for the processing of data and generating statistical results was done A consideration of ethics needs to be a part of there search process.This ethical consideration includes the participants and the conduct of research.The participants' wellness was considered and gives them assurance that the study will not cause them any harm. This also includes informed consent from there search participants; which is to ensure that the participants in the study must be informed about the nature of research project and this consent was obtained prior to their participation in the study. The ethical conduct of research was taken into consideration. This includes the need to framer search questions and plan objectively, get permission from the administrator of the institution and author of the questionnaire to be used,and to maintain confidentiality in the research process.The mentioned considerations were strictly observed through out there search process.

Table 2: Physical Activity of Athletes

Item	StudentAthletes		
	Mean	SD	Interpretation
Low level of physical activity	3.51	31	Important
Moderate level of physical activity	3.68	24	Important
High level of physical activity	3.44	31	Important
Walking	5.48	0.73	Extremely Important
Devote sufficient study time to each of the courses	3.52	0.68	Important
Create and update schedules regularly	3.50	0.72	Important
Avoid activities which tend to interfere with the planned schedule	3.43	0.71	Important

Table 3: Quality of life (Domains) of athletes

Domains	Mean	SD		General Health	QOL	correlations
Physical domains	70.8	12.69	Important	3.67	0.09	Highly correlated
Psychological domains	65.4	12.61	Important	3.61	0.50	Correlated
Social relationships	3.54	0.64	Important	3.67	0.59	Correlated
Environmental domains	3.59	0.64	Important	3.67	0.59	Correlated

In consideration to the intensity of PA, vigorous PA displayed as significant positive association with mental health, physical health and quality of life; although a significant negative relation was revealed with the psychological distress. Similarly, walking had an negative interaction with psychological distress and a significant positive relation with mental health and over all quality of life. Never the less significant, walking did not correlate with physical health. Though, there is an interesting finding that moderate PAdid not significantly correlated with any of them. The previous research has also indicated the variability of results in regards to the intensity of PA and mental health. Hamer, Stamatakis, and Steptoe (2009) illustrated that at least twenty minutes per week of activity was found to be beneficial for mental health. The greater level of PA especially sports has also been illustrated as helpful in the risk reduction. On the other hand, Bouchard, Shephard, and Stephens (1994) stated that over training in exercise might have negative effects on mental health in the general population. Where over exertion could stimulate depression. Similarly, Kim, Park, Allegrante, Marks, Ok, Cho, and Garber(2012) illustrated a curvilinear interaction of physical activity duration and mental health. It was suggested that the optimal duration of physical activity for gaining best the mental health result was 2-7 hours per week, more or less than this range was revealed to be causing adverse effects on mental health. Simultaneously, it is also reported that all type of intensities of PA had a positive linear relationship with emotional well being and had a negative linear correlation with mental health (Asztalos, Bourdeaudhuij, & Cardon, 2009).

Qualitative Result
Themes

The following are the themes along with its titles and descriptions the researcher developed, as well as representative supporting, verbatim quotes in response to the research objectives:

Changes and disruptions to ordinary circumstances may trigger feelings of anxiety, frustration, isolation, and loneliness in students. In this study, college students who are varsity players reported that they experienced challenges in terms of psychological challenges and at the same time have identified different coping mechanisms in dealing with these challenges.

Psychological Challenges

Theme 1: expressed feelings of anxiety, depression, and frustration

The athletes are reporting psychological impacts from the pandemic and feel isolated and disconnected all the time or sometimes.

I also couldn't do the things I should have done before Covid got bored because I always couldn't leave home. the situation today is really very difficult now covid everyone will be affected. I hope this virus disappears when everything returns to normal.

The challenges and problems that I experienced right now these times of pandemic is having an overthinking manner that leads to anxiety. I am worried in our current situation, thinking until when we're in this kind of set up and how to survive each day but despite of that I tried to have a positive mindset, bring happiness and positivity's to others.

Theme 2: fear of being infected by COVID-19 due to social discrimination

Some participants expressed fear of being infected because of discrimination.

Theme 3: Academic Stress due to Transitioning into the distance learning environment

Some participants shared concerns regarding transitioning into the distance learning environment.

I sometimes feel stress in online class because we have a lot of things to do plus the deadlines are same to the other courses, I always feel pressure when this thing happens. I feel sadness too in this time of Pandemic because I miss my mom so much. The accident kept haunting me every night especially when I am alone. To fight my sadness, I always think to the positive side that everything has purpose, that God has a plan that is why she took my mom away from us. Also, I do believe that time heals everything

Theme 4: Worry of loss of fitness

This time of pandemic my physical activity is decrease unlike before because my time is focused on the activities in online class at lesson.

I have a problem at this time because of covid because I can not do physical activities. playing basketball jogging and other activities.

In terms of physical aspect, as of now I don't have a regular exercise because of a busy schedule in work but I assure that I eat healthy foods to strengthen my body to avoid any kind of diseases. This time of pandemic I learned that we need to strengthen ourselves not only physically but also emotionally and mentally.

Regular physical activities at times like this is very important. Due to COVID-19 pandemic, there is minimal ways to do a task to help our body and mind in fit. when this pandemic hit us, specially us, athletes, who used to play and get Physical which is part of our routine my body reacts so fast, from 97kg to 111 kg. I was annoyed on weight, but my body don't like to move then, I tried to do some jogging, do some sprints but my body don't recover from my body before, yes, I'm not to fit but I am light enough to Cary my body but now?? I really feel the heaviness of my body. I am worried that I may not return from fitness. I admit that I am not mentally healthy because of my condition but I will do my best to regain what I started before

The Athletes' Ways of Coping with the pandemic

Participants were asked to describe ways on how they are coping with the challenges of the pandemic. The following are the themes of the responses from participants.

Theme 1 Positive Mindset

Majority of the athletes shared that having a positive mindset and attitude towards life in general contributed to maintaining a healthy well-being and surviving the stress brought about by the pandemic.

In these times of pandemic my mental health remain positive. When I suddenly feel sad, scared of this pandemic and I accidentally think about certain situations. I will spend my time doing my tasks or playing online games to forget it. Afterall I'm so thankful that my family, relatives and friends are all safe. I always think that there is always something positive in every situation, mostly to the people who are infect or giving up on life. It helps to lessen my anxiety by praying everyday, wishing to our Lord to heal our community, hoping that the virus will disappear soon. So that all of us can all return to our former lives.-

I've not experienced anxiety and depression during quarantine until now. As part of taking care of my body is also taking care of my mind to be a healthy one. I did not think anything that would interfere with my mind that would affect what I'm thinking and that would cause anxiety and depression.

I don't feel any mental health problem because i can do activities that entertained my self. I play my French horn and also singing to avoid any mental problems that affect many person in time of pandemic

I think my mental health is stable and normal. I don't experiencing depression and anxiety because I do prefer in the present. Present is a gift to cure all your negative thoughts that misleading to depression and anxiety- positive mind-set

Theme 2 Prayer

Some participant believed that prayer help them a lot to survive and overcome their fears and worries during the pandemic.

I didn't feel any stress or depression, I just felt sad to see others suffering this
pandemic. I want to help them but I can't risk my own health. All I can do is pray
for them. Because prayer is the best way to avoid sadness and also spending
time with the family is the best way too.

I pray to God. Seek help , thank him for his everlasting love.- prayer

Theme 3 Family Support

Family support was regarded as very important by the athletes to face the challenges of the pandemic.

With the help of my family I'm not experiencing anxiety and depression because we kept as open to the problem that we faced and at the same time I keep my mind relax despite pandemic for sleeping early to give a good mindset. Lastly, that helps me to be healthy and well being is to always pray to God and trust him whatever circumstances that we face.

Cherish the time to prioritize what truly matters most, my family

I've not experienced anxiety and depression during quarantine until now. As part of taking care of my body is also taking care of my mind to be a healthy one. I did not think anything that would interfere with my mind that would affect what I'm thinking and that would cause anxiety and depression. With the help of my family I'm not experiencing anxiety and depression because we kept as open to the problem that we faced and at the same time I keep my mind relax despite pandemic for sleeping early to give a good mindset. Lastly, that helps me to be healthy and well being is to always pray to God and trust him whatever circumstances that we face.

As of the moment, I don't have any mental problems. I did not encounter problems or challenges that I can't solve because I manage to stay positive as possible and always think that this phase shall pass and I have my family here with me, safe and sound so I don't have to worry about anything that can cause sadness, depression or worst, anxiety.

Theme 4 Being Productive

Keeping oneself busy, doing meaningful and productive activities are considered by athletes as an effective tool to combat sadness, stress and anxiety during the pandemic.

In times like this , I have spent my time I a very fruitful one though most of us are struggling in thissituation. First , I am educating myself listening to webinars and podcasts about covid-19 so that I will aware of that really covid-19 is. Second , cleaning , cleaning the inside and outside part of the house.,take a walk and do exercising.

to fight the stress and depression is to pray and being productive with your family

Depression and stress, what I experienced because of the online class where I do not have gadgets and internet connection where I can study well, my parents also do not have a job so I did not stop I looked for extra work to earn money can solve my education and household expenses, and I always pray to overcome my problems and this pandemic.-

Discussions

Among the four domains of QOL, the athletes in this study had a relatively higher QOL in the physical health domain and a lower QOL in the environmental domain. Significant correlations between QOL in the four domains, overall QOL and general health were observed. These findings are consistent with previous studies which showed that the four domains of QOL and perceived general health are interrelated. People with positive emotions or better QOL in the psychological domain evidence better physical health outcomes, such as fewer physical complaints, more exercise, longer sleeping hours and better sleep quality [Howell et.al, 2017]. Increasing transient emotions can strengthen immune functioning and buffer the impact of stress which gives people better health [Howell et.al; Kok Be et/al,n.d.]. On the other hand, exposure to nature or green space has been found to improve people's health and well-being by providing restoration from stress and mental fatigue [Groenewegen PP, 2006]. Detrimental social relationships also play a role in physical and psychological health. An adverse family environment and lack of social support may result in depressive symptoms and subsequent psychological distress which in turn

would affect one's general health [Syansfeldet.al,nd.]. To facilitate social interactions and networking, a neighbourhood with better built environment, such as street connectivity, traffic and pedestrian safety, improved air quality and greenery are necessary especially now in this time of a pandemic. Studies have shown that people tend to have better mental health if they are living in an environment which is less affected by noise and increasing temperatures, with better air quality, plenty of vegetation and open spaces, adequate social and entertainment facilities, and safe to go out in the day and at night.

Such findings are supported by the themes of responses of the student athletes in terms of the challenges they faced during the pandemic. The result of interview with the respondents reveals that, during this pandemic most of them have reported psychological and physical challenges, which were summarized in the identified themes: expressed feelings of anxiety, depression, and frustration; fear of being infected by COVID-19 due to social discrimination ; Academic Stress due to Transitioning into the distance learning environment and Worry of loss of fitness

Their emotional health showed to be the major concerns and that it has greatly affected their physical health. Qualitative data also reveals new essential themes as coping strategies used by athletes to face the challenges brought about by the pandemic in their physical and mental health such as positive mind-set, family support, prayer and being productive emerges as effective tools.

Summary

In this study, the following salient points were revealed:

- Most of athletes in this time of a pandemic were categorized as having low physical activity level (40.79%), 31.58 % were having moderate activity level and 27.63% were having high activity level. This is supported by the result of the qualitative data gathered through interview with the respondents that most of them expressed decreased in their physical activity.
- Comparing the four domains of the athletes, physical health domain was the highest with a mean score of 70.83 ± 12.69 while the environmental domain was the lowest with a mean score of 61.98 ± 13.76
- The athletes are reporting psychological impacts from the pandemic. Most of them have reported psychological and physical challenges, which were summarized in the identified themes: expressed feelings of anxiety, depression, and frustration; fear of being infected by COVID-19 due to social discrimination;Academic Stress due to Transitioning into the distance learning environment and Worry of loss of fitness
- Qualitative data also reveals new essential themes as coping strategies used by athletes to face the challenges brought about by the pandemic in their physical and mental health such as positive mind-set, family support, prayer and being productive emerges as effective tools.

Conclusion

The challenges of a COVID-19 pandemic for university athletes is considerable. The vast majority of athletes have faced the postponement or cancellation of important competitions or meets during this time. The isolation, anxiety, depression, and frustration among student athletes is clear, but many of them have found strategies to deal with the pandemic. It was most prevalent among respondents that they were concerned about the decline in their physical fitness during this time and also concerned about the effect of the COVID-19 pandemic on their future performance. This finding suggests the need for interventions to be provided both remotely and in-person, whenever possible, to help support the athletes in their emotional challenges. One central theme and area of focus identified by participants in the study was in regards to transitioning to distance learning environments. This finding suggests that institutions with distance learning courses in the upcoming semester should provide programming and services in a proactive manner.

Applications in sport

Society as a whole has ground to a halt as a result of the COVID-19 pandemic. How athletes have been affected and reacted to such adversity, particularly student athletes, and

how they can cope with this dramatic challenge is beneficial for coaches, clubs, parents, support staff and sports bodies to understand many subjects, including crisis response, emotion control, coping mechanisms, endurance, mental wellbeing, and athlete well-being.

Recommendations

Findings of this study suggest the following interventions: 1) pay greater attention to student athletes, as they are young and are simultaneously engaged in both academic and athletic challenges; 2) the well-being of this demographic should be addressed, particularly addressing mental health concerns in the midst of these changes; 3) enhanced in-home virtual training during COVID-19 outbreak should be further bolstered and improved to protect the mental and physical health of the athletes, especially to decrease the risk of anxiety and depression..

References

1. Anderson, E. (2020, August 12). Mental Health Concerns for Student-Athletes During Pandemic. NBC 5. https://www.nbcdfw.com/news/back-to-school/mental-health-concerns-for-student-athletes-during-pandemic/2424516/
2. Asztalos,M.,Bourdeaudhuij,I.D.,&Cardon, G.(2009).The relationship between physical activity and mental health varies across activity intensitylevels and dimensions of mental health among women and men. PublicHealthNutrition,13(8), 1207-1214.
3. Best Colleges Online. (2020). 14 Surprising Facts About Being a College Athlete. Https://Www.Bestcollegesonline.Com/Blog/14-Surprising-Facts-about-Being-a-College-Athlete/. https://www.bestcollegesonline.com/blog/14-surprising-facts-about-being-a-college-athlete/
4. Bullard, J. A. (2020). The Impact of COVID-19 on the Well-Being of Division III Student-Athletes. The Sport Journal, 21, 1. https://thesportjournal.org/article/the-impact-of-covid-19-on-the-well-being-of-division-iii-student-athletes/
5. Egan, K. P. (2019). Supporting Mental Health and Well-being Among Student-Athletes. Clinics in Sports Medicine, 38(4), 537–544. https://doi.org/10.1016/j.csm.2019.05.003
6. Howard, J. (2013, June 13). The Life of a Student Athlete. Huff Post. https://www.huffpost.com/entry/the-life-of-a-student-ath_b_2963409 https://eric.ed.gov/?id=EJ727977
7. Khan, B.A., &Hassandra, M. (June, 2016). Interactionofphysicalactivity,mentalhealthandquality of life: a study on university students in Pakistan. Journal of Physical Education Research, Volume 3, Issue II,01-10.
8. Kimiecik, J. (2005). Phat Exercise: How Young Adults Enjoy and Sustain Physical
9. Kuik, R. (2019). Mental Health and Athletes. Athletes for Hope and Passion. https://bit.ly/2JP8FpZ struggles in already vulnerable young athletes. Medill Reports Chicago. https://news.medill.northwestern.edu/chicago/pandemic-amplifies-mental-health-struggles-in-already-vulnerable-young-athletes/
10. Jewett, R., Kerr, G., & Dionne, M. (2021). Canadian athletes' perspectives of mental health care and the importance of clinicians' sport knowledge: A multi-method investigation. Psychology of Sport and Exercise, 53(November 2020), 101849. https://doi.org/10.1016/j.psychsport.2020.101849
11. Lowry, R., Galuska, D., & Fulton, J. (2000). Physical Activity, Food Choice, and Weight Management Goals and Practices Among U.S. College Students. American Journal of
12. Mills, A. (2019, October 3). A Day in the Life of a Student-Athlete. Michigan Tech. https://www.mtu.edu/magazine/2019-1/stories/student-athlete/
13. Moberger, D. (2020, September 1). Pandemic amplifies mental health struggles

in already vulnerable young athletes. Medill Reports Chicago. https://news.medill.northwestern.edu/chicago/pandemic-amplifies-mental-health-struggles-in-already-vulnerable-young-athletes/

14. National Association for Sport and Physical Education (NASPE). (1900). Appropriate Instructional Practice Guidelines for Higher Education Physical Activity Programs (2nd edition).https://rmpe.appstate.edu/sites/rmpe.appstate.edu/files/naspe_app_pract_gdlns_hepap.pdf
15. National Association for Sport and Physical Education. (NASPE) (2007).College /university
16. National Center for Biotechnology Information. (n.d.). Physical Activity, Fitness, and Physical Education: Effects on Academic Performance. NCBI. Retrieved December 9, 2020, from https://www.ncbi.nlm.nih.gov/books/NBK201501/ paper]. Reston, VA: Author. physical activity programs: A critical piece in the education of young adults [Position Preventive Medicine, 18, 26. https://www.ajpmonline.org/article/S0749-3797(99)00107-5/pdf
17. Pankow, K., McHugh, T. L. F., Mosewich, A. D., & Holt, N. L. (2021). Mental health protective factors among flourishing Canadian women university student-athletes. Psychology of Sport and Exercise, 52(August 2020), 101847. https://doi.org/10.1016/j.psychsport.2020.101847
18. Rishe, P. (2019, December 12). The Mental Health Of Student-Athletes: A Necessary Operational Investment In Contemporary Collegiate Athletics. Forbes. https://www.forbes.com/sites/prishe/2019/12/12/the-mental-health-of-student-athletes-a-necessary-operational-investment-in-contemporary-collegiate-athletics/?sh=20ea96197ebb
19. Sammarone, O. (2020). Finding Balance In Life As A College Athlete. Athlete Network. https://an.athletenetwork.com/blog/finding-balance-in-life-as-a-college-athlete#:~:text=The%20daily%20life%20for%20a,and%20complete%20their%20academic%20work.
20. Sienkiewicz, T. (2019, April 5). What its Really Like to be a College Student Athlete Rewards and Challenges. Peterson's. https://www.petersons.com/blog/what-its-really-like-to-be-a-college-student-athlete-rewards-and-challenges/

EFFECTIVENESS OF SPECIFIC SPORTS TRAINING PROGRAM ON SPEED & STRENGTH TO PREPARE ATHLETICS RUNNERS ON BOYS AGED 12-14 YEARS

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ABSTRACT

The training is a process of preparing an individual for any event or an activity or job. Usually in sports we use the term sports training which donates sense of preparing sportspersons for the highest level of performance. But nowadays sports training is not just a term but it is very important subject that affects each and every individual who takes up physical activity or sports either for health and fitness or for competitions for different levels. For the said study as a sports training researcher has selected some specific exercises and prepares a specific training program of eight weeks to develop speed &strength of Athletics runner which will help him to achieve highest performance in running events. To achieve the motive of the study A sample of forty (N=40) boys students were selected by random sampling method as subject from Dhuv Global School, Sangamner. Further, they were randomly divided in to two equal groups as Experimental and Control. The specific sports training given to only experimental group for eight weeks continuously in the morning session for 1 (one) hour daily except Sunday. Control group was not treated any training during this period. The students were evaluated before i.e. pre-test and after the specific sports training i.e. post-test of eight weeks. Paired't' test was used as a statistical test to discover the Effects, if any, and the level of significant was set at 0.05 level. From the findings of data, the result had exhibited significant improvements on physical fitness variables i.e. Speed & Strength, after eight weeks specific sports training on boys aged 12-14 years of Dhuv Global School, Sangamner to prepare athletics runners.

***Key Words**: Sports training, speed, explosive strength,, School Boys*

Introduction

According to Harre (1982) Sports training is a process of athletic improvement, which is conducted on the basis of scientific principles through which systematic development of mental and physical efficiency, capacity and motivation enables athletes to produce outstanding and record breaking athletic performance. The aim of specific sports training is to improve rapidly the sports performance of a sports person particularly in sports competitions, which is mainly based on his physical, psychological, intellectual and technical capacities and capabilities. In other words the aim of the study of specific sports training program to prepare players of Athletics for running events for the attainment of highest possible sports performance in various competitions.

Sample of Any

For the present study a sample of forty boys students were selected by random sampling method as subject from Dhruv Global School, Sangamner, Dis-Ahmednagar. Further, they were randomly divided in to two equal groups as Experimental and Control.

Objectives of the Study

1. To Study the effectiveness of specific sports training program on speed of boys aged 12-14 years to prepare athletics runners.
2. To Study the effectiveness of specific sports training program on strength of boys aged 12-14 years to prepare athletics runners.

Hypothesis of the Study

Ho_1 There is no significant difference in mean score of speedas measured by 50 meter run test between Experimental and Control Group.

Ho_2 There is no significant difference in mean score of Strength as measured by Standing Broad Jump Test between Experimental and Control Group.

Definition

According to Hardial Singh (1993), Sports training is a pedagogical process, based on scientific principles, aiming at preparing sportsmen for higher performance in sports competitions.

Method

The present study was conducted by using the experimental method of research. After study the available sports literature and discussion with experts researcher has selected two physical fitness tests as dependent variables like 50 meter run test to measure speed and Standing Broad Jump Test to measure Explosive Strength. Before starts the study researcher has conducted Pre-tests of both experimental and control groups.

for experimental group As a training of specific sports training program Independent variables like Bounds, Hurdle hopping, single leg hoping, Box Jump, Depth Jump, Accelerations run, resistance run, Hill run etc. were selected and given training for eight weeks in morning session for 1 (one) hour daily except Sunday. During the training of experimental group control group was not treated by any activity or training.

After the eight weeks of specific sports training conducted post-test of both experimental Group and control group and collected pre-test and post-data data of two selected physical fitness components which was speed and Explosive strength of the subject.

Analysis of data

The analysis of the data collected by the researcher before and after the training, the data were analyzed by using descriptive statistics and 't' test procedure of the techniques, for the same purpose the Statically Package for Social Science (SPSS) software was used.

Result

Comparison of the result of selected variables between control group & experimental group

Table 1
Comparison of mean gain in selected variables between the control and experimental group

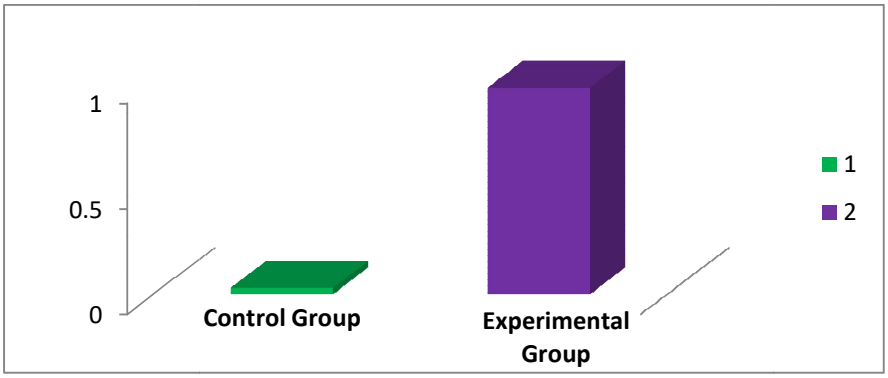
Sr. No.	Variable	Group compared	N	Mean Scores	Standard Deviation	Mean Difference	t-value
1.	Speed	control	20	.03	.093	-1.01	-5.05
		experimental	20	.98	.17		
2.	Strength	control	20	.80	.38	-.25	-3.47
		Experimental	20	5.05	1.16		

Influence of specific sports training program on Speed

The First objective was to compare mean scores of speed of experimental and control groups. The data were analyzed with the help of t-test and the results are given in Table 1.

From Table 1 it can be seen that the t-value is –5.05 which is significant. It reflects that the men scores of speed of Experimental and Control groups differ significantly. Thus the null hypothesis that there is no significant difference in mean score of speed as measured by 50 meter run Test between experimental and Control Groups is rejected.

The above result has been also presented in fig. 1 graphically

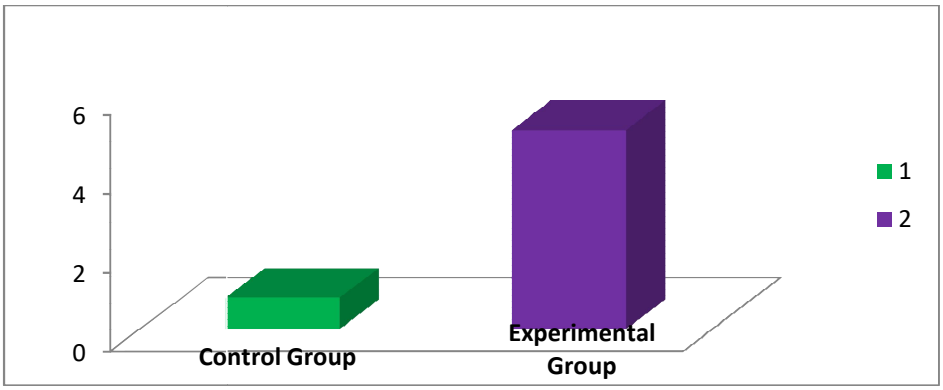


Influence of specific sports training program on Explosive Strength

The second objective was to compare mean scores of explosive strength of experimental and control groups. The data were analyzed with the help of t-test and the results are given in Table 1.

From Table 1 it can be seen that the t-value is -3.47 which is significant. It reflects that the men scores of Explosive Strength of Experimental and Control groups differ significantly. Thus the null hypothesis that there is no significant difference in mean score of Explosive Strength as measured by Standing Broad Jump Test between experimental and Control Groups is rejected.

The above result has been also presented in fig. 2 graphically



Findings

From the above analysis and interpretation of data the following findings may be drawn

- The specific sports training program improves the speed significantly.
- The specific sports training program improves the Explosive Strength significantly.

Conclusion

With the enhanced status of sports in society the provision of sports training become very important although the need for competent training has long been recognized.

After the study of the specific sports training, the interpretation & analysis of the data, scholar came to conclusion on the basis of the result of the research, and within limitation it is observed that there is a significant improvement on physical fitness variables i.e. speed and Explosive Strength after Eight week specific sports training program on boys aged 12-14 years of Dhruv Global School, sangamner, Dist- Ahmednagar.

Thus, thespecific sports training program for the period of eight weeks is effective to improve speed and Explosive Strengthof school boys.

References

1 Kansal, D.K. (1996) Test and Measurement in Sports and Physical Education, New Delhi: D.V.S. Publications.

1. Harre, Dietrich. (1982) Principles of Sports Training, Berlin: Sportverlag.
2. R. Gupta. (2011)Physical Education,UGC NET/SLET Junior Research Fellowship and lectureship Exam.
3. Late Prof. Ajmer Singh, Dr. JagdishBains. (2012) Essentias of Physical Education.
4. Singh Hardyal (1991) Science of Sports Training, New Delhi: DVS Publications.
5. Wilmore, J.H. and Costell, D.L. (1999) Physiology of Sports and Exercise. Champaign. IL: Human Kinetics.