The Relationship Between Level of Physical Activity
and GPA in High School Students

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INTRODUCTION

Eight National Education Goals, more commonly known as National Education Goals 2000, were established by a group of Governors and Congress in order to improve learning and achievement in our nationís schools and promote specific changes. The ìcoreî subjects in which students should demonstrate proficiency are reading, writing, math, science, civics, history and geography (Summit Education Initiative, 2000). With the increasing use of proficiency testing and teacher accountability, educational programs and curricular objectives have focused on a return to basics. Many schools have had to reduce or eliminate what are considered ìfringeî subjects (Seefeldt, 1986). Throughout the eight goals, physical education is mentioned once with the statement, íAll students will have access to physical education and health education to ensure they are healthy and fitî (Summit Education Initiative, 2000). No further description or method is proposed on how the statement should be achieved.

The concept of a Comprehensive School Health Program (CSHP), less known to the general public, addresses health-related problems in children by taking advantage of the important role schools have in reaching families and children. One critical goal or area in the CSHP is teaching skills necessary to maintain lifelong fitness (Allensworth, Lawson, Nicholson, & Wyche, 1997). Critics of such plans question the importance of goals that do not focus on academic subjects. Yet, nearly half of American youths aged 12-21 years are not actively vigorous on a regular basis. Only 19 percent of all high school students are physically active for 20 minutes or more, five days a week, in physical education classes. Also, participation in all types of physical activity rapidly decline as grade in school increases (National Center for Chronic Disease Prevention and Health
Promotion, 2000). One of the seven major contributing factors in heart disease, as stated by the American Heart Association (2000), is physical inactivity.

Although the statistics of activity levels of today’s youth are reason for concern, why should schools have an interest in increasing the students’ activity? One reason is that physical activity lends itself to setting goals for improvement and self-monitoring progress, which are also valuable in the cognitive arena (Pangrazi, 1982). Second, greater emphasis on physical education could help reverse trends of low fitness and enhance the mental achievement of students. Fitness and physical activity have been linked to improved academic performance and cognitive development in numerous studies (Allensworth, Lawson, Nicholson, & Wyche, 1997; Fry, 1988; Keller, 1982; Powell, 1984; & Templeton & Jones, 1988). Most of the published research has focused on measuring fitness using specific tests such as strength, motor skills and skinfold measurement. Physical activity, on the other hand, is considered a more general term which includes activities that take place any time during the day—such as organized sports, leisure activity and physical education courses. The purpose of this study is to look at the relationship between the activity level of high school students—including physical education, sports and leisure activities—and grade point average.

REVIEW OF LITERATURE

History of Related Studies

Interest in the relation between the physical and cognitive realms is apparent by the types of research studies that been conducted over the last 50 years. A study in Vanves, France in 1951 (as cited in Keller, 1982) was one of the first experimental studies to compare groups of students with
additional opportunities for physical fitness to those in a control group who maintained the regular amount of physical education. This study showed that school children with more physical education performed better academically and seemed to spark more studies in North America.

A study by Arnett in 1968 found that high levels of physical activity correlated significantly with grade point average in female college students. Plack (1968) studied the relationship between motor skills and reading achievement in first, third and fifth graders. Motor skills were found to be significantly different among the high, middle and low achievement groups. Kirkendall and Ismail (as cited in Keller, 1982) also looked at motor skill variables in relation to academic achievement in preadolescent children. The high intellectual group performed the best on the motor skills test, while the low intellectual group performed the poorest. A study by Ismail and Gruber (as cited in Keller, 1982) attempted to experimentally manipulate activity level. Two groups of elementary students were matched for intellectual capacity and were then randomly designated as experimental or control. Subjects in the experimental group received 30 more minutes of physical education over an entire school year. Analysis of an achievement test revealed that the children who had received more physical activity had higher achievement in reading and mathematics. A study conducted by the Manitoba Department of Education in 1976 also found a positive correlation between academic performance and physical fitness (Cosens, 1976).

More Recent Research

Studies done since the 1980s have had mixed results and often have focused on independent variables other than fitness levels. A study done in 1984 by Powell looked at the effects of a twelve week fitness program on cognitive performance. No meaningful relationship was found between cognitive ability and the three physical factors of cardiovascular, body fat and forearm strength. However, the duration of the study was short-term considering the researcher
was looking for increases in fitness. A 1988 study by Templeton and Jones had conflicting results. Three out of the ten motor skills were predictors of academic achievement in mathematics and reading, while the remaining items had very little or no correlations. Fry (1988) conducted a study with the null hypothesis that activity seekers and non-activity seekers would not differ in achievement orientation. The findings were that activity seekers had a more positive attitude toward school. No difference was found through the achievement test; however, teachers reported that the activity seekers showed higher ability in their interactions with them in class.

Considering the nature of the correctional studies that have been conducted with all age levels of students, the different definitions of physical activity and the possibility of other influences on achievement, the ability to generalize the results between physical activity and academic achievement is limited. Research from the 1990s has shifted more to how self-esteem and activity level of family members or peers relates to fitness levels of students. These recent studies show the focus is on a more holistic approach when looking at physical activity.

Two studies were identified with the variables involving self-esteem. Research done in 1997 with third through six grade students found a negative correlation between levels of high fat and low self-esteem (Corbin, Corbin, Pangrazi, Peterson and Pangrazi). Self-worth and academic motivation in student athletes were the variables in a study done by Simons, Rheenen and Covington (1999). The results indicated that those who were classified as Failure-Avoiders and Failure-Acceptors were more committed to the athletic role, while the Success-Oriented and Overstrivers showed high academic performance.

The studies done by Anderssen & Wold (1992) as well as Mathias, Brynteson, Adams & Caldwell (1997) note the importance of significant others on the general level of activity children and youth. Two major findings of the Anderssen & Wold study were that significant others do
have an influence on the leisure-time physical activity in young adolescents and that physical education can have a strong impact on positive self-concept, which is a foundation for general cognitive learning. The results of Mathias et al. were that family members who live an active lifestyle for children to observe may be the most valuable for a child’s level of fitness.

Implications for Future Research

After reviewing the various types of studies relating physical activity and fitness to academic achievement, it was apparent that the research topic is a broad area. The research historically began with a focus on children and measuring fitness levels and evolved into focusing on what other factors may influence the fitness level of participants. The recent focus on health and physical activity as lifelong endeavors and the lack of fitness especially beginning in the adolescent years, has brought the focus to that of the impact of general physical activity of high school students and academic performance.

METHODOLOGY

Subjects

This study will be conducted using a sample of high school students who will be randomly selected from schools in Northwest Ohio. The counties included are Hancock, Wyandot, Wood, Henry and Defiance. All districts are considered in this procedure because the area will represent the population as a whole. Two hundred students will be randomly selected from the five county area.
Instrumentation

The amount of physical activity that each student performs will be determined for three areas: physical education courses, extra-curricular sports, and leisure activities. The researchers produced The Physical Activity Test (P.A.T.) since no similar instrument was found. P.A.T. is a Likert-type scale that measures the level of a student's general physical activity. This instrument serves as a survey that uses a four-point scale that can be administered in a relatively short amount of time. The students will simply respond to the questions by answering to a pre-formulated point system with a range from 1 to 4 of “How often I engage in this activity”. An answer of 1 would mean “never” and 4 would mean “daily”. The instrument will contain 60 items, 20 in each of the three sections of physical education courses, extra-curricular sports and leisure activities. A few examples of questions on the P.A.T. are: “How often do you engage in an extra-curricular sport?”, “How often do you engage in the leisure activity of bicycling for more than a thirty minute time period?” and “How often do you engage in a physical education class during the school week?”

To test reliability a test/retest method will be used and a Pearson correlation will determine correlation coefficients. Validity will be measured by a pilot test of randomly chosen students at the researcher’s school. The construct validity will be measured for the activity level of students during leisure time, the student enrollment in physical education courses and the involvement in extra-curricular sports.

Procedure

At the beginning of the school year, the P.A.T. will be mailed to the appropriate high schools and administered to the 200 randomly selected students by the homeroom teacher. The directions and defined terms will be detailed at the top of the first page. Homeroom teachers will
be asked to only administer the survey and not provide any assistance. The surveys will then be mailed back to the researcher along with the most current grade point average of each student, as reported by the high school principal from the students’ accumulative file.

Data Analysis

The P.A.T. will be scored to receive a correlation coefficient. In addition, finding a mean will indicate typicality of scores, while calculating the range will show diversity in the scores. Finally, computing percentiles will enable the researcher to break the students into sub-groups: high physical activity, medium physical activity and low physical activity. This measure of relative position will allow for statistical significance for summarization and simplification of data from the sample. Significance of correlation will enable the understanding of the variable relationship.
References


http://www.cdc.gov/nccdphp/sgr/adoles.htm


http://www.seisummit.org/natlgoals.htm