



## ACADEMIC PERFORMANCE AS A FUNCTION OF MANY MEASURES OF PHYSICAL, MENTAL, AND SOCIAL HEALTH

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### ABSTRACT

**Introduction:** *The introduction of youngsters to the idea of sports, followed by some time spent participating in those games while having fun, and then moving on to the many other facets of sports should be the first step in the process of sports education.*

**Aim of the study:** *the main aim of the study is academic performance as a function of many measures of physical, mental, and social health*

**Material and method:** *The research scholar have read relevant literature pertinent to the current topic and has engaged in conversation with professionals who are well-versed in both research and physical education.*

**Conclusion:** *Agility, balance, hand-eye co-ordination, and speed were all found to have positive and significant relationships with academic achievement*

### 1. INTRODUCTION

#### 1.1 SPORTS IN INDIA

The introduction of youngsters to the idea of sports, followed by some time spent participating in those games while having fun, and then moving on to the many other facets of sports should be the first step in the process of sports education. Because youngsters are so easily swayed by video and film snippets, the training really must have auditory and visual components. This should be accomplished with the joint assistance of the instructor and the parents. When compared to the state of affairs 10 to 15 years ago, the number of individuals who have begun becoming aware of sports has increased dramatically, making it more important than ever before for there to be education provided in the field of sports. All parties involved in sports should give the Sports Education Programs the attention they are due. It's possible that a lot of people see sports as nothing more than a method to get in shape or a way to kill time, but in truth, sports are a way to experience life with all of its gusto and passion.

## **2. LITERATURE REVIEW**

Singh (2016) - Physical education and sports are the main parts of our program of study for so many years. In spite of being having its relevant aspect in our life it was ignored by the each part of the society like administration, professionals and students. In physical education, we deal with the theoretical and practical aspects as well. General concept of society regarding physical education is not so good. People think that playing is just a wasting of time that is ironically wrong. We use our time when we are under game situation and that must be considered fullest utilization of time devoted to that task. Awareness about health need to be spread to get maximum output from physical education and sports. So hurdle on the way of sports must be removed so that to enlighten the society with the brightest light of sports.

Patil&Malipatil (2016) -Youth are the salt of nation. Nations development depends on its youthful productive human resource. Healthy youthfulness emerges from all round development of the children. Physical exercises, sports and yoga play the vital role in ensuring sound health of the children. Sports and yoga help the children physically, psychologically and intellectually. Thus calls for a scientific study development of the children in order to have healthy youth to the nation.

Khandare (2016) -Development around the world has made Physical Education & Sports an important part of our life. The neglected discipline has started receiving importance these days in all the strata's of human beings. Hence due importance to physical education teaching & sports is being given due attention. Sports person are considered to be the best ambassadors of the nation & the same can be true for a teacher in physical education in Schools & Colleges. The overall scenario doesn't seem to be encouraging as there is reduced demand for physical education instead of increased risk of life for a common individual.

Tripathi, Himanshu. (2016). Studying the correlation between school-based physical exercise (such as PE) and student achievement is important. Finding the independent variables on which academic success depends is the first step in this research paper's exploration of these interrelationships. This research comes from a variety of settings where kids get their move on: in and out of the classroom, during and after school, during and after recess, and in other extracurricular settings. A total of 120 pupils from four different CBSE schools in the Bikaner District of Rajasthan were analysed in the study. To measure how well students are doing in school academically and cognitively, he employs the Stroop Color Word Task, the Examination/Test Scores, and the Physical Activity Questionnaire for Children (PAQ-C).

Dacica (2015) -Due to the fact that physical education and sports represent an important element of education and training, the purpose is to form a strong conception in youth regarding the practice of physical exercise and to value the budget of leisure for a sanogenic, educational and

recreational purpose. The paper was started from the premises that physical education represents a branch of permanent education, which desires the realization of a harmony between biologic and psychic components of the child's personality. Through sports, physical education and motion, the road towards a dreamt perfection is searched.

### **3. METHODOLOGY**

#### **SELECTION OF VARIABLES**

The research scholar has read relevant literature pertinent to the current topic and has engaged in conversation with professionals who are well-versed in both research and physical education. The research scholar made the decision to choose the variables for the study that was being carried out after conducting an exhaustive examination of the relevant prior literature. The specifics of the variables that were chosen, namely Health-Related Physical Fitness, Skill-Related Physical Fitness, Cognitive Variables, and Academic Achievement, are described in the pages that follow. During the process of identifying the variables, enough focus was placed on selecting appropriate tests and methods with which to measure those variables. In addition, the administrative viability of the tests for measuring the chosen variables and collecting the appropriate data was given the due attention it deserved. On the following pages, a tabular representation of the specifics of the tests and measurements that were chosen may be found.

#### **COLLECTION OF DATA**

According to the guidelines provided in the literature and manual, the results of chosen individuals on different test items for assessing selected variables were recorded. The evaluations of performance were quantified. All of the data for this research was compiled from the reported numerical scores on the various tests and measures. The school year 2014-2015 was examined in detail for data on academic performance; specifically, the mean percentage of marks earned on both the semester and final exams.

## 4. RESULTS

### 4.1 REGRESSION NON-SPORTS ONLY

**Table 4.1 Analyses of academic performance as a function of many measures of physical, mental, and social health.**

Model	Variables Entered	Variables Removed	R	R Square	Adjusted R Square
1	Intelligence	.	.809	.655	.655
2	Memoryreverse	.	.880	.774	.774
3	Depthperception	.	.915	.836	.836
4	Imitation	.	.915	.838	.837

a. Dependent Variable: academic

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

The following are the results of a stepwise multiple regression analysis conducted on students who did not participate in sports. The following findings were obtained by doing a multiple linear regression analysis between health and fitness, skill and fitness, and cognitive factors and academic performance. Eighteen factors (7 health-related, 6 skill-related, and 5 cognitive) were regressed on academic accomplishment, and only four of these variables significantly predicted academic success for adolescents who did not participate in sports. Intelligence was included as the first independent variable, and its R value was .809, its R<sup>2</sup> value was .655, and its variance was 65.5%. Memory reversal is the second factor in the equation alongside intellect, and it has a R value of .880, an R<sup>2</sup> value of .774, and a variance of 77.4%. With a R value of .915, an R<sup>2</sup> value of .836, and a variance of 83.6%, depth perception is the third variable in an equation including the first two. Fourth, imitation is factored in, bringing a R value of .915, a squared R value of .838 and a variance of 83.7% to the table. Thus, the remaining 16.3% of the variance in academic performance is not explained by these four factors. The other 14 factors had no effect on the outcome and contributed little if anything to student performance.

**Table 4.2 Regression analysis of variance (ANOVA) results for academic performance on a subset of health-related fitness, skill-related fitness, and cognitive variables**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	131476.660	1	131476.660	1193.228	.000
	Residual	69196.600	628	110.186		
	Total	200673.260	629			
2	Regression	155373.101	2	77686.551	1075.260	.000
	Residual	45300.158	627	72.249		
	Total	200673.260	629			
3	Regression	167863.144	3	55954.381	1067.581	.000
	Residual	32810.115	626	52.412		
	Total	200673.260	629			
4	Regression	168111.004	4	42027.751	806.681	.000
	Residual	32562.256	625	52.100		
	Total	200673.260	629			

In all 4 models, the F values produced were statistically significant at the .000 level. Models 1, 2, and 3 yielded F values of 1193.228, 1075.26, 1067.581, and 806.681, whereas model 4 yielded a value of 806.681.

**Table 4.3 Results of a regression study comparing academic performance with a variety of measures of health, skill, and intelligence**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-123.742	5.535		-22.355	.000
	Intelligence	3.671	.106	.809	34.543	.000
2	(Constant)	-154.798	4.797		-32.272	.000
	Intelligence	3.776	.086	.833	43.782	.000
	Memoryreverse	5.848	.322	.346	18.187	.000
3	(Constant)	-165.515	4.144		-39.941	.000
	Intelligence	4.080	.076	.900	53.649	.000
	Memoryreverse	4.977	.280	.294	17.798	.000
	Depthperception	4.459	.289	.264	15.437	.000
4	(Constant)	-165.566	4.132		-40.073	.000
	Intelligence	4.054	.077	.894	52.833	.000
	Memoryreverse	4.785	.292	.283	16.361	.000
	Depthperception	4.278	.300	.254	14.272	.000
	Imitation	.282	.129	.039	2.181	.030

Step one yields a beta coefficient of .809 for IQ, whereas step four yields a value of .894. Findings for the second variable, memory reversal, show a beta value of .346 at the second stage and .283 at the fourth. In the same way, the beta values for depth perception in the third and fourth stages are .264 and .254, respectively. At the fourth stage of imitation, the beta value is .039.

**Table 4.4 Characteristics not included in the regression study of academic performance on a subset of physical, mental, and social health, fitness, and cognitive variables.**

Model	Beta	t	Sig.	Partial Correlation	Collinearity Statistics	
					Tolerance	
1	Righthandgrip	-.013	-.559	.577	-.022	1.000
	Lefthandgrip	-.021	-.894	.372	-.036	1.000
	Legstrength	-.006	-.240	.810	-.010	1.000
	Situps	.013	.547	.584	.022	1.000
	Harvardstep	.085	3.640	.000	.144	.994
	Sitandreach	.054	2.299	.022	.091	.996
	BMI	-.003	-.122	.903	-.005	.989
	Shuttlerun	.032	1.371	.171	.055	.988
	Bassticktest	.002	.084	.933	.003	.996
	Handeyecoordination	-.006	-.242	.809	-.010	.997
	Speed30mtrs	.032	1.371	.171	.055	.988
	Reactiontime	-.042	-1.791	.074	-.071	1.000
	Verticaljump	.141	6.045	.000	.235	.949
	Mrmorydirect	.324	15.754	.000	.533	.934
	Memoryreverse	.346	18.187	.000	.588	.996
Imitation	.216	9.888	.000	.367	.997	
Depthperception	.326	15.844	.000	.535	.929	
2	Righthandgrip	-.012	-.646	.519	-.026	1.000
	Lefthandgrip	-.013	-.672	.502	-.027	.999
	Legstrength	-.008	-.403	.687	-.016	1.000
	Situps	-.018	-.952	.341	-.038	.992
	Harvardstep	.023	1.196	.232	.048	.962
	Sitandreach	.021	1.073	.284	.043	.986
	BMI	.023	1.195	.233	.048	.983
	Shuttlerun	.008	.393	.695	.016	.983
	Bassticktest	.006	.295	.768	.012	.996
	Handeyecoordination	.001	.061	.951	.002	.996
	Speed30mtrs	.008	.393	.695	.016	.983
	Reactiontime	-.006	-.312	.755	-.012	.989
Verticaljump	.267	15.360	.000	.523	.869	

2	Memorydirect	.258	14.932	.000	.512	.890	
	Imitation	.110	5.552	.000	.217	.879	
	Depthperception	.264	15.437	.000	.525	.891	
3	Righthandgrip	-.012	-.768	.443	-.031	1.000	
	Lefthandgrip	-.017	-1.038	.299	-.042	.999	
	Legstrength	-.018	-1.132	.258	-.045	.998	
	Situps	.003	.160	.873	.006	.985	
	Harvardstep	.021	1.288	.198	.051	.962	
	Sitandreach	.004	.243	.808	.010	.982	
	BMI	.020	1.202	.230	.048	.983	
	Shuttlerun	.022	1.321	.187	.053	.980	
	Basssticktest	.001	.059	.953	.002	.996	
	Handeyecoordination	-.002	-.116	.907	-.005	.996	
	Speed30mtrs	.022	1.321	.187	.053	.980	
	Reactiontime	-.003	-.177	.859	-.007	.989	
	Verticaljump	.098	.918	.359	.037	.023	
	Memorydirect	.053	.871	.384	.035	.069	
	Imitation	.039	2.181	.030	.087	.811	
	4	Righthandgrip	-.008	-.470	.639	-.019	.980
		Lefthandgrip	-.013	-.810	.418	-.032	.987
Legstrength		-.015	-.916	.360	-.037	.988	
Situps		.000	.015	.988	.001	.980	
Harvardstep		.021	1.251	.211	.050	.962	
Sitandreach		.006	.358	.721	.014	.979	
BMI		.019	1.143	.253	.046	.982	
Shuttlerun		.021	1.309	.191	.052	.980	
Basssticktest		.005	.291	.771	.012	.985	
Handeyecoordination		.002	.108	.914	.004	.986	
Speed30mtrs		.021	1.309	.191	.052	.980	
Reactiontime		-.004	-.248	.804	-.010	.988	
Verticaljump		.116	1.084	.279	.043	.023	
Memorydirect	.063	1.022	.307	.041	.069		

Right hand grip, left hand grip, leg strength, sit-ups, the Harvard step, the sit-and-reach test, body mass index, the shuttle run, the bass stick test, hand-eye coordination, speed at 30 metres per second, reaction time, vertical jump, memory in the forward and reverse directions, imitation, and depth perception are not included in the first step. Right hand grip, left hand grip, leg



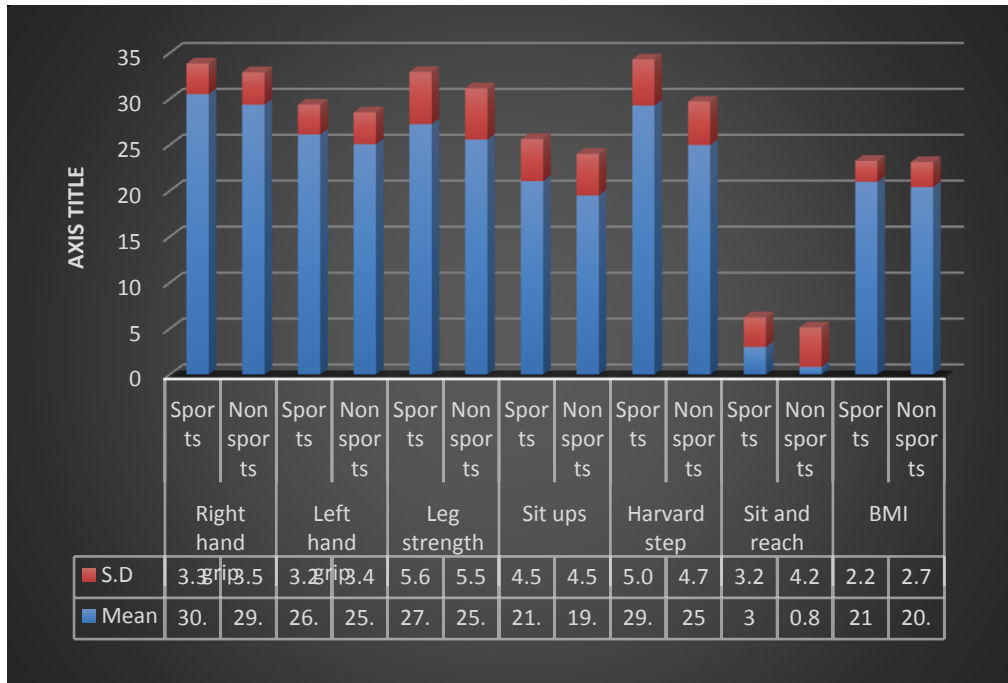
strength, sitting ups, the Harvard step jump, sitting and reaching, body mass index, the shuttle run, the bass stick test, hand-eye coordination, speed at 30 metres per second, reaction time, vertical jump, memory, imitation, and depth perception are all factors that are not included in the second step. Tests for right- and left-hand grip strength, sit-ups, the Harvard step, the sit-and-reach, body mass index, the shuttle run, the bass stick test, hand- and eye-coordination, speed (30 m/s), reaction time, vertical leap, memory (direct and indirect), and imitation are not included in the third step. Right hand grip, left hand grip, leg strength, sit-ups, the Harvard step, the sit-and-reach test, body mass index, the shuttle run, the bass stick test, hand-eye coordination, speed at 30 metres per second, reaction time, vertical jump, and direct memory are all factors that are not included in the fourth step.

**H7:** Sport participant and non-sport participant groups of subjects differ significantly in their Health Related Physical Fitness, Skill Related Physical Fitness, Cognitive and Academic Achievement variables.

**Table 4.5 Z-test results and mean scores on health-related physical fitness factors for students who do and do not participate in extracurricular sports.**

<b>Variables</b>	<b>Sports involvement</b>	<b>Mean</b>	<b>S.D</b>	<b>Zvalue</b>	<b>pvalue</b>
Righthandgrip	Sports	30.52	3.33	6.089	.000
	Non sports	29.37	3.54		
Lefthandgrip	Sports	26.12	3.25	5.692	.000
	Non sports	25.07	3.46		
Legstrength	Sports	27.25	5.69	5.437	.000
	Non sports	25.57	5.58		
Situps	Sports	21.05	4.58	6.251	.000
	Non sports	19.49	4.52		
Harvardstep	Sports	29.28	5.01	16.020	.000
	Non sports	24.99	4.71		
Sitandreach	Sports	3.00	3.23	10.307	.000
	Non sports	0.84	4.28		
BMI	Sports	20.98	2.27	4.137	.000
	Non sports	20.41	2.71		

All health-related fitness metrics show statistically significant differences between the sports and non-sports engaged groups, as determined by the Z test. All of the Z values obtained were statistically significant: right hand grip (Z=6.089; p=.000), left hand grip (Z=5.692; p=.000), leg strength (Z=5.437; p=.000), sit-ups (Z=6.251; p=.000), the Harvard step (Z=16.020; p=.000), the sit-and-reach (Z=10.307; p=.000), and body mass index (Z There is a statistically significant difference between the results of athletes and non-athletes on all of the measured categories.

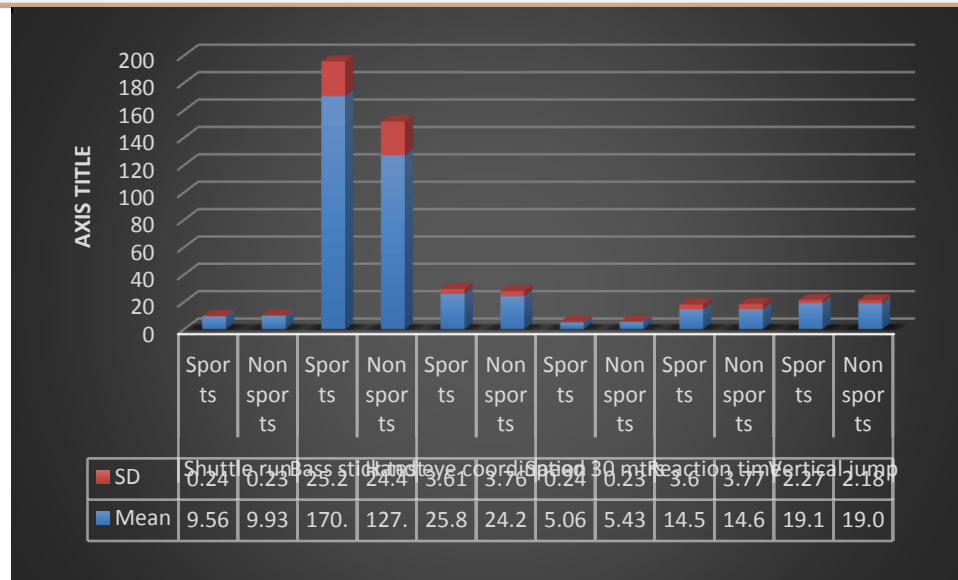


**Figure 4.1 Comparison of health-related mean scores between students who participate in sports and those who do not**

**Table 4.6 Averages and Z-test findings for many measures of skill-related fitness among athletes and non-athletes**

<b>Variables</b>	<b>Sportsinvolvement</b>	<b>Mean</b>	<b>SD</b>	<b>Zvalue</b>	<b>pvalue</b>
Shuttlerun	Sports	9.56	0.24	-28.726	.000
	Non sports	9.93	0.23		
Basssticktest	Sports	170.29	25.29	31.60	.000
	Non sports	127.20	24.46		
Hand eyecoordina tion	Sports	25.89	3.61	8.150	.000
	Non sports	24.24	3.76		
Speed30 mtrs	Sports	5.06	0.24	-28.726	.000
	Non sports	5.43	0.23		
Reactiontime	Sports	14.59	3.60	-.395	.693
	Non sports	14.67	3.77		
Verticaljump	Sports	19.15	2.27	.984	.325
	Non sports	19.03	2.18		

The shuttle run ( $Z=28.726$ ;  $p=.000$ ), the bass stick test ( $t=31.60$ ;  $p=.000$ ), the Hand eye coordination ( $t=8.15$ ;  $p=.000$ ), and the speed 30 metres ( $t=27.921$ ;  $p=.000$ ) all show significant differences between athletes and nonathletes. Students who don't participate in sports tend to do better than athletes in the shuttle run and the 30-meter dash. Students who participate in sports had much better results on the bass stick test and hand-eye coordination than their non-sports-playing peers. However, no significant changes were identified in response time or vertical leap between sports-involved and non-sports-involved adolescents, since the Z values did not meet the significance level requirement.



**Figure 4.2 Comparison of athletes and nonathletes on a range of skill-related fitness variables**

## 5. CONCLUSION

Among the health-related physical fitness variables examined, it was discovered that higher grades were associated with greater levels of leg strength, muscular endurance, cardio-respiratory endurance, and flexibility; however, only cardiovascular endurance, flexibility, and muscular endurance emerged as major predictors of grades. Agility, balance, hand-eye coordination, and speed were all found to have positive and significant relationships with academic achievement, while reaction time and power were found to have no such relationship; and balance, hand-and-eye co-ordination, and power emerged as major predictors of academic achievement.

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