



HEALTH-RELATED PHYSICAL FITNESS VARIABLES AND ACADEMIC PERFORMANCE

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ABSTRACT

Introduction: Participation in sports has become more enticing to many people in different regions of the world as a result of sports and the contests that are related with sports taking place all over the world.

Aim of the study: the main aim of the study is Health-related physical fitness variables and academic performance

Material and method: The goal of the current investigation is to determine the extent to which certain health-related physical fitness, skill-related physical fitness, and cognitive variables are related to the level of academic achievement attained by adolescent boys.

Conclusion:The goal of this research was to examine the connections between adolescents' health-related, skill-related, and cognitive fitness and their performance in the classroom.

1. INTRODUCTION

1.1 OVERVIEW

Participation in sports has become more enticing to many people in different regions of the world as a result of sports and the contests that are related with sports taking place all over the world. It is often believed that a sound mind may be found inside a healthy body. According to Choi, Johnson, and Kim (2014), one of the most important factors in encouraging healthy lives among students who participate in athletic activities is the presence of sporting activities. Students gain both cognitive and social skills via participation in sports. It is generally accepted that a kid who participates in extracurricular sports activities has a healthy mind; hence, there is a very good chance that this student will do very well in their academic endeavours. In general, Bailey, Hillman, Arent, and Petitpas (2013) found that the engagement in sports by students is related with a cluster of advantages. These benefits include social, mental, and cognitive welfare, as well as academic success. However, there is a rising group of individuals who hold on to an argument that kids who participate in sports activities do not do well academically. This has resulted in a discussion among academics on the consequences of students' involvement in sports and how it affects their academic performance. Throughout the last several decades, this discussion has been a source of disagreement amongst a number of different scholars.



1.2 PHYSICAL EDUCATION IN INDIA

In India, physical education has successfully attracted sufficient attention and has been generating a respectable amount of revenue. It takes an interdisciplinary approach to all of the scientific fields that deal to the transfer of physical knowledge and abilities from one person or group to another. Additionally, it is concerned with the application of these skills in order to achieve the intended outcomes. It's possible that our assumption that the educational system of a nation does not include physical education is incorrect. It is essential that it be taken into consideration as the government formulates educational strategies and draughts educational legislation. In order to maintain its health and physical fitness, India must be active and continue to work out. In general, the vast majority of those who are responsible for teaching physical education don't realise that the term "physical education" refers to more than just activities related to physical fitness; rather, it refers to the participation in organised sports along with the acquisition of the appropriate amount of knowledge pertaining to those sports and the positive effects they have on the body. The duties of a physical trainer include instructing, directing, and leading a variety of physical fitness activities for individuals or for groups, as well as leading courses for different forms of physical training. It is about cultivating and integrating movement, difficulty, health, mobility, endurance, and the ability to manage one's body as well as other bodily abilities.

2. LITERATURE REVIEW

Kapur, Radhika. (2018). The importance of education extends beyond the individual to the collective and national good. Everyone needs to raise their level of awareness and education in order to implement changes and make use of cutting-edge practises and procedures. The primary goal of this study is to investigate the elements that affect Indian secondary school students' academic performance. The academic success of children in secondary schools is affected by a wide variety of circumstances, both within and outside the classroom. Consideration has been given to the main areas of factors influencing academic performance of students, academic performance and large numbers of students in class, parental and associated factors relating to academic achievement, the contribution of school factors towards the academic performance of students, the influence of poverty on academic achievement of students, and other causes of low academic achievement.

Wretman, Christopher. (2017). Social workers should take an interest in physical activity because of the strong evidence showing its positive effects on children's growth. Regarding the potential of school sports to improve academic achievements, there is a significant void in the



literature. The purpose of this cross-sectional study was to test the mediation hypothesis between school sports involvement with academic success by way of a healthy self-perception of one's body weight and overall confidence. Method The data come from a convenient sample of 3,186 children in grades 6-9 from 14 different schools in a single county of North Carolina. The School Success Profile questionnaire was used for all the measurements. Non-normal, ordinal, and clustered data were analysed using latent variable structural equation modelling with suitable estimate strategies. Results There was a satisfactory degree of match between the measurement and structural models. Participation in school athletics was found to have a favourable effect on students' grades, how they felt about their bodies, and their sense of confidence. There was a substantial standardised effect (.225) between playing on a school sports team and final grades. School athletics were shown to be both unique and desirable when compared to a model that included solely participation in extracurricular activities that did not involve sports. Conclusions Research in the field of social work should further explore the mechanisms underlying the correlations found between school sports and a number of outcomes of relevance to social workers.

Ravikumar (2017) –This study investigate the impact of physical education and sports in promoting social values among youth. Physical education and sports plays a vital role in educating the youth regarding the importance of social values in their life. Reviewed literature investigated that the importance of association in educating both minds and body. Further, it also encourages the social values among youth that allow them to develop the social relations with their community. Moreover, the benefits of physical education and sports can influence both academic learning and physical activity of the youth.

Basak and Dutta (2016) - Physical fitness is a required element for all the activities in our society. Physical fitness of an individual is mainly dependent on lifestyle related factors such as daily physical activity levels. Physical fitness is also considered as the degree of ability to execute a physical task under various ambient conditions. The aim of this study was to determine the comparative analysis of physical fitness components of general and training college students. The data were collected by standard tools and techniques. Mean and standard deviation was used as descriptive t-test was used to measure the significance of different between two groups. Result of the present study revealed that among various physical fitness variables explosive strength, flexibility, agility, balance and muscular endurance is better in training college students than the general college students. It is concluded that training college students are significantly more fit than the general college students.



3. METHODOLOGY

3.1 RESEARCH METHODOLOGY

The goal of the current investigation is to determine the extent to which certain health-related physical fitness, skill-related physical fitness, and cognitive variables are related to the level of academic achievement attained by adolescent boys. In the first chapter of the thesis, you'll find a list of the goals that this particular research aims to accomplish. The selection of individuals, a sample, a sampling technique, variables, tests, and methods for the gathering of pertinent data were all necessary components in order to accomplish the goals and realise the purpose of the research. In order for the research scholar to accomplish the goals and realise the purpose of the current study, which he or she undertook, it was necessary for the study to have both a specific design and adequate statistical methods for the analyses of data. The research researcher has included a description of the approach that was followed as well as the strategies that were used in this chapter.

3.2 SAMPLE

A total of one thousand three hundred thirty-three (N=1333) male adolescents were selected at random from one of 10 distinct private high schools located in either of the city's two zones for this particular research project. Subjects who did not participate in sports made up 630 of the total sample size, whereas sports participants made up 703 of it. The subjects who were included in the sports participant group were those who had competed for their respective schools in a variety of interscholastic sports and games contests that were conducted by the Department of public instruction during the academic year 2014-2015. Students who did not compete for their school in any interscholastic athletic or gaming events made up the members of the non-sports participation category.



4. RESULTS

4.1 DATA ANALYSIS

4.1.1 Each hypothesis is analysed using inferential statistics

H1: There will be a significant relationship between selected Health Related Physical Fitness variables and Academic Achievement, and only a few Health-Related Physical Fitness variables will emerge as dominant predictors of Academic Achievement.

Table 4.1 Health-related physical fitness variables and academic performance: a Pearson product-moment correlation analysis (For the entire sample)

Variable1	Variable2	Correlation coefficient	Df	Pvalue
Righthandgrip	Academicachievement	.041	1331	.138
Lefthandgrip	Academicachievement	.027	1331	.320
Legstrength	Academicachievement	.070	1331	.011
Situps	Academicachievement	.082	1331	.003
Harvardstep	Academicachievement	.133	1331	.000
Sitandreach	Academicachievement	.122	1331	.000
BMI	Academicachievement	.044	1331	.109

The following are the findings from an analysis of the Pearson product moment correlation between academic success scores and a subset of health-related fitness factors. Leg strength, sit-ups, the Harvard step, and the sit-and-reach were favourably connected with academic performance. The achieved significance levels for the correlation coefficients are .011, .003, .000, and .000, yielding values of .070, .082, and .133, and .122, respectively. In other words, there was a linear and substantial improvement in leg strength, sit-ups, the Harvard step, and the sit-and-reach as academic performance scores rose. There is no correlation between right hand grip, left hand grip, or body mass index and academic performance.



Table 4.2 Findings from a hierarchical multiple regression examining academic performance with certain measures of physical health and fitness

Model	Variables Entered	Variables Removed	R	R Square	Adjusted R Square
1	Harvardstep	.	.133	.018	.017
2	Sitandreach	.	.164	.027	.025
3	Situps	.	.173	.030	.028

a. Dependent Variable: academic achievement

b. Stepwise (Criteria: Probability-of-F-to-enter \leq .050, Probability-of-F-to-remove \geq .100).

When using academic performance as the primary dependent variable and fitness-related characteristics as the independent variables in a stepwise multiple regression analysis, we find the following. Only three of seven health and fitness characteristics were significant predictors of academic success in a multiple regression analysis of fitness and accomplishment. Harvard step, with its R value of.133 squared, its R value of.018 squared, and its variance of 1.7, was the first input into the equation. Sit and reach are added to the equation as a second variable, and their combined R value is.164, R² is.027, and the variance is 2.5. Sit-ups, the Harvard step, and the sit-and-reach are the final variables added to the equation. We get a R squared value of.030, a variance of 2.8, and a R value of.173. When taken collectively, these factors could only explain for 2.8% of the variance in academic performance.

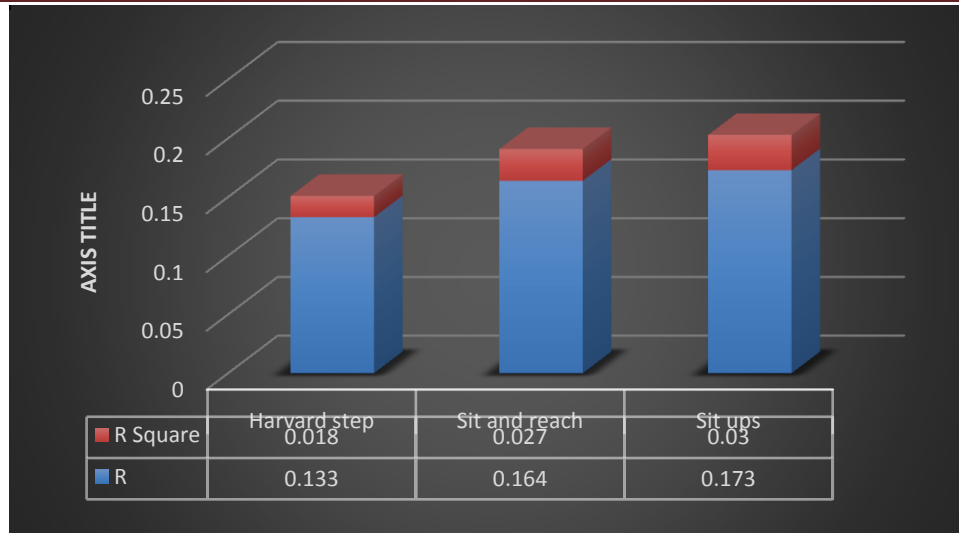


Figure 4.1 Results of a hierarchical multiple regression study of academic performance vs a subset of fitness-related factors

Table 4.3 Findings from a multiple regression analysis comparing academic performance vs certain measures of physical health and fitness

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7093.164	1	7093.164	23.793	.000
	Residual	396801.849	1331	298.123		
	Total	403895.014	1332			
2	Regression	10844.812	2	5422.406	18.348	.000
	Residual	393050.202	1330	295.526		
	Total	403895.014	1332			
3	Regression	12100.984	3	4033.661	13.683	.000
	Residual	391794.029	1329	294.804		
	Total	403895.014	1332			



All of the projected models had F-values that were statistically significant, as shown by the regression ANOVA. Significant at the .000 level are the F values of 23.793, 18.348 and 13.683 for Models 1, 2, and 3, respectively.

Table 4.4 Regression beta coefficients and t-test statistics for the relationship between academic performance and a subset of health and fitness measures

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	57.530	2.469		23.304	.000
	Harvardstep	.434	.089	.133	4.878	.000
2	(Constant)	58.465	2.472		23.652	.000
	Harvardstep	.368	.090	.112	4.064	.000
	Sitandreach	.438	.123	.098	3.563	.000
3	(Constant)	55.253	2.918		18.934	.000
	Harvardstep	.324	.093	.099	3.487	.001
	Sitandreach	.446	.123	.100	3.629	.000
	Situps	.216	.105	.057	2.064	.039

For Harvard, we get a beta of .133 in the first stage, .112 at the second, and .099 at the third. In the second stage, the beta values for sit and reach are .098, and in the third stage, they are .100. In the third stage, the beta value for sit ups is .057. Significant levels varied from .039 to .000 for the t values obtained for the constants and anticipated models.



Table 4.5 Variables not included in the regression study of academic performance on a set of health and fitness indicators

Model	Beta In	T	Sig.	Partial Correlation	Collinearity Statistics	
					Tolerance	
1	Righthandgrip	.028	1.034	.301	.028	.991
	Lefthandgrip	.016	.597	.551	.016	.993
	Legstrength	.059	2.185	.029	.060	.994
	Situps	.054	1.945	.052	.053	.948
	Sitandreach	.098	3.563	.000	.097	.958
	BMI	-.044	-1.628	.104	-.045	1.000
2	Righthandgrip	.023	.839	.401	.023	.988
	Lefthandgrip	.010	.369	.712	.010	.989
	Legstrength	.053	1.962	.050	.054	.989
	Situps	.057	2.064	.039	.057	.947
	BMI	-.041	-1.525	.127	-.042	.999
3	Righthandgrip	.023	.830	.407	.023	.988
	Lefthandgrip	.009	.348	.728	.010	.989
	Legstrength	.052	1.915	.056	.052	.989
	BMI	-.040	-1.494	.135	-.041	.999



Right hand grasp, left hand grip, leg strength, sit ups, sit and reaches, and body mass index are all first-stage exclusions. The factors right hand grip, left hand grip, leg strength, sit ups, and body mass index (BMI) are eliminated in the second phase. Finally, in Stage 3, factors such as Right hand grasp, Left hand grip, Leg strength, and Body Mass Index are ruled out.

H2: There will be a significant relationship between Skill Related Physical Fitness variables and Academic Achievement, and only a few selected Skill Related Physical Fitness variables will emerge as dominant predictors of Academic Achievement.

Table 4.6 There is a positive link between skill-related physical fitness variables and academic performance, as measured by the Pearson product moment correlation coefficient (For the entire sample)

Skillrelated variables	Variable2	Correlation coefficient	Df	Pvalue
Shuttlerun	Academicachievement	-.066	1331	.016
Basssticktest	Academicachievement	.109	1331	.000
Handeyecoordination	Academicachievement	.057	1331	.039
Speed30 mtrs	Academicachievement	-.066	1331	.016
Reactiontime	Academicachievement	-.025	1331	.355
Verticaljump	Academicachievement	-.050	1331	.068

It has been discovered that the shuttle run and speed have a substantial and negative effect on academic performance. Both the shuttle run ($r=-.066$; $p=.016$) and the speed ($r=-.066$; $p=.016$) are significantly correlated with academic performance. The table also showed a positive and substantial correlation between academic performance and the bass stick test ($r=.109$, $p=.000$) and hand-eye coordination ($r=.057$, $p=.039$). There is no statistically significant relationship between academic performance and either response time ($r= -.025$; $p=.355$) or vertical jump ($r= -.050$; $p=.068$).

Table 4.7 Multiple regression analysis of chosen skill-related fitness factors and academic performance

Mode	VariablesEntered	Variables Removed	R	R Square	Adjusted R Square
1	Basssticktest	.	.109	.012	.011
2	Handeye coordination	.	.123	.015	.014
3	Verticaljump	.	.134	.018	.016

a. Dependent Variable: academic

b. Stepwise (Criteria Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

When regressing skill-related fitness factors on academic attainment, a stepwise multiple regression analysis uncovered three important predictors. Only three of the six fitness-related skills significantly predicted academic success in a regression analysis. An R squared value of.109, a R value of.012, and a variance of 1.1 for the bass stick test were included as the first independent variable. The combined R value of.123, R2 value of.015, and variance of 1.4 is due to the inclusion of both hand and eye coordination and the first variable. In addition to the results of the bass stick test and the hand-eye coordination test, the vertical leap is the last factor. The results show an R-squared value of.018, a variation of 1.6%, and an R-value of.134. Collectively, these factors only predicted 1.6% of the students' final grade point average.

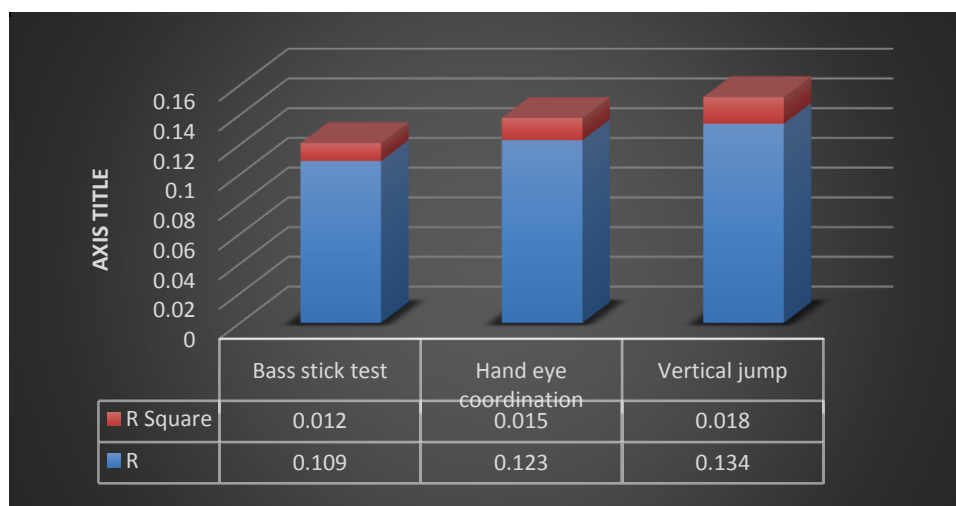


Figure 4.2 Step-by-step multiple regression results for academic performance on a subset of fitness-related skill factors



5. CONCLUSION

The goal of this research was to examine the connections between adolescents' health-related, skill-related, and cognitive fitness and their performance in the classroom. The goals of the study were to determine which independent variables best predicted academic success, to determine whether or not there were significant differences between the sports and non-sports groups of subjects with regard to the independent variables selected, to arrive at reduced components from the independent variables selected, and to observe the inter relationship among the selected independent variables. One thousand one hundred thirty-three (N=1333) male teenage students were recruited from ten different private schools in Mysore city to meet the aim and goals of the current research. These students ranged in age from 13 to 16 and were enrolled in grades 8 through 10. There was a total of 1,703 people in the sample, including 703 athletes and 630 people who didn't engage in any sports. The study's sample was selected using a combination of stratified and purposive sampling methods. In order to acquire the required data for the research, several test items were given to the individuals, and certain variables were examined. Statistical methods such as product moment correlation, stepwise multiple regression, the 'Z' test, and principal component analysis (PCA) were used to examine the data and evaluate the hypothesis (Principal component analyses).

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