

Participation in School Based Physical Exercise and Academic Performance: A Need for Medical and Counselling Implication in Calabar South LGA of Cross River State, Nigeria

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Abstract: - The Main Purpose of This Study Was To Investigate The Relationship Between School Based Physical Exercise And Academic Performance: Need For Medical And Counselling Implication In Calabar South, Cross River State, Nigeria. To Achieve The Purpose, Two Null Hypotheses Were Generated To Direct The Study. Literature Review Was Done According To The Variables Under Study. Survey Research Design Was Adopted And A Sample Of Two Hundred (200) Students, Were Randomly Selected For The Study. The Questionnaire Was The Main Instrument Used For Data Collection. The Reliability Estimate Of The Instrument Was Established Through A Test-Retest Method. Pearson Product Moment Correlation Analysis Was Used To Analyse The Variables Under Study At 0.05 Level Of Significance. The Result Of The Analysis Revealed That Students' Attitudes Towards Physical Exercise And Participation In Morning Physical Exercise Significantly Relate To Academic Performance. Based On The Findings It Was Recommended That Students Should Develop Positive Attitude Towards Physical Education And Exercise To Enhance Their Physical, Cognitive And Improve Academic Performance.

Keywords: Participation, Physical Exercise, Academic Performance, Medical Counselling Implication

I. INTRODUCTION

Physical education is “a planned sequential standard-based programme of curricula and instruction designed to develop motor skills, knowledge and behaviours of healthy active living, physical fitness, sportsmanship, self-efficacy and emotional intelligence”. As a school subject, physical education is focused on teaching school-aged children the science and methods of physically active, healthful living (National Association of State Boards of Education – NASBE, 2012). It is an avenue for engaging in developmentally appropriate physical activities designed for children to develop their fitness, gross motor skills and health.

According to the Centre for Disease Control and Prevention (2010) physical activity is any bodily movement produced by the contraction of skeletal muscle that increase energy expenditure above a resting level. Physical exercise or activity can be repetitive, structured and planned movement (for instance, a fitness class or recreational activity such as

hiking); leisurely as in gardening; sports-focused as in basketball, volleyball; work-related as in lifting, moving and boxing; or transportation related – walking to school. Physical exercise can also be seen as biocultural behaviour; energy is expended in active behaviours that occur in different forms of cultural contexts. Through physical activity, people learn to move. Exercise is a sub-category of physical activity and can be defined as a planned, structured and repetitive physical activity (Syväoja, Kantomaa, Laine, Jaakkola, Pihälto & Tammelin, 2012).

Therefore, physical education and exercise are generally promoted for positive effect on children's physical health and regular participation in physical activity in childhood is associated with a decreased cardiovascular risk in youth and adolescents (Singh, Uijtewilligen, Twisk, Mechelen & Chanapaw, 2012). It also has beneficial effects on several mental health outcomes including health related quality life and better moods states. Thus regular participation in physical exercise enhances the brain function and cognition, thereby positively influencing academic performance (Hilman, Erickson & Kramer, 2008).

Contrarily, presently there are indicators of falling standard of education in Nigeria, Cross River State inclusive as reflected in the poor performance of students in the core subjects – Mathematics and English Language, reported by the West African Examination Council (WAEC) and the National Examination Council (NECO) in the yearly results released. The implication is that affected candidates cannot gain admission into institution of higher learning. On this, Anake (2017) advocated that, programme development in schools is an important aspect of counselling because it produces the basic foundation and direction for practice; assisting students to develop generic competencies to enable them cope effectively with their continuous development as students, workers as well as citizens in the psychological-educational approach to learning.

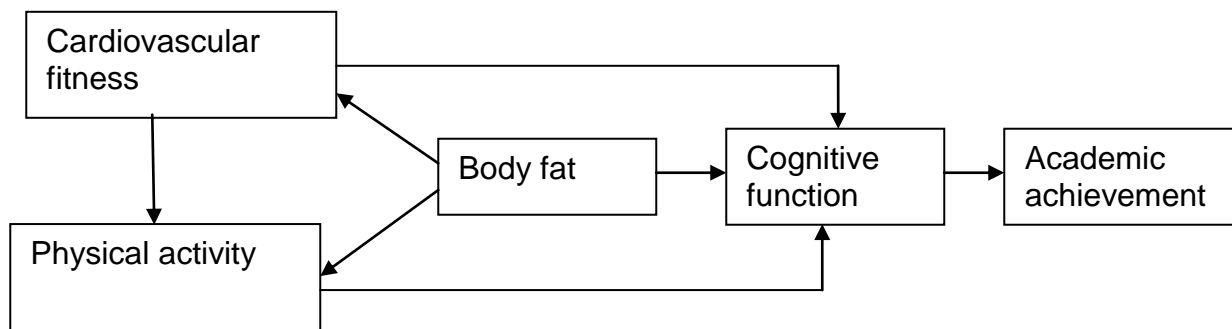
Hence, physical exercise is an opportunity for all children to be physically active and improve aerobic fitness

and academic performance. Given the demonstrated academic and health benefit; providing physical education and exercise in primary and secondary schools is recommended by the Physical Activity Guidelines for Americans (Office of Disease Preventive and Health Promotion, 2013) is a justifiable use of valuable school time.

Finally, it is incumbent on schools to maximize students’ potentials to learn. Accordingly, educators need to have the resources, support, training and skills to provide variety of physical activity opportunities for children. The national policy on education should thoughtfully integrate physical education and exercise across the curriculum, to facilitate learning for all students in various fields of studies. Hence, exercise such as biking and walking to school, playing at recess, engaging in active classroom lessons and participating in a quality physical education programme may decrease the odds of children and adolescents forming lifelong habits for learning and for positive behaviour. The main purpose of this study therefore is to determine the relationship between participation in school base physical exercise and academic performance among students in secondary schools in Calabar South Local Government Area of Cross River State.

Theoretical framework

The theoretical work adopted for this study is the Physical Activity Across the Curriculum (PAAC) model developed by Donnelly and Lambourne in 2011 in their three year project intervention that evaluated the impact of physically active academic achievement. It is randomized controlled trial to promote physical activity and diminish obesity in elementary school children. The major aim of PAAC was to increase physical activity by using classroom teachers to teach existing lessons with using physical activity. Also to diminish increase in body mass index and determine association between physically active lessons and academic achievement as well as characterized metabolic syndrome. The components of this model include cardiovascular fitness, physical activity, body fats, cognitive function and academic achievement. The model describes the associations between level of cardiovascular fitness and cognitive function in children. According to the model, children who are fit perform better on attention tasks that require greater amounts of cognitive control. This includes a subset of goal directed, self-regulatory processes that include planning, organization, abstract problem solving, working memory, motion control and inhibitory control. The model also describes the role of body fats on cognitive functions – fitness and academic achievement as shown in the figure below.



The implication of these factors associated with improved academic achievement to this study is that physical education and exercise improve cardiovascular function and fitness which in turn improves the cognitive function of students and academic performance. On the other hand inactivity or lack of exercise may lead to increase body fats (obesity) and poor cardiovascular function of students as well as poor academic performance.

Statement of problem

Observing the physical setting of most Nigerian secondary schools, where public schools have no space for sporting activities. It becomes very worrisome how children in such schools would be engaged in physical education and exercise. Physical activity is one of the contributing factors in obesity and obese youth have elevated risk for health problems like hearts disease, type II diabetes, high blood

pressure, unhealthy blood cholesterol patterns and other health risks related to cardiovascular disease. Obesity also have serious effect on the cognitive development of the child resulting to poor school attendance and achievement (Castelli, Glowack, Barcelona, Calver & Hwang, 2015).

Similarly, the inadequate provision of facilities for physical activities and the dilapidated state and lack of maintenance of the existing one have effect on the effectiveness of physical activities in schools. Moreover, there seems to be an increase in population of students due to high enrolment rate. A close observation of students’ performance seems to indicate lack of inadequate physical facilities and an enabling learning environment that could motivate students toward competitive learning and good performance.

These problems and concerns necessitated the researchers into investigating the relationship between an

assessment of participation in school based physical exercise and academic performance of students in Calabar South Local Government Area.

Purpose of the study

The purpose of the study was to investigate the relationship between schools based physical education and exercise and academic performance of secondary school students in Calabar South Local Government Area. The objectives of this study are:

- (a) To investigate students' attitudes toward school based physical education and exercise on academic performance among secondary schools in Calabar South.
- (b) To determine the impact of participation in physical exercise on academic performance of students in the core subjects (English Language and Mathematics).

Research questions

The following research questions were raised:

- (a) What are the attitudes of students towards school based physical education and exercise on academic performance of students in Calabar South L.G.A.?
- (b) To what extent does participation in physical exercise relate to academic performance of students in the core subjects (English Language and Mathematics)?

Research hypotheses

Two null hypotheses were formulated for this study in answer to the research questions.

- (a) There is no significant relationship between students' attitude towards physical education and exercise on academic performance.
- (b) Participation in morning physical exercise does not significantly relate to academic performance.

II. LITERATURE REVIEW

Literature on the study was reviewed within the context of the main objectives set out for this study on the views, opinions, assertions and empirical findings of earlier studies, to give direction and focus on what was being investigated. Hence the reviewed literature was organized under the following sub-headings:

- (a) Students' attitudes towards school based physical education and exercise and academic performance
 - (b) Students' participation in school based exercise and academic performance in the core subjects – English Language and Mathematics
- (a) Students' attitudes towards school based physical education and exercise and academic performance: Physical activity is the energy expenditure as any bodily movement that substantially increases energy expenditure over the

resting level while school based exercise is a sub-category of physical activity and can be defined as planned, structured and repetitive physical activity such as curl ups, pull ups, sit and reach, mile run or walk and the shuttle run designed by secondary school administrators to improve the physical, social and mental health of students. Accordingly, Colquitt, Walker, Langdon, McCollum & Pomazal (2012) conducted a study to explore student attitudes toward physical education among students in Georgia (US) which recently implemented a policy requiring statewide fitness testing. A paper requiring survey and fitness testing were administered to a convenience sample of middle school students. Students attitude were assessed by a likert type scale survey that measured two attitude constructs, enjoyment and perceived usefulness. Health-related fitness was assessed by the FITNESSGRAM. Females ($M = 85.76$, $SD = 10.99$) and males ($M = 88.6$, $SD = 9.78$) had similar attitude. Overall, students ($N = 122$) had positive attitudes toward physical education ($M = 87.51$) out of a possible 100 points, $SD 10.51$. Separate stepwise regression analysis indicated the PACER test was the only significant predictor of enjoyment in physical education, accounting for 16.4% of the variable ($F = (1,120) = 20.32$, $p < .0001$). PACER AND BMI were significant predictors of perceived usefulness of physical education, accounting for 15.2% of the variance ($F(1,119) = 10.69$, $p < .001$). This shows that students' attitude toward physical education can serve as a mediating factor for health-related fitness. Addressing the social and emotional health of students as advocated in the coordinated school health model may also impact health-related fitness.

In the same views, Kopczyński, Chen-Stute and Kellmann (2014) examined potential differences in attitudes toward physical activity and exercise between adolescents with body mass indices in obese and health-weight ranges. A questionnaire measuring attitudes toward, and current levels of physical activity and exercise was completed by 395 adolescents recruited from schools and 16 adolescents recruited from a non-stationary obesity treatment programme. This one year obesity treatment programme combined dietary, psychological and physical activity and exercise-related interventions administered under medical supervision compared the adolescents in the healthy-weight range, obese peers showed less positive attitudes toward intensive exercise or sporting competition and risky sporting activities. Additionally, in both weights ranges an active lifestyle is attended by a higher value of training and competition plus social experiences in sports. Independent from weight status, more positive attitudes in "training and competition" and social contacts" were related to physical and sport activity. They, therefore concluded that these results suggested that training, competitive and risky activities offer a lower incentive for obese adolescents than for healthy-weight peers, thus suggested for physical and sport activities for intervention therapy for obesity.

(b) Students' participation in school based exercise and academic performance in the core subjects (English Language and Mathematics): In a research study carried out by Sikowski (2008) to determine the effects of participation in athletics on academic performance among high school sophomores and juniors, the relationship between the in-season and out of season school academic performance of high school sophomores and juniors in United States of America. It was determined that there was a significant relationship that existed between academic performance measured by GPA, and athletic participation. Through an analysis of 249 high school sophomore and junior boys and girls, it was found that athletic participation had a positive impact on academic performance and that impact may be attributable to the difference between male in season and out of season performance.

Shriharan and Samarasinghe (2014) carried out a study to compare grade five students' academic performance with their physical fitness in Sri Lanka. Data was collected from 40 students (24 males and 16 females) during the 2014 school session to compare the relationship between academic performance and the physical fitness. Physical fitness was measured by using the "President's challenge physical fitness test" (PCPFT) and the three model papers on grade five scholarship examination were used to evaluate the academic performance. It was found that there existed a significant positive correlation between physical fitness level except for one test on PCPFT: curl ups test and scores of model papers. Among the five physical fitness tests in the PCPFT, the highest positive correlation with the scores obtained for academic papers was on the shuttle run. Overall results concludes that the alternative hypothesis of a 'significant relationship between physical fitness scores based on PCPFT and academic performance based on scores of model papers on grade five scholarship examination for fifth graders at the participation school' is true.

Furthermore, in Nigeria, Hamza and Babangida (2015) found significant differences between Nigeria college of education (NCE) students who engaged in regular physical exercise and those who did not in their performance in the NCE mathematics results. Also Abubakar, Rabin, Usman and Yahaya (2015) examined the impact of physical exercise on junior secondary school students' performance in mathematics in Nigeria, among 100 junior secondary (JSS 2) students, the statistical analysis showed there was a significant difference before and after the exercises in students' performance in mathematics ($p \leq 0.05$). Based on the findings, it was recommended among the other things that morning physical exercise should be adopted in the school system particularly at junior secondary school level in Nigeria, as it will improve students' performance in mathematics towards sustainable development in fitness and academic among Nigeria students.

III. METHODOLOGY

The area of the study was Calabar South local

government area of Cross River State located in Calabar. It is one of the 18 local government areas that constitute Cross River State; with headquarters at Anantigha. It has an area of 646km² with an estimated population of 191,630 (NPC, 2006). Politically, it is in the southern senatorial district of Cross River State and is made up of twelve (12) political wards. There are seven public secondary schools in Calabar South local government area. The targeted population of the study consist of all senior secondary two (SS 2) students in the 2016/2017 academic session in public schools only; with a total of 1,367 students from the seven secondary schools in Calabar South (Secondary School Management Board, CRS, 2017). A sample of two hundred (200) students was used for the study.

The instrument used for the study was questionnaire to elicit information from the respondents. This was made up of four sections: section A is a socio-demographic data and consists of seven (7) items; section B measures the students' attitudes towards school based physical education/exercise using CAPA scale and consists of 10 items, section C measures participation in school based exercise and consists of 13 items, while section D measures academic performance using standardized test scores of past terminal examination in core subjects (English Language and Mathematics) and consists of two (2) items. The items based on a four point likert scale were 30 items.

The appropriateness of the instrument was validated through face and content validity by experts in measurement, evaluation and psychology, who examined and certified that the instrument is capable of measuring variables in the study. Corrections observed were effected before the administration of the instrument. To determine the reliability of the instrument, the test, re-test reliability method was applied. Data generated was used to compute the reliability coefficient, which ranged between 0.77 to 0.83, indicating that the instrument was reliable to measure the variables under study.

With the help of research assistance in the selected schools, the administration of the instrument was carried out and a 100% collection of the questionnaire was retrieved with careful monitoring.

IV. RESULTS

The result of the study was based on the hypotheses tested at 0.05 level of significant.

Hypothesis 1: There is no significant relationship between students' attitudes toward physical education/exercise and academic performance. The independent variable is students' attitude toward physical education and exercise, while the dependent variable is academic performance. To test the hypothesis, the independent variable was correlated using Pearson product moment correlation analysis. The results of the analysis is presented in table 1 below.

TABLE 1

Pearson product moment correlation analysis of the relationship between students' attitude toward physical education and academic performance (N = 200)

Variables	X	SD	t-value	Sig*
Students' attitudes toward physical education and exercise	19.78	2.26	0.310*	.000
Academic performance	63.02	6.47		

Significant at .05, critical r = 000; df = 198

The result of the analysis presented in Table 1 revealed that the calculated t-value of 0.310 is higher than the critical t-value of .000 at .05 level of significance with 198 degree of freedom. With the result of this analysis, the null hypothesis was rejected. This implies that students' attitudes toward physical education and exercise has a significant positive relationship with academic performance. Also this indicate that the higher the students' attitudes towards physical education and exercise, the higher their academic performance. On the other hand the lower the students' attitude the lower the academic performance would tend to be.

Hypothesis 2: Participation in morning physical exercise does not significantly relate to academic performance. The independent variable here is participation physical exercise, while the dependent variable is academic performance. To test the hypothesis, academic performance was correlated with the participation in morning physical exercise using Pearson product moment correlation analysis. The result of the analysis is presented in table 2 below.

TABLE 2

Pearson product moment correlation analysis of the relationship between participation in morning physical exercise and academic performance (N = 200)

Variables	X	SD	r-value	Sig
Participation in morning physical exercise	19.87	8.24	0.069*	.042
Academic performance	63.02	6.49		

* significant at .05 level; critical r .042; df = 198

The result of the analysis as presented in Table 2 revealed that the calculated r-value of 0.069 is higher than the critical r-value of .042 at .05 level of significance and 198 degree of freedom. With this result, the null hypothesis which stated that participation in morning physical exercise does not significantly relate to academic performance was rejected. The result indicated that participation in morning physical exercise has a significant positive relationship with academic performance. The positive r-value implies that the more participation in morning physical exercise the higher academic performance of students tends to be.

V. DISCUSSION AND CONCLUSION

The discussion of the findings of this study was based on the result of analysis of data from the research conducted under the following:

- a. Students' attitudes toward physical education and exercise and academic performance.

The result revealed that there is a significant relationship between students' attitudes towards physical education and exercise on academic performance. This finding is in line with the views of Kopczynski, Chen-Stute and Kellmann (2014) whose results showed less positive attitudes toward intensive exercise/sporting competition and risky sporting activities. Additional, in both weights ranges of an active lifestyle is attended by a higher value of training and competition plus social experiences in sports. Independent from weight status, more positive attitude in 'training and competition' and social contacts were related to physical and sport activity. They therefore concluded that training, competitive and risky activities offer a lower incentive for obese adolescents than for wealthy-weight peers; suggested for join physical and sport activities – examples, in physical education and sport relating intervention within the therapy of obesity.

Colquitt, Walker, Langdon, McCollum and Pomazal (2012) also noted that females (M = 56.76, SD = 10.99) and males (M = 88.6, SD = 9.78) had similar attitudes. Overall, students (N = 122) had positive attitudes toward physical education (M = 87.51 out of a possible 100 points, SD = 10.51). Separate stepwise regression analysis indicated the PACER test as the only significant predictor of enjoyment in physical education, accounting for 16.4% of the variance (F(1,120) = 20.32,9<.001) PACER and BMI were significant predictors of perceived usefulness of physical education, accounting for 15.2% of the variance (F(1,119) = 10.69, p<.001). Students' attitudes toward physical education can serve as mediating factor for health-related fitness. Thus addressing the social and emotional health of students as advocated in the coordinated school health model – may also impact health related fitness.

- (b) Students' participation in school based exercise and academic performance in the core subjects (English Language and Mathematics)

The result of the second hypothesis participation in morning physical exercise and academic performance revealed a significant relationship between participation in physical exercise and academic performance. The findings in this hypothesis is in line with the view of Sitkowski (2008) who found that athletic participation had a positive impact on academic performance which may be attributed to the difference between male in season and out of season performance.

Accordingly, Shrinharan and Samarasinghe (2014) also found that there is a significant positive correlation

between physical fitness levels except for one test in PCDFT: curl ups test and scores of model papers. Among the five physical fitness tests in the PCPFT, the highest positive correlation with the scores obtained for academic papers was obtained in the shuttle run. Overall results concludes that the alternative hypothesis of a ‘significant relationship between physical fitness scores based on PCPFT and academic performance based on scores of model papers on grade five scholarship examination for fifth graders at the participation school’ is true.

It was therefore concluded that physical education and exercise, participation in morning physical exercise had a significant positive relationship on students’ academic performance which should be encourage in schools for better fitness and cognitive development of students to enable them to face any academic task.

Recommendations

Based on the findings and results, the following counselling implications were made:

1. Counsellors in collaboration with school administrators and government to intensify campaign on the importance and need for daily physical education and exercise to students and parents.
2. Physical exercise reduces the risk of heart diseases, prevent obesity, help to improve blood sugar control in patient with diabetes), check or guard against cancer.
3. Counsellors and teachers should involve all students in physical education and exercise to help keep them healthy and fit. Without exercise the muscles tone become weaker. Exercise releases endorphins, which create feelings of happiness and euphoria, thus it improves muscles and bones strength.
4. Physical exercise can also boost self esteem and improve positive self-image. Participating in physical exercise by students improve the ones’ self image which help to increase memory and ability to learn new things.
5. Finally, various studies on mice and men have shown that cardiovascular exercise can create brain cells (examples neurogenesis) and improve overall brain performance (Mustroph, Chen, Desai, Cay, DeYoung & Rhodes (2012). Their studies shows that a vigorous workout increases levels of a brain-derived protein in the body, which help in decision making, higher thinking and learning.
6. Regular physical activity increases memory and ability to learn new things. Getting sweaty increases production of cells in hippocampus responsible for memory and learning. Thus children’s brain development is linked with level of physical fitness. Hence, exercise-based brain-power also boosts memory among adults.

Conclusion

Physical education and exercise not only makes an individual physically fitter, but it also improves one’s body health and general sense of well-being. Thus physical activity or exercise can reduce the risk of developing several disease like type 2 diabetes, cancer and cardiovascular disease.

Daily exercise by students and adults can reduce stress and anxiety, boost happy chemicals, improve self-confidence, increase the brain power, sharpen the memory and increase muscles and bone strength. It is beneficial for growing children and adults to improve individuals’ quality of life.

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