

EFFECT OF SPORT PARTICIPATION ON THE ACADEMIC ACHIEVEMENT PERFORMANCE OF STUDENTS IN THE SUBJECT OF MATHEMATICS AT SECONDARY LEVEL

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ABSTRACT

Most of the previous studies' conclusions and results show that sports have great consequences and are important to students' academic achievement. The rationale of the study was to inspect the effect of participating in sports activities on the academic performance of students in the subject of Mathematics at the secondary level. Sports are considered as exertion which is competitive with precise directives with pre-requisite physical tools and area.

In these there are different physical activities like football, netball, hockey, and table tennis are the part of sports activities. The prime purpose of this research is to clarify the effect of all these activities on students' mental and physical health and academic performance in school life. The objective of this study was to investigate the impact of sports participation on the academic achievement of students in the subject of Mathematics at the secondary level. The study hypothesized that there is no significant difference between the mean score of the experimental and non-experimental groups in the subject of Mathematics at the secondary level. The study was conducted on a sample of 58 9th-class students of Government high school Ghazni Khel Lakki Marwat Khyber Pakhtunkhwa. The sample students again were grouped as experimental and control having 29 students each of the group. The posttest-only equivalent group design was used for data collection. Data were collected from the sample students in three stages by three different tests. The collected data was analyzed by applying mean, standard deviation, and t-test. The study showed that there is a statistically significant difference between the performance of the experimental and control groups.

INTRODUCTION

Choi, Johnson, and Kim (2014), highlighted that the sports activities are a main factor and always promote a healthy lifestyle among all those students who take part in these activities on daily bases.

Through sports activities, students can also increase social and cognitive skills. A student who takes part in sports activities is believed to have a sound mind and body and thus the possibility for

him to get high academics during his learning process in the institution. According to the principle of the Amateurism National Collegiate of Athletic Association (2013), an individual taking part in sports or a student-athlete is a student who is an amateur and competing in sports activities between the different colleges during the sports session to enhance his educational motivation as well as he is expected to

get social, physical and mental wellbeing from sports activities. Generally, Bailey, Hillman, Arent, and Petitpas (2013) also identified that student participation in sports is associated with a collection of advantages including mental, social, and cognitive well-being and academic achievement.

Sports and games provide an atmosphere intended for enjoyment, leisure, good health, physical development, and freedom of expression, career building, and acquisition of skills that enable one to earn a living and reduce stress (Rintaugu, 2005). United Nations (2003) demonstrated that school sports programs motivate children to enroll in and attend school therefore lowering absenteeism which in turn improves academic achievement. According to Witt and Estes (2001), participation in sports has been linked directly to higher academic performance for children under the age of 18. This is because both sports and academics require discipline, time commitment, motivation, and a desire for success. Similarly, the United Nations (2005) during of research noted that participation in sports activities contributes to the acquiring of virtues that are considered healthy in any educational program such as teamwork as well as increasing the confidence level of the students and hence leads to promoting school connectedness. Participation in sports decreases the dropout rate and allows students to build a positive attitude toward school.

Physical Education is a key component of quality education and can be used to promote schooling among young people. Bailey (2006) found that engagement in sports activities promotes academic achievement of the participants and there is a relationship between participation in sports and academic achievement. Similarly, one other study by Sibley & Etnier (2003) found that participation in both sports and physical activities enhanced the cognitive role of the brain. Nelson & Gordon-Larsen (2006) established that males and females who participated in sports performed well in Mathematics, English as well as in science subjects. This shows that athletes perform better due to their effort, hard work, and discipline gained through competitive sports participation.

Statement of the Problem

In the world, there are so many research that have been conducted on sports and academic achievement which are based on gender, dropout

rate of students, behavior and ethnicity of the students. Unfortunately in our country there are no such studies present which find out the effect of the sports activities in the subjects of science and arts at secondary level. Here in this paper the researcher tried out to found the effect of sports on the academic achievement.

Significance of the Study

The present study findings must established the effect of sports on the academic achievement of students at secondary level. This paper not only helps the Govt. views about the sports and academic performance at secondary level but it will also fill the gap in the literature found in our education side research in the subjects of Mathematics at secondary level because no sufficient and valuable research conducted at this stage on the said subject in Pakistan. This study will also help to the parents as well as the teacher of the students. This paper must provide help to the policy and also to the curriculum maker at secondary level. This research paper will also provide help not only to the science teacher but also to all subject teachers.

LITERATURE REVIEW

According to some of the research findings participating in sports activities and academic achievement are usually proportional to time spent in sports activities (Shepherd, 1997; Sallis, et al, 1999; Miller, et al 2005). Sports activities ameliorate the working capacity of crucial body systems and improve the degree of alertness among participants. Sports activities affect both students' mood and mental alertness. i.e. Leaves a positive effect on the mood and also increases the mental alertness of the students. (Hills, 1998) and it is quite apparent that physically and mentally alert students always perform better, achieve more (Taras, 2005), and like to remain present in their classes. It has been noticed that sportsmen/women show better results in Math, English (Broh, 2002), and science subjects particularly (Nelson, 2006).

Studies based on longitudinal research of children which attempt to use methodologically sound correlational data, showed that extracurricular (sport and physical) activity participation was positively related to Grade Point Average, educational aspirations, educational /occupational attainment, and standardized achievement test scores (Young,

Helton, & Whitley, 1997). Din (2006) conducted a study to ascertain the effects of sports activities on the academic development of its participants in high schools in rural areas. A total of 225 students from 5 different rural high schools in the Kentucky area of the Appalachian Mountains region were taken as samples of the study. Post-sports season academic record and standing of the students taking part in sports were compared to their pre-sports season academic record, in the subjects of English, Math, Sciences, and Social sciences. The findings of the study done by Din indicate no significant impact of "school-sponsored" sports activities on the academic enhancement of the students taking part in sports. Three research studies were conducted to determine the relationship between sports and academic performance. The result of two studies indicated that there is no positive and negative relation between participation in sports and academic performance while one study, which was conducted in Canada in 2000, indicated a negative association between participation in sports and standardized test scores (Daley and Ryan, 2000; Fisher, Juszczak and Friedman, 1996; Tremblay, Inman and Williams, 2000). The role of sports participation in the academic achievement of students has been a topic of debate for decades. Critics observe that sports activities deflect time away from the classroom, sports diverted talent from academic programs and the students who put their energies into sports are less likely to pursue academic objectives. They do not have the time or energy to achieve excellence and satisfaction in both roles. Supporters of school sports programs argue that sports participation improves students' achievement, and motivation, improves students' grades, keeps them in school, raises their educational aspirations, increases students' overall interest and commitment to schooling as well as their engagement in more student-teacher contact, more positive attitudes about schooling, and more parent-school contact. Some researchers suggested that further studies may be conducted on this topic because previous studies conducted on the topic were limited and their results were not clear (Din, 2006).

In previous years' researchers have conducted several studies to know the relationship between high school sports participation on academics but Broh (2002) said that little pieces of evidence are

present on this topic. Some other researchers said that many research studies and debates have been conducted on this topic but the impact of participation in sports on academic achievement of students is still not clear (Miller et al, 2005). In educational institutions sports activities are not regarded as an essential part of education and many people have believed that participation in sports negatively affects the education of the students (Arnett, 2006). It is also affirmed that the relationship between participation in high school sports and the academic achievements of students is a topic mostly discussed by sportsmen, society members, and researchers (Hartman, 2008). However, during research on this topic majority of researchers were not able to control the race and gender of the participants. Moreover, researchers failed to know whether the relationship between sports participation and academic achievement is permanent or casual (Broh, 2002).

Methodology

Research Design

This research was focused on the effect of sports participation on academic achievement of students in the subject of Mathematics at Govt. High School Ghazni khel Male Lakki Marwat. The study was experimental in nature and posttest only equivalent group design was used.

Population

All 372349 secondary Students participants were the population of this study (Govt. of Khyber PakhtunKhwā, 2017- 2018).

Sample

The process of selecting a portion or subset of the population to represent the entire population is known as sampling (LoBiondo -Wood & Haber. 1998, Polit & Hungler 1999). In this study Sample was 58 students of class 9th of Government High School Ghazni khel (Male) Lakki Marwat. Khyber PakhtunKhwā. The selection of school was made through convenient sampling method.

Research Instrument

This school was selected for the study because it was approachable for the researcher. A posttest was used to collect the data from the student group of experimental and control. To analyze the collected data, the mean, standard deviation, and t-test were used.

Validity of the Tools

For the validation of research tools to collect the data, the researcher requested the experts in the field of education research and the English language to refine the tool according to the needs, and requirements and make it easy, clear, and understandable after completing the requirements the tool was finalized.

Treatment Procedure

This study investigated the effect of sports activity on the student's academic performance secondary level in Khyber Pakhtunkhwa. Two groups were made each one containing 29 students and were taught by the same conventional method by the concerned subject teachers. According to the experimental procedure, eleven weeks of treatment were given through playing football. Treatment time was fixed before the school assembly for the experimental group students. The researcher took the proper consent of the

school principal as well as of the assistant director of sport for District Lakki Marwat for experimenting with the Government High School Ghazni Khel Boys at District Lakki Marwat Khyber Pakhtunkhwa. The treatment was started on 10/9/2018, and the treatment was done under the supervision of the researcher was always present in the said school from 6:30 to 7:45. The Physical instructor was always present in the ground during the treatment time of the students. The sports activities (football) duration was based on two halves of 25 minutes with 10-minute breaks after the first half. The study was carried on in three stages. The first stage of the study was 20 days and after completion, the 1st stage tests were conducted. Similarly, the 2nd stage of the study was 32 days, and tests were also conducted like the first stage after the treatment. The last and the final stage of the study were of 24 days. In the last stage, tests were also taken according to the defined procedure.

Table 1: Experimental and Control group performance description in the Subject of Mathematics at Stage 1 concerning mean, standard deviation and t-value

Subject	Groups	N	Marks	Mean	S.D	t-obtained Value 2.89
Mathematics-2	Experimental	29	50	33.59	9.32	t-obtained Value 0.679
	Control	29	50	26.21	7.99	M.D- 7.38

Now, to look at the performance of both the groups in the subject of mathematics, it can be observed, that the experimental group mean is better than that of the control group mean. It

clearly showed that the sports activities affected the Individual academics in the subject of Mathematics, who were participated in sports activities.

Table 2: Experimental and Control group performance in the subject of Mathematics at stage -2 concerning mean, standard deviation and t-value

Subject	Groups	Marks	N	Mean	S.D	t-obtained value 5.80
Mathematics-2	Experimenta 1	50	29	46.03	4.4 5	t-tabulated value 0.679
	Control	50	29	34.93	7.9 2	M.D- 11.1

Now, check the performance of both the groups in the subject of Mathematics, it can be observed, that the experimental group mean is better than

that of the control group mean. It clearly showed that the students who participate in sports activities have a higher mean than those who do not participate in sports activities.

Table 3: Experimental and Control group performance description in the subject of Mathematics at Stage 3 concerning mean standard deviation and t-value

Subjects	Marks	Groups	N	Mean	S.D	t-obtained value 5.72
Mathematics-3	50	Experimental	29	41.38	6.47	t-tabulated value 0.679
	50	Control	29	30.17	8.92	MD-11.21

Looking at the performance of both groups in the analyses of the subject Mathematics, it can be observed from the above-mentioned table that the

experimental group mean is higher than that of the control group mean, and it was due to the

participation of experimental group students in the activities of sports.

Conclusion

The conclusion made on the observations of both groups of students participating and not participating in the sports activities, students who participated in the sports activities had a greater mean than that of those who did not participate in the sports activities. All this means that sports activities affect the academic performance of the students at the secondary level. It also shows that participating in sports does not affect the teaching-learning process of students. It was also concluded that more of the students take part in football (sport) they show better results. It was also concluded that sports and academic achievements are positively correlated.

Findings

1. At stage 1st, the posttest result shows that the experimental group students performed well in academics after sports activities as compared to the control group result in the subject of Mathematics. Also, the mean score of the experimental group is higher than that of the control group. The standard deviation of the experimental group is lower than that of the control group which means that the participation in sports activities equally affected the performance of the experimental group.

2. The result of Stage 2nd showed that the posttest result of the experimental group mean is greater than that of the control group in the subject of Mathematics, while the standard deviation of the experimental group is lesser than that of the control group. All the above details show that the experimental group students' performance was well as compared to the control group students' results.

3. As all the students of the three stages were taught by the same teaching method, so in the 3rd and final stage result of the posttest both groups show that the mean score of an experimental group in the subject of Mathematics is better than that of a control group in the said subject and the standard deviation of experimental group is lesser as compared to the control group Mathematics subject. It means that the sports activities equally affected the performance of an experimental group as a whole in comparison with a control group that was involved in the sports activities.

Students who possess the talent and ability to take part in sports should be motivated by their teachers, parents, and school authorities to engage in sports activities daily inside and outside of the school.

Recommendations for Further Research

As the present study only investigated the effect of football on the academic achievements of students at the secondary level in the subject of Mathematics, therefore further studies can be conducted on the following aspects of sports. 1st of all this type of research must conduct at elementary and higher levels of education. Similarly, sports effects should also be checked on the social skills, and mental health of students at elementary, secondary, higher secondary, college, and university levels. Other sports than football effects should also be investigated on the academic achievement of students. Similarly, Rural and Urban areas of the country should also be part of such a study.

REFERENCES

- Arnett, B. (2006). *The effects of high school athletics participation in academic achievement, discipline referrals, and school attendance*. Unpublished doctoral dissertation, Argosy University, Atlanta.
- Bailey, R (2006). Physical Education and sports in Schools: A Review of Benefits and outcomes. *The journal of School health* 76 (8):397-401
- Broh, B. A. (2002). Linking extracurricular programming to academic achievement: who benefits and why? [Electronic version]. *Sociology of Education*, 75, 69-96.
- Daley, and Ryan, J. (2000). *Academic performance and participation in physical activity by secondary school adolescents*. *Perceptual and Motor Skills*: 91: 531- 534.
- Din . (2006) Sport Activities Versus Academic Achievement for Rural High School students' national forum of applied educational research journal-electronic volume 19, number 3e, 2005-2006
- Fisher, N; Juszczak, L; and Friedman, SB. (1996). Sports participation in an urban high school: Academic and psychologic correlates. *Journal of Adolescent Health*: 18: 329-334.

- Hartman, D. (2008). High school sports participation and educational attainment: Recognizing, assessing, and utilizing the relationship. Report to the LA84 Foundation.
- Hills, A.P. (1998) Scholastic and Intellectual Development and Sport. In K.M. Chan & L.J. Mitchell (eds), Sports and Children. Champaign, IL, Human Kinetics.
- Rintaugu, E. G. (2005). Socialization into Sports of Secondary School athletes in Kenya. Unpublished PhD thesis, Kenyatta University, Nairobi, Kenya.
- Miller, K. E., Melnick, M. J., Barnes, G. M., Farrell, M. P., and Sabo, D. (2005). Untangling the links among athletic involvement, gender, race, and adolescent academic outcomes. *Sociology of Sport Journal*, 22(2), 178-193.
- Nelson M.C, Gordon-Larsen P. (2006). Physical activity and sedentary behavior patterns are associated with selected adolescent health risk behaviors. *pediatrics*;117:1281-1290.
- Sallis, J., McKenzie, J., Kolody, B., Lewis, M., Marshall, S. & Rosengard, P. (1999) Effects of Health-related Physical Education on Academic Achievement: Project SPARK. *Research Quarterly for Exercise and Sport*, 70: 127-134.
- Sibley, B.A & Etnier. L (2003). The relationship between physical activity and cognition in children: A meta- analysis. *Pediatric Exercise Science* 15: 246-256.
- Shephard, R.J. (1997) Curricular Physical Activity and Academic Performance, *Pediatric Exercise Science*, 9: 113-126.
- Taras, H. (2005) Physical activity and student performance at school. *Journal of School Health* (75) (6), 214-218.
- Tremblay, Inman, & Williams, JD (2000). The relationship between physical activity, self-esteem and academic achievement in 12- years old children. *Pediatric Exercise Science*: 12: 312-323
- Witt, P. & Estes, C. (2001). Re-Examining the Role of Recreation and Parks in After-School Programs; *Parks & Recreation*, 36, (7) 20.
- Ahmed, A., Rahman, S., Islam, M., Chowdhury, F., & Badhan, I. A. (2023). Challenges and Opportunities in Implementing Machine Learning For Healthcare Supply Chain Optimization: A Data-Driven Examination. *International journal of business and management sciences*, 3(07), 6-31.
- Badhan, I. A., Neeroj, M. H., & Rahman, S. (2024). Currency rate fluctuations and their impact on supply chain risk management: An empirical analysis. *International journal of business and management sciences*, 4(10), 6-26.
- Rahman, S., Sayem, A., Alve, S. E., Islam, M. S., Islam, M. M., Ahmed, A., & Kamruzzaman, M. (2024). The role of AI, big data and predictive analytics in mitigating unemployment insurance fraud. *International Journal of Business Ecosystem & Strategy* (2687-2293), 6(4), 253-270.
- Badhan, I. A., Hasnain, M. N., Rahman, M. H., Chowdhury, I., & Sayem, M. A. (2024). Strategic Deployment of Advance Surveillance Ecosystems: An Analytical Study on Mitigating Unauthorized US Border Entry. *Inverge Journal of Social Sciences*, 3(4), 82-94.
- Young, B.N., Helton, C., & Whitley, M.E. (1997, November) Impact of School-Related, 106 Community-Based and Parental-Involvement Activities on Achievement of At-Risk Youth in the High School Sitting. Paper presented at the Annual Meeting of the Mid-South Educational Research Association, Memphis, TN. (ERIC Document Reproduction Service No. ED414533)