

**A STUDY OF THE EFFECT OF BODY MASS INDEX ON TCAP SCORES
AND ATTENDANCE OF MIDDLE SCHOOL STUDENTS**

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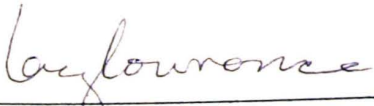
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A STUDY OF THE EFFECT OF BODY MASS INDEX
ON STUDENT ACHIEVEMENT AND ATTENDANCE
OF MIDDLE SCHOOL STUDENTS

A Field Study
Presented to the
Graduate and Research Council of
Austin Peay State University

In Partial Fulfillment
of the Requirements for the Degree
Education Specialist

By
D. LaJoyce Weatherspoon

April 2006

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ABSTRACT

WEATHERSPOON, D. LAJOYCE. *A Study of the Effect of Body Mass Index on TCAP Scores and Attendance of Middle School Students* (Under the direction of DR. HERALDO RICHARDS).

Obesity has an enormous affect on our school-aged children that warrants attention. Not only is obesity affecting their health, but can affect their school performance and attendance. The purpose of this study was to focus on whether body mass index (BMI) would significantly affect student achievement (TCAP scores) and attendance of middle school students. The Tennessee Comprehensive Assessment Program (TCAP) test was used because it measured student achievement in Math and Reading/Language Arts, both required for Annual Yearly Progress (AYP) by the No Child Left Behind Act. Data were gathered randomly by a third party on middle school students in grades 6th through 8th who attended Clarksville Montgomery County School System (CMCSS) in Tennessee. Three independent t-tests were performed for probability of the effect body mass index (BMI) had on Math, Reading/Language Arts TCAP scores and Attendance. The results of the first two t-tests measuring the effect of BMI on student achievement were not significant. However, the third t-test measuring the effect of BMI on attendance resulted in significance at the 0.03 level.

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION	1
Statement of the Problem	4
Purpose of the Study	4
Significance of the Study	4
Research Questions	5
Hypothesis	5
Definition of Terms	5
Limitations of the Study	7
II. REVIEW OF THE LITERATURE	8
National Education/American Heart Association Findings	8
Impact of Obesity on Gender and Race	8
Impact of Obesity on Quality of Life	9
Related Health Problems	10
Dietary Implications	11
The Effect of Obesity on Absenteeism and the Economy	13
The Effect of Obesity on School Performance	14
Obesity and Schools	15
Centers for Disease Control & Prevention Findings	16
Obesity Treatment	17
Our Government Intervention	17

III. METHODOLOGY	19
Research Design	19
Participants	19
Instruments	19
Procedure	20
Data Analysis Plan	20
IV. RESULTS	21
Background of Samples and Variations	21
Results of the t-Tests	22
Table 1: Body Mass Index and Math TCAP Scores	24
Table 2: Body Mass Index and Reading TCAP Scores	25
Table 3: Body Mass Index and Attendance	26
V. SUMMARY AND CONCLUSION	27
Summary	27
Conclusion	28
Implications for Further Research	29
LIST OF REFERENCES	30
APPENDICES	
A. IRB Approval Letter	34
B. CMCSS Approval Letter	35
C. NPMS Approval Letter	36
D. RMS Approval Letter	37
E. Table 4: BMI Percentile Chart	38
F. Table 5: BMI Value Chart	38
G. Table 6: TCAP Proficiency Range Chart	39
CURRICULUM VITAE	40

CHAPTER I

INTRODUCTION

Our society has produced a serious epidemic that is soaring and attacking our most precious jewels, our youth. From the schools that our youth attend to the homes in which they live, this epidemic is flourishing year by year and our youth are becoming helpless victims of this problem. This plague is not anything new; as a matter of fact, it was once thought to be an indicator of a healthy, prestigious part of life in which one would survive the rigors of undernourishment and infection (Ebbeling, Pawiak & Ludwig, 2002). On the contrary, today it is among the most sobering health challenges facing us today (U.S. Department of Health & Human Services, 2001). This annoying attacker is called obesity. Not only is obesity a threat to our youth's health, but it is also becoming a threat on their school performance and attendance.

According to a recent 2004 research study conducted by California Department of Education on academics and fitness, results showed a consistent positive relationship between overall fitness and academic achievement (Vail, 2006). Student achievement is a high priority in the public school arena. It is so crucial that most school districts include it in their strategic work plan. As a matter of fact, the Clarksville-Montgomery County School System (CMCSS), the one used in this

study, is no exception. This school district's strategic goal is "improving student achievement".

Research has found obesity affects one in five youth in the United States and is the most widespread nutritional disease of children and adolescents in the United States (Dietz, 1998). Body Mass Index (BMI) is a guide to predict your body fat based on your height and weight. BMI correlates height and weight and gives a better idea of healthy body size. Overweight is defined in youth as being at the 85th percentile of body mass index (BMI) value, and obese defined as being at or above the 95th percentile of body mass index (BMI). BMI for children and teens sometimes referred to as "BMI-for-age." The Centers of Disease Control and Prevention (CDC) which provides national statistical data for weight status of American youth, avoids using the word "obesity" and identifies every child and adolescent above the 85th percentile as overweight (American Obesity Association, 2002).

Obesity is the most crucial medical problem in our society today. Overweight adolescents are at a significant risk for becoming obese as an adult and are predisposed to a range of short-and long-term health problems. Despite the enormous implications of obesity on our economy, effective prevention strategies are still lacking (Trent & Ludwig, 1999). Furthermore, researchers found that fifty percent of these overweight youth become overweight adults (Holm et al., 2001).

Overweight youth are destined to a range of medical, psychosocial problems (Trent & Ludwig, 1999), lower academic performance (Mo-swan, Lebel, Puetpaiboon and Junjana 1999) and higher absenteeism (Vetiska, Glaab, Perlman & Daneman, 2000). If this epidemic continues, we could end up with a multitude of serious health problems, increased rates of high school dropouts and high crime rates that will be too vast for anyone to control.

Research studies such as this one must continue in order to improve the holistic being of our youth. We must strive to touch all aspects of our youth's lives - from their health to their quality of life and the root to it all begins with improving their school performance and attendance. By focusing on these positive indicators, it could eliminate negative outcomes in our youth's lives such as school dropouts, unemployment and medical and psychological problems, all of which could lead to detrimental lifestyles of drug abuse, depression, murder, suicide, etc. In addition, the benefits gained from this study are important because it will add to the body of research intended to report findings that will offer insight into a solution of childhood overweight issues and academic outcomes.

Statement of the Problem

Approximately, nine million school-aged youth in our society are officially overweight or obese. Over 60% of school age youth who fall into these categories could develop serious health problems in their lifetimes and shorten their normal life spans (Crute, 2005). Research findings indicate that being overweight can decrease school performance in many ways, including health-related absenteeism (Story, Kaphinger & French, 2006)

Purpose of the Study

The purpose of the study was to determine if obesity (Body Mass Index - BMI) had an effect on student achievement as measured by TCAP scores in Math and Reading/Language Arts and Attendance of middle school students.

Significance of the Study

The results of this study were used to gain a better understanding of the effect of obesity on student achievement and attendance of middle school students. It was also be used to gain awareness of the dangers of being overweight and promote good health habits for middle school students.

Research Questions

1. Is there a significant difference in Math achievement TCAP scores of middle school students based on body mass index (BMI)?
2. Is there a significant difference in Reading/Language Arts achievement TCAP scores of middle school students based on body mass index (BMI)?
3. Is there a significant difference in school attendance of middle school students based on body mass index (BMI)?

Hypotheses

1. There is no significant difference in the Math achievement scores of middle school students based on BMI.
2. There is no significant difference in the Reading/Language Arts achievement scores of middle school students based on BMI.
3. There is no significant difference in absentee rate of middle school students based on BMI.

Definition of Terms

Body Mass Index (BMI) is a reliable indicator to predict total body fat, which is related to the risk of disease and death (American Obesity Association, 2002).

High Body Mass Index (HBMI) - Bodily weight much greater than normal. BMI values at or above the 85th percentile of the sex-specific BMI growth charts in youth. Also, referred to in this study as "overweight" or "obese".

No Child Left Behind Act (NCLB) -The Elementary and Secondary Education Act (ESEA), renamed the "No Child Left Behind" NCLB Act of 2001, established laudable goals -- high standards and accountability for the learning of all children, regardless of their background or ability.

Target Body Mass Index (TBMI) -Normal bodily weight. BMI values between 5% and 85% percentile of the sex-specific BMI growth charts in youth.

Tennessee Comprehensive Assessment Program (TCAP) -A test administered annually to all public schools in Tennessee to measure student achievement in Math, Reading, Language, Social Studies and Science.

Youth - referred to and used simultaneous with children and adolescents.

Limitations of the Study

This study was limited to two local middle schools within the Clarksville-Montgomery County School System (CMCSS) in Tennessee. One school located in the northern area of the county is a highly populated, transit military community which yields a high turnover rate in the student population; the other school located in the southern area of the county is a highly populated, middle to upper-middle socioeconomic level community which produces a more stable student population. Students' attendance data did not include students who were tardy and some who usually miss the same core classes (i.e., Math, Reading/Language) at least once a week. The count for Reading/Language Arts TCAP tests was different than the count for Math TCAP tests because Non-English speaking students were exempt from taking the Reading/Language Arts TCAP tests. However, these students took the Math TCAP tests.

Chapter II

REVIEW OF RELATED LITERATURE

National Education/American Heart Associations Findings

The National Education Association (NEA) found all across our nation, the occurrence of obesity in our school-aged children is growing so rapidly that some health experts are calling it a national crisis (Crute, 2005). In addition, unbelievable data found children as young as two years old developing obesity. In December 2004, the American Heart Association (AMA) reported 10 percent of American children ages two to five years of age were overweight, a seven percent increase since 1994 (Crute, 2005).

Impact of Obesity on Gender and Race

The American Obesity Association (*Obesity in Youth*), 2002 conducted various longitudinal studies from 1971 - 2000 and found obesity prevalence quadrupled over 25 years among children ages 6 to 11 (boys and girls); among adolescent males and females, researchers found that obesity occurrence more than doubled. The results reaffirmed overweight children prevalence higher in boys (32.7 percent) than girls (27.8 percent). In adolescents, overweight prevalence was almost equal for females (30.2 percent) and males (30.5 percent). Furthermore, the

results regarding race indicated African-American, Hispanic American and Native American children and adolescents have particularly higher prevalence of obesity. Among female youth, the highest overweight and obesity prevalence was found in African-American (non-Hispanic) girls. Among male youth, the highest overweight and obesity prevalence was found in Mexican-American boys. Asian-American and Hispanic-American adolescents born in the United States to immigrant parents were more than twice as likely to be overweight as foreign born adolescents who moved to the U.S. (*American Obesity Association, 2002*).

Impact of Obesity on Quality of Life

Researchers continue to stress the impact of obesity on our society as "one of the most common chronic disorders in childhood and its prevalence continues to increase rapidly" (Schwimmer, Burwinkle & Varni, 2003, p. 1813). These researchers also indicated an upward trend in long-term health problems as a result of obesity. The results showed that when obese youth were compared to healthy youth, the obese youth had a significantly lower health-related quality of life in all domains--physical, psychosocial, emotional, social functions and school academics. The research continually pointed out that obese youth were more likely to demonstrate more damage in psychosocial health when compared with healthy youth. Other

studies show that overweight children as young as five years of age had problems with lower self-concept (Holm, et al., 2001).

Related Health Problems

The American Obesity Association (2002) further observed the health effects associated with overweight children and adolescents and found some alarming notable findings:

1. Asthma - occurrence of overweight was reported significantly higher in children and adolescents with moderate to severe asthma compared to a non-obese peer group. In 2003, researchers found that asthma is highly correlated with obesity and continues to be a threat to children's health and well-being. Results found that obesity is more common among children with asthma and associations between asthma and high body mass index (BMI) have been observed in cross-sectional studies of adults and children. These associations have been explained as evidence that asthma causes obesity due to the lack of physical activity among children with asthma; however, this interpretation has been challenged by the results of recent longitudinal studies (Gilland, et al., 2003).
2. Diabetes (Type 2) - obese children and adolescents reported 12.6 times more likely than non-obese youth to have higher fasting blood insulin levels.

3. Hypertension - obese children and adolescents reported 2.4 times more likely to have high diastolic blood pressure and 4.5 times more likely to have high systolic blood pressure than their non-obese counterparts.
4. Orthopedic Complications - A variety of orthopedic complications occur in children and adolescents with obesity because bone and cartilage in the process of development were not strong enough to bear excess weight.
5. Psychosocial effects and stigma -Overweight adolescent females reported experiences with comments such as direct and intentional weight-related teasing, jokes and derogatory name calling more often than their non-obese peers. Overweight youth reported negative assumptions made about them were voiced by others.

Dietary Implications

A 15-year study (1985-2000) by Pereira, et al. (2005), found that fast food intake increased the risk of obesity and Type 2 diabetes and that people who eat fast foods two or three times a week gained 10 more pounds than those who ate fast foods less than once a week. Fewer kids are sitting down to a family dinner with parental supervision, meaning kids are eating whatever they want. Findings confirmed white women had the lowest fast-food frequency compared to other ethnic-sex groups.

Changes in fast-food frequency were highly correlated with changes in body weight gain and insulin resistance.

Society, as a whole, is responsible for creating this uncontrollable situation, (from fast foods to computer games, from parents to schools) across our nation and across our world. Parents, as well as our schools, play an integral part in making this appalling situation become a reality. The hurried lifestyles created by our society have caused parents to become more and more depended on quick meals such as McDonald's and Burger King. These types of foods are what end up inside our youth's bodies' day in and day out (Pereira, et al., 2005).

In addition to our children's poor dietary intake, our technological world has turned our youth into lazy creatures with little or no motivation to overall fitness. No longer do most youth go outdoors to play; instead they stay indoors playing video and computer games via Internet. The computer has replaced what was once youth's active past-time with a sedentary routine past-time that has caused slow metabolisms at an earlier age. Our youth today are considered the most inactive generation in history. Because of continued deteriorating dietary habits and inactivity, the rise of obesity, diabetes, high blood pressure, asthma and other diseases that were once considered adult-onset diseases, are now prevalent in our youth

at earlier ages than ever before (American Obesity Association, 2002).

Not only in America, but throughout the world, obesity is on the rise. Research continues to support that these findings are due to poor dietary habits and sedentary lifestyles. As better living standards throughout the world are improving, increases in obesity among the wealthy men and middle-income women are also on the rise. (Example: China now has fast food restaurants accessibility and Russia and Europe economies are improving). All around the world, sedentary activity patterns have been adapted by other countries that increased the amount of hours spent on the computer with decreased amount of hours spent during sporting or outdoor activities (Holm, et al., 2001).

The Effect of Obesity on Absenteeism and the Economy

Absenteeism is another concern among our obese youth associated with health issues. Research studies found that overweight/obesity in adults and children is a worldwide health problem associated with significant economic burden as measured in sick leave, life and disability insurance rates and contributes to absenteeism from school and work. They also found more obese students often develop health problems such as hypertension, elevated cholesterol, Type 2 diabetes, cancers and

suffer more joint and mobility problems (Holm, et al., 2001). More alarming was the annual obesity-related hospital costs in 6-17 year olds which reached \$127 million per year (Goran, Ball, & Cruz, 2003) and the \$100 billion yearly cost to society (AOA, 1999). Not surprisingly, unhealthy kids continue to miss school more often (Crute, 2005). When these problems surface, they equate to an increased number of doctor visits along with numerous sick days which would lead to students being absent from school. Moreover, research findings established that absentee rates of obese children and adolescents increased; a mean of 4.2 days of school in the month prior to evaluation. The reasons for absenteeism were not investigated, but increased school absenteeism has been documented in children and adolescents with other chronic diseases including diabetes and asthma (Vetiska, et al., 2000).

The Effect of Obesity on School Performance

Students' high rate of absenteeism correlates highly with decreased school performance. The long-term consequences of school absenteeism are not known, but for females, being overweight as an adolescent may be associated with the completion of fewer years of school (Gortmaker, et al., 1993).

Research continues to support negative effects obesity has on our youth both in the U.S. and worldwide. A study conducted

in Thailand reported that obese children and adolescents were many times more likely to report impaired school function and subtle behavior differences. This particular study used BMI as its primary measurement along with a questionnaire comparing parental education levels and occupations, income, along with GPA and grades in Math and Language in 1994. The results found that overweight children and adolescents in grades 7 through 9 were twice as likely to have low grades in math and language as healthy children and adolescents (Mo-swan, Lebel, Puetpaiboon & Junjana, 1999).

A related study conducted in the U.S. strengthened these findings. This study included nutritional status, school performance and behavior assessed for a group of black, inner-city school children. A questionnaire given in this study indicated that the obese children were more likely to have abnormal scores on the Child Behavior Checklist (CBCL) and the proportion of obese children placed in special education or remedial classes was twice that for non-obese children (Tershakovee, Weller & Gallagher, 1994).

Obesity & Schools

National Education Association (NEA) cited a 2004 study by the Center for Science in the Public Interest (CSPI) which surveyed 9,723 school vending machines and found 70 percent held

soft drinks with sugar; 42 percent held candy; 5 percent offered milk and less than half of those offerings were low-fat. Even with these alarming numbers and the public overwhelmingly supporting adding nutrition curricula to schools and likes the idea of healthy food in vending machines, a related study by a firm that conducts surveys to public health policy found that less than half were willing to contribute an additional \$100 per year in taxes to support such anti-obesity efforts. (Crute, 2005).

Crute (2005) found some schools in our nation are fighting back and giving students healthier choices by using creative taste-testing efforts. These schools have already began replacing coke machines with water and milk and also replacing candy with low-fat and fat-free choices.

It is of utmost importance that more schools across the nation follow these efforts and minimize the opportunities that students have in selecting unhealthy foods. Perhaps limiting unhealthy food choices to one day per week versus everyday would be a start in the right direction.

Centers for Disease Control and Prevention (CDC) Findings

The Centers for Disease Control and Prevention (CDC) states that a lack of physical activity can seriously damage children's health. It subsequently noted a report from U.S. National

Center for Health Statistics in 2003 that heart disease related to obesity has surpassed cancer (smoking-related). The researchers analyzed data from 2000 for the leading causes of death and for those preventable factors known to contribute to them. Like tobacco, obesity and inactivity increase the risks for the top three killers: heart disease, cancer and such cerebrovascular ailments as strokes. Obesity and sedentary lifestyle also strongly increase the risk of diabetes, the sixth leading cause of death. Forty percent fewer children reported that they walked or rode their bikes to school in 1995 than in 1977 (Dietz, et al., 2002).

Obesity Treatment

"Obesity is among the easiest medical conditions to recognize but the most difficult to treat" (Childhood Obesity, 1999, p. 55). There is a tremendous need for awareness of the chronic health complications of obesity in children and adolescents, yet many pediatricians do not offer treatment to obese children and adolescents in the absences of comorbid conditions (Jonides, Buschbacher, & Barlow, 2002).

Our Government Intervention

Most importantly, our government has joined forces in stepping up efforts to control this epidemic. The Surgeon

General's Call to Action to Prevent and Decrease Overweight and Obesity is giving various approaches to change the number of obese children in our nation. It was reported that approximately 300,000 U.S. deaths a year currently are associated with obesity and overweight compared to more than 400,000 deaths a year associated with cigarette smoking. Obesity is equal to approximately the same amount of preventable deaths as smoking and contributes to billions of dollars yearly in healthcare cost to our society (Childhood Obesity, 1999).

Researchers reiterated that while the prevalence of overweight and obesity increased across all races, ethnic and age groups, disparities exist. Members of minority populations and lower-income families generally experience a greater prevalence than of those of non-Hispanic white populations and with higher-income families. In order for this plan to be successful, we must be proactive. It is suggested strategies be put in place as follows: 1) ensure daily, quality physical education classes be required for all school grades; 2) place healthier foods in our schools (milk instead of soda) and safe recreational equipment; 3) reduce time spent watching TV and other sedentary behaviors; 4) educate all expectant parents about the benefits of breast feeding; 5) increase research, and 6) educate health care providers, educators, teachers and communities. (U.S. Department of Health & Human Services, 2001).

Chapter III

METHODOLOGY

This study was designed to determine if obesity as measured by body mass index (BMI) had any significant effect on student achievement (TCAP scores) and attendance of middle school students.

Research Design

Three independent t-tests were used to conduct the research study. The independent variable was body mass index and the dependent variables were Math TCAP scores, Reading/Language Arts TCAP scores and attendance data.

Participants

The participants consisted of 262 local middle school students, ages 11 years old to 15 years old in the Clarksville-Montgomery County School System in Tennessee.

Instrument(s)

Body Mass Index (BMI) value tests, Math & Reading/Language Arts TCAP scores and attendance reports were the instruments used. TCAP scores used in this study were Criterion Reference Test (CRT) scale scores.

Procedure

The Physical Education departments at the participating middle schools took body mass index (BMI's) on all students enrolled in physical education during the 2004-05 and 2005-06 school years. Physical Education departments gave data to Guidance departments of the BMI test results. The Guidance departments matched random BMI results to each student's TCAP scores and attendance record. The middle schools' Physical Education departments who participated in this study already used body mass index (BMI) testing as part of their curriculum. The collection of data was taken only during physical education classes did not interfere with regular instruction. All participants were given an identifier number for purposes of collecting data. No names were used in the study therefore no student consent forms were required. The Guidance departments assigned numbers to each student and delivered data to the researcher. The researcher received approval letters from each school administrator prior to collecting data.

Data Analysis Plan

Three independent t-tests were used for this group design study. The tests measured 1) the effect of BMI on Math TCAP achievement scores; 2) the effect of BMI on Reading/Language Arts TCAP achievement scores and 3) the effect of BMI on attendance of middle school students.

CHAPTER IV

RESULTS

Background of Samples and Variables

A third party took random samples on 262 middle school students from two middle schools in the Clarksville Montgomery County School System in Tennessee, to see if body mass index (BMI) had any significant effect on student achievement scores and attendance. The Tennessee Comprehensive Assessment Program (TCAP) test was used to measure student achievement. This test was chosen for this study because it is administered annually to all students in grades 3-12 to measure student achievement in four cognitive areas (Math, Reading/Language Arts, Science and Social Studies). Math and Reading/Language Arts were chosen among the four because they impose a greater foundation for the basis of the No Child Left Behind (NCLB) Act. TCAP combines one score for Reading and Language Arts within the middle school areas of testing. The scores selected were Criteria Referenced (CRT) scale scores, with a range between 300 to 700. These scores fell into three categories- below proficient, proficient and advanced proficient. The cut off scores for each category were based on the subject area and grade level (see Table 6, p. 38).

Results of the t-Tests

Three independent t-tests were conducted in this study to measure 1) BMI on Math TCAP scores; 2) BMI on Reading/Language Arts TCAP scores and 3) BMI on Attendance. The statistical program used to run the data analyses was Statview. The level of significance was set at a p-value of .05.

In Table 1, an independent t-test was conducted to measure the effect of BMI on Math TCAP achievement scores. Both the TBMI and the HBMI groups fell between the proficient range of 479-536. The TBMI group had a mean score of 527.1 and the HBMI had a mean score of 522.0. The results showed no significant difference between the two groups with a p-value of .781. Therefore, the null hypothesis was not rejected.

In Table 2, a second independent t-test was conducted to measure the effect of BMI on Reading/Language Arts achievement scores. Both scores fell between the proficient range of 479-536. The TBMI group had a mean score of 518.5 and the HBMI had a mean score of 516.9. The results showed no significant difference between the two groups with a p-value of .814. Therefore, the null hypothesis was not rejected.

In Table 3, a third independent t-test was conducted to measure the effect of BMI on attendance. The TBMI group had a mean score of 6.1 missed days and the HBMI group had a mean score of 7.7 missed days. The results showed a significant

ifference between the two groups with a p-value of .03. Therefore, the null hypothesis was rejected. This outcome strongly supports recent research that indicate the higher the BMI, the higher the rate of absenteeism (Taras & Potts-Datema, 2006). A study conducted by the Center for Science in the Public Interest (2004) showed that childhood obesity is costing school districts hundreds of thousands of dollars per year and for some larger school districts, millions due to higher rates of absenteeism in our obese youth. Schools' state funding is greatly impacted by attendance (National PTA, 2005).

Table 1
 Body Mass Index and Math TCAP Scores
 Clarksville-Montgomery County School System
 Middle School Students - Grades 6th - 8th

Unpaired t-test for Math
 Grouping Variable: BMI
 Hypothesized Difference = 0

	Mean Diff.	DF	t-Value	P-Value
HBMI, TBMI	-5.142	260	-.705	.7815

Group Info for Math
 Grouping Variable: BMI

	Count	Mean	Variance	Std Dev.	Std Err
HBMI	107	522.0	2577.4	50.8	4.9
TBMI	155	527.1	3911.5	62.5	5.0

Table Key

TBMI - Target Body Mass Index

HBMI - High Body Mass Index

Table 2
 Body Mass Index and Reading/Language TCAP Scores
 Clarksville-Montgomery County School System
 Middle School Students - Grades 6th - 8th

Unpaired t-test for Reading/Language Arts
 Grouping Variable: BMI
 Hypothesized Difference = 0

	Mean Diff.	DF	t-Value	P-Value
HBMI, TBMI	-1.546	237	-.235	.8145

Group Info for Reading/Language Arts
 Grouping Variable: BMI

	Count	Mean	Variance	Std Dev.	Std Err
HBMI	106	516.9	1803.6	42.5	4.1
TBMI	153	518.5	3343.8	57.8	4.7

Table Key

TBMI - Target Body Mass Index

HBMI - High Body Mass Index

Table 3
 Body Mass Index and Attendance Data
 Clarksville-Montgomery County School System
 Middle School Students - Grades 6th - 8th

Unpaired t-test for Attendance
 Grouping Variable: BMI
 Hypothesized Difference = -0

	Mean Diff.	DF	t-Value	P-Value
HBMI, TBMI	1.6	260	2.2	.0313

Group Info for Attendance
 Grouping Variable: BMI

	Count	Mean	Variance	Std Dev.	Std Err
HBMI	107	7.7	40.7	6.4	.6
TBMI	155	6.1	30.8	5.6	.4

Table Key

TBMI - Target Body Mass Index
 HBMI - High Body Mass Index

Chapter v

SUMMARY AND CONCLUSION

Summary

Our society has created a time bomb for our youth and if something is not done soon, it will explode. Obesity is everyone's problem either now or later. We must all come together as one and take part in making a difference in our youth's lives, not just creating a healthier lifestyle, but also educating them academically to make them better citizens. Without education, they will not be able to make it in our high technological world that is high on Math and Reading/Language mastery. We must not only educate our youth, but educate ourselves and live by example. Good health equals good brain power (Vail, 2006). Instead of buying foods that are high in fat, we need to start looking at healthier choices.

Healthcare is at an all time high for our youth, they are now facing problems that adults used to face. Not only do they have to worry about overcoming puberty and adolescence but also must learn to overcome diseases that use to be adult-onset only.

Research suggests that our current knowledge is not enough and emphasizes more understanding and research on this epidemic of obesity. It is relevant that better understanding of what

contributes to an increase in BMI becomes a priority. Research might enhance our knowledge of specific intervention efforts that are effective and make appropriate changes accordingly (Hill & Trowbridge, 1998). More importantly, we must gain a better understanding of what impact obesity have on student achievement and attendance.

Conclusion

It is time for our society to take a stand and give youth the motivation needed to fight this continuing problem of obesity. Overweight youth are four times more likely than their health-weight peers to report impaired school performance (Story, Kaphinger & French, 2006).

Parents, schools and communities must all play a role and do their part in order for obesity to be resolved. Effective public policy is required to address the rising issue of childhood obesity (Dietz, Bland, Gortmaker, Molloy & Schmidt, 2002). We must all do what it takes to ensure our youth live a quality, healthy life and conquer as many barriers as possible to reach their highest potential both physically and academically.

Implications for Future Research

This study investigated the effect of body mass index (BMI) on achievement using TCAP scores; however, other measures of achievement such as grade point averages and teacher recommendations might be used in the future to further investigate this variable. Additionally, the impact of BMI on discipline referrals and parental questionnaires may also be examined. Correlations among BMI, behavior and attendance may also yield important findings.

Furthermore, this study did not analyze differences among gender, ethnicity and socio-economic status (SES), but these are important variables that might be differentially affected by BMI. In conclusion, there are several other factors in which BMI might impact the outcomes. The answers lie in future research.

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College of Graduate Studies

March 21, 2006

Laloyce Weatherspoon
117 Southpoint Drive
Clarksville, TN 37043

RE: Your application regarding study number 06-008: The Effects of Obesity on Students Achievement and Absenteeism in Middle School

Dear Laloyce Weatherspoon,

Thank you for your recent submission. We appreciate your cooperation with the human research review process. I have reviewed your request for expedited approval of the new study listed above. This type of study qualifies for expedited review under FDA and NIH (Office for Protection from Research Risks) regulations.

Congratulations! This is to confirm that I have approved your application through one calendar year. This approval is subject to APSU Policies and Procedures governing human subject research.

You are granted permission to conduct your study as described in your application effective immediately. The study is subject to continuing review on or before March 21, 2007, unless closed before that date. Enclosed please find the forms to report when your study has been completed and the form to request an annual review of a continuing study. Please submit the appropriate form prior to March 21, 2007.

Please note that any changes to the study as approved must be promptly reported and approved. If you have any questions or require further information, contact me at (221-7415; fax 221-7641; email pinder@apsu.edu).

Again, thank you for your cooperation with the APSU IRB and the human research review process. Best wishes for a successful study!

Sincerely,

A handwritten signature in cursive script that reads 'Charles A. Pinder'.

Charles A. Pinder, Ph.D.
Chair, Austin Peay Institutional Review Board
c/o Dr. Heraldo Richards

Sallie Armstrong
Curriculum & Instruction Director

Board of Education	621 Gracey Avenue	Clarksville, Tennessee 37040
931-920-7819	Fax: 931-920-9819	email: sallie.armstrong@cmcss.net

March 16, 2006

Ms. LaJoyce Weatherspoon
117 Southpoint Drive
Clarksville, TN 37043

Dear Ms. Weatherspoon:

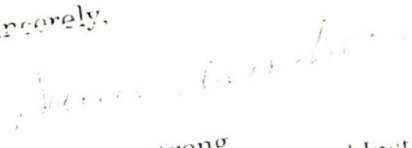
Your research, survey, and/or research project proposal entitled, "The effect of obesity (BMI) on student achievement (TCAP scores) and attendance in middle school students" has been approved by the research committee. The date of approval was March 16, 2006.

Now that you have approval from the research committee, you may contact the principal(s) for approval. The principal(s) has the final authority and responsibility for approving or disapproving research conducted in their building.

Please read the Research Policy and Procedures Handbook for all information concerning research in Clarksville-Montgomery County Schools.

If you have questions, please call my office at (931) 920-7819.

Sincerely,


Sallie Armstrong
Director of Curriculum and Instruction

SAMph



New Providence Middle School

146 Cunningham Lane Clarksville, Tennessee 37042

931-648-5655 Fax: 931-503-3409

To Whom It May Concern:

LaJoyce Weatherspoon, Education Specialist candidate, has permission to conduct her research study at our school. Her topic "the effect of obesity (BMI) on student achievement (TCAP scores) and attendance in middle school students" will involve utilizing BMI data that has already been collected.

It is understood that she will ensure a blind, anonymous format for collecting data. No consent forms are required because no names will be used in the study; instead a specific number will be given to match and identify the data. Our P.E. department and guidance department collected the data.

If you have any questions, please feel free to contact our office.

Sincerely,

Laura Barnett
Principal





Richview Middle School

2350 Memorial Drive Clarksville, Tennessee 37043

931-648-5620 Fax: 931-551-8111

to Whom It May Concern:

LaJoyce Weatherspoon, Education Specialist candidate, has permission to conduct her research study at our school. Her topic "the effect of obesity (BMI) on student achievement (TCAP scores) and attendance in middle school students" will involve utilizing BMI data that has already been collected.

It is understood that she will conduct a blind, anonymous format for collecting data. No consent forms are required because no names will be used in the study instead a specific number will be given to match and identify the data. P.E. departments and guidance departments collected the data for this study.

If you have any questions, please feel free to contact our office.

Sincerely,



Patrick Digby
Principal



Table 4
Centers for Disease Control and Prevention (CDC)
Body Mass Index Chart

Body Mass Index Percentile Chart for Youth

BMI for age (percentile)	Child's Health
Less than 5	Underweight
5 - 85	Target weight
85- 95	Officially overweight
Greater than 95	Obese

Table 5

Centers for Disease Control and Prevention (CDC)
Meaning of BMI Value (Index)

Meaning of Your BMI Value (Index)		
Meaning	BMI Value (Index)	
	Women	Men
Underweight	Under 19	Under 15
Target weight	Between 19-25	Between 15-25
Overweight	Over 25	Over 25

Table 6

Proficiency Ranges for TCAP Achievement CRT Scores
 Scale Score and Number Correct Cut Scores for Proficient
 and Advanced

Content Area	Grade	Scale Score		Number Correct	
		Proficient	Advanced	Proficient	Advanced
Reading/Language Arts	6	479	537		
	7	490	543	21	40
	8	495	548	21	39
Mathematics	6	479	537		
	7	487	550	24	43
	8	494	561	24	42
Science	6	191	216	23	38
	7	193	216	24	39
	8	193	217	27	42
Social Studies	6	194	216	22	39
	7	194	216	27	44
	8	195	216	24	43

Reporting Categories Performance Index (RCPI) Cut Scores

The Reporting Categories Performance Index is an estimate of the number of items the student would be expected to answer correctly if there had been 100 such items for that category.

Curriculum Vitae of D. LaJoyce Weatherspoon

Family

Clarksville native, only child to Nezzie Harris, married to Eddie Weatherspoon, four sons, Daniel, Doug, Kevin & Antonio and one daughter, Christal.

Education Background

AUSTIN PEAY STATE UNIVERSITY, CLARKSVILLE, TENNESSEE

2006 – Education Specialist Candidate in Administration & Supervision

1995 – Master of Science – Public Health Education

1986 – Bachelors of Business Administration

1985 – Associates of Science in Office Management

Professional Employment and Leadership Background

CLARKSVILLE MONTGOMERY COUNTY SCHOOL SYSTEM (CMCSS), TENNESSEE

Computer Technology Instructor, New Providence Middle School (NPMS)

Leadership Team Member, NPMS

Member, CMCSS Aspiring Leaders Program

Featured Educator & Classroom, CMCSS State of School's Address, 2005

CLARKSVILLE MONTGOMERY COUNTY EDUCATION ASSOCIATION (CMCEA)

Associate Representative

Technology Chair

Negotiations Team Member

Professional Memberships

NATIONAL EDUCATION ASSOCIATION (NEA)

TENNESSEE EDUCATION ASSOCIATION (TEA)

CLARKSVILLE MONTGOMERY COUNTY EDUCATION ASSOCIATION (CMCEA)

Professional Magazines

FEATURED EDUCATOR IN NEA TODAY, SEPTEMBER 2005 EDITION

The "D" Word- Twenty Five Tips #6 and #14

Future Goals

BECOME A SCHOOL ADMINISTRATOR

EARN A DOCTOR OF PHILOSOPHY (PH.D.)