The Importance of Physical Education

A Study of Physical Fitness at the Middle School Level

by

Matthew J. Roseland

Submitted in Partial Fulfillment of the Requirements for the

Degree of Master of Education

July 2009

Graduate Programs in Education

Goucher College

Table of Contents

List of Tables

Abstract

This study aimed to determine whether middle school students better improve their abdominal and upper body fitness level better through teacher-directed or student-directed warm-up activities. A quasi-experimental design was used for the study utilizing a pre-test/post-test assessment strategy. After having abdominal and upper body fitness assessed using a Fitnessgram assessment, students participated in the study over the course of 30 class periods. At the beginning of each class period, students either participated in teacher-directed or student-directed warm-up activities consisting of push-ups and sit-ups. At the end of the 30-class period, a Fitnessgram assessment was once again used to determine whether student-directed or teacher-directed warm-ups produced a greater increase in abdominal and upper body fitness. The results of the post-test indicate that there is no significant difference in improvement between the student-directed and teacher-directed group.

CHAPTER I

INTRODUCTION

Overview

Over the years, the goals and objectives of physical education have evolved to fit the prevailing public health views regarding the contributions of physical activity and fitness to health and well-being. The recent shift in public health policy toward the importance of regular physical activity has changed the way physical education is viewed in schools. (Meredith & Welk, 2007). During adolescence, it is especially critical to educate students about the importance of being fit and to encourage them to create positive habits in regard to exercise and movement that can lead to life-long fitness. Building their awareness of the importance of regular exercise may be best accomplished by involving them in self-directed—versus teacher-directed activities. The research described was conducted to explore that strategy.

Statement of the Problem

The purpose of this study is to determine whether middle school grade students improve their abdominal and upper body fitness level better through teacher directed or student directed warm-up activities.

Hypothesis

There is no identifiable difference in fitness improvement between students who perform teacher-directed warm-ups compared to students who perform student-directed warm-ups.

Operational Definition

The independent variables of this study are the fitness programs to which students are assigned. Students from Class 1 will perform student-directed warm-ups while students in Class 2 perform teacher-directed warm-ups for 30 days. The dependent variable for this study is the

FITNESSGRAM assessment developed by The Cooper Institute (Meredith & Welk, 2007). A *class* in this study is defined as a group of students who attended physical education class on a daily basis with the same teacher. *Improvement* in this study is defined as the difference between student performance on the pre-assessment and post-assessment of fitness based on using the Push-up and Sit-up Test from the FITNESSGRAM program.

CHAPTER II

A REVIEW OF THE LITERATURE

The middle school setting was established to meet the needs of adolescent learners. To address the learning needs of this student population, educators and parents act with the knowledge that this is a period of development marked by change and growth (Pill, 2006). The middle school years are documented as a vital time in the development of adolescents' knowledge, attitudes, beliefs, and behaviors. This growth period has major implications for youth far beyond the middle school years (Mohr, Townsend, & Pritchard, 2006). It is a time of exploration, self discovery and most of all, a time where children begin to move toward the independence required by adulthood . During this crucial time, it is evident that students need to be educated about the importance of being fit and to be encouraged to create positive habits in regards to exercise and movement that can lead to life-long fitness. During this stage of development, students begin to correlate positive habits in exercise and movement with healthy, safe images.

The Importance of Being Fit in the Middle School Years

The importance of fitness at the middle school level has been elevated due to the epidemic of childhood obesity in the United States. According to the Surgeon General Report (2001), "13 percent of children ages 6 to 11 years and 14 percent of adolescents aged 12 to 19 years in the United States were overweight. This prevalence has nearly tripled for adolescents in the past two decades" (Overweight Children and Adolescents Section para, 1). Children plagued by excess weight are at an increased risk of type 2 diabetes, respiratory disorders, orthopedic problems, hypercholesterolemia, heart disease, and psychological problems during their

adolescent years. Alarmingly, overweight adolescents have a 70 percent chance of becoming overweight or obese as adults.

Learning and demonstrating appropriate habits and attitudes regarding fitness during formative childhood years creates a continuous pattern into adulthood (Wright & Karp, 2006). Regular physical activity for youth results in improved strength and energy while enhancing cardio respiratory fitness. It improves the muscle/fat ratio, leading to better physical appearance and increased self-esteem. Exercise directly impacts the improvement of the cardiovascular system, the lowering of blood pressure, the strengthening of bones, and controls the chances of becoming obese (Luepker, 1999). Because social discrimination of overweight children often occurs during adolescence, exercise and increased self-perception could dramatically impact a child's experiences. Social discrimination and the subsequent isolation is often linked to poor self-esteem and depression (Overweight, 2001). Regular physical activity decreases the risk for health problems such as coronary heart disease, hypertension, and obesity. Participation in physical activity and sport can promote social well-being as well as physical and mental health among children and adolescents. (Ayvazoglu, Ratliffe, & Kozub, 2004). It is at this stage in development when students begin to attach a personal intrinsic value to exercise and a healthy lifestyle (Ward, Wilkinson, & Graser, 2008).

Why Middle School Students are Not Physically Fit

Physical activity is widely recognized as an important behavioral characteristic for health promotion and disease prevention. A large portion of the population, however, is not active enough to obtain these health benefits. Among those who begin an exercise program, 50 percent tend to abandon the program after the first three to six months. Nahas, Goldfine and Collins (2003) study indicates that "between 30% and 60% of the adult population in most industrialized

countries are considered sedentary during leisure time" (p. 43). Also, nearly two-thirds (60%) of U.S. adults report irregular patterns of leisure-time physical activity, while close to one-third (30%) report no leisure time physical activity at all (Hampson, Andrews, Peterson, & Duncan, 2007, p. 287). It is no surprise, then, that the youth of America place little value on physical fitness and healthy living habits.

One of the main causes for obesity is the excess of calories taken in relative to the calories expended (Hampson et al., 2007). According to the Center for Disease Control, a calorie is defined as a "unit of energy supplied by food". All foods, despite any label of "fat free," contain calories. A fit person is in balance with his/her caloric intake and outtake. That person is eating roughly the same number of calories that his or her body is using, causing that individual's weight to remain relatively stable over a period of time. Therefore, a person who gains weight is using fewer calories for normal body functioning that he or she ingests each day. This surplus of calories leads to more weight gain and begins the cycle for an unhealthy lifestyle. It is at this critical juncture between adolescence and adulthood that students need to acknowledge the complex relationship between physical activity, eating habits, and maintaining a healthy weight (Overweight and Obesity, 2008).

To complicate the situation, children often have a difficult time developing a clear understanding of which physical activities improve or maintain fitness. Additionally, children seem to lack a foundational knowledge of the purposes of varying intensities of exercise. (Nahas et al., 2003). Whereas adults understand the differences between the nature and purpose of leisure, aerobic, and fitness activities, children often lack that understanding. Light, moderate, and vigorous intensity levels are also concepts that generally escape students.

There are many issues in the educational community where scholars debate the effects of nature versus nurture. Certainly, the environment or community impacts the decisions adolescents make with regard to health and fitness. An increase in homework at the middle school level, along with the influx of popular sedentary activities such as time spent on the computer and video games, helps entice youth away from healthier options such as free play and exercise. Studies have reported that the average U.S. student watches approximately 24 hours of television per week. In addition, the use of the computer with video games, internet and other similar sedentary activities is increasing and permeates much of society. Many popular active leisure activities among adults, such as jogging are individual activities and are not social or group activities designed to engage youth. At home, too, parents are not modeling appropriate social activities that in the school setting promote a healthy lifestyle (Luepker, 1999).

The menu options offered at breakfast and lunch do not meet nutritional standards for a healthy lifestyle. Students would find it difficult to maintain that balance between caloric intake and outtake if they were eating two meals at school each day. Like their parents, youth rely on motorized transport and other labor saving approaches. Consequently, riding in a car tends to replace bicycling or walking as the primary source of transportation; further complicating this situation is the acquisition of the driver's license at the high school age (Wright & Karp, 2006).

The decline in the number of students participating in physical education classes has undoubtedly contributed to decreasing fitness among adolescents. The emphasis on academic education, combined with the tightening of budgets, reduced and aging facilities, and other lost resources also impacts the ability of students to participate in physical education class. The quality of any physical education that students are receiving has been in question since there has been an increasing trend to require classroom teachers to instruct physical education classes as a

reaction to budget cuts, leading to a reduction in physical education teachers. Many regular classroom teachers are neither qualified nor physically able to lead these activities, yet they are being forced into these roles by principals across the country (Luepker, 1999).

Improving Fitness of Middle School Students

"Finding ways to alter the course of our fattening world, particularly for children, is a global health priority (Hampson et al., 2007, p. 287)." If fitness development were to take place, it would seem that physical education class would be an optimum place to start. "For families who do not have community resources for physical activity, the school physical education curriculum is the one place where all children have the opportunity to be physically active (Wright & Karp, 2006 p. 145)." As anxiety continues to grow for students to perform well on high stakes tests, the value of physical education will be heavily scrutinized, making the possibility of eliminating physical education from school schedules an option for many principals.

The purpose of physical education in America's schools is profound due to the role it plays in helping students develop physically and socially (Stevens-Smith, Fisk, William, & Barton, 2006). Physical education teaches younger students how to appropriately interact with their peers, aids in the development of motor skills, and lays the foundation for basic skills associated with movement concepts. During the middle school years, PE plays a critical role in helping students deal with awkward growth spurts, uneasy social situations, and refining sporting skills for future play at an advanced level. At the high school level, PE is generally the only time for exercise and organized play that is allowed in the busy, often hectic schedules of older students (Bennett, 2008).

Today, one of the ultimate goals of physical education, at all instructional levels, is to assist in the reduction of obesity in America's youth. A recent report indicated that 13% of American children and adolescents are obese, doubling in numbers since the late 1980's. The US Food and Drug Administration (USFDA) (2002) stated, "Our modern environment has allowed these conditions to increase at alarming rates and become a growing health problem for our nation" (p. 202). That report suggests that students in all grade levels participate in daily, quality physical education classes. Physical education provides students with more opportunities to exercise, which in turn will help children address the potentially fatal issue of obesity. Certainly, many educators use these statistics as reasons to support physical education programs in public schools at all grade levels. In addition, physical education classes provide all students the opportunity to be introduced to and to practice healthy exercise habits. Because obesity is on the rise, the nation as a whole should rely on physical education classes to encourage and promote an active lifestyle.

In a middle school setting, physical education classes are a unique time of development for students. Relationships with peers, teachers, and the subject area are vital to each student's quality of participation. Instructors must incorporate student-focused activities that are based on the needs of the learner and driven by student-based results. A safe learning environment is necessary as students are beginning to engage in risk-taking activities. In addition, the environment must be free from criticism, ridicule, and embarrassment. Since middle grade students place high importance on social interactions, the physical education environment is the perfect setting to encourage collaborative interactions between students who rarely intermingle or work together (Bennett, 2008).

Outside of the classroom, adolescents need to reduce time spent watching television and other similar sedentary behaviors and build time into their day for regular physical activity. According to the Surgeon General Report (2001)," it is recommended that Americans accumulate at least 30 minutes (adult) or 60 minutes (children) of moderate physical activity most days of the week" (Healthy Weight Advice for Consumers para. 2). The report also suggest that children be encouraged to get involved in activities that provide exercise and enjoyment such as swimming, skating, biking and ball sports (Overweight, 2001). Involvement in enjoyable and pleasurable exercise promotes healthy life habits and fosters a multi-faceted sense of self.

In reference to diet and nutrition, parents and schools need to promote healthier food choices which include reasonable portion sizes and encouraging young adults to eat only when hungry and to practice eating slowly. The US Department of Agriculture sets regulations that prohibit serving foods of minimal nutritional value during mealtimes in school food service areas, including vending machines; following such regulations would encourage students to eat healthier. Schools also can work harder to provide meal options for students that are low in fat and calories and increase options for more fruits, vegetables, whole grains, and low fat foods. Families are encouraged to eat together, cut down the amount of fat and calories in the family diet, and avoid using food as a reward. One's perception of the purpose of food comes into play in this aspect as well. Too often in today's society, food has a social connotation, where food is used as way to make connections with others or satisfy a personal shortcoming. However, students need to view food as fuel for their body's daily activities. Finally, parents should encourage their children to drink water and limit the intake of beverages with added sugars such as soda, fruit juice drinks and sport drinks (Overweight, 2001).

Summary

Students at the middle school level are growing physically as well as emotionally. They are in the process of discovering who they are and who they want to be. Middle school educators thus have the opportunity to help students learn the habits of mind required for physically active and healthy living now and in the future (Pill, 2006). Physical education provides students with positive experiences associated with physical activity that helps in maintaining a physically active lifestyle. Few would argue against the idea that physical education represents an area of the middle school curriculum that has the potential to impact adolescents' developing knowledge, attitudes, beliefs, and behaviors in positive and meaningful ways that may endure across the lifespan.

CHAPTER III

METHODS

The purpose of this study was to examine whether students would improve their upper body and abdominal strength and endurance better through teacher-directed warm-ups as opposed to through student-directed warm-ups.

Design

The study was a quasi-experimental design using a pre- and post-test format.

Participants

The participants were students enrolled in one of two eighth grade physical education classes. A convince sample was utilized in this study as the classes were the two in the researcher's schedule that attended physical education on a daily basis. Class 1 consisted of 30 students (8 females and 22 males) who attended class everyday from 9:50 to 10:40. Class 2 consisted of 29 students (8 females and 21 males) who attended class on a rotating schedule. On A days, Class 2 attended physical education class from 1:00pm to 1:50pm, while on B days they attended class from 8:10 am to 8:50 am.

Instrument

The instrument used for the data collection was the FITNESSGRAM program developed by the Cooper Institute in Dallas Texas (Meredith & Welk, 2007). FITNESSGRAM is designed to assist teachers in helping students establish physical activity as a part of their daily lives. FITNESSGRAM is a comprehensive health-related fitness assessment that is designed to measure students cardiovascular fitness, muscle strength, muscular endurance, flexibility, and body composition. This program allows teachers to produce individualized reports that provide feedback based on whether the child achieved the criterion-referenced standard for physical

activity or fitness. The use of health-related criteria helps to minimize comparisons between children and emphasizes personal fitness for health rather than goals based on performance.

During this study, the 90 degree push-up test and the sit-up test were utilized. The push up test measures the strength and endurance of the muscles in the upper body which are important in activities of daily living, maintaining functional health and promoting good posture. The sit-up test measure the strength and endurance of the abdominal muscles which are important in promoting good posture and correct pelvic alignment. It is important that children learn the importance of upper body and abdominal strength and endurance as well as methods for developing and maintaining this area of fitness

Procedures

The purpose of the study was to investigate whether students better improved their fitness levels during physical education through student directed or teacher directed warm-ups. Both classes used in this study were assessed on their current fitness levels for abdominal and upper body strength using the FITNESSGRAM assessment program. Before the students performed the assessment, their name, age, and race were recorded on a data sheet.

The 90 degree push-up test is used to assess each student's upper body strength. The objective of the test was for the students to complete as many 90 degree pushups as possible at a rhythmic pace. The students performed push-ups to a cadence of 20 push-ups per minute (one 90 degree pushup per 3 seconds). The students being tested were asked to assume prone position on the mat with hands placed under or slightly wider than their shoulders, fingers stretched out and their legs straight. The student performed as many push-ups as possible until they were stopped for their second form correction (mistake). Only one form correction was allowed during the testing process. Form corrections included one of the following: stopping to rest or

not maintaining the rhythm, not going all the way to 90 degrees, not maintaining correct body position and not extending arms fully. For easy administration, the first mistake is counted as a successful pushup. The students' results for the push-up test were recorded on a data sheet.

The sit-up test was performed in groups of five students for timing purposes. The objective of the test was to complete as many sit-ups as possibly up to a maximum of 80. The sit-ups were also completed at a specific pace of one sit-up every three seconds. Students were stopped after completing 80 sit-ups or after their second form correction/mistake were made. Form corrections include students not keeping pace with the cadence, their arms coming off their shoulders or their hips coming off the ground. The students' results for the sit-up test were recorded on a data sheet.

For approximately 30 class periods, Class 1 participated in daily physical education warm-ups where the students chose their own workout during the same time period. Class 2 participated in daily physical education warm-ups where the teacher directed the entire warm-up while the students followed his or her direction. At the conclusion of the study, both groups went through the same FITNESSGRAM testing and the data was recorded. Other data collected at the end of the study was each student's current physical education grade and the number of classes the student missed during the 30 day trial.

CHAPTER IV

RESULTS

This study aims to determine whether middle school students improved their abdominal and upper body fitness level better through teacher directed or student directed warm-up activities. Two groups were selected and participated in a pre-test assessment. Over the course of 30 days, one group received teacher directed warm-up activities and the other participated in student directed warm-up activities. The groups then participated in a post test and the results were recorded. The null hypothesis that there is no difference in upper body/abdominal strength related to instructional approach was not rejected.

Table I describes the mean and the standard deviation of the number of sit-ups (abdominal strength) and pushups (upper body strength) performed by the students whose instruction was student directed (experimental) and teacher directed (control group).

Table 1. Pre- and Post-Treatment Performance on Two Indicators of Fitness

Treatment Group	Number of Students	Pre—Mean/SD Upper Body Strength (Sit-Ups)	Post—Mean/SD Sit-Ups Performed	Pre—Mean/SD Push-Ups Performed	Post—Mean/SD Push Ups Performed
Experimental	30	75.23/10.64	77.16/8.37	19.40/8.07	21.20/8.36
Control	27	73.70/14.13	74.70/12.91	19.70/11.60	21.28/11.15

To address the null hypothesis, an analysis of covariance was performed on the post-test data in order to see whether there were any treatment group differences once pre-existing group differences (unrelated to the treatment) were accounted for. In both cases, as Tables 2 and 3 show, the null hypothesis was not rejected. There were significant pre test differences, but once the posttest scores were adjusted for those, there was no difference attributable to treatment.

Table 2: A Comparison of Experimental and Control Group Performance on Number of Sit-Ups Performed: An Analysis of Covariance

Source of Variance	Degrees of Freedom	Mean Square	F
Pretest	1	3560.14	69.99*
Treatment	1	13.85	<1 (n s)
Within (Error)	56	50.86	

*p<.000

Table 3: A Comparison of Experimental and Control Group Performance on Number of Push-Ups Performed: An Analysis of Covariance

Source of Variance	Degrees of Freedom	Mean Square	F
Pretest	1	4212.79	216.12*
Treatment	1	1.13	<1 (n s)
Within (Error)	54	19.49	

*p<.000

CHAPTER V

DISCUSSION

The null hypothesis that there is no difference in upper body and abdominal strength related to instructional approach was not rejected. Although improvement was evident in both groups, there was no significant evidence that one treatment led to a higher improvement of fitness.

Threats to Validity

There are several threats to the validity of this study. Internal sources of threats to validity include the flaws in the design and execution of the study. There was a limited sample of behavior on the pre and post test as each test was given in one day. The students' energy level, motivation and emotional state on the day of the pre and post test could have impacted their results.

The execution of the test could have impacted the results as well. The sit-up test was distributed to half of the class at a time. This form of distribution relied on one partner to proctor the their partners performance. The teacher thus relied on the middle school peer examiner to make form corrections and to stop their partner when they had made their second mistake. Each student interprets whether their partner is conducting the test appropriately leading to inconsistencies in whether a student was performing the task correctly.

Students absent multiple days as well as disruptions such as fire drills, picture days, and students lateness to class could have also effected student improvement. The post test was distributed to the kids the day before spring break. The makeup test was not distributed until after a 13 day break from school. Such a layover may have affected student performance.

The daily attendance time of each class could also be a factor in student performance. The experimental group attended class on a consistent basis from 9:30 am to 10:40 am daily. The control groups schedule rotated on an every other day basis where they ended class either at 8:10 am or 1:00 pm. This could have had effects on both the testing and treatment phases of the study.

Student motivation and personal learning styles may also affect their performance. Students who are not intrinsically motivated probably struggled to achieve improvement in the student directed learning group. Similar assumptions can be made for the students who are not extrinsically motivated and they may have struggled to achieve improvement in the teacher directed group.

External sources of threats of validity include the likelihood of getting the same results if you performed this study with a different sample. The fact that this study was done in a small school setting only utilizing two classes limits the results. Also, the sample limited the students to every day physical education students. Over half of the school building is involved in a performing arts class and attend physical education on an every other day basis. This study consequently excluded half of the school's population.

Other studies have found similar findings in reference to student achievement and their learning style. A similar study explores whether the leadership style of the teacher or the learning style of the student affects academic achievement more. The sample included 746 eighth-grade students where the learning styles examined were: group, individual, visual, auditory, tactile, and kinesthetic. Findings indicated that teacher leadership style was the main factor affecting academic performance and that there was no significant relationship between learning style and academic achievement (Osman, Ahmet, Bull, & Levent, 2008). This study's

results were similar in that both led to no significant evidence that one particular style led to an increase in achievement or improvement.

In reference to future studies, it was observed that both groups showed improvement in both abdominal and upper body strength throughout the study. Although research on teaching/learning styles has been ongoing for quite some time, further research is still warranted. Future suggestions for this specific type of study are to target a larger population and to extend the treatment over a longer period of time. The inclusion of the entire physical education program rather than one teacher is also suggested.

REFERENCES

Ayvazoglu, N. R., Ratliffe, T., & Kozub, F. M. (2004). Encouraging lifetime physical fitness. *Teaching Exceptional Children, 37*(2), 16-20.

Bennett, C. (2008). Research Starters Education: Teaching physical education. (pp. 1-1) Great Neck Publishing.

Hampson, S. E., Andrews, J. A., Peterson, M., & Duncan, S. C. (2007). A cognitive-behavioral mechanism leading to adolescent obesity: Children's social images and physical activity. *Annals of Behavioral Medicine, 34*(3), 287-294.

Luepker, R. V. (1999). How physically active are american children and what can we do about it? *International Journal of Obesity & Related Metabolic Disorders, 23,* s12.

Meredith, M.D., & Welk, G. j. (2007). FITNESSGRAM ACTIVITYGRAM Test Administration Manual.(4th ed.) Dallas: The Cooper Institute.

Mohr, D. J., Townsend, J. S., & Pritchard, T. (2006). Rethinking middle school physical education: Combining lifetime leisure activities and sport education to encourage physical activity. *Physical Educator, 63*(1), 18-29.

Nahas, M.V., Goldfine, B., & Collins, M.A. (2003). Determinants of physical Activity in adolescents and young adults: The basis of high school and college physical education to promote active lifestyles. *Physical Educator, 60*(1), 42-57.

Osman, Y., Ahmet, C.A., Bull, S., & Levent, S. (2008). Relationships between teachers/ perceived leadership style, students' learning style, and academic achievement; a study on high school students. *Educational Psychology*, 28(1), 73-81.

Overweight and Obesity. (2008, October 24). *Center for Disease Control: Division of Nutrition, Physical Activity and Obesity* [Fact sheet]. Retrieved December 8, 2008, from Department of Health and Human Services Web site

http://www.cdc.gov/nccdphp/dnpa/obesity/index.htm

Overweight in Children and Adolescents. (2001, January 8). The Surgeon General's Call To Action To Prevent and Decrease Overweight and Obesity (Press Release). Retrieved December 8, 2008, from U.S. Department of Health and Human Services: Office of the Surgeon General Web Site: http://www.surgeongernal.gov/topics/obesity/calltoaction/fact_adolescents.html

Pill, S. (2006). Physical education in the middle school. *Primary & Middle Years Educator, 4*(2), 25-29.

Stevens-Smith, D., Fisk, W., William, F., & Barton, G. (2006). Principals' perceptions of academic importance and accountability in physical education. *International Journal of Learning, 13*(2), 7-19.

U.S. Food and Drug Administration. (2002). Overweight, obesity threaten U.S. health gains. *FDA Consumer Magazine*, 202-203.

Ward, J., Wilkinson, C., & Graser, S. V. (2008). Effects of choice on student motivation and physical activity behavior in physical education. *Journal of Teaching in Physical Education, 27*(3). 385-398.

Wright, R. W., & Karp, G. T. (2006). The effect of four instructional formats on aerobic fitness of junior-high school students. *Physical Educator*, *63*(3), 143-153.