

Meeting Minimum Health Standards in the
Presidential Fitness Challenge Fitness Tests for
Cardiorespiratory Endurance and Muscular Endurance

A Special Project

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FACULTY APPROVAL

Meeting Minimum Health Standards in the Presidential Fitness Challenge Fitness
Tests for Cardiorespiratory Endurance and Muscular Endurance

Approved for the Faculty

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ABSTRACT

The purpose of this study was to determine if receiving the Washington State mandated minutes of physical education as pursuant to WAC 28A.230.040 which equates to minimum of three of four quarter scheduling system, was effective in improving health related fitness scores on the Presidential Fitness Challenge health related fitness tests of the mile run for cardiorespiratory endurance and curl-ups for muscular endurance. Two eighth grade classes at Tumwater Middle School participated. The control group received three quarters, and the experimental group did not receive three quarters of Health and Fitness. The intervention was conducted for 27 weeks or three quarters. The growth shown by the control group was significant enough to support the hypothesis; therefore, the null hypothesis was rejected.

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TABLE OF CONTENTS

	Page
FACULTY APPROVAL.....	ii
ABSTRACT.....	iii
PERMISSION TO STORE.....	iv
TABLE OF CONTENTS.....	v
LIST OF TABLES.....	viii
LIST OF FIGURES.....	ix
CHAPTER 1.....	1
Introduction.....	1
Background for the Project.....	1
Statement of the Problem.....	3
Purpose of the Project.....	4
Delimitations.....	5
Assumptions.....	6
Hypothesis or Research Question.....	7
Null Hypothesis.....	8
Significance of the Project.....	8
Procedure.....	9
Definition of Terms.....	11
Acronyms.....	12

	Page
CHAPTER 2.....	14
Review of Selected Literature.....	14
Introduction.....	14
Current Trends in Childhood Obesity.....	14
No Child Left Behind Act.....	17
Federal Movements on Physical Activity and Fitness levels.....	18
Physical Activity on Learning.....	26
Summary.....	30
CHAPTER 3.....	32
Methodology and Treatment of Data.....	32
Introduction.....	32
Methodology.....	32
Participants.....	33
Instruments.....	34
Design.....	37
Procedure.....	37
Treatment of the Data.....	40
Summary.....	40
CHAPTER 4.....	42
Analysis of the Data.....	42

	PAGE
Introduction.....	42
Description of the Environment.....	42
Hypothesis/Research Question	43
Null Hypothesis.....	44
Results of the Study.....	44
Findings.....	59
Discussion.....	61
Summary.....	62
CHAPTER 5.....	63
Summary, Conclusions and Recommendations.....	63
Summary.....	63
Conclusions.....	64
Recommendations.....	66
REFERENCES	67
SUPPLEMENTAL REFERENCES.....	67
APPENDICES	79

LIST OF TABLES

	Page
Table 1 Student Cardiorespiratory Endurance Growth for 3 Quarters.....	45
Table 2 Student Cardiorespiratory Endurance growth for Less Than Three Quarters.....	47
Table 3 Student Muscular Endurance Growth for Three Quarters.....	49
Table 4 Student Cardiorespiratory Endurance Growth for Less Than Three Quarters.....	50
Table 5 Student Post Confidence Survey.....	58

LIST OF FIGURES

	Page
Figure 1 Mean Cardiorespiratory Growth	53
Figure 2 Mean Muscular Endurance Growth.....	54
Figure 3 Mean Muscular Endurance Growth of Males and Females.....	55
Figure 4 Cardiorespiratory Endurance t-Test for Independent Samples.....	56
Figure 5 Muscular Endurance t-Test for Independent Samples.....	57
Figure 6 Post Confidence Survey Results for Question Nine.....	59

CHAPTER 1

Introduction

Background for the Project

Federal emphasis on physical fitness began in June of 1956 with the adoption of the Presidential Council of Physical Fitness and Sport (PCPFS) by President Eisenhower. The council was derived based upon research about how the youth of the United States compared to their European counterparts. Over the following years of the program along with the guidance of President John F. Kennedy, the federal emphasis moved towards the issue of increased levels of physical activity in all Americans, which emphasized children in schools. The emphasis on school aged individuals resulted in the prioritization of physical education programs and community partners. (Centers for Disease Control and Prevention, 2009) The council led research on physical activity as related to levels of obesity and heart disease. The research reported by the Center for Disease Control helped lead to the creation of the American Alliance of Health, Physical Education & Recreation along with the development of youth fitness tests. These youth fitness tests would be one of the first fitness tests used to assess students' fitness levels with focus on health related fitness levels rather than the original skills related fitness levels. (Centers for Disease Control and Prevention, 2009) Much research from the President's Fitness Council led to more research focused in the areas of student fitness levels as associated with how the brain learns and the relationship to student academic achievement. (Active Living Research, 2007)

As a result of the increased research and emphasis from the federal level in the area of obesity and physical activity, many other agencies research became important, such as reports by the Center for Disease Control and Prevention (CDC). The CDC has led the research and

reported important obesity related statistics, such as the growing trend of childhood obesity in the United States. As reported in 2008 the CDC found a dramatic increase from 1980 to 2008 in childhood obesity. The CDC reported, “The prevalence of obesity among children age 6 to 11 years increased from 6.5% in 1980 to 19.6% in 2008 while the prevalence of obesity among adolescents age 12 to 19 years increased from 5.0% to 18.1%.” (Center for Disease Control and Prevention, 2010 p. 3)

With reported data and statistics on childhood obesity and physical activity levels, Healthy People 2010 was created and implemented during the Bush Administration to deal with the different areas of health that were occurring with the people of the United States. The one area associated with childhood obesity was the area of physical activity in children and adolescents. The collected data gave areas of strength and weaknesses in which the federal government could use Healthy People 2010 to set specific goals on increasing students physical activity levels and fitness levels.

1. The collected data showed that only 27% of students in grades 9-12 engaged in moderate physical activity for at least 30 minutes on 5 or more of the previous 7 days in 1999 with a goal to increase to at least 35% by 2010.
2. Increase the percentage of students in grades 9-12 engaged in various physical activity 3 or more days per week for 20 or more minutes per occasion in 1999 from 65% to 85% by 2010.
3. Increase the number of private and public schools that require daily physical activity for all students 17% in 1999 to at least 25% in 2010.
4. Increase the proportion of adolescents who participate in daily school physical education in grades 9-12 from 29% in 1999 to at least 50% by 2010. (Spain & Franks, 2001)

Statement of the Problem

In the state of Washington, the Washington Administrative Code (WAC) and the Revised Code of Washington (RCW) 28A.230.040 stated that all students in public education should receive no less than 100 minutes per week in quality physical education per year. This law presented an issue that Tumwater Middle School (TMS) students were not meeting the required number of minutes per student per year with the scheduled system. The scheduled plan along with high demands to meet annually yearly progress (AYP) escalated the issues of TMS students who did not meet the required physical education minutes for all students. TMS had Health and Fitness, the equivalent to state defined physical education scheduled as an elective and not a core class which resulted from a scheduled four quarter system. In order to meet the RCW and WAC for physical education for all students, each student would be required to be in at least three of the four quarter of physical education.

With Health and Fitness on a four quarter elective scheduling system, a small percentage of students received four quarters of Health and Fitness with a growing percentage that received three quarters, two quarters, or zero quarters of Health and Fitness. All students who received less than three quarters did not meet the state requirements of physical education and were placed in other class subject areas such as band, choir, remedial learning classes, and high capabilities classes with no proper waiver processes as pursuant WAC 392-410-136.

Purpose of the Project

The purpose of the project was to demonstrate the need of meeting WAC 392.410.135 in order to give adequate time and education to all students that showed improvement on their health related fitness levels in order to meet the Presidential Fitness Challenge as derived by the Presidential Fitness Council. By testing and collecting data the project would show how students

that met the WAC 392.410.135 demonstrated greater improvement in the Presidential Fitness Challenge cardiorespiratory endurance health related fitness scores and the Presidential Fitness Challenge muscular endurance health related fitness scores. Along with a higher percentage of students that received three quarters of Health and Fitness, students could also benefit from the growing demand of student achievement scores as quality physical activity related to student learning and student achievement.

The project would also demonstrate a greater perception of the students through the acknowledged confidence in the ability to meet the Presidential Fitness Challenge fitness standards in cardiorespiratory endurance and muscular strength.

Delimitations

This project was delimited to, two eighth grade Health and fitness classes over three quarters of a four quarter schedule at TMS. The study was conducted during the 2010-2011 school year with 68 eighth graders. TMS had an overall student enrollment of 441 students with 221 male students and 221 female students. The ethnicity break of TMS was also delimited to 85% white or Caucasian, 3% Hispanic, 3% African American, 4% Asian or Pacific Islander, 4% Asian, and 2% American Indian or Alaskan Native.

Each student was assessed twice, each quarter with a pre-fitness test beginning of the quarter and a post- test at the end of the quarter in cardiorespiratory endurance, muscular strength, muscular endurance, and flexibility. Students who received one quarter received one pre and one post fitness test, students who received two quarters received two pre and two post fitness tests, and students who received three quarters received a total of three pre and three post fitness tests in cardiorespiratory endurance, muscular strength, muscular endurance, and flexibility.

Assumptions

The first assumption was that all students participated in all class directed instruction and activities as prescribed to help improve personal health related fitness scores in cardiorespiratory endurance and muscular endurance. The second assumption was that none of the students participated in enough extracurricular activities such as school or club sports to negatively or positively affect fitness related scores outside of class directed activities and instruction. The third assumption was that all students participated in the average daily sedentary activities such as watching television, playing on the computer, and playing sedentary based video games of 2 hours or more a day. (United States Department of Agriculture, 2008)

Hypothesis

Students who receive three quarters of physical education will demonstrate greater improvement on Presidential Fitness Challenge cardiorespiratory endurance health related fitness scores than students who receive less than three quarters.

Students who receive three quarters of physical education will demonstrate greater improvement on Presidential Fitness Challenge muscular endurance health related fitness scores than students who receive less than three quarters.

Students who receive three quarters of physical education will acknowledge a greater confidence in meeting the presidential fitness standards in cardiorespiratory endurance and muscular endurance than students who do not receive three quarters of Health and Fitness.

Null Hypothesis

Students who receive three quarters of physical education will not demonstrate greater improvement on Presidential Fitness Challenge cardiorespiratory endurance health related fitness scores than students who receive less than three quarters.

Students who receive three quarters of physical education demonstrate will not demonstrate greater improvement on Presidential Fitness Challenge muscular endurance health related fitness scores than students who receive less than three quarters.

Students who receive three quarters of physical education will not acknowledge a greater confidence in meeting the presidential fitness standards in cardiorespiratory endurance and muscular endurance than students who do not receive three quarters.

Significance of the Project

The significance of this project was to show the effectiveness of improving students' health related fitness scores in cardiorespiratory endurance and muscular strength by participating in three quarters of Health and Fitness while meeting WAC 392.410.135 of physical education for every student. Not every student received three quarters of Health and Fitness which had an impact on the ability of those students to make as significant of gains as students with three quarters of Health and Fitness.

Procedure

For the purpose of this project, the following procedures were implemented:

1. Permission to conduct research at TMS was granted by Principal Jon Wilcox. (see appendix A)
2. Permission to use selected fitness testing procedures and software through Tumwater School District curriculum director of student learning. (see appendix B)
3. Permission to use students' private fitness data through secured fitness data collection software, Well Pro through Focused Fitness. (see appendix B)
4. All students were fitness tested with the mile run and progressive aerobic cardiovascular endurance run (PACER) for cardiorespiratory, pushups for muscular strength, curl-ups

for muscular endurance, and sit and reach for flexibility at the beginning and end of the first quarter for their pre-test scores and their post test scores.

5. All students were fitness tested with the mile run and progressive aerobic cardiovascular endurance run (PACER) for cardiorespiratory, pushups for muscular strength, curl-ups for muscular endurance, and sit and reach for flexibility at the beginning and end of the second quarter for their pre-test scores and post-test scores.
6. All students were fitness tested with the mile run and progressive aerobic cardiovascular endurance run (PACER) for cardiorespiratory, pushups for muscular strength, curl-ups for muscular endurance, and sit and reach for flexibility at the beginning and end of the third quarter for their pre-test scores and post-test scores.
7. All test scores were tabulated, analyzed and disaggregated into students that only had one quarter of Health and Fitness, two quarters of Health and Fitness, and three quarters of Health and Fitness by the end of the third quarter looking at the percentage of gains in cardiovascular endurance and muscular endurance for each group of students. (see Appendix G)
8. All test scores were tabulated, analyzed and disaggregated by gender.
9. A confidence based perception survey was given to each of the students at the end of their last quarter in Health and Fitness class. (see appendix C)
10. Data from the survey was tabulated and graphed. (see appendix H)
11. Results from the study was evaluated and conclusions drawn.

Definition of Terms

For the purpose of this study, the following words were defined:

Health and Fitness: Term adopted by Washington State and Tumwater Middle School to identify a class or classes that combined the state learning standards and requirements of physical education and/or health.

Health Related Physical Fitness: Parts of physical fitness that helps a person stay healthy; including body composition, cardiovascular fitness, flexibility, muscular strength, and muscular endurance.

Skill Related Physical Fitness: Six areas of physical fitness often associated with games and sports such as; agility, balance, coordination, power, reaction time, and speed.

Physical Fitness: The ability of the body to perform daily physical activities without getting out of breath, sore, or overly tired.

Cardiorespiratory Endurance: The ability of the heart, lungs, and blood vessels to use and send fuel and oxygen to the body's tissues during long periods of moderate-to-vigorous activity.

Muscular Endurance: The ability of the muscles to perform physical tasks over a period of time without becoming fatigued.

Muscular Strength: The amount of force a muscle can exert.

Flexibility: The ability to move the joints through a full range of motion.

Body Composition: all of the tissues that together make up the body; bone, muscle, skin, fat, body organs.

Presidential Fitness Challenge: a group of physical fitness assessments developed specifically for youth by the President's Council on Physical Fitness and Sports.

Wel-Net: Web based fitness recording software purchased through Focused Fitness Curriculum Company.

Quarters: Standard class time in which the 180 school day is broken into four equal quarters of time of 95 days each quarter.

Acronym

PFC: Presidential Fitness Council

PFC: Presidential Fitness Challenge

NCLB: No Child Left Behind

CDC: Center for Disease Control and Prevention

TMS: Tumwater Middle School

PCPFS: Presidential Council on Physical Fitness and Sport

WAC: Washington Administrative Code

RCW: Revised Code of Washington

AAHPER: American Alliance of Health, Physical Education, Recreation

AAHPERD: American Alliance of Health, Physical Education, Recreation, Dance

CHAPTER 2

Review of Selected Literature

Introduction

This chapter has been organized around the following topics: (a) Current Trends in Childhood Obesity and Research, (b) No Child Left Behind Act, (c) Federal Movements on Physical Activity and Fitness Levels, (d) Physical Activity on Learning, and (e) summary.

Current Trends in Childhood Obesity

The trend of childhood obesity has dramatically increased in the past years which has resulted in higher numbers of obese youth that demonstrated the negative affects related to obesity. As stated by the Center for Disease Control (CDC) the numbers associated with childhood obesity has more than tripled in the past thirty years. In school age children from 6-11 years of age, obesity numbers have increased from 6.5% in 1980 to 19.6% in 2008 while prevalence of childhood obesity has increased 5.0% to 18.1% in school aged children of 12 to 19 years of age. (Center for Disease Control and Prevention, 2010)

There are a number of reasons that the numbers of childhood obesity have increased including; genetics, behavioral, and environmental factors. However, the most influential factor as cited by the CDC as well as being the most controllable factor was behavioral habits. These behavioral habits resulted in a caloric imbalance due to a lack of daily physical activity and increased daily calories with low nutritional caloric diet. (Center for Disease Control and Prevention, 2010) Along with obesity are associated negative health factors that affect the obese individuals for the duration of their lifetime if not controlled and monitored. Obese youth are more at risk of developing cardiovascular diseases, such as high cholesterol and high blood pressure. According to the CDC in a population based sample of 5 to 17 year olds, 70% of obese

youth had at least one risk factor for cardiovascular disease. (Center for Disease Control and Prevention, 2010)

As well as cardiovascular diseases, children and adolescents who are obese are at greater risk for bone and joint problems, sleep apnea, and social and psychological problems such as stigmatization and poor self-esteem. With this information by the CDC, it was a realization that as time moves forwards with enhancements in technology and emphasis on other areas such as learning, our youth are finding ways to not move and stay inactive which affects their chances of becoming obese and gaining the negative health effects associated with childhood obesity. As mentioned, one area competing with youth attention for physical activity time was technology use. The CDC surveyed from 2003 to 2009 two areas of technology used by youth including the viewing of television outside of school and the use of computer based games or technology outside of school. In 2003 television viewing decreased from 42.8% in 2003 to 32.8% in 2009. However, the use of computer based technology increased from 22.1% in 2003 to 24.9% in 2009. (Centers for Disease Control and Prevention, 2009)

Along with physical activity affecting childhood obesity it was important to understand and look at nutritional data to understand the direction and growth over time. The CDC composed a study using the Youth Risk Behavior Survey System (YRBSS) on nutrition and health education as offered by schools and school lunch programs. As identified by the CDC and the YRBSS, less than 40% of children and adolescents in the United States met the U.S. dietary guidelines for saturated fat and 39% meet the U.S. Dietary guidelines for fiber. Also reported, only 22.3% of high school students reported eating fruits and vegetables five or more times daily while 85% of adolescent females reported consuming the required amount of Calcium. (Center for Disease Control and Prevention, 2010)

These statistics along with data on student learning and behavior demonstrated how the negative impact that the growing number of childhood obesity affected physical health, economics, and student learning. This was a very scary but true epidemic that has been created in our country. Studies showed that at least 70% of obese youth will grow up to be obese adults with more dramatic impact on their physical health and risks of heart disease.

No Child Left Behind Act

The No Child Left Behind Act (NCLB) which was signed into law in 2002 had varying effects on education viewed as both positive as well as negative. The one true aspect was that it has forced schools to change the way students were educated. Rizzardo stated (2010), “Subjects that used to be included in a child’s education are being cut back or even eliminated from the school day.” (pg. 5)

With federal policies being a major contributor to educational decisions, NCLB became a major influence in the decision to cut and limit certain subject areas in order to meet the large demands on student achievement and learning through specific areas titled under, No Child Left Behind. Trost and Der Mars concluded that, “policy makers must stop trying to justify cuts to physical education on the grounds that such cuts will strengthen student achievement, or ultimately the economy.” (Trost & Mars, 2009 pg. 13) However, state and federal policies such as No Child Left Behind continued to set high demands in areas of high stakes testing and student achievement that continued to burden education as stated by Trost from Oregon State University and Der Mars from Arizona State University.

Federal Movements on Physical Activity and Fitness Levels

As statistics and data were collected and proved the growing epidemic of childhood obesity, priorities on learning and student achievement rose to the top and many movements in

the United States have taken place. One of the first and still most prevalent movements was the Presidential Council on Youth Fitness (PCYF), which later became what is now known as the Presidential Council on Physical Fitness (PCPF). This council was developed in 1956 during Dwight D. Eisenhower's administration in regards to specific youth fitness levels as compared to European youth. Over the years the council was established to collect data and help identify the needs and trends on youth fitness until the Kennedy Administration in which it changed title to the Presidential Fitness and Physical Fitness (PFPF) and changed the direction and priority to all Americans and youth in schools. The PFPF also ensured an identifying mission and purpose for the council in 1963. (Wargo, 2007)

There have been many programs that helped identified and supported the issue of youth fitness including the Presidents Fitness Challenge (PFC), a school and public based award program designed to motivate all Americans with emphasis on school physical education programs to start and maintain a regular physical activity program for health and overall well being. (Wargo, 2007) Along with the PFC the council established the state champion award for the PFC. This program was established to identify three schools for each state based on the number of award winners of the PFC. Also implemented upon the state champion award was the National School Demonstration Program which identified an elementary, a middle level, and secondary level school with the highest identified quality physical activity program which was used as model schools for other programs looking to implement or develop their physical education program. (Wargo, 2007)

Some very strong and influential movements have been implemented by the PCPF such as the Healthier US and Steps to a Healthier US which were prevention initiatives created to help Americans live longer, better, and healthier lives. These initiatives were a stepping stone towards

what later was to be called the Healthy People 2010 initiative. The four pillars of the Healthier US initiative were identified as 1) Be physically active every day; 2) Eat a nutritious diet; 3) Get preventative screenings; 4) Make healthy choices/avoid risky behavior. (Wargo, 2007) One of the last strong federal initiatives focused on youth obesity and fitness levels was Healthy People 2010 initiative. This initiative was the National Health Promotion and disease prevention initiative of the U.S. Department of Health and Human Services. This initiative published national health goals and objectives for the years 2001-2010 and tracked progress in meeting specific objectives. Physical activity and fitness was one of 28 focus areas identified for improving the health and fitness of Americans. (Spain & Franks, 2001) Along with with the many technology web based portals for public interaction, one very important document that the PCPF produced was the PCPFS Research Digest. This quarterly publication, synthesized scientific knowledge about topics related to physical activity, fitness, and exercise science. This publication presented much needed information that fitness professionals used to help understand or attend to specific topics, issues, or problems directly linked to physical activity and fitness.

After Healthy People 2010, the Obama administration issued the federal movement known as “Let’s Move”, a movement created to promote a healthier generation of healthy youth, based on the childhood obesity task force report of May, 2010. This initiative was a combined effort based from Healthy People 2010 with direct emphasis on youth health and youth fitness. The reports covered multiple areas with emphasis upon five categories including 1) Early Childhood; 2) Empowering Parents and Caregivers; 3) Healthy Foods in Schools; 4) Access to Healthy, Affordable Food; 5) Increasing Physical Activity. (President, 2010) The Task Force Reported to the President the increased physical activity that in combination with healthy eating,

physical activity can help prevent a range of chronic diseases, including heart disease, cancer, and stroke, the three leading causes of death. (Services, 2008)

The difficulty identified by the report was that society had become a social physical environment that enabled our youth to be inactive and made it easy to live a sedentary life. The report also talked about how society made it inconvenient to be active even though it is recommended that our youth receive at least 60 minutes of vigorous physical activity at least 3 days a week. The report emphasized quality physical activity programs in schools that helped our youth receive at least 60 minutes of physical activity five days a week while in school. However, the report along with the daily required guidelines reported that only 43.7% of high school age males and 25.6% of high school age females received at least 60 minutes of vigorous physical activity at least five days a week. (President, 2010) The question was, how do these initiatives help affect educational programs and student learning? There were five main school based approaches designated towards increasing physical activity for students in school including; 1) Creating infrastructure and policies that increase access to and encourage physical activity for all students; 2) Collecting valid and reliable data and using analytical tools and systems to understand student needs and fitness levels, and promoting approaches that are effective in changing physical activity behaviors and, ultimately, health outcomes; 3) Maintaining strong physical education (PE) programs that engage students in moderate to vigorous physical activity for at least 50% of PE class time; 4) Providing a variety of activities and specific skills so that students can be physically active not just during class but throughout the day and year; and 5) Providing qualified school professionals who are trained in teaching methods to engage students in PE, including for students who face greater barriers to activity. (President, 2010)

The National Association for Sport and Physical Education (NASPE) was a federal level advocacy organization that supported the importance and need of quality physical activity for all individuals. NASPE supported many state and federal initiatives towards supporting physical activity for all individuals. Based upon research and data, the National Association of Sport and Physical Education (NASPE) had created national standards for physical education programs, including the recommended need of daily physical education from kindergarten through grade 12, suggesting 150 minutes per week for elementary schools and 225 minutes per week for secondary schools. (Education, 2004) Along with having supported other national statistics, NASPE was one of the higher governing forces for all physical education programs in which state and federal programs drew from for governing standards. NASPE had provided six national standards including; 1) Demonstrates competency in motor skills and movement patterns needed to perform a variety of physical activities; 2) Demonstrates understanding of movement concepts, principles, strategies, and tactics as they apply to the learning and performance of physical activities; 3) Participates regularly in physical activity; 4) Achieves and maintains a health-enhancing level of physical fitness; 5) Exhibits responsible personal and social behavior that respects self and others in physical activity settings; 6) Values physical activity for health, enjoyment, challenge, self-expression, and/or social interaction. (Education, Moving into the Future: National Standards for Physical Education, 2004)

Many modules of prevention were continuously being implemented and evaluated for effectiveness. Along with federal initiatives in the United States, initiatives in other cultures such as Britain were being implemented in the school systems. In Britain, the Healthy Schools Program encouraged awareness of local health issues and schools attempted to present consistent informed messages about healthy eating and activity levels. These types of programs and

initiatives including one such program in the United States which showed that a 10 week education program resulted in a 15.4% decrease in the percentage of overweight in obese children. (Yarnell & Skidmore, 2004) Having these education programs constantly evaluated, improved upon, and implemented in school systems was one of the largest and most effective ways that had helped reduce the epidemic of childhood obesity.

It was not a subtle sign that the childhood obesity issue had become an epidemic in the United States, and the school setting was one area that was being looked at as being part of the problem for this issue or part of the solution for the problem. In the United States, one third of the youth were considered overweight or obese which was equivalent over 25 million of the children in the United States being overweight or obese. When the surgeon general reported that children should participate in at least 60 minutes of moderate activity the Journal of Active Living Research reported that only 3.8% of elementary schools, 7.9% of middle schools, and 2.1% of high schools provided daily physical education that would provide time towards that required daily 60 minutes of physical activity. (Active Living Research, 2007) This was very important because the school systems served as an excellent venue to provide students with the opportunity for daily physical activity, helped educate the importance of physical activity for health, and helped build skills that support active lifestyles.

Obesity in general was not only a vast national concern but international concern. The International Obesity Task Force indicated that the prevalence of obesity in European adults was between 10-25% in women and 10-20 % in men and that the prevalence had increased by 10-40% in Europe in the past 10 years. (Yarnell & Skidmore, 2004) In contrast the CDC reported on American youth obesity that some percentages were similar in particular ages. The International Task Force reported that obesity in 2 to 4 year old children had almost doubled from 5% from

1989 to 1998 while 6 to 15 year old children tripled from 5% to 16% in from 1990 to 2001.

(Yarnell & Skidmore, 2004)

Internationally, the reasons for the growing rate of obesity were similar since the basic formula for obesity was having an energy imbalance of less energy being expended through physical activity compared to energy being taken in as the form of food. This crossed race, gender, and culture as percentages were looked at from Europe including the fact that in the 1980s, about 67% of children aged 5 to 10 years walked to school, 20% travelled by car and less than 10% by bus. By the year 2000 in Europe, only 55% walked to school, 35% travelled by car, and 10% travelled by bus. Statistics provided by the Center for Disease Control of one third of adolescents spending more than 5 hours of day watching television per day. This was important when understanding that there was less recorded obesity in those children who watched less than 1 hour of television per day. (Yarnell & Skidmore, 2004)

Physical Activity on Learning

Growing research and data demonstrated the critical impact that daily physical activity had on student learning and in return student success. A study conducted by the CDC reviewed literature with the positive impact on learning outcomes related to school based physical education, recess, classroom based physical activity, and extra-curricular activities. What came of the literature review was that spending time on these four approaches resulted in a positive effect on academic achievement, or did not detract from academic outcomes. (Prevention, 2010)

In the report many stated specific examples and areas were identified that demonstrated a positive impact upon academic success including; 1) Eleven of the 14 studies on school-based PE showed one or more positive associations between this intervention and indicators of academic performance; 2) All eight studies on recess found one or more positive association

between recess and indicators of cognition, emotion, and academic behaviors, as well as a positive or no effect on children's attention, concentration, and/or on-task classroom behavior; 3) Eight of nine studies on classroom physical activity, either through physical activity breaks or learning activities designed to promote learning through physical activity, found positive associations between these activities and indicators of cognitive and academic behavior; and 4) All 19 studies examining the relationship between participation in extracurricular physical activity, including afterschool sports or other afterschool physical activity programs, and academic performance found one or more positive associations. Research continued to grow and many school leaders identified areas of intervention and budget priorities. The priorities generally led toward the high stakes testing areas of reading and math with a growing concern for the cutting of programs such as physical education that demonstrated a direct link towards improved scores and lifting student achievement

Dr. John Medina (2009), one of the world's leading authorities on the science of the brain has researched and published many of the important factors directly related to how the brain learns. In "Brain Rules" published by Dr. John Medina, one of the twelve identified rules was that exercise increased brain power. The two main reasons identified by research for exercising were that exercise increased oxygen flow to the brain, which reduced brain-found free radicals. The second important factor stated that exercise acts directly on the molecular machinery of the brain itself. It increased neurons' creation, survival, and resistance to damage and stress. Dr. John Medina represented years of science and research that was discovered and opened to the idea of how learning could be improved through specific strategies including physical activities. This research was important as school leaders and educational programs look at improved student scores and learning.

The National Association for Sport and Physical Education was a federal level advocacy organization that supported the importance and need of quality physical activity for all individuals and supported many state and federal initiatives to support these movements. Based upon research and data, NASPE had determined national standards for physical education programs including the recommended need of daily physical education from kindergarten through grade 12, suggesting 150 minutes per week for elementary schools and 225 minutes per week for secondary schools. (Education, 2004)

Due to many concerns including budget restraints and the growing importance of student academic achievement on high stakes testing, one area that had endured many cuts and restraints was physical education. The idea of this was to find more time and money for other educational fields such as math and reading to help raise student scores. However, much research did contradict this view. There have been five controlled experimental studies in the United States, Canada and Australia. These control groups evaluated the effects on academic performance of allocating additional instructional time for Physical Education. In all five studies, the results demonstrated that physical activity did not need to be sacrificed for academic excellence. One study in Michigan found that 214 sixth grade students had similar grades and standardized test scores as students who were not enrolled in PE, despite receiving 55 minutes less of daily classroom instruction time for academic subjects. (Active Living Research, 2007) In fact as stated by Active Living Research, “Students whose time in PE or school based physical activity was increased maintained or improved their grades and scores on standardized achievement tests, even though they received less classroom instructional time than students in control groups. (Active Living Research, 2007)

It was important to understand that physical activity through physical education did not need to be cut or be limited to maintain student achievement scores, but the fact that quality daily physical activity actually helped improve student achievement. Two studies by Active Research showed a direct correlation between physical activity and student achievement. A national study conducted in 2006 analyzed data collected from 11,957 adolescents across the United States to examine the relationship between physical activity and academic performance. Adolescents who reported either participating in school activities, such as PE and team sports, or playing sports with their parents, were 20 percent more likely than their sedentary peers to earn an “A” in math or English while three other studies between 1970 and 2006 from one or two schools also reported a positive correlation between physical activity and academic performance. (Active Living Research, 2007)

Active Living Research identified multiple studies demonstrating the correlation of physical activity and student achievement. Five studies identified by Active Living Research consistently showed that more time in physical education and other school-based physical activity programs did not adversely affect academic performance. In some cases, more time in physical education led to improved grades and standardized test scores. Also, physically active and fit children tend to have better academic achievement. The research also identified several possible mechanisms by which physical education and regular physical activity could improve academic achievement, including enhanced concentration skills and classroom behavior. (Active Living Research, 2007)

Summary

The focus of this chapter was to address the available evidence to the topics of (a) Current Trends in Childhood Obesity and Research (b) No Child Left Behind act (c) Federal

Movements on Physical Activity and Fitness Levels (d) Physical Activity and Learning----- The methodology and treatment of the data are reported in Chapter 3.

CHAPTER 3

Methodology and Treatment of the Data

Introduction

This chapter has been organized around the following topics: (a) Methodology, (b) Participants, (c) Instruments, (d) Design, (e) Procedure, (f) Treatment of the Data, (g) Summary.

Methodology

The methods for this special project began with the identification of a problem and a development of a hypothesis to test and accept or reject through the process of the special project. A review of literature was gathered and conducted through multiple online databases including the use of Heritage University's online library and databases. After the review of literature was conducted, permission for the project was granted by Tumwater Middle School Principal, Jon Wilcox.

The next step of action was the gathering of student data and information through quasi/experimental research. The purpose of the experimental research was to test the acceptance or rejection of the identified hypothesis, and then to support or not support a causal relationship between the number of quarters of Health and Fitness and the degree of growth in cardiorespiratory endurance and muscular endurance health related fitness levels. One of three types of experimental comparison of A versus B or a comparison of two different approaches was used. The researcher controlled and manipulated the variable of students that received three quarters of physical education and students that received less than three quarters of physical education.

At the end of the project a qualitative descriptive research was conducted in the form of a survey known as cross-sectional. The survey was given at the end of the third quarter to students

who received three quarters of Health and Fitness as stated by Gay as, “a way in which data can be collected from selected individuals at a single point in time in order to provide a snapshot of the current behaviors, attitudes, and beliefs in a population.” (Gay, Mills, & Airasian, 2009)The survey was used to measure students’ confidence levels of meeting the minimum fitness levels as related to the number of quarters received of Health and Fitness. All survey data was tabulated and graphed (see table 1).

Participants

The experimental group in this study consisted of 68 8th grade students during the 2010-2011 school year at TMS, in the Tumwater School District. In the experimental group there were 33 male students and 35female students. In the experimental group, 4 students had 504 plans due to physical limitations.

Instruments

There was one instrument used to gather data in this study with two specific fitness test protocols from the selected Presidential Fitness Challenge test battery. The first fitness test used to collect data was the Presidential Fitness Challenge mile run test protocol (see appendix D) used to measure cardiorespiratory endurance health-related fitness levels. This assessment was adopted Tumwater School District by Health and Fitness departments and was conducted eight times during the four quarter year but only six times during the three quarter time line of the project. The mile run fitness test was given once in September, twice in November, twice in December, twice in March and once in June. The assessment was conducted by Health and Fitness certified teachers.

The second assessment was the curl-ups health-related fitness test protocol (see appendix E) that was given the same time as the mile run test with once in September, twice in November,

twice in December, twice in March and once in June. The curl-ups test was also adopted by the Tumwater School District from the Presidential Fitness Challenge fitness test battery for muscular endurance.

For the mile run fitness test participants ran four laps outside on the TMS track which equaled one mile in distance. The students were timed how long it took to run the four laps and recorded their time into personal fitness portfolios and collected by the instructor in Wel-Net, the web based fitness recording instrument. Each quarter a student was enrolled in Health and Fitness they would be pre-tested and post-tested in the mile run and recorded their time taken to complete the assessment. The scores were tabulated and graphed (see table 1). The same process was conducted for each fitness test until the end of the third quarter. The curl-ups health-related fitness test was used for muscular endurance. Each participant would follow the test protocol and were timed for sixty seconds and then recorded the number of accurate curl-ups that were completed in the given amount of time. These scores were also tabulated and graphed (see appendix G).

A descriptive survey was used to collect students' feelings about meeting the adopted minimum fitness standards for cardiorespiratory endurance and muscular endurance (see appendix C). The survey asked participants ten different questions regarding perceptions of fitness testing and participants feeling about meeting minimum health standards. The participants that received three quarters of Health and Fitness were asked to respond asking about gender, participation in extracurricular activities, quarters of Health and Fitness, time spent on sedentary activities, and ability to meet minimum health standards for cardiorespiratory endurance and muscular endurance using multiple choice answers circling only one of two choices. The last four questions asked students to answer about their perceived confidence levels in meeting the

minimum health standards answered with a likert rating scale of; strongly disagree, disagree, agree, and strongly agree. This survey was given to participants at the end of the third quarter time line.

The instrumentation validity in this study was not an issue. The same assessment, mile run, curl-ups, was used as a pre-test and a post-test. The assessment was administered by the same teachers for both the pre and post tests. Test reliability issues were taken in consideration with multiple testing's for each participant. According to Beachle and Earle certain issues can affect the mile run fitness test including; (Baechle & Earle, 2009)

1. High ambient temperatures over 80 degrees.
2. High humidity levels over 50 percent.
3. Uncontrollable health levels in multiple testing procedures.
4. Age and sex due to lack of experience interest levels.

The same testing procedures were followed in both the pre and post tests. The presidential mile run and curl-ups health related fitness tests were objective assessments of student cardiorespiratory and muscular endurance levels. Biases of the researcher were rendered insignificant by the strict procedures and absence of subjective assessments techniques.

Design

This study was a single-variable design, with the one manipulated variable being students receiving three quarters of Health and Fitness and students who received less than three quarters of Health and Fitness. This variable was introduced to the experimental group, while no interventions were used with the controlled group. This study falls in the category of a quasi-experimental design because the groups were predetermined, and not randomly selected. A true

experimental design was not feasible, since class schedules were predetermined to the groups in the study.

Procedure

For the purpose of this study, the following procedures were implemented:

1. Permission to conduct research at Tumwater Middle School was granted by Principal Jon Wilcox (see appendix A)
2. Permission to use selected fitness testing procedures and software through Tumwater School District curriculum director of student learning. (see appendix B)
3. Permission to use students' private fitness data through secured fitness data collection software Well Pro through Focused Fitness. (see appendix B)
4. A review of selected literature was conducted through Heritage University and online research databases. A thorough report of information gathered was reported in Chapter 2 of this project.
5. A meeting involving the TMS Health and Fitness department was conducted to determine the specific needs and limitations of the project with a partnership formed with the other Health and Fitness teacher at TMS during scheduled professional learning communities' time.
6. The Presidential Fitness Challenge mile run test and curl-ups test was given to all 7th and 8th grade health and fitness classes as a pre-test for quarter number 1 on the week of September 13, 2010. The assessment was administered by two Health and Fitness certified teachers.
7. The results from the mile run and curl-ups fitness test were recorded and tabulated.

8. The student were post-tested on the mile run and curl ups fitness for cardiorespiratory endurance and muscular endurance on the week of November 8, 2010.
9. The results from the mile run and curl-ups fitness test were recorded and tabulated in student fitness portfolios and Wel-net collection database.
10. The student were pre-tested on the mile run and curl ups fitness test on the week of November 15, 2010.
11. The results from the mile run and curl-ups test fitness test were recorded and tabulated.
12. The students were post-tested on the mile run and curl ups fitness test on the week of February 7, 2010.
13. The results from the mile run and curl-ups test fitness test were recorded and tabulated.
14. The students were pre-tested on the mile run and curl-ups fitness test on the week of February 14, 2010.
15. The results from the mile run and curl-ups test fitness test were recorded and tabulated.
16. The students were post-tested on the mile run and curl ups fitness test on the week up March 14, 2010.
17. A survey measuring student confidence levels were given to all students receiving three quarters of Health and Fitness. (see appendix C)
18. Data from the survey was collected, tabulated and graphed. (see appendix H)
19. Results from the student were examined, evaluated, and conclusions were drawn.
20. A meeting was conducted to determine the effectiveness of receiving three quarters of Health and Fitness had in regards to student fitness levels in future planning and scheduling in regards to health and fitness classes.

Treatment of Data

The data gathered from meeting fitness standards survey was calculated and examined using the Microsoft excel program. The questions were tabulated and analyzed, and all participants were categorized as either male or female and as either having three quarters of Health and Fitness or not having three quarters of Health and Fitness. All information for both groups was represented in Microsoft Excel Data Sheet, as well as Microsoft Excel Graphs.

The data collected through the pre and post cardiorespiratory endurance and muscular strength tests were tabulated and examined using the Microsoft Excel Program. The data was also interpreted using the STAKPAK program. This program was used to find the mean, mode and t-score of the Presidential Fitness Challenge cardiorespiratory endurance and muscular strength health related fitness test data gathered by the researcher.

Summary

This chapter was designed to review the methodology and treatment of data related to the September and March Presidential Fitness Challenge cardiorespiratory endurance and the Presidential Fitness Challenge muscular endurance health related fitness tests of two eighth grade classes at Tumwater Middle School. This chapter also reviewed the treatment and methodology of data gathered through post confidence survey in meeting the national fitness standards to two eighth grade classes at Tumwater Middle School. The analysis of data and findings from this study were reported in Chapter 4.

CHAPTER 4

Analysis of the Data

Introduction

Chapter 4 has been organized around the following topics: (a) description of environment, (b) hypothesis, (c) results of the study, (d) findings, and (e) summary. The significance of this project was to show the effectiveness of improving students' health related fitness scores in cardiorespiratory endurance and muscular strength by participating in three quarters of physical education and meeting WAC 392.410.135 of physical education for every student. Not every student received three quarters of physical education which had an impact on the ability of those students to make as significant of gains as students with three quarters.

Description of the Environment

This study was delimited to two eighth grade classes over three quarters at Tumwater Middle School in Tumwater School District, located in Tumwater, Washington. The project was conducted during the 2010-2011 school year with 68 eighth grade students. TMS had a student enrollment of 442 students for the 2010-2011 school years. The student population demographics consisted of 85% white or Caucasian, 3% Hispanic, 3% African American, 4% Asian or Pacific Islander, 4% Asian, and 2% American Indian or Alaskan Native.

Each student was assessed twice, each quarter with a pre-fitness test beginning of the quarter and a post- test at the end of the quarter in cardiorespiratory endurance, muscular strength, muscular endurance, and flexibility. Students that received one quarter received one pre and one post fitness tests, students with two quarters received two pre and two post fitness tests, and students with three quarters received a total of three pre and three post fitness tests in cardiorespiratory endurance, muscular strength, muscular endurance, and flexibility.

Hypothesis

Students who receive three quarters of physical education will demonstrate greater improvement on Presidential Fitness Challenge cardiorespiratory endurance health related fitness scores than students who receive less than three quarters.

Students who receive three quarters of physical education will demonstrate greater improvement on Presidential Fitness Challenge muscular endurance health related fitness scores than students who receive less than three quarters.

Students who receive three quarters of physical education will acknowledge a greater confidence in meeting the presidential fitness standards in cardiorespiratory endurance and muscular endurance than students who do not receive three quarters of Health and Fitness.

Null Hypothesis

Students who receive three quarters of physical education will not demonstrate greater improvement on Presidential Fitness Challenge cardiorespiratory endurance health related fitness scores than students who receive less than three quarters.

Students who receive three quarters of physical education demonstrate will not demonstrate greater improvement on Presidential Fitness Challenge muscular endurance health related fitness scores than students who receive less than three quarters.

Students who receive three quarters of physical education will not acknowledge a greater confidence in meeting the presidential fitness standards in cardiorespiratory endurance and muscular endurance than students who do not receive three quarters.

Results of the Study

To test the hypothesis, the researcher evaluated and examined the data collected during the study using the STATPAK program and the Microsoft Excel program. The sum, mean and t-scores were calculated.

Table 1 shows the students' growth in the Presidential Fitness Challenge cardiorespiratory endurance health related fitness test for students who received three quarters of Health and Fitness during the 2010-2011 school years. Table one showed the scores for both pre and post assessments for each student, as well as the growth of each student from the pre test to the post test. The growth for each student represented the amount of change in the student's mile run scores from September 2010 to March 2011. The value of growth for each student was compiled and a mean of 1.68 was found. This mean represented the average increase in cardiorespiratory endurance scores for the students in the group. Therefore, the average increase in mile run scores for students whom received three quarters of health and fitness was one minute and sixty-eight seconds.

Table1

Student cardiorespiratory endurance growth for 3 quarters

<i>Student</i>	<i>Mile Pre score</i>	<i>Mile Post score</i>	<i>Student growth</i>
A	11.23	8.08	3.15
B	11.5	11.02	0.48
C	7.05	6.54	0.51
D	18.04	16.36	1.68
<i>Student</i>	<i>Mile Pre Score</i>	<i>Mile Post score</i>	<i>Student Growth</i>
E	13.45	11.04	2.41
F	7.5	7.45	0.05
G	14	11.46	2.54
H	13.23	11.02	2.21
I	10.3	8.31	1.99
J	11.05	9.25	1.8
Σ	117.35	100.53	16.82

\bar{X}	11.74	10.05	1.68
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Table 2 displayed the scores of the students that did not receive three quarters of Health and Fitness in the Presidential Fitness Challenge Cardio Respiratory Endurance health related fitness test. Table 2 showed the scores for both pre and post assessments for each student, as well as the growth of each student from the pre to the post test assessment. The growth for each student represented the amount of change in the student's mile run score from September 2010 to January 2011. The value of growth for each student was compiled and a mean of -0.95 was found. This mean represented the average increase in mile run scores for the students in the group. Therefore, the average increase in mile run scores for students not receiving three quarters of Health and Fitness was negative one minute and thirty-five seconds.

Table 2

Student cardiorespiratory endurance growth for <3 quarters

<i>Student</i>	<i>Mile Pre score</i>	<i>Mile Post score</i>	<i>Student growth</i>
K	11.56	18.54	-6.98
L	11.23	8.4	2.83
M	10.04	11.34	-1.3
N	10.13	10.34	-0.21
O	11.37	15.35	-3.98
P	8.26	8.45	-0.19
Q	8.26	8.45	-0.19
R	14.2	15.45	-1.25
S	9.35	9.17	0.18
T	12.33	12.44	-0.11
U	15.41	14.38	1.03
V	11.48	13.12	-1.64
W	9.02	9.26	-0.24
X	9.58	10.18	-0.6

Y	12.03	12.5	-0.47
Z	14.15	11.45	2.7
AA	10.15	9.1	1.05
BB	11.54	11.34	0.2
CC	10.09	13.1	-3.01
DD	7.53	7.32	0.21
EE	10.04	18.18	-8.14
FF	7.55	7.41	0.14
GG	13.15	13.33	-0.18
HH	10	13.05	-3.05
II	13.2	13	0.2
JJ	7.3	8.02	-0.72
KK	12.34	16.5	-4.16
LL	6.51	6.58	-0.07
MM	10.04	9.22	0.82
NN	7.15	7.23	-0.08
OO	19.12	20.27	-1.15
PP	8.17	8.5	-0.33
QQ	10.01	11	-0.99
RR	12.04	12.54	-0.5
SS	7.05	8.3	-1.25
TT	11.05	13.2	-2.15
UU	14.08	14.51	-0.43
VV	11.33	15.36	-4.03
WW	9.45	10.32	-0.87
XX	14.02	16.11	-2.09
YY	12.3	11.56	0.74
ZZ	14.06	14.62	-0.56
AAA	12.34	13.21	-0.87
BBB	15.33	19.17	-3.84
CCC	7.06	7.12	-0.06
DDD	11	13.05	-2.05
EEE	13.34	13.32	0.02
FFF	10.28	13.1	-2.82
GGG	9.42	11.21	-1.79
HHH	9.36	9.12	0.24
III	18.4	21.26	-2.86
JJJ	8.31	8.41	-0.1
KKK	12.34	12.38	-0.04
LLL	8.58	10.58	-2
MMM	12.03	12.12	-0.09
NNN	8.1	8.5	-0.4
OOO	9.36	9.02	0.34

PPP	10.42	10.21	0.21
Σ	868.13	891.43	-56.93
\bar{X}	15.43	15.81	-1.00

Table 3 shows the students growth in the Presidential Fitness Challenge muscular endurance health related fitness test for students who received three quarters of Health and Fitness. Table 3 showed the scores for both pre and post assessments for each student, as well as the growth of each student from the pre test to the post test assessment. The growth for each student represented the amount of change in the students' curl up scores from September 2010 to March 2011. The value of growth for each student was compiled and a mean of 10.40 was found. This mean represented the average increase in muscular endurance scores for the students in the controlled group. Therefore, the average increase in curl up scores for students that received three quarters of Health and Fitness was 10.40 curl ups.

Table 3

Student muscular endurance growth for 3 quarters

<i>Student</i>	<i>Curl Ups Pre score</i>	<i>Curl Ups Post score</i>	<i>Student growth</i>
A	25	35	10
B	29	35	6
C	15	29	14
D	16	25	9
E	24	27	-3
F	34	56	22
G	24	39	15
H	20	33	13
I	35	42	7
J	2	13	11
Σ	224	334	104
\bar{X}	22.40	33.40	10.40

Table 4 shows the students growth in the Presidential Fitness Challenge muscular endurance health related fitness test for students that did not receive three quarters of Health and Fitness. Table 4 showed the scores for both pre and post assessments for each student, as well as the growth of each student from the pre to post test assessment. The growth for each student represented the amount of change in the student's curl up scores from September 2010 to March 2011. The value of growth for each student was compiled and a mean of -0.56 was found. This mean represented the average increase in muscular endurance scores for the students in the controlled group. Therefore, the average increase in curl up scores for students that did not receive three quarters of Health and Fitness was -0.56 curl ups.

Table 4

Student cardiorespiratory endurance growth for <3 quarters

<i>Student</i>	<i>Curl Ups Pre score</i>	<i>Curl Ups Post score</i>	<i>Student growth</i>
K	11	8	-3
L	35	45	10
M	24	29	5
N	31	30	-1
O	25	37	12
P	10	12	2
Q	24	20	-4
R	4	2	-2
S	40	30	-10
T	29	34	5
U	25	20	-5
V	48	20	-28
W	36	40	4
X	28	33	5
Y	30	25	-5
Z	21	27	6
AA	32	43	11
BB	25	17	-8
CC	32	24	-8
DD	38	42	4
EE	40	40	0

FF	48	56	8
GG	21	26	5
HH	40	42	2
II	27	30	3
JJ	52	42	-10
KK	25	30	5
LL	46	49	3
MM	46	51	5
NN	52	54	2
OO	28	17	-11
PP	45	46	1
QQ	34	36	2
RR	26	21	-5
SS	42	24	18
TT	38	28	-10
UU	43	32	-11
VV	33	33	0
WW	25	24	-1
XX	25	23	-2
YY	32	40	8
ZZ	20	20	0
AAA	25	27	-2
BBB	20	16	4
CCC	32	34	2
DDD	49	37	-12
EEE	38	35	-3
FFF	25	23	-2
GGG	50	53	3
HHH	36	37	1
III	31	4	-27
JJJ	19	22	3
KKK	37	50	13
LLL	39	26	-13
MMM	37	33	-4
NNN	16	13	-3
OOO	31	36	5
PPP	39	40	1
Σ	2308.04	2456.03	-32.00
\bar{X}	40.88	43.68	-0.56

The findings expressed that the mean scores of students who received three quarters of Health and Fitness increased by 2.66 over students who did not receive three quarters of Health and Fitness in the Presidential Fitness Challenge cardiorespiratory endurance health related fitness test. Of the ten students, 10 (100%) showed improvement from pre to post tests after receiving three quarters of Health and Fitness in the Presidential Fitness Challenge cardiorespiratory endurance health related fitness test as compared to the fifty-eight students in which 22 (38%) showed improvement from pre to post tests after not receiving three quarters of Health and Fitness in the Presidential Fitness Challenge cardiorespiratory endurance health related fitness test.

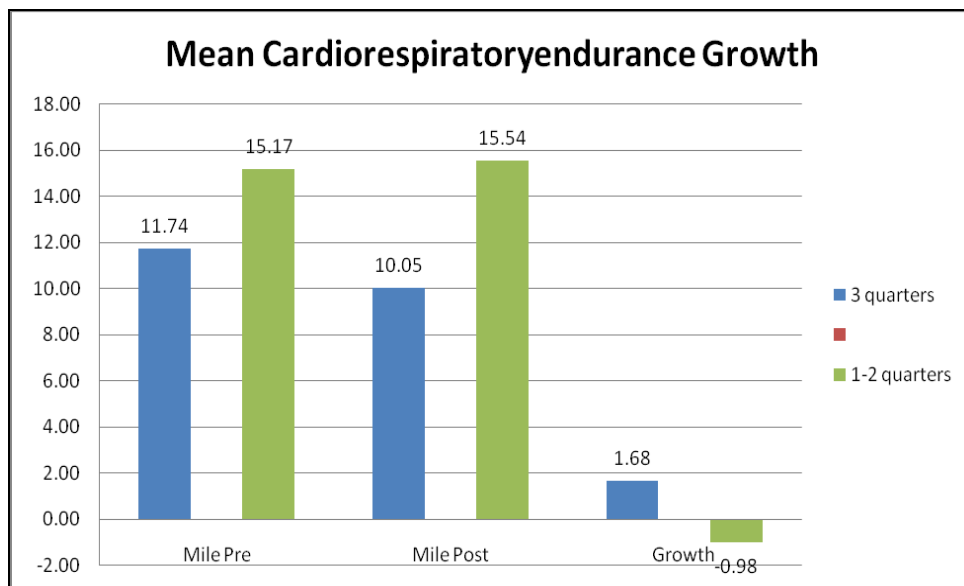


Figure 1

The findings expressed that the mean scores of students who received three quarters of Health and Fitness increased by 10.95 over students who did not receive three quarters of Health and Fitness in the Presidential Fitness Challenge muscular endurance health related fitness test. Of the ten students, nine (90%) showed improvement from pre to post tests after receiving three quarters of Health and Fitness in the Presidential Fitness Challenge muscular endurance health

related fitness test as compared to the fifty-eight students in which 32 (55%) that showed improvement from the pre to post test in the Presidential Fitness Challenge muscular endurance health related fitness test.

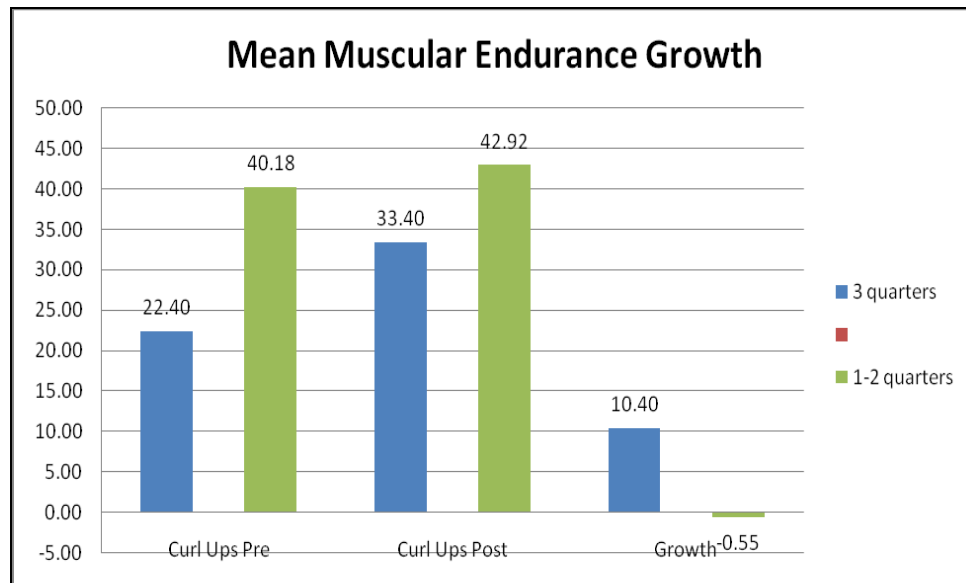


Figure 2

The data was desegregated by gender. Of the forty-one boys and twenty-seven girls, a significant gain by gender was obtained in the muscular endurance mean growth of boys. The mean growth of females in the Presidential Fitness Challenge muscular endurance health related fitness test was expressed as -1.56 and the boys mean growth was expressed as 2.78. The mean growth by boys was 4.34 greater than the mean increase by girls in the Presidential Fitness Challenge muscular endurance health related fitness test demonstrated as a positive growth.

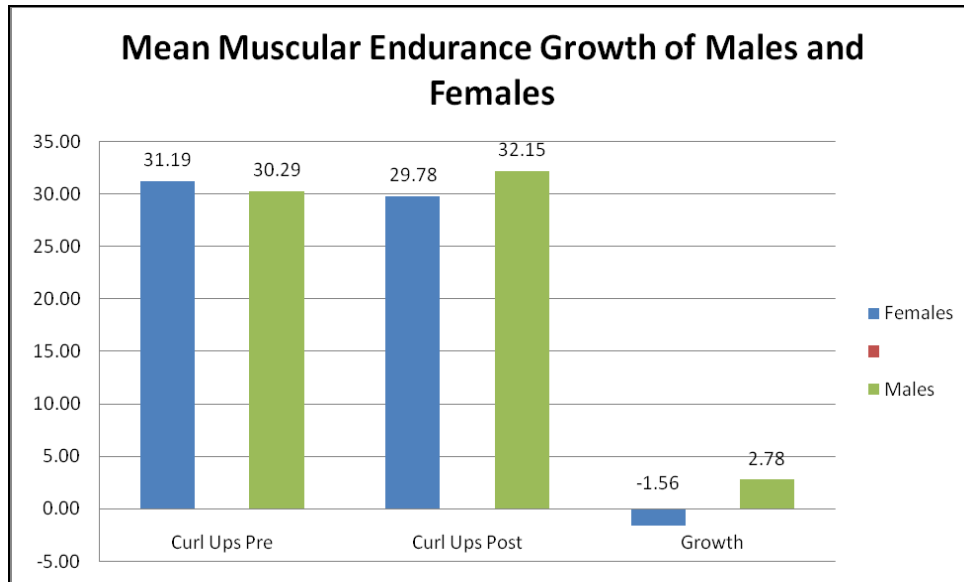


Figure 3

The data was entered into a statistical calculator and an independent t-test was conducted to determine significance for improvement of students in the Presidential Fitness Challenge cardiorespiratory endurance health related fitness test. The t-value for improvement of students in the Presidential Fitness Challenge cardiorespiratory endurance health related fitness test for students that received three quarters of health and fitness was 4.26 and the degree of freedom was 66. A required t-score of $p = 2.045$ was needed to demonstrate a significant change. A t-score of 4.26 was significant enough to meet the criteria needed to show significant change at $p = .05$.

t - TEST FOR INDEPENDENT SAMPLES

Statistic	Values	Group X	Group Y
No. of Scores in Group X	10	3.15	-1.79
Sum of Scores in Group X	16.8200	0.48	0.24
Mean of Group X	1.68	0.51	-2.86
Sum of Squared Scores in Group X	37.58	1.68	-0.1
SS of Group X	9.29	2.41	-0.04
No. of Scores in Group Y	58	0.05	-2
Sum of Scores in Group Y	-56.9300	2.54	-0.09
Mean of Group Y	-0.98	2.21	-0.4
Sum of Squared Scores in Group Y	266.77	1.99	0.34
SS of Group Y	210.89	1.8	0.21
t - Value	4.26		
Degrees of freedom	66		

Figure 4

The data was entered into a statistical calculator and a independent t-test was conducted to determine significance for improvement of students in the Presidential fitness Challenge muscular endurance health related fitness test. The t-value for improvement of students in the Presidential Fitness Challenge muscular endruance health related fitness test for students who received three quarters of Health and Fitness was 3.86 and the degree of freedom was 63. A required t-score of 2.045 was needed to demosntrate a ignificant change. A t-score of 3.86 was significant enough to meet the criteria needed to show significant change at $p = .05$.

t - TEST FOR INDEPENDENT SAMPLES

Statistic	Values	Group X	Group Y
No. of Scores in Group X	10	10	3
Sum of Scores in Group X	104.00	14	1
Mean of Group X	10.40	9	-27
Sum of Squared Scores in Group X	1470.00	-3	3
SS of Group X	388.40	22	13
No. of Scores in Group Y	55	15	-13
Sum of Scores in Group Y	-32.00	13	-4
Mean of Group Y	-0.58	7	-3
Sum of Squared Scores in Group Y	3952.00	11	5
SS of Group Y	3933.38		1
t - Value	3.86		
Degrees of freedom	63		

Group X

 Group Y

Figure 5

Table 5 represented data from the post student confidence survey from March, 2011 (see appendix G). All scores of the survey were collected and tabulated a numerical scoring system or 1-4. For question 1, a response a score of 1 was assigned to a response of “boy” and a score of 2 was assigned to a response of “girl”. For question 2, a score of 1 was assigned to a response of “yes” and a score of 2 was assigned to a response of “no”. For question 3, a score of 1 was assigned to a response of “1-2 quarters” and a score of 2 was assigned to a response of “3 quarters”. For question 4, a score of 1 was assigned to a response of “7 hours or less a week” and a score of 2 was assigned to a response of “more than 7 hours a week”. For question 5, a score of 1 was assigned to a response of “yes” and a score of 2 was assigned to a response of “no”. For question 6, a score of 1 was assigned to a response of “yes” and a score of 2 was assigned to a response of “no”. For questions seven through ten a score numerical score of 4 was assigned to a response of “strongly agree”, a score of 3 was assigned to a response of “agree”, a

score of 2 was assigned to a response of “disagree” and a score of 1 was assigned to a response of “strongly disagree” for the assigned belief statements.

Table 5 *Student Post Confidence Survey*

Student	Male	Female	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
A	X		1	2	2	2	1	1	4	4	4	4
B	X		1	2	2	2	1	1	4	3	4	4
C	X		1	1	2	2	1	1	3	3	4	4
D		X	2	1	2	1	2	2	3	3	3	4
E	X		1	2	2	2	1	1	4	4	3	4
F	X		1	1	2	2	1	1	4	3	4	3
G	X		1	1	2	2	2	2	3	4	3	4
H		X	2	2	2	2	2	2	4	4	4	4
I	X		1	2	2	1	2	2	4	4	3	3
J	X		1	2	2	1	1	1	3	4	3	3
Σ			12	16	20	17	14	14	36	36	35	37
\bar{X}			1.2	1.6	2	1.7	1.4	1.4	3.6	3.6	3.5	3.7

A student survey was conducted in March, 2011 and showed that most students felt that receiving three quarters of Health and Fitness helped them meet the minimum fitness standards for the cardiorespiratory endurance and muscular endurance health related fitness tests. Of the ten students that received three quarters of Health and Fitness, 6(60%) strongly agreed and 4(40%) agreed with the questions.

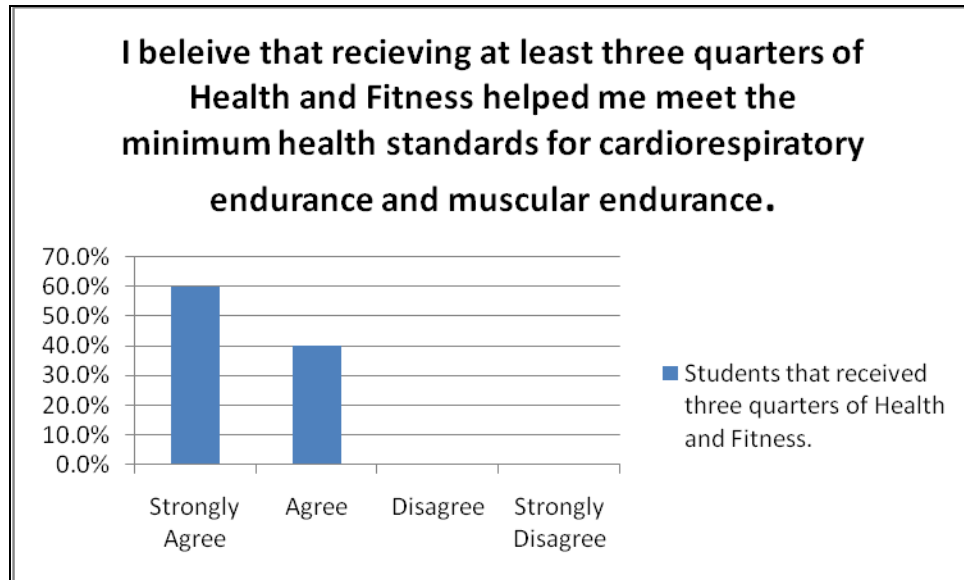


Figure 6

Findings

The researcher analyzed the data with the degree of freedom at 66 the required a t-score of $p = 2.045$ to demonstrate a significant change. The t-score of $p = 4.26$ met the criteria needed to show significant change at $p = 0.5$ to accept the hypothesis; students who receive three quarters of health and fitness will demonstrate greater improvement on the Presidential Fitness Challenge cardiorespiratory endurance health related fitness test. The t-score of $p = 3.86$ met the criteria needed to show significant change at $p = 0.5$ to accept the hypothesis; students who receive three quarters of health and fitness will demonstrate greater improvement on the Presidential Fitness Challenge muscular endurance health related fitness test.

The hypothesis; students who receive three quarters of physical education will demonstrate greater improvement on the Presidential Fitness Challenge cardiorespiratory endurance health related fitness test than students who do not receive three quarters of health and fitness was accepted by the researcher. The hypothesis; students who receive three quarters of health and fitness will demonstrate greater improvement on the Presidential Fitness Challenge

muscular endurance health related fitness test than student who do not receive three quarters of health and fitness was accepted by the researcher.

The null hypothesis; students who receive three quarters of health and fitness will not demonstrate greater improvement on the Presidential Fitness Challenge cardiorespiratory endurance health related fitness test than students who do not receive three quarters of health and fitness was rejected by the researcher. The null hypothesis; students who receive three quarters of health and fitness will not demonstrate greater improvement on the Presidential Fitness Challenge muscular endurance health related fitness test than students who do not receive three quarters of health and fitness was rejected by the researcher.

Discussion

This study resulted in findings that were consistent with the expectations of the researcher. In general, the hypothesis of the researcher stated that students receiving three quarters of physical education would demonstrate greater improvement on both the Presidential Fitness Challenge cardiorespiratory endurance and muscular strength health related fitness tests. The results were consistent and validated the acceptance of the researcher's hypothesis.

With the support of research and data collected it was feasible to state that the results of this study would prove consistent if initiated for a longer period of time or in another setting where the delimitations and environment were similar to the current experimental group. The experimental data and results would validate the ability of the group to demonstrate greater mean growth over longer periods of time.

Summary

This chapter was designed to analyze the data and identify the findings. From results of the collected data, the hypothesis was supported and the Null Hypothesis was rejected. The

group of students that received three quarters of health and fitness demonstrated greater improvement in both the Presidential Fitness Challenge cardiorespiratory endurance and muscular endurance health related fitness test as compared to the group of students that did not receive three quarters of health and fitness. Both of which were found significant with at least a $p = .05$. Chapter 5 will summarize the study, draw conclusions, and make recommendations.

CHAPTER 5

Summary, Conclusions and Recommendations

Introduction

This chapter has been organized around the following topic: (a) introduction, (b) summary, (c) conclusions, (d) recommendations.

Summary

Students at Tumwater Middle School were receiving between zero and three quarters of Health and Fitness during a school year dependant upon outside factors including ;Washington State high stakes testing scores, district intervention assessment scores and exploratory or enrichment classes. This brought up the issue of students who did not meet the minimum three quarters of Health and Fitness which resulted in not meeting the state mandated requirements of physical education minutes of average, 50 minutes a week as set by WAC 392-410-136. The purpose of this study was to determine if the number of quarters a student received of Health and Fitness had a positive affect on their ability to meet the minimum health standards of the Presidential Fitness Challenge cardiorespiratory endurance and muscular endurance health related fitness tests. A review of literature showed direct correlation between the amounts of physical activity an individual received positively affected their health levels and a direct positive relationship between student learning and physical activity.

Two eighth grade classes were chosen to participate in the study. One group was the experimental group which was the students that received three quarters of Health and Fitness between September of 2010 and March of 2011. The other group was the control group which received between one and two quarters of Health and Fitness between September of 2010 and March of 2011. Both groups received both pre and test assessment in both the Presidential

Fitness Challenge cardiorespiratory endurance health related fitness test of the mile run as well as a pre and post test assessment in the Presidential Fitness Challenge muscular endurance health related fitness test of curl ups. The student's growth between the pre test assessments and the post test assessments were collected and analyzed to determine if the researchers hypothesis would be accepted or rejected.

Conclusions

After conducting the study, gathering the data, and evaluating the implications, it was determined that the hypothesis was accepted. Students who received three quarters of physical education did show greater improvement in the Presidential Fitness Challenge cardiorespiratory endurance health related fitness test. The second hypothesis was also accepted that students receiving three quarters of physical education did show greater improvement in their Presidential Fitness Challenge muscular endurance health related fitness tests than students who did not receive three quarters of physical education. Table 1 demonstrated the cardiorespiratory endurance growth for students receiving three quarters of Health and Fitness. Table 2 demonstrated the cardiorespiratory endurance growth for students in the group not receiving three quarters of Health and Fitness. Table 3 demonstrated the muscular endurance growth for student in the receiving three quarters of Health and Fitness. Table 4 demonstrated the muscular endurance growth for students not receiving three quarters of Health and Fitness.

The average cardiorespiratory endurance growth for students that received three quarters of Health and Fitness was 1.68, while the average cardiorespiratory endurance growth for students that did not receive three quarters of Health and Fitness was -0.98. Therefore, the students that received three quarters of Health and Fitness demonstrated a growth of 2.66 over the students that did not receive three quarters of Health and Fitness. This growth rate resulted in

a t-value of 4.26. The t-value of students that received three quarters of Health and Fitness did meet the t-value of 2.021 required to accept the hypothesis at a $P = .05$.

The average muscular endurance growth for students who received three quarters of Health and Fitness was 10.40, while the average muscular endurance growth for students who did not receive three quarters of Health and Fitness was -0.55. Therefore, the students who received three quarters of Health and Fitness demonstrated a growth of 10.95 over the students that did not receive three quarters of Health and Fitness. This growth rate resulted in a t-value of 3.86. The t-value of students who received three quarters of Health and Fitness did meet the t-value of 2.021 required to accept the hypothesis at a $P = .05$.

Recommendations

The literature in this study showed a direct correlation between the amounts of physical activity an individual received, related to their overall health related fitness levels as well as a direct correlation between activity levels and academic success. Various studies have shown that the amount of physical activity a student received had a direct and positive impact on their academic success and their ability to learn.

Although this study did show a significant growth in order to accept the hypothesis, it is recommended that this study be conducted over a longer period of time with a larger sample group in order to validate the hypothesis with other health related fitness components such as muscular strength, flexibility and body composition along with the validated muscular endurance and cardiorespiratory endurance.

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Appendix A

Permission Slip

I, Jon Wilcox, give Joshua Stoney, permission to conduct research for the degree of Masters of Educational Administration at Heritage University during the 2010-2011 academic school year at Tumwater Middle School, with the hypothesis of; Students who receive three quarters of health and fitness will demonstrate greater improvement on their Presidential Fitness Challenge cardiorespiratory endurance health related fitness test than student who do not receive three quarters of health and fitness. Students who receive three quarters of health and fitness will demonstrate greater improvement on their Presidential Fitness Challenge muscular endurance health related fitness test than student who do not receive three quarters of health and fitness.

Jon Wilcox, Tumwater Middle School

Appendix B

Permission Slip

I, Sue Anderson, give Joshua Stoney, permission to use the Tumwater School District purchased licensed software, Wel-Net in order to conduct research for the degree of Masters of Educational Administration at Heritage University during the 2010-2011 academic school year at Tumwater Middle School in Tumwater School District, with the hypothesis of; Students who receive three quarters of health and fitness will demonstrate greater improvement on their Presidential Fitness Challenge cardiorespiratory endurance health related fitness test than student who do not receive three quarters of health and fitness. Students who receive three quarters of health and fitness will demonstrate greater improvement on their Presidential Fitness Challenge muscular endurance health related fitness test than student who do not receive three quarters of health and fitness.

Sue Anderson, Tumwater School District

Appendix C

Student Confidence Survey for March 2010

The purpose of this survey is to find out about how you feel about your ability to meet the minimum health standards for the cardiorespiratory endurance fitness test (mile run) and the muscular endurance fitness test (curl ups). Read each question carefully and then circle the answer that best shows your how you feel at this time.

What is your gender?

Boy

Girls

Do you participate in any activity based extracurricular activities such as sports or clubs?

Yes

No

How many quarters of Health and Fitness have you participated in for the 2010-2011 school year at this point and time?

1-2 quarters

3 quarters

How much time a week do you spend in sedentary activities such as watching television or video games?

7 hours or less a week

More than 7 hours a week

Have you met the minimum health standard for cardiorespiratory endurance at this time?

Yes

No

Have you met the minimum health standard for muscular endurance at this time?

Yes

No

For the following belief statement please circle one of the four answers of strongly agree, disagree, agree, or strongly agree that best fits your opinion of the questions below.

I believe that overall fitness levels such as cardiorespiratory endurance and muscular endurance are important to know about.

Strongly Disagree

Disagree

Agree

Strongly Agree

I believe that it is important to always work towards improving your overall fitness levels such as cardiorespiratory endurance and muscular endurance.

Strongly Disagree

Disagree

Agree

Strongly Agree

I believe that having at least three quarters of Health and Fitness can help in meeting the minimum health standard for cardiorespiratory endurance and muscular endurance.

Strongly Disagree

Disagree

Agree

Strongly Agree

I believe that overall fitness levels such as cardiorespiratory endurance and muscular endurance are important to know about.

Strongly Disagree

Disagree

Agree

Strongly Agree

Appendix D

Mile Run Fitness Test Protocol for Cardiorespiratory Endurance

One-Mile Run

Alternative

The one-mile run can be used instead of the PACER to provide an estimate of $\dot{V}O_{2\max}$. For students who enjoy running and are highly motivated it is a very good alternative assessment.

Test Objective

To run a mile at the fastest pace possible. If a student cannot run the total distance, walking is permitted.

Equipment and Facilities

A flat running course, stopwatch, pencil, and score sheets (included in appendix B) are required. The course may be a track or any other measured area. The course may be measured using a tape measure or cross country wheel. Caution: If the track is metric or shorter than 440 yards, adjust the running course (1,609.34 meters = 1 mile; 400 meters = 437.4 yards; 1,760 yards = 1 mile). On a metric track the run should be four laps plus 10 yards.

Test Instructions

Students begin on the signal “Ready, Start.” As they cross the finish line, elapsed time should be called to the participants (or their partners). It is possible to test 15 to 20 students at one time by dividing the group. Have each student select a partner; one is the runner and one is the scorer. While one group runs, partners count laps and record the finish time.

Scoring

The one-mile run is scored in minutes and seconds. A score of 99 minutes and 99 seconds indicates that the student could not finish the distance. Students ages 5 to 9 years in grades K-3 do not have to be timed; they may simply complete the distance and be given a score of 00 minutes and 00 seconds. Regardless of the entry in the software for students ages 5 through 9 years, a performance standard will not be used to evaluate their score. Nine-year-olds in grade 4 should receive a score. All 10-year-olds should receive a score regardless of grade level.

Performance standards for students in grades K-3 have purposefully not been established. There are concerns regarding the reliability and validity of the test results for very young children. Even with practice, it is difficult to ensure that young children will pace themselves appropriately and give a maximal effort. The object of the test for these younger students is simply to complete the 1-mile distance at a comfortable pace and to practice pacing.

Suggestions for Test Administration

Call out times as the runners pass the start/stop line to assist students in pacing themselves.

Preparation for the test should include instruction about pacing and practice in pacing. Without instruction, students usually run too fast early in the test and then are forced to walk in the later stages.

Results are generally better if the student can maintain a constant pace during most of the test.

Walking is definitely permitted. Although the objective is to cover the distance in the best possible time, students who must walk should not be made to feel inferior. Encourage students who walk to

Appendix E

Curl-Ups Fitness Test Protocol for Muscular Endurance

Curl-Up

Recommended

This section provides information on the curl-up assessment used in *Presidential Fitness Challenge*. The curl-up with knees flexed and feet unanchored has been selected because individually these elements have been shown to a) decrease movement of the fifth lumbar vertebra over the sacral vertebrae, b) minimize the activation of the hip flexors, c) increase the activation of the external and internal obliques and transverse abdominals, and d) maximize abdominal muscle activation of the lower and upper rectus abdominals relative to disc compression (load) when compared with a variety of sit-ups.

Few results are available on the consistency and accuracy of the curl-up. Reliability is higher for college students than for children but the values are acceptable for this type of assessment. Determination of validity has been hampered by the lack of an established criterion measure. Anatomical analysis and electromyographical documentation provide the primary support for the use of the curl-up test to determine abdominal strength and endurance.

Test Objective

To complete as many curl-ups as possible in a 60 second time period.

Equipment and Facilities

Gym mats and a measuring strip for every two students are needed. The measuring strip may be made of cardboard, rubber, smooth wood, or any similar thin, flat material and should be 30 to

35 inches long. Two widths of measuring strip may be needed. The narrower strip should be 3 inches wide and is used to test 5- to 9-year-olds; for older students the strip should be 4.5 inches wide. Other methods of measuring distance such as using tape strips and pencils are suggested..

Test Instructions

Allow students to select a partner. Partner A will perform the curl-ups while partner B counts and watches for form errors.

Partner A lies in a supine position on the mat, knees bent at an angle of approximately 140°, feet flat on the floor, legs slightly apart, arms straight and parallel to the trunk with palms of hands resting on the mat. The fingers are stretched out and the head is in contact with the mat. Make sure students have extended their feet as far as possible from the buttocks while still allowing feet to remain flat on floor. The closer the feet are positioned in relation to the buttocks, the more difficult the movement.

After partner A has assumed the correct position on the mat, partner B places a measuring strip on the mat under partner A's legs so that partner A's fingertips are just resting on the nearest edge of the measuring strip. Partner B then kneels down at partner A's head in a position to count curl-ups and watch for form breaks. Partner B places a piece of paper under partner A's head. The paper will assist partner B in judging if partner A's head touches down on each repetition. The observer should watch for the paper to crinkle each time partner A touches it with his or her head.

Before beginning the curl-up, it is a good practice for partner B to pull on partner A's hands to ensure that the shoulders are relaxed and in a normal resting position. If partner A is allowed to hunch the shoulders before beginning the test, he or she may be able to get the fingertips to the other side of the testing strip by merely moving the arms and shoulders up and down. Keeping

heels in contact with the mat, partner A curls up slowly, sliding fingers across the measuring strip until fingertips reach the other side; then partner A curls back down until his or her head touches the piece of paper on the mat. Partner A continues without pausing until he or she is complete with the 60 second time period.

When to Stop

Students are stopped after the 60 second time period is elapsed.

Form Corrections

Heels must remain in contact with the mat.

Head must return to the mat on each repetition.

Appendix F

Minimum Health Standards

		Age								
Fitness Test	Gender	8	9	10	11	12	13	14	15	16
Curl-Ups	F	29	30	30	32	35	37	37	36	35
Curl-Ups	M	31	32	35	37	40	42	45	45	45
Mile Run	F	11:00	11:00	10:00	10:00	10:30	10:30	10:00	10:00	10:00
Mile Run	M	11:00	10:00	9:30	9:00	9:00	8:00	8:00	7:30	7:30
PACER	F			7	15	15	23	23	23	32
PACER	M			23	23	32	41	41	51	61
Push-Ups	F	5	6	7	7	8	7	7	7	7
Push-Ups	M	5	6	7	8	9	10	12	14	16
Sit and Reach	F	9	9	9	9	9	9.5	9.5	9.5	9.5
Sit and Reach	M	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5

Appendix G

Tabulated Fitness Scores for September 2010-March 2011

<i>I2</i>	<i>Mile Pre</i>	<i>Mile Post</i>	<i>Growth</i>	<i>Student</i>	<i>Curl Ups Pre</i>	<i>Curl Ups Post</i>	<i>Growth</i>
A	11.23	8.08	3.15	A	25	35	10
B	11.5	11.02	0.48	B	29	35	6
C	7.05	6.54	0.51	C	15	29	14
D	18.04	16.36	1.68	D	16	25	9
E	13.45	11.04	2.41	E	24	27	-3
F	7.5	7.45	0.05	F	34	56	22
G	14	11.46	2.54	G	24	39	15
H	13.23	11.02	2.21	H	20	33	13
I	10.3	8.31	1.99	I	35	42	7
J	11.05	9.25	1.8	J	2	13	11
sum	117.35	100.53	16.82	sum	224	334	104
Mean	11.74	10.05	1.68	Mean	22.40	33.40	10.40
<i>Student</i>	<i>Mile Pre</i>	<i>Mile Post</i>	<i>Growth</i>	<i>Student</i>	<i>Curl Ups Pre</i>	<i>Curl Ups Post</i>	<i>Growth</i>
K	11.56	18.54	-6.98	K	11	8	-3
L	11.23	8.4	2.83	L	35	45	10
M	10.04	11.34	-1.3	M	24	29	5
N	10.13	10.34	-0.21	N	31	30	-1
O	11.37	15.35	-3.98	O	25	37	12
P	8.26	8.45	-0.19	P	10	12	2

Q	8.26	8.45	-0.19	Q	24	20	-4
R	14.2	15.45	-1.25	R	4	2	-2
S	9.35	9.17	0.18	S	40	30	-10
T	12.33	12.44	-0.11	T	29	34	5
U	15.41	14.38	1.03	U	25	20	-5
V	11.48	13.12	-1.64	V	48	20	-28
W	9.02	9.26	-0.24	W	36	40	4
X	9.58	10.18	-0.6	X	28	33	5
Y	12.03	12.5	-0.47	Y	30	25	-5
Z	14.15	11.45	2.7	Z	21	27	6
AA	10.15	9.1	1.05	AA	32	43	11
BB	11.54	11.34	0.2	BB	25	17	-8
CC	10.09	13.1	-3.01	CC	32	24	-8
DD	7.53	7.32	0.21	DD	38	42	4
EE	10.04	18.18	-8.14	EE	40	40	0
FF	7.55	7.41	0.14	FF	48	56	8
GG	13.15	13.33	-0.18	GG	21	26	5
HH	10	13.05	-3.05	HH	40	42	2
II	13.2	13	0.2	II	27	30	3
JJ	7.3	8.02	-0.72	JJ	52	42	-10
KK	12.34	16.5	-4.16	KK	25	30	5
LL	6.51	6.58	-0.07	LL	46	49	3

MM	10.04	9.22	0.82	MM	46	51	5
NN	7.15	7.23	-0.08	NN	52	54	2
OO	19.12	20.27	-1.15	OO	28	17	-11
PP	8.17	8.5	-0.33	PP	45	46	1
QQ	10.01	11	-0.99	QQ	34	36	2
RR	12.04	12.54	-0.5	RR	26	21	-5
SS	7.05	8.3	-1.25	SS	42	24	18
TT	11.05	13.2	-2.15	TT	38	28	-10
UU	14.08	14.51	-0.43	UU	43	32	-11
VV	11.33	15.36	-4.03	VV	33	33	0
WW	9.45	10.32	-0.87	WW	25	24	-1
XX	14.02	16.11	-2.09	XX	25	23	-2
YY	12.3	11.56	0.74	YY	32	40	8
ZZ	14.06	14.62	-0.56	ZZ	20	20	0
AAA	12.34	13.21	-0.87	AAA	25	27	-2
BBB	15.33	19.17	-3.84	BBB	20	16	4
CCC	7.06	7.12	-0.06	CCC	32	34	2
DDD	11	13.05	-2.05	DDD	49	37	-12
EEE	13.34	13.32	0.02	EEE	38	35	-3
FFF	10.28	13.1	-2.82	FFF	25	23	-2
GGG	9.42	11.21	-1.79	GGG	50	53	3
HHH	9.36	9.12	0.24	HHH	36	37	1

III	18.4	21.26	-2.86	III	31	4	-27
JJJ	8.31	8.41	-0.1	JJJ	19	22	3
KKK	12.34	12.38	-0.04	KKK	37	50	13
LLL	8.58	10.58	-2	LLL	39	26	-13
MMM	12.03	12.12	-0.09	MMM	37	33	-4
NNN	8.1	8.5	-0.4	NNN	16	13	-3
OOO	9.36	9.02	0.34	OOO	31	36	5
PPP	10.42	10.21	0.21	PPP	39	40	1
Sum	879.78	901.38	-56.93	Sum	2330.40	2489.40	-32.00
Mean	15.43	15.81	-1.00	Mean	40.88	43.67	-0.56

Appendix H

Tabulated Post Student Confidence Survey for March 2010

Health and Fitness Confidence Survey

Students who receive three quarters of physical education will acknowledge a greater confidence in meeting the presidential fitness standards in cardiorespiratory endurance and muscular endurance than students who do not receive three quarters of Health and Fitness.

Student	Male	Female	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
A	X		1	2	2	2	1	1	4	4	4	4
B	X		1	2	2	2	1	1	4	3	4	4
C	X		1	1	2	2	1	1	3	3	4	4
D		X	2	1	2	1	2	2	3	3	3	4
E	X		1	2	2	2	1	1	4	4	3	4
F	X		1	1	2	2	1	1	4	3	4	3
G	X		1	1	2	2	2	2	3	4	3	4
H		X	2	2	2	2	2	2	4	4	4	4
I	X		1	2	2	1	2	2	4	4	3	3
J	X		1	2	2	1	1	1	3	4	3	3
total			12	16	20	17	14	14	36	36	35	37
mean			1.2	1.6	2	1.7	1.4	1.4	3.6	3.6	3.5	3.7