

**THE IMPACT OF PHYSICAL EXERCISES ON STUDENT
PERFORMANCES IN MATHEMATICS AT ISA KAITA
COLLEGE OF EDUCATION DUTSIN-MA**

HAMZA ABUBAKAR*

BABANGIDA MUSA**

Abstract

This study investigated effect of physical exercise on student achievement in mathematics at Isa Kaita College of Education Dutsin-Ma Katsina state, Nigeria. All NCE I student that offer Mathematics combination were purposively selected for the study. One hundred students participated in the study. The Physical Exercise group was the experimental group with Physical Exercise as the treatment while the control group was the None Physical Exercise group. All the student selected were offering Algebra, Coordinate Geometry, Trigonometry and Differential Calculus. Students result for 2013/2014 was extracted from the score sheet. No Physical exercise test was given exposure to Physical Exercise by the student was served as treatment. There was significant difference between Physical Exercise and none. Physical Exercise groups in achievement in each subject. However Physical Exercise student had significantly better overall achievement ($t = 2.405$ $p < 0.05$). It is recommended among the other thing that Mathematics student should be encouraged participating in physical exercise as it increased their overall performance in Mathematics at NCE Level.

* DEPARTMENT OF MATHEMATICS, ISA KAITA COLLEGE OF EDUCATION, P.M.B 5007 DUTSIN-MA KATSINA

** DEPARTMENT OF PHYSICAL AND HEALTH EDUCATION, ISA KAITA COLLEGE OF EDUCATION, P.M.B 5007 DUTSIN-MA, KATSINA

Background

The importance of physical fitness cannot be emphasized enough. In today's society that is moving towards a more sedentary lifestyle, there is a greater need than ever to increase the daily activity level to maintain both cardiovascular fitness and body weight.

Staying active means keeping your body functioning at a high level. Regular exercise will maintain the performance of your lungs and heart to most efficiently burn off excess calories and keep your weight under control. Exercise will also improve muscle strength, increase joint flexibility and improve endurance.

Another main benefit of physical activity is that it decreases the risk of heart disease, the leading cause of death in America. Additionally, it can decrease your risk of stroke, colon cancer, diabetes and high blood pressure. Regular exercise has been long associated with a fewer visits to the doctor, hospitalization and medication.

Exercising does not have to be something boring and dreaded. It can be something that you enjoy that helps to increase the overall happiness in your life, as well as relieve symptoms of stress, depression and anxiety. Try to find some activities that give you pleasure, or even a buddy to do them with so that exercise is a fun and enjoyable activity (and one that you continue on a regular basis because it adds something good to your life.

Musa (2015) the psychological benefits of exercise are just as important as the physical ones. Not to be overlooked are the positive effects of physical activity on self-image and self-confidence, and on promoting general feelings of health and wellness. Movement develops brain cells and stimulates the production of endorphins, body chemicals that help create feelings of happiness and calmness as well as ease stress and pain. A good workout can leave students feeling better about life and about them. An inactive student will feel lethargic and under stimulated.

It is important to understand that **physical activity** positively affects the following:

- Overweight and obesity

- HDL cholesterol
- Blood pressure
- Insulin resistance
- Skeletal health
- Musculoskeletal injuries
- Psychological well-being
- Self-esteem
- Anxiety and depression

Related Study

A positive relationship of physical activity and academic performance has been explored through several studies conducted in the USA by the California Department of Education; Dwyer, Sallis, Blizzard, Lazarus, & Dean (2001); Dwyer et al. (1983); Linder (1999); Linder (2002); Shephard (1997); Tremblay et al. (2000); and others. These studies support one another in suggesting that when a substantial amount of school time is dedicated to physical activity, academic performance meets and may even exceed that of students not receiving additional physical activity (Shephard, 1997).

Young people's participation in sport may lead to improved educational outcomes. Young people's participation in organized sporting activities, when compared to non-participation, improves their numeracy skills. Young people's participation in organised sports linked with extra-curricular activities, when compared to non-participation, improves a range of learning outcomes for underachieving pupils. These findings are based on six "high"-quality studies conducted in the UK and North America. Study populations included young people within the range of four to 16 years old (Karen, 2013).

Sanna, et al (2009) Physical activity and aerobic exercise in particular promotes health effective cognitive functioning. To elucidate mechanisms underlying beneficial effects of physical fitness and acute exercise, behavioural and electrophysiological indices of task preparation and response inhibition as a part of executive functions were assessed in a modified version of an Enksen

flanker task subsequently an acute bout of aerobic exercise and a period of rest, respectively. (Hasslet 2007).

Regular physical activity in adolescents is related to a favourable self-image in addition to physical and psychological well-being (Sherpert, 2002).

Amirtash, (2013) found that academic achievement was not related to enrolment in PE but surprisingly it was associated with the total amount of vigorous activity performed by the children. Subsequent analysis of 55 minute PE class revealed that only 19 minutes of this time was spent in moderate to vigorous activity and it was suggested that this was sufficient rigorous activity to impact academic activity (Molina 2006, and Saed, 2013). However a study conducted with 214 six-grade students in Michigan found that students enrolled in PE had similar grades as students who were not enrolled in PE, despite receiving 55 minutes daily classroom instruction time for academic subjects (Milina, 2006). In 2007, 287 fourth-and-fifth-grade students from British Columbia were evaluated to determine if physical activity sessions affected their academic performance. Students in the intervention group participated in daily 10-minute classroom sessions in addition to 80-minute PE class. Despite increasing in school physical activity minutes per week, students receiving the extra physical activity timescores for mathematics, reading and language arts as did students in the control group (Ahmed, 2007 and Truscott 1989).

A test for cross-sectional (at age 11) and longitudinal associations between objectively measured free-living physical activity (PA) and academic attainment in adolescents. Findings suggest a long-term positive impact of moderate-vigorous intensity PA (MVPA) on academic attainment in adolescence.

Fairul (2012) conducted study to examine the associations between self-determination, exercise habit, anxiety, depression, stress, and academic achievement among adolescents aged 13 and 14 years in eastern Malaysia. The findings support the notion that habituated exercise fosters academic performance. In addition, we found that habituated exercise buffers the combined effects of stress, anxiety and depression.

As the researchers themselves have highlighted, there is need for further high quality studies to be formed to clarify any potential link. In particular none of the studies used an objective

measure of physical activity, so it is not clear whether exercise estimates in existing studies been accurate.

Population and Sampling Techniques

A random sample of NCE I students in Mat/Phy, Mat/Chem, Mat/Geo, Mat/Comp, Mat/Bio and Mat/Eco combinations were used from Isa Kaita College of Education, Dutsin-Ma, Katsina State.

Purpose of the study

The purpose of this study was:

1. To determine whether relationship exist between physical exercise and Mathematics (Algebra, Coordinate Geometry, Differential Calculus and Trigonometry)performance at NCE level.
2. To determine whether students who participate in physical exercise have advantage over those that do not participate in physical exercise in Mathematics performance at NCElevel

Research questions

For the purpose of this research study, the following research questions were put forward:

1. Is there any relationship between physical exercise and student's performance in Mathematics at NCE Level.
2. Is there any differences between students who engage in physical exercise and those that do not engage in Mathematics performance?

Research Hypothesis

HO1: There is no significant relationship between physical exercise and student's performance, in Mathematics at NCE Level.

HO2: There is no significant differences between students who engage in physical exercise and those that do not engage in mathematics performance

Research Design

This study employed an experimental research design. There was one treatment group and also one control group. The treatment on the respondents was the Physical exercise engage by students. This was already occurring as part of the student normal activities before the analysis was conducted.

Population and Sample

The target population for the is study was all the NCEs Students offering Mathematics as one ofhis subject combinations.

One hundred (100) NCE I; students were randomly selected Fifty(50) Physical exercise and Fifty(50) none Physical exercise group

Instrumentation

The NCE I Students result for 2013/2014 was used for this study. The result for each studentwas extracted from the scores sheet. The maximum marks was 100 for each subject,

Data Analysis

Data collected from the was analysed using t-test statistics to compare means oftwo groups.

Results

Research Question: Is there any significant difference between Physical Exercise students andNone Physical Exercise students in Mathematics Combination

Subject	Whether students Engage in Physical Exercise PE or not	N	Mean	S.D	t-cal	Sig. value	Rmks
Algebra	PE student	50	44.26	18.26	1.312	1.671	Not Sign.
	None PE Students	50	40.08	13.20			
Coordinate Geometry	PE student	50	42.50	12.48	0.808	1.671	Not Sig
	None PE Students	50	.41.30	13.50			
Differential Calculus	PE student	50	39.60	13.68	0.417	1.671	Not Sig
	None PE Student	50	40.94	17.27			
Trigonometry	PE student	50	40.14	17.07	0.071	1.671	Not Sig.
	Wont PE Students	50	40.36	13.11			

df= 98, NS at 5% level of Sig.

Table 2 Comparison of PE and None PE students in Mathematics Combinations in overall achievement in Algebra, Geometry, Trigonometry and Differential Calculus

Groups	N	Mean	SD	d.f	t-cal	Sign.	Rmks
PE Students	50	44.88	17.54	98	2.409	1.99	Sign
None PE Students	50	36.96	1525				

Table 1 above shows that there is no significant difference between Physical Exercise and None Physical Exercise achievement in mathematics performance. This implies that though Physical Exercise students perform better than their None-Physical Exercise counterparts, but then difference was not statistically significant. The mean achievement of students in the mathematics clusters around average (40) as the maximum obtainable score in each subject was 100. **Research Question 2:** Is there any significant difference between Physical Exercise and None Physical Exercise overall achievement in mathematics?. Overall achievement in Algebra, Geometry, Differential Calculus and Trigonometry, sum of students' scores in various subjects. This was done to determine if Physical Exercise would influence the overall students' achievement in these subjects. Interesting, there is significant difference between Physical Exercise and None Physical Exercise achievement. Physical Exercise students have better overall mean score than none-Physical Exercise students at NCE level. The comparison of means using t-test statistics shows that the difference in achievement is statistically significant ($t = 2.409$, $p < 0.05$). Though, exposed to Physical Exercise has no significant impact on students' achievement in each of the identified subjects as presented in table 1, however, it has significant effect on the overall achievement.

Conclusion

Studies consistently show that more time in physical education and other school-based physical activity does not adversely affect academic performance.

In some cases, more time in physical education leads to improved grades and standardized test scores.

Physically active and fit children tend to have better academic achievement.

Evidence links higher levels of physical fitness with better school attendance and fewer disciplinary problems.

There are several possible mechanisms by which physical education and regular physical activity could improve academic achievement, including enhanced concentration skills and classroom behavior.

Additional research is needed to determine the impact of physical activity on academic performance among those children who are at highest risk for obesity in the United States, including black, Latino, American Indian and Alaska Native, and Asian-American and Pacific Islander children, as well as children living in lower-income communities.

Conclusion

Enhanced brain function, energy levels, body builds/perceptions, self-esteem, and behavior have been attributed to physical activity and to improved academic performance. One cannot make direct correlations from the information offered. However it is obvious that many positive relationships have been suggested. Perhaps instead of decreasing physical activity, school officials should consider developing enhanced physical activity programs.

No doubt, Students who engage in Physical Exercise is an advantage in understanding mathematics subjects. , the effect is not significant in each of the subject, however there is significant difference in the overall achievement of Physical Exercise and on mathematics students, the former performed better. If the effect of Physical Exercise can be very important at this level, no doubt this knowledge will provide a good foundation for students in College of Education especially for those who will later study mathematics and engineering at University.

Recommendations

A quality tertiary Student Physical exercise program should offer challenging yet achievable goals and include all students in each activity session. Students should build basic skills, such as skipping and hopping, and work up to developing sport skills.

All tertiary education programs in Nigeria should also include cross-curricular activities so that students who think that math is not applicable in tertiary level can see how a football field is measured and how the trajectory of a soccer kick or basketball free throw has math and physics elements. Vocabulary and history of the sport activities should be a small part and, most important, all activities should be fun and rewarding for all participants.

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