1-1-2010

Risk Factors for Development of High Blood Pressure and Obesity Among African American Adolescents

Monique Shanta White
Walden University

Walden University

COLLEGE OF HEALTH SCIENCES

This is to certify that the doctoral dissertation by

Monique White

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Mary Lou Gutierrez, Committee Chairperson, Public Health Faculty
Dr. Clifton Addison, Committee Member, Public Health Faculty
Dr. Patrick Williams, Committee Member, Public Health Faculty
Dr. JaMuir Robinson, University Reviewer, Public Health Faculty

Chief Academic Officer

David Clinefelter, Ph.D.

Walden University
2010

Abstract

Risk Factors for Development of High Blood Pressure and Obesity Among African American Adolescents

by

Monique Shanta White

MPH, Jackson State University, 2005

BA, Jackson State University, 2001

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

November 2010

Abstract

Childhood obesity has reached epidemic proportions in the United States and has been linked to hypertension, especially among African American youth. Optimistic bias leads youth to underestimate their susceptibility to negative health outcomes. Public health officials want to reduce risk factors to result in significant long term reduction in cardiovascular disease. The purpose of this study was to explore adolescent behavior practices in a school district and prevalence of high blood pressure and obesity in that population.The health belief model guided the framework for this study. Research questions examined relationship between individual health risk practices and optimistic bias on health outcomes. Using a correlational research design, 433 African American high school students were administered a face-to-face survey and had their obesity and blood pressure measured by the school nurse. Canonical correlational analyses were used to examine relationships between health risk practices and descriptive statistics for optimistic bias and health outcomes. Among the health risk practices, engaging in moderate exercise for at least 30 minutes in the last 7 days and lower blood pressure was the only statistically significant relationship. Despite presence of clinical risk factors for hypertension and obesity, two-thirds of the students did not perceive themselves to be at risk of developing cardiovascular disease, with males at greater risk than females. Reducing health optimistic bias is viewed as an effective way of motivating young people to adopt more positive behaviors. This study has social change implications for using educational institutions to implement intervention programs that promote positive health behavior among youth not as an individual responsibility but as a way to reduce health disparities at the systemic level.

Risk Factors for Development of High Blood Pressure and Obesity Among African American Adolescents

by

Monique Shanta White

MPH, Jackson State University, 2005

B.A., Jackson State University, 2001

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

November 2010

ProQuest LLC
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106-1346

Dedication

I can do all things through Christ who strengthens me. Philippians 4:13

I dedicate my dissertation to my mother, Dr. Brenda White-Jenkins. Words cannot express my gratitude for your support through this journey. Without your encouragement and prayers, I probably wouldn't be able to be who I am. Thank you for being my sounding board, my educational and professional inspiration, and for giving me the confidence to embrace this process. Mommy you are my "Shero".

I want to give a special dedication to my wonderful girls, Ahmyya and Macauli. I know it's been tough dealing with me through this process. Also, thanks to my wonderful family and friends for all of the support and encouragement.

Grandmother, thank you for being a grandmother. You always keep me lifted in love and humor.

And last but not least, thank you Dr. Addison for keeping me focused. Your pep talks kept me motivated and gave me strength when I wanted to give it all up. Your listening ear and guidance are greatly appreciated. Thank you for being you.

Acknowledgments

I am humbly grateful to have completed this awesome process. Since the time I entered college it was my goal to obtain my doctorate in public health. To my Boss, Dr. Azevedo, thank you for encouraging me to reach for the stars.

To Dr. Addison, thank you being my silent strength and consistent redirection for the task at hand. Mark you have watched me evolve into the professional I am today. You are my inspiration for wanting the very best out of life.

Special thanks to my committee members Dr. Addison, Dr. Bassey and Dr. Gutierrez. Dr. Addison, I could always count on you to provide comprehensive feedback. Dr. Bassey, thank you for agreeing to be a part of the committee during a very critical transition. I look forward to working with you. Finally, without saying, I would like to thank my committee chair, Dr. Mary Lou Gutierrez. Your witty humor pushed me through my moments of stress. Thank you for listening to me talk on and on about numerous tasks without falling asleep and for being encouraging to me at my weakest points through this process. You were my “Rock.”

Table of Contents

List of Tables

Chapter 1: Introduction to the Study

Cardiovascular disease (CVD) is regarded as a major source of excess premature death in the United States and many other areas of the world. Research has suggested that the cardiovascular disease processes begin early in life and progress into adulthood (American Heart Association, 2006; Barker & Bagley, 2005; Hayman et al., 2007). The prevalence of obesity among children is increasing worldwide, and evidence demonstrates that obesity, poor dietary practices, and inadequate physical activity in childhood substantially increase the risk of being an obese adult (Couch & Daniels, 2005; Daniels et al., 2005; Hayman et al., 2007; Kwiterovich, 2008). Childhood obesity has also been connected to the incidence of chronic disease in adulthood, such as hypertension and cardiovascular diseases (Daniels et al., 2005; Din-Dzietham, Liu, Bielo, & Shamsa, 2007; Lorch & Sharkey, 2007). There is also proof that the psychological impact of obesity stems from stigmatization, discrimination, depression, and emotional trauma and leads to other risky behaviors such as alcohol and tobacco use (Kwiterovich, 2008; National Heart, Lung, and Blood Institute, 2007).

Some studies have reported significant positive associations between some of the modifiable CVD risk factors and the presence of CVD symptoms (Li et al., 2003; McGill et al., 2001). By the time some young people are between the ages of 12 and 19 years, they have already developed risk factors that place them at an increased risk of developing hypertension (National High Blood Pressure Education Program [NHBPEP], 2004) and other types of CVD (Thom, Haase, & Rosamund, 2006). Children who experience elevated blood pressure are likely to experienced elevated blood pressure as adults (Rodolfo et al., 2007).

Background of the Study

As medical personnel began to define what constitutes normative blood pressure levels in childhood, they began to observe elevated blood pressure in many children and adolescents (Luma & Sppiotta, 2006). Some of these experts have attributed elevated blood pressure in children to the increase of childhood obesity (Luma & Sppiotta, 2006). As a result, many health organizations have been advocating for early detection and intervention in childhood hypertension as an important first step in the fight to reduce health disparities and long-term health risks (Luma & Sppiotta, 2006). As childhood obesity has increased and awareness of the effects of risk factors increased, the number of children and adolescents diagnosed with hypertension has been increasing as well (Sorof, Lai, Turner, Poffenbarger, & Portman, 2004).

For more than 20 years, researchers have been highlighting the need to address early development of cardiovascular disease. Lauer and Clarke (1989) had reported that childhood hypertension was a precursor to hypertension in adulthood, and because hypertension has been a possible cause of coronary artery disease (CAD) in adults (Berenson et al., 1998), hypertension in young people should serve as a warning sign of the future health status. Medical personnel have indicated that detection and intervention of hypertension at the early stages of development in children are critical to reducing the development of the chronic complications of hypertension (Sorof, Alexandrov, Cardwell, & Portman, 2003), because it has been generally accepted that severe cases of childhood hypertension could increase the risk of developing other diseases and congestive heart failure (Hanevold, Waller, Daniels, Portman, & Sorof, 2005).

Studies have reported a relationship between blood pressure and body mass index (BMI; Stabouli, Kotsis, Papamichael, Constantopoulos, & Zakopoulos, 2005). Other researchers have suggested that obesity was strongly linked to the development of childhood hypertension (Muntner, He, Cutler, Wildman, & Whelton, 2004). Over the years, there have been many studies

that have concluded that black children had higher blood pressure than white children (Berenson, Wattigney, & Webber, 1996; Dekkers, Snieder, Van Den Oord, & Treiber, 2002).

Lifestyle changes for many young people have been recommended because hypertension in preadolescents was believed to be indicative of some underlying disorder (NHBPEP, 2004). The reduction of risk practices was believed to be even more critical because the presence of obesity could increase the occurrence of hypertension threefold (Dolan et al., 2004; Flynn, 2005). Exercise has been shown to lower blood pressure in children, and it is one of the lifestyle changes recommended to young people (Eisenmann, Welk, Ihmels, & Dollman, 2007). In addition, changes in dietary practices have also been encouraged to help lower blood pressure in children (Rodriguez et al., 2006).

The preponderance of fast food outlets, increased access to computer information, and increasing availability of DVDs and negative images have made it difficult to persuade children and other individuals of the need to adopt healthier diets and to engage in more physical activities (Krebs et al., 2007). The childhood obesity problem is believed by some researchers to be highly related to socioeconomic status (SES) and race/ethnicity. It has been noted that children in ethnic minority populations are faced with an increased risk of becoming obese, with much of this risk caused by ethnic group differences in socioeconomic status (Kumanyika & Grier, 2006; Wang & Kumanyika, 2007).

Optimistic bias (perceived invulnerability or lack of perceived risk) appeared to have a greater impact on individuals who struggle to deal with issues that relate to personal control. This situation usually occurs when people overestimate their position or condition in relation to other people. In one study, 85-90% of the participants perceived that their situation was more favorable than their peers (Armor & Taylor, 2002). Findings from one study indicated that smokers believed that they were at reduced risk of developing smoking-related diseases than other

individuals who smoked (Waltenbaugh & Zagummy, 2004). This false belief about one's vulnerability to the multitude of health risk factors could result in at-risk individuals ignoring the preventive actions that could reduce their chances of contracting diseases prematurely (Waltenbaugh & Zagummy, 2004).

In addition to surveillance tracking of major risk factors and CVD-related health behaviors, the Centers for Disease Control and Prevention (CDC) developed the Youth Risk Behavior Surveillance Survey (YRBSS) in 1991 to disseminate data on the distribution, prevalence, and trends of risk factors in children and youth. Individual, school, and community health initiatives can be developed based on these data on the modifiable risk factors and behaviors (CDC, 2004). The data examined from these investigations revealed that there was a great need for the development and implementation of preventive and therapeutic measures (Graf, 2006). As a result, public health and medical researchers are placing more emphasis on the prevalence of childhood obesity as one of the most pressing public health concerns, mainly because of the immediate and long term health consequences and difficulties accompanied by this disease (Fulton et al., 2001).

Until recently, hypertension was regarded as primarily an adult onset disease and was not considered a health concern for children. However, the relationship between body weight and blood pressure has become an area of concern, especially since the prevalence of childhood overweight/obesity has increased. It is imperative that public health officials ensure that efforts are made to reduce the prevalence of obesity in children because weight loss in youth has the potential to result in significant positive long term results. Because of the tremendous burdens placed on the economic system by illnesses related to obesity, family and community programs emphasizing behavior modification, diet restraint, and increased physical exercise should be encouraged. Dietz (2004) and Lobstein, Baur, & Uauy (2004) have expressed the belief that

effective components of any health management plan for children and adolescents should include better supervision by parents, better control of dietary intake, and exposure to regular physical activity. With the increase in obesity, children are following the adult obese population, placing themselves at higher risk of becoming obese as adults by continuing to practice negative risk behaviors. Portman et al. (2005) and Sorof et al. (2004) have already shown that obesity, observed in many adults as a major contributor to the development of diseases, originated for many in the childhood and adolescent years. Obesity raises the risk for many chronic conditions, including cardiovascular diseases, like diabetes, hypertension, coronary artery disease, and cancer (Dietz, 2004; Lobstein, Baur, & Uauy, 2004; Portman et al., 2005; Sorof et al., 2004).

Problem Statement

It was estimated that among U.S. children aged 2 to 18 years, 17.1% were overweight, and another 16.5% were at risk of overweight (Ogden et al., 2006). These children had a multitude of risk factors that predisposed them to developing cardiovascular disease (Williams et al., 2005). Reducing health optimistic bias is viewed as an effective way of motivating young people to adopt more positive behaviors. This study sought to examine the association between negative behavior practices and the development of high blood pressure and obesity in adolescents in a Mississippi school district in the context of generalized perceived risk (optimistic bias). The students' physical activity practices, dietary practices, alcohol consumption, tobacco use, and obesity levels were examined and their association with high blood pressure will be assessed.

Purpose of the Study

The purpose of this study was to examine the association between negative behavior practices and the development of high blood pressure and obesity in adolescents in a Mississippi school district in the context of generalized perceived risk (optimistic bias). In spite of what is known about the effects of cardiovascular diseases and the economic burdens that these diseases create, there has been inadequate attention placed on the implementation of school-based prevention and intervention programs to adequately address the issue. It is hoped that the information gathered can be used to further educate the student body on healthy practices that could improve their health status. This is especially critical because it has been widely accepted for a long time that a person's opinions, beliefs, and assessments of any situation results in certain types of behaviors (Festinger, 1954).

Nature of the Study

This study used a quantitative, correlational design, and computed descriptive statistics in order to examine their risk behaviors and health outcomes. I measured variables on a sample of 433 students attending one high school in a rural community in central Mississippi and enrolled in Grades 9-12. The data were collected using the Student Health History Survey (SHHS) and recorded in descriptive terms. In addition to the collection of primary data using the survey, clinical measures, such as BMI and blood pressure, were also collected in order to assess the impact of negative student behaviors on their health status. The primary data collected on the survey included students' dietary practices, their physical activity behaviors, and their alcohol consumption and tobacco use.

The overarching research question developed for this study intended to explore to what extent obesity and high blood pressure existed among African American high school children in a

rural Mississippi school district in a culture of optimistic bias (perceived invulnerability). This study examined the students' daily practices with the intention of providing information that would assist educators and public health officials in developing strategies for promoting cardiovascular health that can be integrated into a comprehensive health education tool for children.

The research was supported by the teachers, the principal, and the superintendent of the school district who welcomed this process as an additional activity to complement activities planned for semester and an opportunity to raise awareness about risk factors and health information designed to eliminate health disparity. After IRB was granted, the consent and assent forms were distributed by the researcher to the children to be signed by them and their parents. The study was conducted during the 2009-2010 academic school year after the receipt of the signed consent/assent forms. Further details of the methodology of this study are presented in chapter 3.

Research Questions and Hypotheses

Research Question 1: How do health risk behaviors, the students' dietary practices, their physical activity behaviors, and their alcohol consumption and tobacco use relate to the development of obesity and high blood pressure among adolescents?

$H1_0$: There will be no association between tobacco use and alcohol consumption and adolescent blood pressure levels.

$H2_0$: There will be no association between consumption of fruits and vegetables and adolescent blood pressure levels.

$H3_0$: There will be no association between physical inactivity and adolescent blood pressure levels.

$H4_0$: There will be no association between tobacco use and alcohol consumption and adolescent BMI.

$H5_0$: There will be no association between consumption of fruits and vegetables and adolescent BMI.

$H6_0$: There will be no association between physical inactivity and adolescent BMI.

Research Question 2: What is the association between prevalence of obesity, high blood pressure, and lack of perceived risk (optimistic bias)? The three hypotheses listed below were developed to address this research concern.

Optimistic bias is the unrealistic optimism that influences the behavior of the youth causing them to underestimate their susceptibility to negative health outcomes and negatively impacts their judgment regarding regular risk behaviors. For this study, optimistic bias (positive perceived health status) is not used as a variable, substituting for more objective indicators. It is used to complement the other measures under investigation, because previous studies have shown that poor/fair perceived health is a strong predictor of subsequent mortality within two years among adults.

$H7_0$: There will be no association between adolescent blood pressure levels and optimistic bias.

$H8_0$: There will be no association between adolescent obesity and optimistic bias.

$H9_0$: There will be no association between adolescent obesity and optimistic bias by gender.

Theoretical Framework

Behavior plays a major role in disease prevention, the maintenance of good health, and the improvement of the quality of life. According to Steptoe and Wardle (2004), if adolescents can change health risk behaviors, they can considerably reduce their chances of premature morbidity and mortality, thereby making the quality of their life better. Health risk behaviors are behaviors that when done frequently and intensely can eventually lead to sickness and eventual

death. For this study, health risk behaviors include inadequate physical activity, poor nutritional habits, alcohol consumption and tobacco use (Steptoe & Wardle, 2004). There is epidemiological information available on the relationships between behavior and various health outcomes (Rutter & Quine, 2004). There are some models and theories that reflect effective interventions that could be applied to improve the quality of life by reducing some of these risk factors. This study reflects the underpinnings of two models: health belief model and optimistic bias.

The theory of optimistic bias is generally referred to as the unrealistic belief that a person's likelihood of experiencing a negative event is lower than others (Weinstein, 1980). This is sometimes referred to as a person's unrealistic optimism, or in young people, their illusion of invulnerability, as many young people are optimistically biased when they feel overconfident about experiencing a positive event or avoiding a negative consequence. In many instances, optimistic biases can be detected when the events involved are preventable (Klein & Helweg-Larsen, 2002). Many health behavior models, including the health belief model (Janz & Becker, 1984), protection motivation theory (Rogers, 1983), and the precaution adoption process model (Weinstein, 1988), are centered around perceived vulnerability. Optimistic bias represents a lack of belief of risk for the occurrence of a negative health outcome. People who are optimistically biased tend to reject protective measures; given that optimistic biases represent low estimation of risk, it is believed that such biases are unrealistic and irresponsible (Armor & Taylor, 2002). These researchers had previously reported that optimistic bias could result in positive illusions that can be beneficial if they are able to instill internal inspiration (Armor & Taylor, 1998).

The construct of optimistic bias can be measured by estimating an individual's risk relative to that of their peers. Through this type of evaluation, individuals might be asked if they think they are at risk of developing a negative outcome to another similar group of individuals, using a certain scale to describe such beliefs. This type of measurement of the optimistic bias

construct asks participants to compare others' risk to their own risk (Otten & van der Pligt, 1996). This study is concerned mainly with the theory of optimistic bias and does not evaluate the construct of optimistic bias among the students. Table 1 is a summary of the models and the particular behaviors where interventions proved effective.

Table 1

Summary of Constructs Related to Perceived Risk

Theory	Smoking	Alcohol Abuse	Eating Habits	Exercise	Perceived Susceptibility	Optimistic Bias
Health Belief Model	X	X	X	X	X	
Generalized Susceptibility	X	X	X	X		X

Even though some researchers believe that to promote obesity prevention, there is still a great need for the development of new theoretical models that could provide greater utility (Baranowski et al., 1997; Baranowski et al., 2003), the health belief model (Becker, 1994) has been a popular theoretical model and conceptual framework that has been applied in childhood obesity prevention research. Many public health researchers have adopted elements of this theory to serve as a basis for programs that are designed to modify certain risk factors.

The health belief model (HBM) is applicable to diverse populations because it examines a variety of health behaviors in diverse populations. HBM is a structure for motivating people to take positive health actions. This HBM framework has as its primary impetus the desire to avoid a negative health consequence. This model, as proposed by Becker (1994), suggested that behavior change could be achieved by increasing people’s risk perception (risk for chronic disease) and developing their confidence in their ability to do something about the risk. In

addition, the concept of self-efficacy was included to address the problems associated with regular unhealthy actions such as smoking and overeating (Becker, 1994).

Researchers, including Collard et al. (2010), Forester-Scott (2007), Malmberg et al. (2010), and Shariff et al. (2008), have suggested that students can improve their health status through participation in school-based interventions that promote positive, healthy attitudes. According to these researchers, a prevention program that emphasizes healthy themes and provides avenues for positive change can influence changes in students' attitudes towards physical activity, dietary practices, and health hazards, such as the use and abuse of alcohol and other drugs. These positive messages can even be disseminated from youth who participate in the intervention campaigns to youth who do not participate in the campaigns. This approach can project positive differences in intended future behavior. The end result of these activities will be significantly more opportunities for youth to communicate among themselves as they learn new, positive practices together. Intervention programs like these also make it possible for teachers, administrators, youth, and parents, as well as community members to participate together in the wellness campaign (Shariff et al., 2008). The overall expectation will be modification in physical activity and dietary patterns and differences in overall tobacco, alcohol and other drug use, obesity levels and hypertension readings (Kimm et al., 2002).

An effective intervention campaign using these techniques will produce positive long-term trends in attitudes and behaviors among the high school students as they evolve into adulthood. The expected results will be that the proportion of young people who reported using tobacco and alcohol regularly will decline, the rate of obesity will decline, positive physical activity and dietary practices will increase, and high blood pressure levels will decrease. These techniques will enable an intervention campaign to have significant impact through the development of partnerships with a wide variety of partners who will be engaged to spread the

wellness messages further by involving others who recognize the value of their involvement in the campaign through long-term commitment. This type of comprehensive social marketing campaign can effect social change and can be used to motivate and encourage the adolescents to adopt beneficial health behaviors. The ultimate goal of this approach is to create a social climate that is conducive to change, especially as communities struggle to address current and emerging health issues (CDC, 2006). Further discussion of the associated theories and conceptual framework is presented in chapter 2.

Definition of Terms

BMI: BMI is used to describe the weight and height relationship using a ratio of weight (in kilograms)/[height (in meters)]^2. The procedure is used because the measurements are easy to obtain. The BMI measurement has become the standard as a trustworthy indicator of overweight and obesity (Dutar & Sturm, 2004).

Dietary factors: Dietary factors refer to eating patterns that may lead to obesity and the development of other chronic diseases. To assess food habits, students write down, for several days, the regularity with which they consume specific foods and beverages (Story et al., 2001).

Obesity: In the medical arena, obesity is described as excess body fat. It is sometimes described as a surplus percentage of body weight that is fat. Obesity was defined on the basis of a threshold body mass index score > 30 (Chiolero et al., 2007).

Overweight: Overweight refers to a body weight that is above the recommended weight for a person of a particular body type and stature. Overweight is defined on the basis of an onset body mass index score 26-30 (Chiolero et al., 2007).

Physical Activity: Physical activity is defined as any bodily movement produced by the tightening musculo skeletal system for the purpose of increasing energy output above the basic level (Forester-Scott, 2007).

Assumptions

Because self-reported measures were used in addition to some objective measurements (e.g. blood pressure, height and weight), it was assumed that the students participating in this study would give truthful answers and that their answers would be truly representative of their current and past practices, behaviors, and attitudes

Limitations

The results may not account for regional differences in obesity rates in other areas in the school district. Because most of the children in the school were required to enroll in health and/or physical education classes, it was expected that a large enough number of students would participate and their responses could give a good indication of the practices of students in that school. However, one has to proceed with caution when considering generalizing the findings to the entire school and all Mississippi school districts. In addition, it is also a challenge to determine whether children can recall accurately what they did at some time in the past. Because behaviors were self-reported, the extent of under-reporting or over-reporting of behaviors could not be determined.

Delimitations

The major delimitation of this study was the enrollment criteria for participants. The study was delimited by the use of one school from one school district. The data collected represented only students enrolled in Grades 9 - 12, and therefore are not representative of all high school students. The sample represents a generally low income Mississippi school, where the participants were students enrolled in the health and physical education classes. These data applied only to youths who attended school and, therefore, are not representative of all persons in this age group. Further, students who are likely to abuse tobacco, alcohol, and drugs are also likely to be high school drop outs.

Significance of the Study

This study can help to highlight areas of deficiencies in children's daily practices that could assist educators and public health officials in providing strategies for promoting cardiovascular health that can be integrated into a comprehensive health education tool for children. If children are able to engage in reflection and self-monitoring of certain target behaviors, they may be able to develop better decision-making skills regarding physical activity and dietary practices, as was seen in a previous study that showed that self-monitoring was positively associated with weight loss (average of 30 kg for an average of 5.5 years) in adults (Stevens et al., 2007). This study is significant because such studies in children are limited. A Working Group convened by National Heart, Lung, and Blood Institute called for research to identify effective strategies to improve self-monitoring practices and determine their connection to successful weight management in children and adolescents (Wing & Hill, 2001).

The results of this study may make it possible to assess the diet and physical activity, along with other perceived risk factors, in efforts to prevent or reduce the prevalence of obesity and CVD among children in Mississippi.

Good health is believed to be a major resource for social, economic, and personal development, as well as a critical factor for improving the quality of life. The data gathered from this study can be used to initiate a successful health promotion campaign in schools to enable students to accept responsibility for designing the quality of their lives, increase control over the daily choices they make, and, subsequently, to improve their long term health. The impact of this study will be its uncovering of information that can serve as a resource for everyday life to improve social, personal, and physical capacities. Students will have an opportunity to examine their daily practices and understand that by changing patterns of life, work and leisure, they can

have a significant impact on their own health, as well as the health of other members of their community.

It is intended that this type of health promotion will result in an environment that is healthier, safe, stimulating, and satisfying. The information provided can help to create a healthy society by displaying areas where personal and social development can be enhanced through further education and training in positive life skills. This health promotion will provide opportunities for young people to make choices conducive to health. At the same time, it will place new emphasis on the importance of health research and the need for additional avenues for professional education and training. This education and training will result in attitude modification and an emphasis on the provision of health services, which is desperately needed in order to reverse the current trends of increases in obesity levels and increases in the prevalence of cardiovascular disease.

It is intended that by participating in this study, the student population will begin to critically evaluate their practice of optimistic bias as they use the opportunities and activities provided to increase their awareness of the dangers of negative practices and its eventual negative impact on their health status. Their participation in this study should motivate them to change their attitudes towards alcohol, other drugs and tobacco, and to adopt more positive behaviors as they reflect on their current practices. This participation will be a start in the battle against premature morbidity and mortality, which, if sustained, will result in a healthier adult community as they grow older.

Summary and Transition

This research study is organized into five chapters. Chapter 1 is an introduction to the research, providing a background to the problem, the problem statement, and the research questions. In addition, it includes an argument that addresses the overall need for a study of this type. Chapter 2 presents a review of related literature that revolve around studies conducted to examine behavior risk practices in adolescence their relationship to the prevalence of high blood pressure and obesity in the context of generalized perceived risk. Chapter 3 presents the methodology that was used to conduct this research study. The methodology includes the research design, target population, sampling procedure, instruments used, data collection procedure, and analysis of the data. Chapter 4 provides the findings derived from the analyses computed, and chapter 5 consists of the summary, conclusion, and recommendations.

Chapter 2: Literature Review

Introduction

The literature review is a summary of previous research conducted on risk factors for the development of obesity and high blood pressure. The studies presented in this chapter examined the overall overweight/obesity epidemic that is believed to be a major contributing factor to the prevalence of cardiovascular and other chronic diseases in the United States, such as high blood pressure, particularly among African American communities. This literature review covers the major recent work that has been done on the topic, in reference to the impact of physical activity, dietary practices, and drug, tobacco, and alcohol consumption on the health status of individuals. The literature review helped to identify the most productive methodology for use in this present study. It is divided into subsections that include subtitles such as the following: Social/behavioral theory-based antecedents, blood pressure issues in children, benefits of physical activity in youth, dietary factors, alcohol and tobacco use, review of related methodology literature, hypertension, physical activity and hypertension, obesity and hypertension, dietary practices and hypertension, and alcohol consumption and hypertension.

All of the information about the subject under investigation was gathered using books, reference materials, journals electronic databases, conference papers, dissertations, and internet sources. The electronic databases used included Pubmed, EBSCO Host, and ProQuest searching the years 1986 through 2009. To access the required literature sources, key concepts or ideas contained within the title and research questions were entered in the search engines and the search results were carefully matched with the topic of interest and selected for incorporation into this section.

This study examined the effect of perceived generalized susceptibility (optimistic bias) on risk practices of adolescents in a Mississippi school district and its relationship to the prevalence of high blood pressure and obesity. Optimistic bias is the unrealistic optimism that influences the behavior of youth, causing them to underestimate their susceptibility to negative health outcomes and negatively impacts their judgment regarding risk behaviors. One important mission for public health officials is to determine how perceived vulnerability affects health risk behaviors and the development of obesity and high blood pressure among adolescents. Some of the risk factors of adolescents that are believed to be associated with the development of hypertension in adulthood, begin in the youthful years when optimistic bias is a major factor.

The prevalence of these risk factors helped to classify the State of Mississippi as the state with the highest rate of cardiovascular disease in 2005, particularly among African-Americans (Denoon, 2006). Mississippi has also been regarded by Mississippi state health department officials as having the highest prevalence of obesity (MSDH, 2007). This study can help to highlight areas of deficiencies in children's daily practices that could assist educators and public health officials in providing strategies for promoting cardiovascular health that can be integrated into a comprehensive health education tool for children. The cornerstone of cardiovascular health prevention and risk reduction in children and adolescents are lifestyle change and the adaptation of healthy behaviors (Hayman et al., 2007). The studies presented in this chapter examine the overall overweight/obesity epidemic that is believed to be a major contributing factor to the prevalence of cardiovascular and other chronic diseases in the United States, such as high blood pressure, and, particularly, among African American communities. A review of related studies is also presented regarding the impact of physical activity, dietary practices, and drug, tobacco, and alcohol consumption on the health status of individuals.

Trend data on health behaviors suggest that 730, 000 adolescent girls and 565,000 adolescent boys in the United States began smoking in 2004 (CDC, 2006; Eaton et al., 2006). A case control study of obesity among children attending elementary public schools was conducted by da Costa et al. (2003) in Sao Paulo, Brazil. The researchers sought to describe obesity among students of eight public schools in Sao Paulo and to identify risk factors for this nutritional and physical activity disorder. They designed a case-control study of obese and non obese 7-10 year old schoolchildren to the study risk factors for obesity. Parents or guardians provided details about the children's eating behaviors and habits. The data showed that the prevalence of obesity in the surveyed population was 10.5%. A logistic regression model was devised to fit the case-control dataset. This model showed that obesity was positively related to birth weight, watching television for 4 hours per day or longer, mother's schooling > 4 and parents' body mass index. The study recommended that preventive measures be taken to encourage collection of information relative to the children and their guardians' dietary practices and their behaviors regarding sedentary lifestyle. It was recommended that they engage in alternative behaviors, such as reducing television viewing. Schoolchildren with a birth weight of 3500 g or more or whose parents are obese should receive special attention in the prevention of obesity.

Fulton et al. (2001) believed that there has not yet been effective weight gain prevention that they examined revealed that there were decreases in body mass index in elementary school children after exposure to an intervention designed to reduce time spent viewing television. The researchers believed that a combination of weight loss treatment and weight gain prevention strategies could be effective in reducing the children's risk practices (Fulton et al., 2001). They believed that future weight loss studies should be initiated to determine the type, intensity and duration of exercise that would enable individuals to adopt more positive practices that would

result in consequent long term weight loss, and to ascertain the reinforcing factors that determine youth behavior choice.

Some programs, such as the *Bienestar* Health Program, a school-based intervention in the Hispanic community in San Antonio, Texas, have been implemented to reduce the risk factors for diabetes in children from high-risk groups (Trevino et al., 2005). This program consisted of training sessions with messages designed to decrease dietary intake of saturated fat, increase dietary intake of fiber, and increase physical activity. The researchers reported that children in the intervention group had improved their health status by decreasing blood glucose concentrations and increasing fitness and intake of dietary fiber compared to the control group (Trevino et al., 2005).

Social/Behavioral Theory-Based Antecedents

The health belief model (HBM) is a psychological model that was developed for the purpose of explaining and predicting health behaviors. This explanation is accomplished by putting emphasis on the attitudes and beliefs of individuals. The health belief model has four constructs that represent the perceived threat and the net benefits. The constructs are perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. In this study, the perceived susceptibility best explains gap in terms of the relationship among adolescence and their risky behaviors. Perceived susceptibility describes one's opinion of chances of getting a condition, in which adolescents are comfortable participating in risky behavior such as smoking, drinking alcohol, eating a high fat diet and participating less in physical activities. The construct of perceived risk as measured by the HBM assumes that the more susceptible individuals feel to contract disease the more likely they are to engage in a desired behavior. This study was designed to fill a gap in the literature by instead examining generalized perceived risk among adolescents, as their state of mind is to perceive themselves as invincible and excessively optimistic that they

are not at risk of any harm. Optimistic bias (OB) demonstrates the misguided belief that one's chances of suffering a harmful event are minor compared to that of one's peers, which represents the attitude, subjective norm and perceived behavior to influence the intention to change behavior (Klein & Helweg-Larsen, 2002).

Table 2

Summary of Expected Outcomes Based on Youth Beliefs

Concept	Behavior Risk Factors	Outcome
Perceived Susceptibility	Smoking, drinking, inadequate dietary practices and physical activities, BMI measurements	Youth belief in the possibility that they can get high blood pressure or become obese
Optimistic Bias	Smoking, drinking, inadequate dietary practices and physical activities, BMI measurements	Youth belief that their chances of getting high blood pressure or obesity is minimal

In a study by Arnett (2000), 200 adolescents (aged 12–17) and 203 adults (aged 30–50) were examined for optimistic bias in relation to the risks associated with their smoking. Most of the adolescent and adult smokers and nonsmokers understood the campaigns against smoking and the fact that smoking is addictive and results in excessive morbidity and mortality. These study participants, however, could not imagine that long term smoking could kill them or result in chronic disease. A large number of them, particularly adolescents, believed that they could smoke for many years and had sufficient ability and control to quit the habit whenever they got ready. This type of false invulnerability has strong implications for smoking prevention programs, as well as other risk factor prevention programs. This type of risk perception is highly related to the initiation and maintenance of cigarette smoking (U.S. Department of Health and Human Services, 1994).

The HBM and other theories have traditionally been applied to adults and the main premise is that the more people feel vulnerable to an illness, the more ready they will be to change health behaviors or seek health care. The magnitude (correlation) of the association between the constructs and the predicted outcome are at best moderate and likely to be negligible among adolescents who perceive themselves to be indestructible. In this study, the concept of optimistic bias was used to measure generalized risk (Klein & Helweg-Larsen, 2002)**.** This measure asked participants to rate their health compared to others their same age (*excellent, very good*, *good*, *fair*, or *poor*). Optimistic bias predicted a higher level of risk behaviors correlated with a higher level of optimistic bias.

In this study, there were modifiable and non modifiable factors. The non modifiable factors included age, gender, race/ethnicity, and SES. The modifiable factors included four risk behaviors: physical inactivity, unhealthy diet, tobacco and alcohol use. It was expected that optimistic bias would have a strong association with these risk behaviors, with a stronger association with tobacco and alcohol use. Based on the literature, exercise and diet have been shown to directly affect obesity. The association of tobacco and alcohol use with obesity among adolescents had not been studied. Obesity has been shown to have a significant impact on childhood high blood pressure. Children who were obese were found to be three times more likely to develop high blood pressure (Lorch & Sharkey, 2007). The conceptual framework for this study explored the effect of antecedents to behavior (generalized perceived risk) directly and directly on obesity and childhood high blood pressure. The behaviors examined were modifiable and amenable to change through health promotion and education efforts.

Blood Pressure Issues in Children

Increases in blood pressure in U.S. children and youth are partially attributable to the increases in the prevalence of overweight. Even modest increases in blood pressure levels in

children are likely to result in the development of hypertension in adulthood and have a damaging effect on the vascular structure and function (Chiolero, Bovet, Paradis, & Paccaud, 2007; Ingelfinger, 2004; Muntler et al., 2004). An assessment of blood pressure values in children could provide valuable information about the future risk potential for cardiovascular risk adulthood (Williams et al., 2002). Having such important diagnostic information on children and adolescents at hand could enable medical personnel to effectively apply preventive strategies to protect the health of these children and help to reduce the premature development of cardiovascular disease, since blood pressure measurements can serve as significant predictors of reliable health issues (Lurbe et al., 2002; Lurbe, Sorof, & Daniels, 2004; Sega et al., 2005).

Benefits of Physical Activity in Youth

Physical activity is an important component of any program of activities that seek to promote the health and well-being of individuals. There are numerous health benefits that are associated with a physically active lifestyle. For children, an active lifestyle can help them to maintain weight control, lower their blood pressure, improve their psychological well-being, and lay the foundation for increased activity in adulthood. An active lifestyle would increase life expectancy and decrease the risk of developing cardiovascular disease (Williams et al., 2002). The lack of adequate physical activity is regarded as a major cardiovascular risk factor for people of all ages. However, there have not been many longitudinal studies conducted to examine data regarding this type of relationship in children and adolescents. The literature contains some cross-sectional, observational, and short-term intervention studies that have investigated physical activity and cardiovascular risk factors; these studies, however, have demonstrated either inconclusive results or have shown small positive results. One intervention study that was conducted in children for 1 to 2 years reported significant association between blood pressure and

cholesterol level and participation in physical activity (Janz, Dawson, & Mahoney, 2002; Kelley, Kelley, & Tran, 2003; Williams, Hayman, & Daniels, 2002).

There have also been other studies (Datar & Sturm, 2004) using exercise interventions that examined overweight children and their exercise patterns with results showing that regular exercise have favorable effects on markers of inflammation, insulin sensitivity, endothelial function, and vascular reactivity. Other researchers (Patrick, Norman, & Calfas, 2004) have examined relationships between higher BMI levels and sedentary activity and reported that children, exposed to regular periods of scheduled physical education classes in schools, generally observe a reduction in overweight/obesity. Children who participate in physical activity have generally shown a reduction in the existence of cardiovascular risk factors (Datar & Sturm, 2004; Patrick, Norman, & Calfas, 2004).

It was recommended that children maintain physical activity routine of 4 to 5 days a week in order to reap the maximum health benefits. Data from CDC in 2005 indicated that 54.5% of students in the United States were enrolled in physical education classes on 1 or more days per week, and 33.0 % were enrolled in daily physical education (Eaton et al., 2005). Similar results were reported by a population-based study that found that there was a substantial decline in the amount of physical activity throughout adolescence by age 18 or 19 (Kimm et al., 2002). The prevalence of television viewing at least 3 hours per day during the school week was higher (64.1%) among black youths (Eaton et al., 2006).

The Centers for Disease Control and Prevention has issued suggestions to increase participation in physical activity in order to reduce the chances of developing cardiovascular risk factors. A study conducted by the National High Blood Pressure Education Program Working Group that examined adolescents over a 3-year interval showed that there was a significant relationship between the level of physical activity and blood pressure. This study also reported

that there was observed lower LDL-cholesterol level and BMI when youth were engaged in intense activity (NHBPEP, 2004).

Dietary Factors

The majority of teenagers in Maryland were not meeting the daily recommendations for dietary intake. According to one group of researchers (Wright et al., 2003), there was a marked reduction in the consumption of high fiber fruits and vegetables and dairy products and increased consumption of nutrient-poor foods and sweetened beverages and increased percentage of total calories from snacks. The Dietary Intervention Study in Childhood was a randomized clinical trial that examined the effect of a decreased amount of saturated fat and cholesterol diet in a group of 8- to 10-year-old children who were diagnosed with elevated low-density lipoprotein (Wright et al., 2003). In this study, a questionnaire was administered that sought to determine the amount of time the children spent in 5 intensity levels of physical activity. The physical activity timeframes were measured at baseline and these measurements were later taken after 1 year and again after 3 years in the study. Researchers estimated a metabolic-equivalent score for the weekly activities of the children; they also calculated the number of hours per week for intense activities in which the children participated. The researchers predicted that over 3 years, weekly self-reported physical activity would be related to lower systolic blood pressure, low-density lipoprotein, and BMI.

The results of this study demonstrated that children who had high cholesterol levels and were physically active could lower their systolic blood pressure and their low-density lipoprotein over a 3-year interval. It was suggested that these children should become involved in long-term, intense physical activity as a valuable intervention approach to reduce BMI as well (Gidding et al, 2006). Results from two studies indicated that the incidence of type 2 diabetes could be significantly reduced if people were exposed to interventions, such as lifestyle changes that

focused on improving dietary intake, increasing exercise, or a combination of both (Knowler et al., 2002;Tuomilehto et al., 2001).

Alcohol and Tobacco Use

According to reports by the NIH (2008), many teenagers in the United States used alcohol and tobacco regularly. The rate of drinking and smoking seemed to increase among high school students as they advanced from one grade level to the next (NIH, 2008). Studies have demonstrated that people living in rural areas of the U.S. were prone to substance use and abuse (Egan, 2006). Researchers have examined substance abuse to try to understand why residents of rural states and regions abuse alcohol. Egan (2006) listed a number of possible reasons. Some of these reasons included the following: boredom, stress, anxiety, depression, for use as a depressant and sleep aid, possessing a genetic tendency to and family history of substance abuse/addiction, unemployment and underemployment, poverty, living in an area with a poor farm/ranch economy, peer pressure, and, feeling of isolation.

Some researchers with SAMHSA (2006) have reported findings about members of some ethnic/racial minority groups who consumed alcohol at rates that are higher than White populations. It was believed people who began drinking alcohol at early ages later tended to become heavy chronic users of alcohol (SAMSHA, 2006b). Long term, heavy alcohol consumption use, abuse, or dependence could lead to untimely death due to an array of causes (SAMHSA, 2006).

Cigarette smoking has been classified as the most widespread form of drug dependence and is a leading cause of preventable death, resulting in an estimated 3 million deaths annually (CDC, 2009). In fact, cigarette smoking is regarded as the single most preventable cause of mortality. At the present rate of smoking, the worldwide annual death toll due to smoking is expected to reach 10 million by the year 2025 (Morello et al., 2008).

Most smokers acquire their smoking habits in the teenage years, and those habits can serve to predict the future health status of some individuals. The origin of these smoking habits could lead to many social and medical consequences (Williams et al., 2002). Tobacco use is a leading cause of death due to heart disease. A considerable number of high school students practiced behaviors that put them at risk for early death and disability, a fact that accentuated the need for increased health education and counseling agendas and guidelines (CDC, 2003). The findings for some studies underscored the necessity for smoking control interventions aimed at young people, since smoking was regarded as a major, yet preventable cause of morbidity and mortality (Hieras et al., 2008).

Hypertension

According to Kaplan, Gidding, Pickering, and Wright (2005), diagnosing hypertension involves examining the presence of blood pressure (BP) that is persistently at or above certain levels on at least two separate occasions. Individuals over the age of 18 with a blood pressure level above 140/90 mm Hg are considered to be hypertensive (Chobanian et al., 2003)). Hypertension in children and adolescents is considered to be systolic or diastolic levels greater than or equal to the 95th percentile for gender, age, and height (Kaplan et al., 2005).

Physical Activity and Hypertension

It was universally believed that physical activity declined during adolescence (Kimm et al., 2009). Hypertension was diagnosed with increasing frequency in children and adolescents who were not physically active (Daniels & Loggie, 2009). Increased levels of physical activity were believed to be beneficial in reducing hypertension (Hu, Barengo, Tuomilehto, Lakka, Nissinen, & Jousilahti, 2004; Whelton, Chin, Xin, & He, 2002). Kimm et al. (2009) examined data provided by 1213 black girls and 1166 white girls who participated in the National Heart, Lung, and Blood Institute Growth and Health Study. These girls ranged in age from 9 or 10 to the

ages of 18 or 19 years. The researchers used a validated questionnaire to measure leisure-time physical activity. It was found that by the age of 16 or 17 years, 56 percent of the black girls and 31 percent of the white girls were not engaged in regular leisure-time activity. The researchers found that a higher body-mass index was associated with a greater drop in activity among girls of both races. They concluded that extensive declines in physical activity occur during adolescence in girls and these declines are greater in black girls than in white girls.

Public health officials believed that the trends in obesity-induced hypertension among children and adolescents were related in part to physical inactivity. As a result, everyone should be encouraged to engage in regular exercise (Church, Kampert, Gibbons, Barlow, & Blair, 2001). There was one particular study that had conflicting results regarding the effect of exercise on blood pressure measurements indicating that aerobic exercise results in rises in systolic blood pressure. According to this study, diastolic pressures also rose to higher levels during resistance exercise (Albert, Mittleman, Chae, Lee, Hennekens, & Manson, 2000).

Obesity and Hypertension

The prevalence of childhood obesity had been increasing at such an alarming rate that many public health organizations, medical personnel, and local governments had begun to implement policies that were designed to promote prevention methods, such as increasing physical activity in schools (Lobstein, Baur, & Uauy, 2004; Wang & Lobstein, 2006). In 2009, Harris, Kuramoto, Schulzer, and Retallack conducted a methodical appraisal and meta-analysis to determine the effect of school-based physical activity interventions on body mass index (BMI) in children. They conducted a meta-analysis by searching 398 articles that highlighted studies that focused on BMI levels before and after the intervention, that involved school-based physical activity. The results of this study were not consistent with many of the other studies. This study concluded that BMI did not improve with physical activity interventions. The authors proposed

that current policies requiring increased physical activity in schools were unlikely to result in a reduction in the prevalence of childhood obesity.

Extensive epidemiological research on blood pressure in children and adolescents have led to proposed values that normal ranges of blood pressure throughout childhood. Hypertension in the young was defined as systolic or diastolic blood pressure that is repeatedly above the 95th percentile for age and sex (Faulkner & Sadowski, 1995). These researchers believed that hypertension among children and adolescents could be frequently characterized by obesity.

Since obesity was recognized as a major risk factor for the development of hypertension, a cross-sectional population-based study was conducted using data collected during 1996 to 2002 in an army recruitment examination of 560,588 Israeli individuals 16.5 to 19 years of age. This study was designed to determine the prevalence of hypertension and obesity in a large cohort of adolescents and to assess whether pre hypertension and body mass index (BMI) increase with increasing age. The prevalence of pre hypertension was significantly higher in obese subjects (Israeli, Schochat, Korzets, Tekes-Manova, Bernheim, & Golan, 2006).

A combination of excessive calorie intake and physical inactivity were strongly associated with obesity (Kimm et al., 2002). In some studies on weight loss, overweight individuals showed improvement in obesity-related comorbidities, like hypertension, when interventions included regular exercise (Young, Fors, & Hayes, 2004). The association between obesity and numerous cardiovascular risk factors, including high blood pressure, inadequate physical fitness is well established (Gidding, Dennison, Birch, Daniels, Gilman, Lichtenstein, Rattay, Steinberger, Stettler, & Van Horn, 2005).

Dietary Practices and Hypertension

In 2005, the U.S. Department of Agriculture (USDA, 2005) published dietary guidelines for children and adolescents and emphasized that children should limit their intake of sweetened

beverages and sweetened fruit juice. This was supported by the American Academy of Pediatrics has also stated that the pediatric population commonly over consumes sweetened beverages and juices (American Academy of Pediatrics, 2001). When early hypertension was diagnosed in children or adolescents, it was recommended that, emphasis be placed on implementing life-style changes, such as dietary modification, weight control, and increase in physical activity (Faulkner & Sadowski, 1995). As children grew older, significant adverse changes had been noted in their food consumption (French, Story, & Jeffery, 2001). Some of these adverse changes included less regular breakfast consumption, an increase in consumption of fast foods, and an increase in the total calories consumed from snacks. Adolescents also became more addicted to fried and nutrient-poor foods, and sweetened beverages. They exhibited a decrease in dairy product consumption, high-fiber fruits and vegetables (Neilsen & Popkin, 2004). According to Nemby (2009), children did not meet the requirements for most plant foods as recommended in the Dietary Guidelines for Americans. To counteract this practice, there should be policy interventions to ensure that plant foods are affordable and accessible to all children as a means of reducing the burden of childhood obesity and eliminating health disparities.

Adverse behaviors, including poor nutrition, were among the principal causes of risk factors for cardiovascular disease like hypertension (Kavey, Daniels, Lauer, Atkins, Hayman, & Taubert (2003). Good nutrition, along with a physically active lifestyle, contributed to lower risk (Daviglus, Stamler, Pirzada, Yan, Garside, Liu, Wang, Dyer, Lloyd-Jones, & Greenland, 2004). McNaughton, Ball, Mishra, and Crawford (2008) conducted the 1995 Australian National Nutrition Survey, a study of 764 adolescents aged 12-18 years old to examine the dietary patterns of adolescents and their associations with sociodemographic factors, nutrient intakes, and behavioral and health outcomes. The researchers used factor analysis to identify dietary patterns and relationships with sociodemographic factors and behavioral and health outcomes. Three

dietary patterns labeled a fruit, salad, cereals, and fish pattern were identified, along with high fat and sugar pattern, and a vegetables pattern. The high fat and sugar pattern was positively related to males, the vegetables pattern was positively related to rural region of residence, and the fruit, salad, cereals, and fish pattern was inversely related to age. The fruit, salad, cereals, and fish pattern was inversely related to diastolic blood pressure. The researchers concluded that specific dietary patterns were apparent in adolescence and diets rich in fruit, salad, cereals, and fish pattern were related to diastolic blood pressure in older adolescents.

In one study designed to assess the usefulness of an intervention program on obesity and blood pressure in Ioannina, Greece, 646 fifth grade pupils from 13 randomly selected schools comprised an intervention group and a control group (CG). The participants were asked to respond to the TPB questionnaire. They were exposed to an intervention that emphasized overcoming the hurdles that prevented participation in physical activity, increasing the consumption of fruits and vegetables and increasing parental support. The researchers used a general linear mixed model and mediating variable analysis to investigate the differences between the two groups and to test whether changes in certain dietary, physical activity and body measurements could be attributed to the intervention. Students in the experimental group displayed a higher consumption of fruits and lower consumption of fats/oils and sweets/beverages compared with the control group. The intervention appeared to have had an effect on the students' BMI, as a result of increases in consumption of fruit. It was also believed that the decline of systolic and diastolic BP could be explained by the decrease of BMI (Angelopoulos, Milionis, Grammatikaki, Moschonis, & Manios, 2009).

Wang, Bleich, and Gortmaker (2008) sought to investigate caloric contributions from sugar-sweetened beverages and 100% fruit juice among U.S. youth during 1988–2004. They did this by analyzing 24-hour dietary recalls from children and adolescents in 2 nationally

representative population surveys: National Health and Nutrition Examination Survey III (1988–1994, $N = 9882$) and National Health and Nutrition Examination Survey 1999–2004 ($N = 10\ 962$). This study found that soda beverages contributed 67% of all sugar-sweetened beverage calories among the adolescents. As obesity continued to rise among children and youth in the United States, these findings supported the need for limiting intake of these sweet beverages in promoting energy balance.

Alcohol Consumption and Hypertension

According to one study, alcohol drinking increased blood pressure (Djoussé & Gaziano, 2007). Saremi, Hanson, Tulloch-Reid, Williams, and Knowler (2004) examined the associations between alcohol consumption, Type 2 diabetes and hypertension in a Native American population. They conducted a cross-sectional, prospective study that examined 3,789 individuals. The prevalence and incidence of diabetes and hypertension by categories of alcohol intake were determined. The results showed a positive, statistically significant relationship between blood pressure and alcohol consumption in both genders.

In another study that examined the relationship between reported alcohol consumption, cardiovascular disease (CVD) risk factors, a 10-year CHD risk score, and hypertension in women, Nanchahal, Ashton, and Wood, (2000) investigated 14 077 female employees aged 30–64 years. The researchers gathered information on personal and lifestyle factors, including height, weight, blood pressure, lipids, lipoproteins, apolipoproteins and blood glucose. The relationships between alcohol and a derived coronary risk score and hypertension were also examined. The results showed an increase in the prevalence of hypertension among those participants consuming 15–21 units/week.

Heavy alcohol intake increased the risk of hypertension, but there was still uncertainty about the relationship between light-to-moderate alcohol consumption and incident hypertension.

In a prospective study of 28 848 women from the Women's Health Study and 13 455 men from the Physicians' Health Study who were free of baseline hypertension, cardiovascular disease, and cancer, Sesso, Cook, Buring, Manson, and Gaziano (2008) collected self-reported lifestyle and clinical risk factors. During follow-up, 8680 women and 6012 men developed hypertension (defined as participants who received new physician diagnosis, those who were receiving antihypertensive treatment, and those who reported systolic blood pressure ≥140 mm Hg, or diastolic blood pressure ≥90 mm Hg). The study found a relationship between alcohol intake and hypertension in women based on age and lifestyle-adjusted models. The study also found that alcohol consumption was positively and significantly related to the risk of hypertension in men.

Some studies have provided substantial evidence that heavy alcohol consumption (three or more standard drinks per day) was predictive of hypertension, and a reduction in alcohol consumption was related to a significant dose-dependent lowering of mean systolic and diastolic blood pressure (Miller, Raymond, AntonBrent, Egan, & Nguyen, 2007).

Literature Review of Related Methodology

The determination of overweight was based on a computation of body mass index (BMI) by dividing weight by height. Some researchers have described overweight as individuals with a BMI more than 85th percentile (Wickrama, Wickrama, & Bryant, 2006). Children and adolescents with a BMI greater or equal to the 95th percentile were considered obese (Wickrama, Wickrama, & Bryant, 2006). Health concerns resulting from obesity were becoming increasingly important as society considered its impact on young people (Forster-Scott, 2007). Medical officials were convinced that obesity was a contributing cause of the development of many chronic diseases including high blood pressure, heart disease, cancer, diabetes and a major factor in the premature development of diseases and death believed to be preventable (Morone, Litman, & Robins, 2008). Of course, the burdens caused by such premature affliction included increased

medical expenses, decreased work productivity, psychological and social issues, such as low self-esteem, and depression (Morone et al., 2008).

Forster-Scott (2007) summarized findings from the National Center for Health Statistics and concluded that culture had a great deal of influence on food selection. Some minority groups selected and preferred certain foods for meals, eg. chitlings, pig feet, etc. After long periods of eating these foods, with inadequate exercise, health issues sometimes began to develop, including obesity and overweight. The chances of a child/adolescent becoming overweight and obese increase based on certain socioeconomic conditions. Wickrama et al. (2006) reported that African American and Hispanic youth living in low socioeconomic environments had a greater chance of being overweight and obese (Wang & Boeydoun, 2007). Other researchers have reported that gender, race/ethnicity, community socioeconomic conditions, and family conditions all contributed to the presence of overweight /obesity (Cristol, 2003; Karlsen & Nazroo, 2002; Wang, 2001). The influence of dietary practices and the popularity of the fast food industry with its increasing portion sizes have greatly influenced this epidemic (Morone et al., 2008). A greater abundance of convenience stores, selling foods high in fat and sugar, are located in low-income neighborhoods where healthier foods are almost non-existent. Also evident in schools located in low income neighborhoods were limited access to physical education programs, and lowered physical education requirements, all of which contributed to risk factors. All of this contributed to increased calorie intake in children (Harper, 2006).

In minority cultures, obesity has created many social, cultural, and family issues, particularly among African American and Hispanic children between the ages of two (2) and 19 (Block, Scribne, & DeSalvo, 2004; Bowie, Juon, Cho, & Rodriguez, 2007; Forster-Scott, 2007). Some of the negative outcomes of being obese and overweight included experiences of physical, mental, and social health disorders such as negative stereotyping, low self-esteem, discrimination,

teasing and bullying (Harper, 2006). Among the social issues that impacted obesity and helped to increase obesity included time management, media, video games and television exposure that make children sedentary, and commercial foods (Campbell & Crawford, 2001; Dinour, Bergen, & Yeh, 2007). Overall health was also influenced by family genetic predisposition and behavioral practices that shaped food preferences, patterns of intake, eating styles and activity levels.

Campbell and Crawford (2001) came to this conclusion after examining the influence that parental food preferences, beliefs, role-modeling and child-parent interactions has on the way that children eat. Many companies used advertising to greatly influence behaviors, attitudes, and practices in children and adolescents. It was believed that young people viewed more than 40,000 ads per year on television, and exposure to advertising on the internet, in magazines, and in newspaper was a major contributing factor to childhood and adolescent obesity, poor nutrition, and cigarette and alcohol use (Gosliner & Madsen, 2007). Children's dietary and related health practices were influenced by many factors, and food and beverage marketing has had a tremendous impact on the dietary patterns and health condition of American children.

Gable, Chang, and Krull (2007) conducted the Early Childhood Longitudinal Study-Kindergarten Cohort which examined a nationally representative sample of 8, 000 children who entered kindergarten during 1998-1999. This study was conducted to detect dietary and activity factors connected with school-aged children's commencement of overweight and persistent overweight. The researchers collected data at four separate time periods between the children's kindergarten admission and their entry into the third grade. The outcome measures were the following: never overweight, overweight onset, and persistent overweight. The researchers used multivariate logistic regression analyses to examine the effects of eating and involvement in physical activity on the odds of becoming overweight and persistent overweight based on sex, race, and family socioeconomic status. It was found that children were more likely to be

overweight for the first time at spring semester of third grade if they were determined to have watched more television and ate fewer family meals. In addition, children who lived in neighborhoods that were unsafe for outdoor play were more likely to be constantly overweight, if they were determined to have watched more television and ate fewer family meals. Children who participated in aerobic exercise and had opportunities to participate in physical activity were not seen as having a greater chance of developing weight problems. This study supported the belief that television watching, family meals, and neighborhood safety had an impact on childhood weight status.

Henderson (2007) examined 2,379 white and black girls to investigate the effects of television (TV) viewing on the trajectory of body mass index (BMI) during adolescence. He explored data on TV viewing and BMI from the National Heart, Lung, and Blood Institute Growth and Health Study. Latent growth curve models were used to assess the effects of daily TV viewing on the rise of BMI. One of the curve models used TV viewing at age 10 to predict the development of BMI from ages 11-14. The other curve model used TV viewing at age 14 to predict BMI development from ages 15-19. The analysis used models that controlled for baseline BMI, physical activity, maturation stage, and socioeconomic status. The study revealed that white girls who displayed higher levels of baseline TV viewing were positively associated with a quicker development of BMI for the 4 years following a baseline visit (ages 11-14 years, on average). TV viewing was not associated with the emergence of BMI over the last five of the 10 visits. Among black girls, TV viewing was not related to the origin of BMI. TV viewing was determined to be a factor that contributed to overweight among young girls.

Ekelund et al. (2006) conducted a study that took place in three regions in Europe. They examined 921 boys and girls to determine whether TV viewing could be linked to metabolic-risk factors in youth, while controlling for physical activity (PA) and obesity. The researchers

examined the independent associations between TV viewing, PA measured by accelerometry, and metabolic-risk factors (body fatness, blood pressure, fasting triglycerides, inverted high-density lipoprotein (HDL) cholesterol, glucose, and insulin levels). Clustered metabolic risk was calculated as the average of the standardized values of the six subcomponents. The researchers found a positive association between TV viewing and excess weight. After controlling for physical activity, gender, age group, study location, sexual maturity, smoking status, birth weight, and parental socio-economic status, the association of TV viewing with clustered metabolic risk was no longer found to be significant. Physical activity by itself was inversely associated with systolic and diastolic blood pressure, fasting glucose, insulin, and triglycerides. In addition, physical activity was inversely associated with the clustered risk score, when controlling for obesity and other confounding factors.

Parsons, Power, and Manor (2005) studied the 1958 British birth cohort to investigate relationships between frequency of physical activity or television viewing and BMI. Approximately 17,000 participants were examined in this study where BMI and physical activity frequency were recorded at ages 11, 16, 23, 33 and 42 years, and television viewing frequency was measured at 11, 16 and 23 years. A total of 11,109 subjects provided BMI and activity data at age 42 years. Statistical analysis included linear regression analysis to determine relationships between BMI and inactivity. The relationship between BMI and physical activity was found to change with age. A higher activity level, or lower frequency of television viewing, was associated with a lower BMI in early adolescence and in adulthood. In later adolescence, no relationship was found between television viewing and activity and BMI. There was an unexpected BMI-activity relationship in males, however. This was possibly because in some cases, BMI was not believed to be an accurate predictor of adiposity in adolescent boys.

Miller et al. (2008) examined the association between television/video (TV) viewing and markers of diet quality among 3-year-old children. They studied 613 boys and 590 girls, who were 3 years old. The mothers of the children were asked to report the number of hours the children watched TV on an average weekday and weekend day in the past month. The main outcomes examined in this study were intakes of selected foods and nutrients. This information was extracted from a validated food frequency questionnaire. The researchers used linear regression models to determine the associations, adjusting for the mother's sociodemographic information, parental body mass index (BMI), and child's age, sex, race/ethnicity, BMI z-score, sleep duration, and breast feeding duration. Among the 3-year-olds, in this study, the researchers found that that more TV viewing was associated with unfavorable dietary practices.

Krueger, Blanck, and Gillespie (2008) conducted a study to examine behavioral strategies related to maintenance of weight loss. They wanted to explore their belief that weight loss could improve blood lipids, insulin sensitivity, and blood pressure. They examined dietary practices, physical activity, and self-efficacy among adults self-reported to be successful at maintaining weight loss. They explored data on daily fruit and vegetable servings, minutes per week of physical activity, dining out behavior, and confidence in one's ability to engage in behavioral strategies. They conducted frequency and multivariable logistic regression analyses. It was determined that people could reduce weight with a reduction in consumption of fast foods, in addition to consuming five or more fruit and vegetable servings per day and participating in 150 minutes or more per week of physical activity.

According to the Campaign for Tobacco Free Kids (2009), the tobacco industry embarked upon a very aggressive marketing campaign aimed at women and girls and these new marketing campaigns had placed the health of women and girls at risk. This type of campaigning had a devastating impact on women's health. Exposures to drugs, chemical and biological agents,

before and after birth could lead to pediatric or adult cardiovascular anomalies (Mone et al., 2004). Nearly 20% of all deaths from cardiovascular disease were accredited to tobacco use including more than 148,000 deaths from active smoking, and an additional 35,000 deaths caused by secondhand smoke. Among people who quit smoking, the risk of death from coronary heart disease was 50% lower than that of people who continued to smoke after 1 year of abstinence (Erye, Kahn, & Robinson, 2004).

Nikpay et al. (2007) were concerned about the excessive use of alcohol and tobacco that contributed to the development of cardiovascular disorders like hypertension. They studied 120 families, investigating the factors underlying alcohol and tobacco use in those affected by hypertension (high blood pressure) and dyslipidemia (high lipids levels in the blood). They administered questionnaires to gather the data for their study. The authors found that there was a linkage and association for several genomic regions harboring genes with potential pathophysiological functions relating to alcohol and smoking. They also reported that sex may have played a role in the differences in alcohol and tobacco use.

Agribasli et al. (2008) conducted a study to investigate the patterns of cardiovascular risk factors in populations over a 15-year period. They examined trends in body mass index (BMI) in Turkish children aged 15-17 years, examining parental smoking and blood pressure. This study was conducted through the use of two cross-sectional approaches performed in secondary schools in Turkey in 1989-1990 and 2004-2005. The outcome measures were weight, height, BMI, presence and amount of parental smoking, systolic and diastolic blood pressure. Age and sex matched comparisons were performed to assess temporal trends in these measures. The investigation revealed that children in 2004-2005 had increased weight, height, BMI and decreased systolic and diastolic blood pressure in all age groups compared with children in 1989-1990. The researchers also found that there was a sharp increase in obesity and overweight from

1990 to 2005. The research also demonstrated that there was a decrease in blood pressure during this period. There were significant changes in BMI and blood pressure in Turkish children over the last 15 years. Temporal trends in these parameters indicated a change in the type of cardiovascular disease in this population.

McGarvey et al. (2004) examined the occurrence of overweight in children in the United States. They chose to study the 26% of 3.8 million preschool children served by Special Supplemental Nutrition for Women, Infants, and Children (WIC). Two WIC sites participated in this nonrandomized controlled one-year study to assess parents' self-reported behavior changes. The researchers examined the preventive strategies used by parents to help prevent overweight in their preschool children. A state-specific "Fit WIC" childhood overweight prevention program was developed that incorporated developmental guidelines within a program developed from age specific protocols on parental feeding practices and role modeling. All of this was part of a program that was designed to promote healthy weight in infants and children from birth to four years of age. Participants of the study were asked to attend educational groups once every two months and an individual session every six months. They were given instruction on how to increase physical activity, to modify mealtime behavior, to limit household television viewing, to promote drinking water instead of sweetened beverages, and to promote the consumption of 5 fruits of vegetables daily and increasing family activities. The researchers found that the intervention resulted in a significant increase in the frequency of offering water and the frequency of engaging in active play with the child. The findings demonstrated that parental behaviors could be changed by their involvement in a multidimensional education in a WIC clinic setting.

This current study examined behavior characteristics of adolescents that led to the increase of cardiovascular disease risk factors and other chronic diseases. This approach could provide an indication of the current practices and the health status among adolescents in a low

income high school. It is hoped that the associations that might be revealed can provide valuable information to school officials and other interested parties about health education and program development needs that might exist in their respective locations.

Summary and Transition

A convergence of evidence in the last few decades and the reviews presented here suggest that much of the excess development of hypertension could be prevented. These reviews serve to identify conditions that predict the probability of risk factors resulting in the development of chronic diseases, like hypertension. As a result of the work of these researchers, the concept of prevention can be more avidly promoted among the public to reduce the frequency of premature chronic disease development. The literature has identified unequivocally that obesity leads to the development of hypertension and other chronic conditions. The behavioral antecedents of both obesity and hypertension have been less systematically studied. The overall evidence pointed to high fat, high calorie diet and physical inactivity as the major contributors to obesity, and in addition to these, smoking was cited as contributing to the development of hypertension. The evidence between alcohol consumption and obesity and hypertension is inconclusive. While physical activity and diet have been studied exhaustively in relation to obesity and hypertension, tobacco use and alcohol have not been studied in the context of obesity. Genetic and family history of obesity and hypertension are associated with childhood obesity and hypertension as well.

The review on literature of methodology revealed that most studies have been in the form of cross sectional surveys or prevention interventions. Statistical analyses have consisted of either linear or logistic regression. However, there is a dearth of theoretically based studies examining the association of behavioral risk factors and obesity and hypertension. This study was based on the health belief model and examined four modifiable risk factors (physical inactivity, unhealthy

diet, tobacco and alcohol use). Unlike the perceived susceptibility construct of the HBM, this study filled a major gap in the literature by examining generalized perceived risk (optimistic bias) among adolescents, as their state of mind was to perceive themselves as invincible and excessively optimistic that they were not at risk of any harm. The next chapter discusses in detail the methodology proposed for this study.

Chapter 3: Research Method

High school students' behaviors, practices, and attitudes regarding risk factors for development of high blood pressure are especially critical as school leadership and public health officials struggle to find ways to reduce the prevalence of those health hazards in the State of Mississippi. Strong leadership is needed in schools to formulate and implement prevention and intervention programs that can be incorporated in the regular school curriculum. Understanding the children's behaviors and practices is critical to the design of effective strategies. Chapter 3 is a presentation of the methodology that was used to conduct this study. The first three sections of this chapter include the purpose of the study, research questions, and the research design for the study. The next sections describe the population, instrumentation and the validity and reliability. Finally, this chapter concludes with the data collection procedures and the data analysis methods that will be used in the study.

This study examined the practices of adolescents to determine the level of risk factors that existed and to understand the association between risk behaviors and the development of high blood pressure. It was intended that the information gathered could be used to further educate the student body on healthy practices that could improve their health status, especially in situations where optimistic bias (perceived invulnerability/perceived risk) may be a factor. This study could help to highlight areas of deficiencies in children's daily practices that could assist educators and public health officials in providing strategies for promoting cardiovascular health that could be integrated into a comprehensive health education tool for children. This study made it possible for the researcher to provide recommendations for initiating risk behavior management by school educators and other health professionals.

Research Design and Approach

This study used a correlational design and quantitative data gathering techniques. Descriptive statistics was also used in order to examine the effect of students' optimistic bias on their risk behaviors and health outcomes. The goal of a correlation analysis is to examine whether two variables relate to each other, and, if so, to measure the strength of the relationship between the two variables. The results of a correlation analysis are expressed in the form of a $\underline{\rho}$ value (to test the hypothesis of association) and an r value (to provide a correlation coefficient signifying the strength of the relationship) or r^2 value (coefficient of determination). In correlational research, the relationship between two variables is measured. The relationship is recorded as both a degree and a direction. The degree of the relationship is expressed by a number usually between -1 and +1, and the direction of the relationship is generally expressed by a negative (-) sign or a positive (+) sign. Zero correlation signifies no relationship. The closer the correlation coefficient moves toward either -1 or +1, the stronger the relationship with 1 being a perfect correlation at either extreme. A negative (-) correlation means that as scores on one variable rise, scores on the other decrease. A positive (+) correlation means that the scores on one variable increases as the scores on the other increases, or the scores on one variable decreases as the scores on the other decreases (Creswell, 2005).

In quantitative research, the objective is to determine what kind of relationship exists between two variables in a population, an independent variable and a dependent variable, or outcome variable. Quantitative research is designed to measure relationships between variables. Variables are factors like weight, height, behaviors, and practices (Leedy & Ormrod, 2001). In this study, I measured variables on a sample of students and then proceeded to express the relationship between the variables using correlation coefficients.

Data and information for evaluating the students' beliefs, practices, and attitudes were collected through the use of the Student Health History Survey (SHHS). According to Shavelson (1996), quantitative research is empirical in nature. In broad terms, it seeks to provide answers to questions about behavior using the scientific method. With this method, problems are formulated, hypotheses or research questions are identified using a theory and/or direct observation, and inferences are drawn, data are collected through observation and surveys, and influences are drawn about which hypothesis is most credible and appropriate responses to the research questions posed. The data collected were recorded in descriptive terms. Descriptive research is a form of quantitative research collects data in order to make descriptions of educational trends (Gall, Borg, & Gall, 1996). This first type of descriptive research involves measuring the characteristics of a sample at one point in time. At the completion of the survey, a group of 10 students were randomly selected for a qualitative data gathering process to gain insight into what they feel could be effective in motivating students to participate in healthier practices. This conversation was used for deciding on recommendations for prevention implementation.

This study can be regarded as an evidence-gathering investigation that is sometimes needed when a significant and immediate intervention or prevention strategy is needed. Prior to conducting a comprehensive school-based prevention program aimed at changing student's risk factors, such as body fat by increased physical activity in physical education (PE) classes, an empirical evidentiary study of this type might assess activity in PE. For this study, I collected primary data using a questionnaire and the collection of clinical measures in order to assess the impact of negative student behaviors on their health status.

Setting and Sample

The research sample for this study was 433 students attending one high school located in a rural community in central Mississippi. In order to ensure that the sample size was large enough to provide adequate statistical power of the results, software developed by Raosoft (2004) was used. This sample size calculator scientifically estimated the appropriate sample size to assure statistical power. The alpha was set at .05 with confidence interval of 95%. The sample size recommended for this population was 222 participants out of a total student population of 520 students. The formula used for calculating the sample size is as follows.

The sample size n and margin of error E are given by

$$x = Z(c/100)^2 r(100-r)$$

$$n = Nx/((N-1)E^2 + x)$$

$$E = \mathrm{Sqrt}[(N-n)x/n(N-1)]$$

where N is the population size, r is the fraction of responses of interest, and $Z(c/100)$ is the critical value for the confidence level c. A decision was made to oversample and use a sample size of 433 for this study to compensate for any refusal to participate or withdrawal from the study mortality effects.

These high school students whose ages ranged between 15 and 19 years were enrolled in Grades 9 - 12. This rural high school has been classified by the State Department of Education as a school with low socio-economic status. All students attending the health and physical education classess who agreed to participate in the study, completed the questionnaire. This study could not be completed with archival data (existing data) because such data were unavailable. This research activity was endorsed by the teachers, the principal, and the superintendent of the school district who all envisioned this study as an opportunity to introduce to the students, and to address, some very important health-related topics that were included in the curriculum for the health and

physical education classes. Data collection did not disrupt the students' learning time but was regarded as an additional activity to complement activities planned for semester.

Data Collection and Analyses

After approval was granted by the IRB, the consent and assent forms were distributed by the researcher to the children to be signed by them. The students were asked to take the consent forms home to obtain their parents/guardians' signatures. They were asked to return the signed consent forms to the researcher on the following day. The survey instrument was administered to the subjects as soon as possible after the receipt of the signed consent/assent forms. Only students who returned both the consent and assent form signed were allowed to participate in the survey. The survey was administered by the researcher during each of the class periods of one school day during the 2010 spring semester of the academic school year. Students who did not participate in the survey were assigned alternative classroom activities while the other students completed the survey questions. Students who chose not to participate were given an alternate assignment by the teacher to ensure that they were able to cover the same subject matter as the other students who elect to take the survey. At no time were non participants singled out negatively for the choices they made regarding the survey. Upon completion of the survey, the researcher collected the surveys from the students.

Blood pressure measurements and height and weight measurements were collected by the school nurse. All students participating in the study were examined in the school's clinic located on the school premises. This study used strict quality-assurance measures to guarantee measurement accuracy. A Hawksley random-zero sphygmomanometer was used to measure blood pressure. This procedure was completed twice with the students at rest. The students were asked to remove their shoes for the height measurement which was recorded in centimeters using stadiometers constructed by the Medical Instruments Unit of the University of Iowa. Students

were asked to wear light clothing to measure their weight. The weight measurement was taken in kilograms by using scales that were calibrated on a weekly basis. Each measurement was made twice, and the average of the two measurements was taken. In the event that there was discrepancy in the readings, a third measurement was completed. For this study, students did not complete the measurement portion until they had a completed survey. The blood pressures were taken by the school nurse. The school had its own procedure in place and accepted responsibility for doing follow-ups when out of range measures should be found. All of these measurements were done after the initial survey was completed.

Data were collected to assess health-risk behaviors such as the level of physical activity performed by students, dietary intake of students, and other health risk practices that have the potential to eventually result in the premature development of chronic diseases. Descriptive statistics were computed for all study variables of interest. Values computed were expressed as frequencies and percentages. The relationships between the behavior characteristics of the students, and in BMI and blood pressure measurements were assessed using canonical correlation statistics, through the discriminant analysis procedure to explore the hypotheses and compare the behaviors and practices of these local school students. An alpha level of $\underline{p} < .05$ was set as the minimum level of statistical significance. Canonical correlation is a statistical technique that is used to examine the degree of the relationship between two canonical (latent) variables. The purpose of canonical correlation is to explain the relation of the two sets of variables. Wilks's lambda is commonly used to test the significance of canonical correlation. Canonical correlation finds the linear combination of variables that produces the largest correlation with the second set of variables. Like the case of simple correlation, the square of the canonical correlation coefficient provides the percentages of variance that can be explained in the dependent variable as a result of the presences of the independent variable (Dunlap & Greer, 2000).

Research Questions and Hypotheses

The overarching research questions developed for this study intended to explore the extent to which obesity and high blood pressure existed among African American high school children in a rural Mississippi school district in a culture of optimistic bias (perceived invulnerability). This section describes each of the two research questions. Within each research question a description of the measures used to operationalize the hypotheses tested is presented. The statistical analysis plan used for each of the two questions follows the description of the hypotheses and measures. The dependent variables for this study were BMI and blood pressure. The independent variables were the health risk behaviors (physical inactivity and dietary intake of fruits and vegetables, tobacco and alcohol use) and optimistic bias of the children examined in this study. A quantitative data collection procedure provided avenues to fully explore the students' responses on the survey that was administered as well as the clinical measurements of blood pressure and body mass index.

Both research questions shared two outcomes, blood pressure and body mass index. As shown in Table 3, BMI level was classified into four categories: underweight (BMI < 18.5), normal weight (BMI=18.5-25.0), over weight (BMI=26 -30), and obese (BMI > 30). Blood pressure measurements were classified into three groups: normal blood pressure (BP < 120/<80), pre hypertension (BP= 120-139/80-89), and high blood pressure (BP =140 and above/90 and above).

Research Question 1: How do health risk behaviors, the students' dietary practices, their physical activity behaviors, and their alcohol consumption and tobacco use relate to the development of obesity and high blood pressure among adolescents?

Research Question 1 was answered by testing the following four hypotheses:

$H1_0$: There will be no association between tobacco use and alcohol consumption and adolescent blood pressure levels.

$H2_0$: There will be no association between consumption of fruits and vegetables and adolescent blood pressure levels.

$H3_0$: There will be no association between physical inactivity and adolescent blood pressure levels.

$H4_0$: There will be no association between tobacco use and alcohol consumption and adolescent BMI.

$H5_0$: There will be no association between consumption of fruits and vegetables and adolescent BMI.

$H6_0$: There will be no association between physical inactivity and adolescent BMI.

Alcohol Consumption. To determine alcohol consumption and tobacco use, the responses of the students on the following questions were examined: (a) Do you drink alcoholic beverages? (b) If yes, identify the drinks you consume. (c) When going out with friends, do you feel it is necessary to drink to have a good time? (d) How much alcohol do you consume on a weekly basis? (e) Do you smoke? (f) If yes, how old were you when you started smoking?

Physical Activity. To determine physical activity and sedentary practices, the responses of the students on the following questions were examined: (a) On how many of past 7 days did you exercise or participate in hard physical activity for at least 30 minutes (e.g. basketball, soccer, running, swimming laps, fast bicycling, fast dancing, or similar aerobic activities)? (b) On how many of the past 7 days did you participate in moderate physical activity for at least 30 minutes, (e.g. fast walking, slow bicycling, skating, pushing a lawn mower, or mopping floors)? (c) On how many of past 7 days did you do exercises to strengthen or tone your muscles, such as push-

ups, sit-ups, or weight lifting? On an average school day, how many hours do you watch TV? (d) In an average week when you are in school, how many days do you go to physical education (PE) classes? (e) During an average physical education (PE) class, how many minutes do you actually spend exercising or playing sports? (f) How many minutes do you actually spend exercising or playing sports? (g) On the average, how many hours of sleep do you get every night?

Dietary Practices. To determine dietary practices, the responses of the students on the following questions were examined: (a) During the past 7 days, how many times did you eat salad? (b) During the past 7 days, how many times did you consume fried foods? (c) How often do you consume soft drinks? (d) How much water do you drink every day? (d) During the past 7 days, how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice?

Data Analyses for Research Question 1. The first research question was analyzed through Canonical correlation analysis using the discriminant analysis procedure to test the statistical significance of the relationships between the risk practices (alcohol consumption, dietary and physical activity practices) and BMI and blood pressure. This analysis served to examine the risk factors that were associated with school-aged children's BMI and blood pressure. The canonical analyses provided the avenue to discriminate the predictors of the two outcome variables in their multiple-category ordinal variables.

Research Question 2: What is the association between prevalence of obesity, high blood pressure and lack of perceived risk (optimistic bias)? The three hypotheses listed below were developed to address this research concern.

$H7_0$: There will be no association between adolescent blood pressure levels and optimistic bias.

$H8_0$: There will be no association between adolescent obesity and optimistic bias.

$H9_0$: There will be no association between adolescent obesity and optimistic bias by gender.

Optimistic Bias. Optimistic bias or perceived invulnerability was another variable that was examined in conjunction with the students' BMI and blood pressure levels. Optimistic bias is the unrealistic optimism that influences the behavior of the youth causing them to underestimate their susceptibility to negative health outcomes and negatively impacts their judgment regarding regular risk behaviors.

Data Analysis for Research Question 2. The second research question was analyzed using descriptive analyses. Three-way cross-tabulations of optimistic bias by clinical outcome (BMI and blood pressure) by gender was tested using the chi-square statistic at the $\underline{p} < .05$ level.

Table 3

Description of Variables for Hypotheses Testing

Variable	Description	Type	Values
High Blood Pressure (mmHg) Diastolic = top # Systolic = bottom #	Blood pressure measured around the arm above the elbow; it detects the amount of pressure in the blood flowing in the vein (in mm of mercury)	Nominal	1=<120/90 = Normal 2=120-139/80-89 = Pre hypertension 3=140+/90+ = High Blood Pressure
BMI (weight in Kg/squared height in meters)	Calculated based on calibrated measurements performed by school nurse	Continuous Ordinal	0.0 -– 60++ 1=<18.5 Underweight 2=18.5—25.0 Normal 3=26.0—30.0 Overweight 4=>30.0 Obese
Tobacco Use	Q17. Do you smoke	Dichotomous	1=Yes 2=No
Alcohol Use	Q13. Do you drink alcoholic beverages?	Dichotomous	1=Yes 2=No
Optimistic Bias	Ask participants to rate their health compared to others their same age	Ordinal	1=Poor 2=Fair 3=Good 4=Very Good 5=Excellent

Instrumentation and Materials

The 26-item Student Health History Survey questionnaire used for this study was originally developed by Project Health of Jackson State University for use in school studies that examined student risk practices. This instrument was administered by the investigator face-to-face to 422 high school students during regular physical education class time. Administration of

the instrument lasted between 15 to 20 minutes. The instrument assessed frequency of participation in physical activities, high fat/junk food consumption, alcohol consumption and tobacco use products, socio-demographic characteristics, and optimistic bias. Anthropometric measures were obtained using standard protocols by the school nurse while students were at the school health clinic and included height, weight and blood pressure measurements. For measures of weigh an electronic scale was used and a stadometer for height measurement. Weight and height were used to determine the participants' body mass index (BMI). Body mass index was the measure used to identify a participant's obesity/overweight status. Body mass index was calculated as weight in kilograms divided by height in meters squared. BMI level was classified into four groups as follows; underweight = BMI < 18.5, normal weight = BMI 8.5-25.0, overweight = BMI 26 -30, and obese = BMI > 30. Blood pressure was classified into three groups as follows Normal BP = < 120/<80), pre hypertension = 120-139/80-89, and high blood pressure =140 and above/90 and above.

Reliability and Validity

Test-retest reliability analysis was conducted to establish reliability of the Student Health History Survey (SHHS) as prior published measures were not available in the literature. A group of 10 students participated in this exercise. Prior to the beginning of the survey administration to the study participants, the 10 students were first administered the survey. They were tested again after one week and their responses tabulated and analyzed. A test-retest analysis was computed to analyze the relationship between their responses on the two administrations of the survey to establish the reliability scale of the instrument. A group of 10 students participated in this exercise. They were tested again after 1 week and the analysis was computed. The students participating in the test-retest exercise did not participate in the research study so as not to contaminate the sample but were selected from the same classroom.

The original instrument from which this survey was constructed, the YRBSS, already had a reliability and validity analysis conducted. To ensure reliability, CDC conducted two test-retest reliability studies of the national YRBS questionnaire (in 1992 and in 2000). In the first study, the questionnaire was administered to a convenience sample of 1,679 students in grades 7–12. No statistically significant differences were observed between the prevalence estimates for the first and second times that the questionnaire was administered. From this study, it was determined that the questionnaire is best suited for students in grades >8. In the second study, the questionnaire was administered on two occasions, approximately 2 weeks apart to a convenience sample of 4,619 high school students.

Certain items where the reliability was in question were revised or deleted from later versions of the questionnaire. No study has been conducted to assess the validity of all self-reported behaviors that were included on the YRBS questionnaire. However, in 2003 CDC reviewed related literature to assess factors that might affect the validity of adolescent self-reporting of behaviors measured by the YRBS questionnaire. CDC concluded that, the validity of self-reports of each type of behavior was not threatened by the cognitive and situational factors that could sometimes influence self-reporting (CDC, 2004). However, since, this study sought to utilize portions of the items on this instrument, additional reliability and validity analyses were conducted. The SHHS instrument was assessed for content and construct validity through a literature review as well as through the uses of expert involvement. Several health educators and public health professionals from Jackson State University, Jackson, Mississippi, reviewed and critiqued the SHHS survey. This process served to establish content validity. The researcher also established the stability of the instrument by examining 25% of the total questionnaires collected prior to full data analysis.

Protection of Participants

Permission was first obtained from the school district and then from the principal and the teachers to initiate the study at the school selected for investigation. After these approvals were received, application was made to the Walden University Institution Review Board (IRB), seeking approval to conduct the study. IRB approval was granted by Walden University in March 2010. The Walden IRB approval number is 03-02-10-0345948. Data collection began on March 10, 2010 and ended on May 25, 2010.

The IRB application packet included a consent form to be signed by the students' parents or guardians and an assent form to be signed by the students who agreed to participate in the study. The informed consent letters were applied in order to protect the participants. Before signing the informed consent documents, the parents and the students were given an opportunity to read an overview of the study. In that same document, they also read a statement that informed them of their right to withdraw from the study at any time without penalty. They were informed that their participation in the study was on a voluntary basis. The document also informed them of the assurance of strict confidentiality of the information collected. They were informed in the informed consent document that if they agreed to participate, their names would not be used or recorded. The data were recorded using code numbers that cannot reveal their identities. Upon collection of the surveys, and after recording and analyzing the data, all documents related to this study were placed unlabeled in a locked filing cabinet. Only the researcher has access to the information collected. After 7 years, the surveys collected and all other documents relating to the data gathering process regarding the study will be destroyed.

Summary and Transition

Chapter 3 presented the methodology for the study on the high school student's behavior risk practices and their relationship to BMI and blood pressure levels. The methods and

procedures outlined in this chapter included: research question, hypotheses research design, method, participants, instruments, validity, reliability, procedures, data collection, and data analysis. Chapter 4 is a presentation of the results of the study, and chapter 5 represents the interpretation of the results of the study.

Chapter 4: Results

This study sought to explore the relationship between the behavior practices of adolescents in a Mississippi school district and the prevalence of high blood pressure and obesity (BMI) by examining this relationship within the context of optimistic bias. The students' physical activity practices, dietary practices, alcohol consumption, and tobacco use were examined and their associations with obesity levels and high blood pressure levels were assessed.

In order to investigate the high school student's behavior risk practices, the following research questions and hypotheses were developed and used to investigate the extent of obesity and high blood pressure among the students in a culture of optimistic bias (perceived invulnerability). Optimistic bias is the unrealistic optimism that influences the behavior of the youth causing them to underestimate their susceptibility to negative health outcomes and negatively impacts their judgment regarding regular risk behaviors. The overarching research question developed for this study intended to explore the extent to which obesity and high blood pressure existed among African American high school children in a rural Mississippi school district in a culture of optimistic bias (perceived invulnerability). Nine research hypotheses were developed, and the findings are presented by the hypothesis tested.

Demographic Characteristics of the Sample

Table 4 is a presentation of the demographic characteristics of the participants by gender. As seen in the table, the largest percentage of male students (42.6%) was in the 15-16 year age group. This was followed by 33.2% of the male students in the 14 years or younger age group. The females had the larger percentage (23.8%) in the 16-18 years age group and 18.6% in the 18-19 years or older age group. A larger percent of males (44.4%) than females (34.3%) was enrolled in the 9th grade. There were a larger percentage of female students (26.7%) than male students (13.0%) enrolled in the 12th grade. More male students (4.0%) than females (1.5%)

perceived their academic performance as being in the "mostly F" category. More males (11.0%) than females (6.2%) categorized themselves as "D" students, and more females (41.5%) than males (37.5%) were in the 'C' category. In each case, lambda statistics revealed no significant differences between males and females and the demographic characteristics.

Table 4

Socio Demographic Characteristics of Sample of Adolescents (N=433)

	Male		Female	
	%	N	%	N
Age Groups*				
≤ 14 years old	33.2	74	28.1	59
'15 to 16 years old	42.6	95	29.5	62
'17 to 18 years old	11.2	25	23.8	50
19 years old & older	13.0	29	18.6	68
Education*				
9th grade	44.4	99	34.3	72
10th grade	23.3	52	21.0	44
11th grade	19.3	43	18.1	38
12th grade	13.0	29	26.7	56
Grades in last 12 months*				
Mostly A's	4.6	10	5.8	12
Mostly B's	29.3	65	30.2	64
Mostly C's	35.7	80	41.5	87
Mostly D's	11.0	25	6.2	13
Mostly F's	4.0	9	1.5	3
Not sure	15.0	34	14.9	31
Overall	51.5%		49.5%	

*= $\underline{p}$>.05

Table 5 is a presentation of the blood pressure and BMI measurements of the Study participants. As seen in the table, the mean systolic blood pressure measurement was 130.17 mmHg which is above the recommended level for adults of 120 mmHg. The mean diastolic level was 73.53 mmHg which is within the normal range below 90 mmHg. The mean BMI level was 27.37 which is higher than the recommended level (25.0) and puts the average BMI in the overweight category.

Table 5

Mean Systolic and Diastolic Blood Pressure and Body Mass Index (N-433)

Blood Pressure	Mean	S.D.
Systolic Blood Pressure (mmHg)	130.17	19.22
Diastolic Blood Pressure (mmHg)	73.52	9.59
Body Mass Index (Kg/m^2)	27.37	6.53

Table 6 is a presentation of the blood pressure and BMI distribution of the students who participated in this study by gender. As seen in the table, a higher percent of the female students (15.2%) were overweight compared to the male students (10.3%). A higher percent of the male students (29.1%) were obese compared to the female students (10.3%). Overall, 17.6% of the students were classified as underweight, and less than half of the students (42.7%) were considered to be of normal weight. In addition, 12.7% of the students were classified as overweight and 27.0% were classified as obese. As seen in the table, a higher percent of the male students (21.5%) were pre-hypertensive compared to the female students (17.1%). There was no significant difference between gender and hypertension (male students, 3.1%; female students, 2.9%). Over three-quarters of all the students (77.6%) were of normal blood pressure, 19.4% were pre-hypertensive, and 3.0% were hypertensive, with more male students classified as pre-hypertensive than females.

Table 6

Percent Distribution of BMI and Blood Pressure Status by Gender

Outcome	Male	Female	Both
BMI Status			
Underweight	17.5	17.6	17.6
Normal Weight	43.0	42.4	42.7
Overweight	10.3	15.2	12.7
Obese	29.1	24.8	27.0
Blood Pressure Group			
Normal	75.3	80.0	77.6
Pre-Hypertensive	21.5	17.1	19.4
Hypertension	3.1	2.9	3.0

$p > .05$

Table 7 is a presentation of the percent distribution of BMI by optimistic bias orientation of the students. As seen in the table, a higher percent of the students who see themselves as likely to develop cardiovascular disease (19.1%) were underweight compared to students who did not see themselves as likely to develop cardiovascular disease (15.1%). The average for all underweight students was 17.6%. A higher percent of the students who see themselves as likely to develop cardiovascular disease (44.1%) were at normal weight compared to students who did not see themselves as likely to develop cardiovascular disease (39.8%). The average for all underweight students was 42.7%.

A higher percent of the students who did not see themselves as likely to develop cardiovascular disease (14.5%) were overweight compared to students who saw themselves as likely to develop cardiovascular disease (11.6%). The overall average for all overweight students was 12.7%. A higher percent of the students who did not see themselves as likely to develop cardiovascular disease (33.7%) were obese compared to students who saw themselves as likely to develop cardiovascular disease (24.7%). The overall average for all obese students was 27.0%.

Table 7

Percent Distribution of BMI Status by Optimistic Bias (N=433)

	Thinks it is possible he/she could develop heart disease		
BMI Status	Yes	No	All
Underweight	15.1	19.1	17.6
Normal Weight	39.8	44.6	42.7
Overweight	14.5	11.6	12.7
Obese	33.7	24.7	27.0

$p>.05$

Multivariate Analyses to Test Hypotheses

Two overarching research questions were developed for this study. Each of these research questions was accompanied by hypotheses to facilitate further examination and statistical analysis. To address research question one, statistical analyses consisted of cross-tabulations between categorical variables and the risk factors. In addition, canonical correlation was examined through the discriminant analysis process to further inspect the relationship between the risk factors and obesity and blood pressure status of the students. To address research question two, statistical analyses consisted of cross-tabulations between categorical variables and optimistic bias. The following is an examination of the results of the statistical analyses that addressed the hypotheses that were developed for this study.

Hypotheses Related to Predictors of Blood Pressure Level

$H1_0$: There will be no association between tobacco use and alcohol consumption and adolescent blood pressure levels.

Table 7 presents statistics that were computed to examine tobacco use and alcohol consumption by adolescent blood pressure levels. As seen in the table, there is little difference reported in the mean amount of alcoholic beverages consumed and tobacco used by blood pressure levels. The analysis revealed no significant difference in the consumption of alcoholic beverages and the use of tobacco based on blood pressure levels.

Table 8

Mean Distribution of Tobacco Use and Alcohol Consumption by Adolescent Blood Pressure Levels (N=433)

Risk Factor	Normal BP Mean (SD) N=77	Prehypertensive Mean (SD) N=185	Hypertensive Mean (SD) N=55	Total Mean (SD) N=433
Drink alcoholic beverages?	1.68 (0.47)	1.70 (0.46)	1.65 (0.48)	1.71 (0.46)
Do you smoke?	1.82 (0.39)	1.85 (0.45)	1.89 (0.31)	1.85 (0.35)

Wilks' lambda was used to test the significance of canonical correlation between blood pressure levels and tobacco use and consumption of alcoholic beverages. Table 9 indicates that among the blood pressure categories, there was no significant relationship with the consumption of alcoholic beverages and the use of tobacco ($p > .05$).

Table 9

Blood Pressure by Tobacco Use and Alcohol Consumption –Test of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
Drink alcoholic beverages?	.999	0.148	2	430	.862
Do you smoke?	.993	1.420	2	430	.243

$H2_0$: There will be no association between consumption of fruits and vegetables and adolescent blood pressure levels.

Table 10 presents statistics that were computed to examine consumption of fruit and vegetables by adolescent blood pressure levels. As seen in the table, there is little difference reported in the mean amount of fruits and vegetables eaten. The analysis revealed no significant difference in the consumption of fruit and vegetable based on blood pressure levels.

Table 10

Mean Distribution of Consumption of Fruit and Vegetables by Adolescent Blood Pressure Levels

Risk Factor	Normal BP Mean (SD) N=77	Pre-hypertensive Mean (SD) N=185	Hypertensive Mean (SD) N=55	Total Mean (SD) N=433
Eating fruits and vegetables?	1.29 (0.46)	1.20 (0.40)	1.29 (0.46)	1.23 (0.42)

Wilks' lambda was used to test the significance of canonical correlation between blood pressure levels and eating fruits and vegetables. Table 11 indicates that among the blood pressure categories, there was no significant relationship with eating fruits and vegetables ($\underline{p} > .05$).

Table 11

Blood Pressure by Eating Fruits and Vegetables –Test of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
Eating fruits and vegetables?	.996	.812	2	430	.445

$H3_0$: There will be no association between physical inactivity and adolescent blood pressure levels.

Table 12 presents statistics that were computed to examine physical activity and adolescent blood pressure levels. As seen in the table, there is little difference reported in the mean amount of physical activity. The analysis revealed no significant difference in the amount of physical activity, even though, in general, hypertensive and pre-hypertensive students reported less physical activity.

Table 12

Mean Distribution for Physical Inactivity by Adolescent Blood Pressure Levels

Risk Factor	Normal BP Mean (SD) N=77	Pre-hypertensive Mean (SD) N=185	Hypertensive Mean (SD) N=55	Total Mean (SD) N=433
Past 7 days, exercise or participate in hard physical activity at least 30 minutes?	2.79 (0.98)	2.59 (1.12)	2.47 (1.15)	2.58 (1.12)
Past 7 days, exercise or participate in moderate physical activity for at least 30 minutes?	2.37 (1.00)	2.36 (1.04)	2.22 (0.98)	2.42 (1.05)
Past 7 days, exercise to strengthen or tone your muscles?	2.58 (0.91)	2.35 (1.08)	2.24 (1.04)	2.40 (1.06)

Wilks' lambda was used to test the significance of canonical correlation between blood pressure levels and physical activity. Table 13 indicates that among the blood pressure categories, there was no significant relationship with physical activity ($p > .05$).

Table 13

Blood Pressure by Tobacco Use and Physical Activity –Test of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
Past 7 days, exercise or participate in hard physical activity at least 30 minutes?	.998	.529	2	430	.590
Past 7 days, exercise or participate in moderate physical activity for at least 30 minutes?	.989	2.469	2	430	.086
Past 7 days, exercise to strengthen or tone your muscles?	.998	.337	2	430	.714

Hypotheses Related to Predictors of BMI

$H4_0$: There will be no association between tobacco use and alcohol consumption and adolescent BMI.

Table 14 presents statistics that were computed to examine tobacco use and alcohol consumption and BMI. As seen in the table, there is little difference reported in the mean amount of tobacco use and alcohol consumption. The analysis revealed no significant difference in the amount of amount of tobacco use and alcohol consumption, even though, in general, overweight and obese students reported more tobacco use and alcohol consumption.

Table 14

Mean Distribution for Tobacco Use and Alcohol Consumption by BMI

Risk Factor	Underweight Mean (SD) N=77	Normal Mean (SD) N=185	Overweight Mean (SD) N=55	Obese Mean (SD) N=117	Total Mean (SD) N=433
Drink alcoholic beverages?	1.68 (0.47)	1.70 (0.46)	1.65 (0.48)	1.75 (0.43)	1.71 (0.46)
Do you smoke?	1.82 (0.39)	1.85 (0.45)	1.89 (0.31)	1.86 (0.34)	1.85 (0.35)

Wilks' Lambda was used to test the significance of canonical correlation between BMI levels and tobacco use and consumption of alcoholic beverages. Table 15 indicates that among the BMI categories, there was no significant relationship with the consumption of alcoholic beverages and the use of tobacco ($\underline{p} > .05$).

Table 15

Blood Pressure by Tobacco Use and Alcohol Consumption –Test of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
Drink alcoholic beverages?	.995	.693	3	429	.557
Do you smoke?	.996	.522	3	429	.667

$H5_0$: There will be no association between consumption of fruits and vegetables and adolescent BMI.

Table 16 presents statistics that were computed to examine the consumption of fruits and vegetables by BMI. As seen in the table, there is little difference reported in the mean consumption of fruits and vegetables. The analysis revealed no significant difference in the consumption of fruits and vegetables.

Table 16

Mean Distribution of Consumption of Fruits and Vegetables by BMI

Risk Factor	Underweight Mean (SD) N=77	Normal Mean (SD) N=185	Overweight Mean (SD) N=55	Obese Mean (SD) N=117	Total Mean (SD) N=433
Eating fruits and vegetables?	1.29 (0.46)	1.20 (0.40)	1.29 (0.46)	1.20 (0.40)	1.23 (0.42)

Wilks' lambda was used to test the significance of canonical correlation between BMI levels and eating fruits and vegetables. Table 17 indicates that among the BMI categories, there was no significant relationship with eating fruits and vegetables ($p > .05$).

Table 17

Blood Pressure by Eating Fruits and Vegetables –Test of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
Eating fruits and vegetables?	.990	1.456	3	429	.226

$H6_0$: There will be no association between physical inactivity and adolescent BMI.

Table 18 presents statistics that were computed to examine physical inactivity by BMI. As seen in the table, there is little difference reported in the mean amount of physical activity. The analysis revealed no significant difference in the amount of amount of physical activity, even though, in general, overweight and obese students reported less physical activity.

Table 18

Mean Distribution of Physical Inactivity by BMI

Risk Factor	Underweight Mean (SD) N=77	Normal Mean (SD) N=185	Overweight Mean (SD) N=55	Obese Mean (SD) N=117	Total Mean (SD) N=433
Past 7 days, exercise or participate in hard physical activity at least 30 minutes?	2.79 (0.98)	2.59 (1.12)	2.47 (1.15)	2.48 (1.18)	2.58 (1.12)
Past 7 days, exercise or participate in moderate physical activity for at least 30 minutes?	2.37 (1.00)	2.36 (1.04)	2.22 (0.98)	2.66 (1.09)	2.42 (1.05)
Past 7 days, exercise to strengthen or tone your muscles?	2.58 (0.91)	2.35 (1.08)	2.24 (1.04)	2.44 (1.09)	2.40 (1.06)

Wilks' lambda was used to test the significance of canonical correlation between BMI levels and physical activity. Table 19 indicates that among the obesity categories, only those that were moderately physically active in the past 7 days for at least 30 minutes were significantly different compared to the other groups ($p<.05$). All of the other predictor variables did not show significant group differences.

Table 19

Blood Pressure by Physical Activity –Test of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
Past 7 days, exercise or participate in hard physical activity at least 30 minutes?	.990	1.388	3	429	.246
Past 7 days, exercise or participate in moderate physical activity for at least 30 minutes?	.979	3.025	3	429	.029*
Past 7 days, exercise to strengthen or tone your muscles?	.991	1.346	3	429	.259

* $p < .05$

$H7_0$: There will be no association between adolescent blood pressure levels and optimistic bias.

Table 20 presents statistics that were computed to examine blood pressure status by optimistic bias. As seen in the table, 40.5% of the students who were pre-hypertensive believed that it was possible to develop heart disease compared to 59.5% who were pre-hypertensive, but did not believe that it was possible to develop heart disease. In addition, 23.1% of the students who were hypertensive believed that it was possible to develop heart disease compared to 76.5% who were hypertensive, but did not believe that it was possible to develop heart disease.

Table 20

Percent Distribution of Blood Pressure by Optimistic Bias

	Optimistic Bias Thinks it is possible he/she could develop heart disease	
	Yes (38.3%)	No (61.7%)
Blood Pressure		
Normal	38.4	61.6
Pre hypertension	40.5	59.5
Hypertension	23.1	76.7

$p > .05$

$H8_0$: There will be no association between adolescent obesity and optimistic bias.

Table 21 presents cross tabulations that were computed to examine BMI and optimistic bias. As seen in the table, 43.6% of the students who were overweight believed that it was possible to develop heart disease compared to 56.4% who were overweight, but did not believe that it was possible to develop heart disease. In addition, 43.6% of the students who were obese believed that it was possible to develop heart disease compared to 56.4% who were obese, but did not believe that it was possible to develop heart disease.

Table 21

Percent Distribution of BMI Status by Optimistic Bias

	Optimistic Bias Thinks it is possible he/she could develop heart disease	
	Yes (38.3%)	No (61.7%)
BMI Status		
Underweight	32.9	67.1
Normal Weight	35.7	64.3
Overweight	43.6	56.4
Obese	43.6	56.4

$p > .05$

$H9_0$: There will be no association between adolescent obesity and optimistic bias when controlling by gender.

Table 22 presents cross tabulations for blood pressure and BMI status by optimistic bias and gender. About 61.7% of the students did not think that it was possible for them to develop heart disease compared to 38.3% that did not. About 22.8% of the male students and about 18.4.0% of the female students who think it was possible for them to develop heart disease were classified as pre-hypertensive, while 2.5% of those male students and 1.1% of the female students were hypertensive. On the other hand, 20.8% of the male students and 16.3% of the female students who did not think it is possible for them to develop heart disease were classified as pre-hypertensive, while 3.5% of those male students and 4.1% of the female students were hypertensive. The relationship between obesity and gender also was supported by the optimistic bias hypothesis. Only 9.0% of the male students and about 14.6% of the female students who think it is possible for them to develop heart disease were classified as overweight, while 27.1%

of those male students and 22.0% of the female students were obese. On the other hand, 12.7% of the male students and 16.7% of the female students who did not think it is possible for them to develop heart disease were classified as overweight, while 32.9% of those male students and 28.7% of the female students were obese.

Table 22

Percent Distribution of Blood Pressure and BMI Status by Optimistic Bias and Gender

	Optimistic Bias					
	Thinks it is possible he/she could develop Heart Disease (38.3%)			Does Not think it is possible he/she could develop Heart Disease (61.7%)		
	Total	Male	Female	Total	Male	Female
Blood Pressure						
Normal	77.7	74.7	80.5	77.5	75.7	79.7
Pre hypertension	20.5	22.8	18.4	18.7	20.8	16.3
Hypertension	1.8	2.5	1.1	3.7	3.5	4.1
BMI Status						
Underweight	15.1	15.2	14.9	19.1	18.8	19.5
Normal Weight	39.8	39.2	40.2	44.6	45.1	43.1
Overweight	14.5	12.7	16.7	11.6	9.0	14.6
Obese	30.7	32.9	28.7	24.7	27.1	22.0
Overall Gender		35.4	41.4		64.6	58.6

$p > .05$

Table 23 is a presentation of the BMI and blood pressure levels of the students in the study as provided by the discriminant analysis procedure. The analysis revealed that 34.6% of the students were classified as obese and 24.7% were classified as overweight. The data also revealed that 33.7% of the students were classified as pre-hypertensive, and 28.2% of the students were classified as hypertensive.

Table 23

BMI and Blood Pressure Groups (N=433)

	Number	Percent
BMI Status		
Underweight	100	23.1
Normal Weight	76	17.6
Overweight	107	24.7
Obese	150	34.6
Total	433	100.0
Blood Pressure Group		
Normal	165	38.1
Pre-Hypertensive	146	33.7
Hypertension	122	28.2

p>.05

Summary and Transition

The findings of this quantitative cross-sectional study examined two research questions related to risk behaviors and heart disease risk factors. The first question dealt with the relationship between adolescents' risk behaviors (alcohol use and tobacco consumption, dietary

intake of fruits and vegetables, and physical activity) and two risk factors for heart disease, obesity and hypertension. Canonical analyses revealed only one significant finding among those performing moderate physical activity for at least 30 minutes in the last seven days and lower blood pressure but not for obesity. The second research question dealt with the relationship between optimistic bias and both obesity and hypertension. Although no statistically significant findings were detected through descriptive analyses, two-thirds of the students had optimistic bias in relation to their risk of heart disease; that is, they did not think they could develop heart disease despite a prevalence of obesity, pre hypertension and hypertension. There was also a non-significant pattern of males having more optimistic bias than females. The last chapter presents a more conceptual summary of the findings, and conclusions and recommendations.

Chapter 5: Summary, Conclusions and Recommendations

This concluding chapter consists of a summary of the study, summary of the findings, recommendations for action, recommendations for further study, implications for social change, researcher's reflection, and conclusion.

Overview

In Mississippi, there continues to be inadequate attention given to health disparities and there is a paucity of research conducted among school-aged children regarding the relationship between negative health status, such as obesity and high blood pressure and the health risk behavior of the students. This study was designed to provide an avenue through which research can be conducted to evaluate the high school students' BMI levels (underweight, normal weight, overweight, and obesity) and their blood pressure levels (normal, pre hypertensive, and hypertensive) in relation to selected health risk behaviors that included the students' smoking behavior, alcohol consumption, consumption of fruit and vegetables, and engagement in physical activity.

Previous research highlighted the impact of negative behavior practices on cardiovascular health in adult populations. The overarching research question developed for this study intended to explore the extent to which obesity and high blood pressure existed among African American high school children in a rural Mississippi school district in a culture of optimistic bias (perceived invulnerability).

This study was designed as a correlation study to examine the relationship between students' risk behavior practices and their BMI levels and blood pressure levels for the purpose of classifying students into BMI and blood pressure groups based on their practices. The ability to determine the possible association between selected behavior practices and health status was regarded to be an important step in the struggle against health disparity and for the prevention of

premature morbidity and mortality. This study surveyed 433 African American high school students from a rural Mississippi high school. The surveys were completed over a 2 day period.

Summary of Study Sample

Participants in the study were African Americans between the ages of 14 and 19 years old enrolled in Grades 9-12. A little more than half of the students were male (51.5%) and 48.5% were female.

The mean systolic blood pressure level of the students was 130 mm Hg which is above the current recommended systolic level for normal blood pressure of 120 mm Hg or less. Approximately 36.0% of the students were in the pre hypertension stage, and almost a third (31.2%) had systolic blood pressure levels that classified them as hypertensive. While there was a slight higher percentage of male students in the hypertension category (32.7% for males compared to 29.5% for females), there was not much difference in the percentage of male and female students in the pre hypertension category (35.4% males compared to 36.7% for females).

The recommended guideline for systolic blood pressure is less than 80 mm Hg. The mean diastolic blood pressure level for these students was 73 mm Hg which is well within the current recommended diastolic level for normal blood pressure. Based on the diastolic blood pressure alone, 19.4% of the students were in the pre hypertension stage, while approximately 3.0% were classified as hypertensive. Based on diastolic blood pressure measurements, a slightly larger percentage of male students were in the hypertension category (3.1% compared to 2.9% for the female students). There was some difference in the percentage of male and female students in the pre hypertension category (21.5% of the males and 17.1% of the females).

The mean BMI level was 27 which is above the current recommended BMI level for normal BMI of 25. Approximately 27% of the students were classified as being obese, while 12.7% of them were in the overweight category. There was a larger percentage of male students

in the obese category (29.1% of males compared to 24.8% of females), and a larger percentage of female students in the overweight category (15.2% of females compared to 10.3% of males). In addition, more than half of the students who participated indicated that they had knowledge of a family member with cardiovascular health problems.

Summary of Findings

This section provides a summary of the findings in relation to the research question. The mean systolic blood pressure measurement was 130.17 mmHg, which is above the recommended level for adults of 120mmHg.The mean diastolic level was 73.53mmHg, well within the normal range of under 80mmHg. The mean BMI level was 27.37, which is higher than the recommended level and places the average BMI for the participants as a group in the overweight category. A higher percent of the female students (15.2%) were overweight compared to the male students (10.3%). A higher percent of the male students (29.1%) were obese compared to the female students (10.3%). Overall, 12.7% of the students were classified as overweight and 27% were classified as obese.

A higher percent of the male students (21.5%) were pre hypertensive compared to the female students (17.1%). There was not much difference between the hypertensive male students (3.1%) and the hypertensive female students (2.9%). Overall, 19.4% were pre hypertensive, and 3.0% were hypertensive.

A higher percent of the students who did not see themselves as likely to develop cardiovascular disease (14.5%) were overweight compared to students who saw themselves as likely to develop cardiovascular disease (11.6%). The overall average for all overweight students was 12.7%. A higher percent of the students who did not see themselves as likely to develop cardiovascular disease (33.7%) were obese compared to students who saw themselves as likely to develop cardiovascular disease (24.7%). The overall average for all obese students was 27.0%.

To address research question 1, statistical analyses consisted of cross tabulations between categorical variables and the risk factors. In addition, canonical correlation was examined through the discriminant analysis process to further inspect the relationship between the risk factors and obesity and blood pressure status of the students. To address research question two, statistical analyses consisted of cross-tabulations between categorical variables and optimistic bias.

Research Question 1: How do health risk behaviors relate to the development of obesity and high blood pressure among adolescents?

Hypotheses Related to Predictors of Blood Pressure Level

$H1_0$: There will be no association between tobacco use and alcohol consumption and adolescent blood pressure levels.

There was little difference reported in the mean amount of alcoholic beverages consumed and tobacco used of blood pressure groups. The analysis revealed no significant difference in the consumption of alcoholic beverages and the use of tobacco based on blood pressure levels. Wilks' lambda was used to test the significance of canonical correlation between blood pressure levels and tobacco use and consumption of alcoholic beverages. There was no significant relationship with the consumption of alcoholic beverages and the use of tobacco ($p > .05$).

$H2_0$: There will be no association between consumption of fruits and vegetables and adolescent blood pressure levels.

There was little difference reported in the mean amount of fruits and vegetables eaten. The analysis revealed no significant difference in the consumption of fruit and vegetable based on blood pressure levels. Wilks's lambda was used to test the significance of canonical correlation between blood pressure levels and eating fruits and vegetables. There was no significant relationship with eating fruits and vegetables ($p > .05$).

$H3_0$: There will be no association between physical inactivity and adolescent blood pressure levels.

There was little difference reported in the mean amount of physical activity. The analysis revealed no significant difference in the amount of physical activity, even though, in general, hypertensive and pre-hypertensive students reported less physical activity. Wilks's lambda was used to test the significance of canonical correlation between blood pressure levels and physical activity. There was no significant relationship with physical activity ($p > .05$).

$H4_0$: There will be no association between tobacco use and alcohol consumption and adolescent BMI.

There was little difference reported in the mean amount of tobacco use and alcohol consumption. The analysis revealed no significant difference in the amount of amount of tobacco use and alcohol consumption, even though, in general, overweight and obese students reported more tobacco use and alcohol consumption. Wilks's lambda was used to test the significance of canonical correlation between BMI levels and tobacco use and consumption of alcoholic beverages. There was no significant relationship with the consumption of alcoholic beverages and the use of tobacco ($p > .05$).

$H5_0$: There will be no association between consumption of fruits and vegetables and adolescent BMI.

There was little difference reported in the mean consumption of fruits and vegetables. The analysis revealed no significant difference in the consumption of fruits and vegetables. Wilks's lambda was used to test the significance of canonical correlation between BMI levels and eating fruits and vegetables. There was no significant relationship with eating fruits and vegetables ($p > .05$).

$H6_0$: There will be no association between physical inactivity and adolescent BMI.

There was little difference reported in the mean amount of physical activity. The analysis revealed no significant difference in the amount of amount of physical activity, even though, in general, overweight and obese students reported less physical activity. Wilks's lambda was used to test the significance of canonical correlation between BMI levels and physical activity. Among the obesity categories, only those students who were moderately physically active in the past 7 days for at least 30 minutes were significantly different compared to the other groups ($p<.05$). All of the other predictor variables did not show significant group differences. The null hypothesis was rejected.

Hypotheses Related to Optimistic Bias

$H7_0$: There will be no association between adolescent blood pressure levels and optimistic bias.

Although not statistically significant, approximately 40.5% of the students who were pre hypertensive believed that it was possible to develop heart disease compared to 59.5% who were pre-hypertensive, but did not believe that it was possible to develop heart disease. In addition, 23.1% of the students who were hypertensive believed that it was possible to develop heart disease compared to 76.5% who were hypertensive, but did not believe that it was possible to develop heart disease.

$H8_0$: There will be no association between adolescent obesity and optimistic bias.

Although not statistically significant, approximately 43.6% of the students who were overweight believed that it was possible to develop heart disease compared to 56.4% who were overweight, but did not believe that it was possible to develop heart disease. In addition, 43.6% of the students who were obese believed that it was possible to develop heart disease compared to 56.4% who were obese, but did not believe that it was possible to develop heart disease.

$H9_0$: There will be no association between adolescent obesity and optimistic bias when controlling by gender.

Although not statistically significant, approximately 61.7% of the students did not think that it was possible for them to develop heart disease, while 38.3% of them believed that it was possible for them to develop heart disease. About 22.8% of the male students and about 18.4.0% of the female students who thought it is possible for them to develop heart disease were classified as pre-hypertensive, while 2.5% of those male students and 1.1% of the female students were hypertensive. On the other hand, 20.8% of the male students and 16.3% of the female students who did not think it is possible for them to develop heart disease were classified as pre-hypertensive, while 3.5% of those male students and 14.1% of the female students were hypertensive.

More importantly, canonical analyses estimated that approximately 34.6% of the students were predicted to be obese and 24.7% were predicted to be overweight. The analyses also revealed that 33.7% of the students were predicted to be pre-hypertensive, and 28.2% of the students were predicted to be hypertensive. These were clinically significant predictions that merit public health intervention in this minority adolescent population.

As the literature review section of this study demonstrated, behavior risk factors were presented as contributing to the development of premature morbidity and mortality. Results from this study demonstrated that this statement could also apply to the health status of high school children in an environment of optimistic bias. Optimistic bias represents an underestimation of the chances of experiencing a negative health outcome, causing them to disregard prevention activities. The literature reflects that cardiovascular disease processes begin very early in life and progress as children become adults (AHA, 2006; Hayman et al., 2007; Williams et al., 2002). However, the majority of students in this study perceived their health status to be good and their chances of developing cardiovascular disease to be minimal. In one previous study, 85-90% of the participants perceived that their situation was more favorable than their peers (Armor &

Taylor, 2002). Klein and Helweg-Larsen (2002) conducted a study to use the concept of optimistic bias to measure generalized risk. This measure asked participants to rate their health compared to others their same age (*excellent, very good, good, fair*, or *poor*). An examination of optimistic bias revealed that a higher level of risk behaviors correlated with a higher level of optimistic bias.

The optimistic appraisal of the students' health status noted in this study should raise concerns for public health officials and school personnel in view of the degree of risk behaviors that is evident in the school. Previous research has reported significant associations between some of the preventable behavior risk factors and the presence of CVD symptoms (Li et al., 2003; McGill et al., 2001). Many researchers have reported on the effect of obesity on the development of for many chronic conditions, such as cardiovascular diseases (Dietz, 2004; Lobstein, Baur, & Uauy, 2004; Portman et al., 2005; Sorof et al., 2004). That is one reason why many public health and medical researchers have shifted their energies on examining the prevalence of childhood obesity and have elevated it to be one of the most pressing public health concerns. More public health officials have become aware of the immediate and long term health consequences associated with this health condition (Fulton et al., 2001). The high degree of obesity can be viewed as a potential risk factor for the development of future cardiovascular disease.

The number of students with high blood pressure is also cause for concern, especially since other researchers have lamented the fact that modest increases in blood pressure levels in children can result in the development of hypertension in adulthood and have a negative impact on the vascular structure and function (Chiolero, Bovet, Paradis, & Paccaud, 2007; Ingelfinger, 2004; Muntler et al., 2004). Some studies have also demonstrated that there is an association between blood pressure and body mass index (Stabouli, Kotsis, Papamichael, Constantopoulos, & Zakopoulos, 2005), and that obesity is a strong risk factor for developing hypertension in

childhood (Muntner, He, Cutler, Wildman, & Whelton, 2004). The obesity epidemic is evident in this school and should be of great concern because childhood obesity has been linked to the incidence of chronic disease in adulthood, such as cardiovascular diseases, including hypertension, (Daniels et al., 2005: Din-Dzietham et al., 2007; Lorch & Sharkey, 2007).

As is seen from the results of this study, many of these high school students have already developed risk factors that increase their chances of developing hypertension and other types of CVD (Thom, Haase, & Rosamund, 2006). It is highly possible that these children who have demonstrated higher than normal blood pressure levels are likely to experience blood pressure issues as adults (Rodolfo et al., 2007).

Recommendations for Action

As a result of this study, a number of recommendations can be made to address the issue of health disparities in Mississippi and to enable young African-Americans to design a good quality of life for themselves. A good understanding of the implications of poor choices and negative behavior practices could impact the quality of life for many in addition to reducing the degree of disease development. The results from this study can be used to educate students through improved health and physical education classes whose curriculum can adapt additional activities designed to foster positive behavior practices among the student body. The following is recommended:

1. An effective intervention strategy to reduce BMI would be the initiation of opportunities for students to engage in long-term participation in intense physical activity. It is quite clear that an active lifestyle would increase life expectancy and decrease the risk of developing cardiovascular disease. Developing this practice of regular physical activity in the schools could have a positive impact cardiovascular health as they grow into adulthood.

2. Schools can provide adequate health instruction that would demonstrate to students how lifestyle changes can benefit them by helping to lower blood pressure.

3. The school curriculum is recommended as the ideal opportunity to introduce to children the concept of changing dietary practices to help lower blood pressure. With increasing influences from fast food establishments, the internet, and celebrity endorsements, it is becoming increasingly difficult to persuade children to modify their diets and to become more physically active.

Recommendations for Further Research

The results of this study have helped to initiate further discussion that could only be resolved through the initiation of additional research studies. The recommendations listed below were derived from issues discussed in the current literature, outcomes of this study, and the researcher's experience.

1. Researchers should conduct similar longitudinal studies to explore how the students' behaviors and practices evolve over time and how their health status evolves as they adopt new lifestyle changes.

2. A case study could be initiated to investigate targeted individuals to understand their lifestyle, their choices, their challenges, and their successes.

3. Future research should focus on how schools in Mississippi have adopted new regulations and curricula to address the health disparities and the students' own risk behavior practices. Conducting these kinds of studies will provide an understanding of the factors that could assist in improving the quality of life for Mississippi's children and reduce the burden on the health care system regarding treatment for obesity related and blood pressure illnesses.

Implications for Social Change

The findings from this research have implications for using the educational machinery to effect social change. Sound educational strategies to develop professionals with the capacity to use their training to improve public health and promote positive social change at the individual, local and system level. Change in behavior and health quality will not effectively occur if promoted only as an individual responsibility rather than as a responsibility of an entire system of operations. Conforming to these ideals is a responsibility of the system, in addition to the individual responsibility involved. Lifestyle changes for many young people are recommended because hypertension in preadolescents is believed to be indicative of some underlying disorder. The reduction of risk practices is even more critical since the presence of obesity increases the occurrence of hypertension threefold. Everyone can play a role in ensuring that the negative health risk behaviors of the present day students can become a feature of the past.

Researcher's Reflection

Success in conducting this study hinged on my ability to apply educational and professional experiences in the field of research and health promotion and health education. The experiences mentioned relate to many years devoted to the development of prevention and intervention strategies that could improve the health status of young people, and, above all, provide them with the opportunities needed to develop sound decision-making skills. Students have been encouraged, through this work, to learn how to make better and more positive choices, and how to accept responsibility for designing the quality of their lives. That is one of the main reasons this topic was selected as a dissertation topic. The intent was to gather additional information that can be applied to improving health-related instruction that helps students to take charge of their lives and accept the responsibility for the future of their physical health. A very important feature of this endeavor was the fact that the school district that was the focus of this

study was very supportive throughout the process and provided all the assistance necessary to ensure that this work came to a successful conclusion.

Conclusion

This study sought to investigate whether several risk factors can be used to predict whether students can be classified as underweight, normal weight, overweight, or obese, or normal blood pressure, pre-hypertensive, or hypertensive. While individual risk factors were seen to have positive correlations with BMI and blood pressure levels, those variables, when examined as a group, did not reveal a significant relationship with BMI and blood pressure. This research was influenced by some models and theories that reflect effective interventions that could be applied to improve the quality of life by reducing some of these risk factors. This study reflected the underpinnings of two models: (a) the health belief model, a framework for motivating people to take positive health actions that uses the desire to avoid a negative health consequence as the prime motivation, and (b) optimistic bias, sometimes referred to as a person's unrealistic optimism**,** or in young people, their illusion of invulnerability. It is imperative that schools implement remedial education programs that are designed to modify negative practices because it has been demonstrated that, by the time many young people go through their teenage years, they would have already developed risk factors that would place them at risk of developing hypertension and other chronic diseases (NHBPEP, 2004;Thom, Haase, & Rosamund, 2006). It has been reported that children who develop high blood pressure can expect to experience hypertension problems in their adult years (Rodolfo et al., 2007). This study provides justification of the need for activities that will improve communication between teachers, administrators, youth and parents, as well as community members regarding the need to participate in a wellness campaign.

The end result of such a wellness program should be meaningful changes in physical activity and dietary patterns and differences in overall tobacco, alcohol and other drug use, obesity levels and hypertension readings, all of which are contributors to the premature development of chronic disease. It is no secret that the prevalence of these risk factors has helped to rate the State of Mississippi at the top for cardiovascular disease prevalence, particularly among African-Americans, as well as being at the top in the prevalence of obesity. The cornerstone of cardiovascular health prevention and risk reduction in children and adolescents is a combination of lifestyle change and the adaptation of healthy behaviors that can become a major component of the education system curriculum. This is an important first step in the fight to reduce health disparities and health risks that plague many communities around America, and the State of Mississippi (Luma & Sppiotta, 2006). As adult obesity and childhood obesity continue to escalate in Mississippi, education and awareness of the effects of the risk factors are important strategies that would motivate changes in behavior (Sorof et al., 2004).

Early detection and intervention should be the prescribed strategy to reduce the development of chronic diseases and their complications (Sorof, Alexandrov, Cardwell, & Portman, 2003), and the schools are the ideal location to initiate the health revival plan. The two main lifestyle changes that should be recommended to young people are regular exercise (Mitchell et al., 2002) and changes in dietary practices (Sacks et al., 2001). In Mississippi, as well as in other areas around the United States, childhood obesity is closely aligned with socio-economic status and race/ethnicity. The influx of fast food restaurants and the influence of advertisers have contributed significantly to the dietary orientation of many young people today (Krebs et al., 2007). Schools and community health programs should continue to emphasize primary prevention programs to address the modifiable health risk factors and behaviors that have become a fundamental part of the children's lives. References

References

Agirbasli, M., Tanrikulu, B., Arikan, S., Izci, E., Ozguven, S., & Besimoglu, B. (2008). Trends in body mass index, blood pressure and parental smoking habits in middle socio-economic level Turkish adolescents. *Journal of Human Hypertension*, *22*(1), 12-17. doi:10.1038/sj.jhh.1002262

Albert, C. M., Mittleman, M. A., Chae, C. U., Lee, I. M., Hennekens, C. H., & Manson, J. E. (2000). Triggering of sudden death from cardiac causes by vigorous exertion. *New England Journal of Medicine*, *343*, 1355-1361.

American Academy of Pediatrics, Committee on Nutrition. (2001).The use and misuse of fruit juice in pediatrics. *Pediatrics*, *107*(5),1210-1213. doi: 10.1542/peds.107.5.1210 2001

American Heart Association. (2006). *Heart disease and stroke statistics 2006 Update*. Dallas, Texas: American Heart Association.

Angelopoulos, P. D., Milionis, H. J., Grammatikaki, E., Moschonis, G., & Manios, Y. (2009). Changes in BMI and blood pressure after a school based intervention: The CHILDREN study. *The European Journal of Public Health*, *19*(3), 319 – 325. doi: 10.1093/eurpub/ckp004

Armor, D. A., & Taylor, S. E. (2002) *When predictions fail: The dilemma of unrealistic optimism* in Thomas Gilovich, Dale Griffin, and Daniel Kahneman (Eds.) Heuristics and Biases: The Psychology of Intuitive Judgment. Cambridge University Press, Cambridge, MA.

Arnett, J. J. (2000). Optimistic bias in adolescent and adult smokers and nonsmokers. *Addictive Behaviors*, *25*(4), 625–632.

Bandura, A. (1986). *Social foundations of thought and action: Social cognitive theory*. Englewood Place, NJ: Prentice-Hall.

Barker, D. J. P., & Bagby, S. (2005). Developmental antecedents of cardiovascular disease: A historical perspective. *Journal of American Society of Nephrology*, *16,* 2537-2544. doi: 10.1681/ASN.2005020160

Baranowski, T. (2006). Crisis and chaos in behavioral nutrition and physical activity. *International Journal of Behavioral Nutrition and Physical Activity*, *14*(3), 27. doi:10.1186/1479-5868-3-27

Baranowski, T., Cullen, K.W., Nicklas, T., Thompson, D., & Baranowski, J. (2003). Are current health behavioral change models helpful in guiding prevention of weight gain efforts? *Obesity Research*, 1*1Suppl*, 23S-43S. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/14569036

Baranowski, T., Lin, L., Wetter, D.W., Resnicow, K., & Davis, M. (1997). Theory as mediating variables: Why aren't community interventions working as desired? *Annals of Epidemiology*, *7(*S7), 89-95.

Becker, M.H. (1974). The health belief model and personal health behavior. *Health Education Monographs*, *2*(4), 324-473.

Berenson, G. S., Srinivasan, S. R., Bao, W., Newman, W.P., Tracy, R.E., & Wattigney, W.A. (1998). Association between multiple cardiovascular risk factors and atherosclerosis in children and young adults: The Bogalusa Heart Study. *New England Journal of Medicine*, *338*,1650-6.

Berenson, G. S., Wattigney, W. A., & Webber, L.S. (1996). Epidemiology of hypertension from childhood to young adulthood in black, white, and Hispanic population samples. *Public Health Reports*, *111*(suppl 2), 3-6.

Block, J.P., Scribner, R.A., & DeSalvo, K.B. (2004). Fast food, race/ethnicity, and income: A geographic analysis. *American Journal of Preventive Medicine*, *27*(3), 211-217.

Bowie, J.V., Juon, H., Cho, J., & Rodriguez, E.M. (Jan. 2007). Factors associated with overweight and obesity among Mexican Americans and Central Americans: results from the 2001 California Health Interview Survey. *Preventing Chronic Disease*, *4(*1), 1-17.

Campaign for Tobacco Free Kids. (2009). *Deadly in pink: new report warns big tobacco has stepped up targeting of women and girls*. Washington, DC: Campaign for Tobacco Free Kids.Retrieved from http://www.newsroom.heart.org/index.php?s=43&item=678

Campbell, K., & Crawford, D. (2001). Family food environments as determinants of preschool-aged children's eating behaviors: implications for obesity prevention policy: A review. *Australian Journal of Nutrition and Dietetics*, *58,* 174-180. Retrieved from http://www.ajnd.org.au/archive/Vol58No1/abstracts.html

Centers for Disease Control and Prevention. (2003). Tobacco, alcohol, and other drug use among high school students in Bureau of Indian Affairs--funded schools -- United States, 2001. *Morbidity Mortality Weekly Report Surveillance Summary*, *52*(44), 1070-1072.

Centers for Disease Control (CDC). (2005). Methodology of the Youth Risk Behavior Surveillance System. *Morbidity Mortality Weekly Report*, *53*(RR12), 1-3.

Centers for Disease Control (CDC). (2004). Surveillance Summary. *Morbidity Mortality Weekly Report*, *53*, 1-96.

Centers for Disease Control and Prevention. (2005).Youth risk behavior surveillance: United States. *Morbidity Mortality Weekly Report*, *55*, 1-108.

Centers for Disease Control. (2006). Cigarette use among high school students: United States, 1991-2005. *Morbidity Mortality Weekly Report*, *53*, 724-726.

Chiolero, A., Bovet, P., Paradis, G., & Paccaud, F. (2007). Has blood pressure increased in children in response to the obesity epidemic? *Pediatrics*, *119*(3), 544-553.

Chobanian, A. V., Bakris, G. L.. & Black, H. R. (2003). The seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure the JNC 7 report. *Journal of American Medical Association*, *289*, 2560-2572.

Church, T. S., Kampert, J. B., Gibbons, L. W., Barlow, C. E., & Blair, S. N. (2001). Usefulness of cardiorespiratory fitness as a predictor of all-cause and cardiovascular disease mortality in men with systemic hypertension. *American Journal of Cardiology, 88*, 651-656.

Collard, D. C. M, Chinapaw, M. J. M, Verhagen, E. A. L, Bakker, I., & van Mechelen, W. (2010). Effectiveness of a school-based physical activity-related injury prevention program on risk behavior and neuromotor fitness a cluster randomized controlled trial. *Archives of Child and Adolescents Medicine*, *164*(2), 145-50. doi:10.1186/1479-5868-7-9

Couch, S. C., & Daniels, S.R. (2005). Diet and blood pressure in children. *Current Opinion in Pediatrics*, *17*, 642–647. Retrieved from www.ncbi.nlm.nih.gov/pubmed/16160541

Creswell, J. W. (2005). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Pearson/Merrill/Prentice-Hall.

da Costa, R. I., Augusto, A. C., Taddei, J., & Colugnatt, F. (2003). Obesity among children attending elementary public schools in Sao Paulo, Brazil: a case-control study. *Public Health Nutrition*, *6*(7), 659-63.

Daniels, S. R., & Loggie, J. M. H. (2009). Hypertension in children and adolescents. Part I: Exercising nonpharmacologic control. *Eric Education Resources Information Center*. Retrieved from www.eric.ed.gov/ERICWebPortal/recordDetail?accno=EJ443773

Daviglus, M. L., Stamler, J., Pirzada, A., Yan, L.L., Garside, D.B., Liu, K., Wang, R., Dyer, A.R., Lloyd-Jones, D.M., & Greenland, P. (2004). Favorable cardiovascular risk profile in

young women and long-term risk of cardiovascular and all-cause mortality. *Journal of American Medical Association*, *292*, 1588–1592.

Daniels, S. R., Arnett, D. K., Eckel, R. H., Gidding, S. S., Hayman, L. L., Kumanyika, S., Robinson, T. N., Scott, B. J., St Jeor, S., & Williams, C. L. (2005). Overweight in children and adolescents: pathophysiology, consequences, prevention, and treatment. *Circulation*, *111*(15), 1999-2012.

Datar, A.& Sturm, R. (2004). Physical education in elementary school and body mass index: evidence from the early childhood longitudinal study. *American Journal Public Health*, *94*,1501 –1506.

Denoon, D. J. (2006). Mississippi tops state obesity ranking. WebMD Health News. Journal of Pediatrics, 141,770-9.

Dekkers, J C., Snieder, H., Van Den Oord, E. J., Treiber, F. A. (2002). Moderators of blood pressure development from childhood to adulthood: a 10-year longitudinal study. *Journal of Pediatrics*, *141*,770-9.

Dietz , W. H. (2004). Overweight in childhood and adolescence. *New England Journal Medicine*, *350*, 855–857.

Din-Dzietham, R., Liu, Y., Bielo, M.V., & Shamsa, F. (2007). High blood pressure trends in children and adolescents in national surveys 1963-2002. *Circulation, 116*:1488-1496.

Djoussé, L. & Gaziano, J. (2007). Alcohol consumption and heart failure in hypertensive us male physicians. *The American Journal of Cardiology*, *102*(5), 593-597.

Dolan, L. Goodman, E., Daniels, S. R., Morrison, J. A., Huang, B., & M. (2004). Contrasting prevalence of and demographic disparities in the World Health Organization and National Cholesterol Education Program Adult Treatment Panel III definitions of metabolic syndrome among adolescents. *Journal of Pediatrics, 145*, 445-51.

Dunlap, W. P., Brody, C. J., & Greer, T. (2000). Canonical correlation and chi-square: Relationships and interpretation. *The Journal of General Psychology*, *127*(4), 341-353.

Egan, T. (2006). Boredom in the west fuels binge drinking. *New York Times*. September 2, 2006.

Eisenmann, J. C., Welk, G. J., Ihmels, M., & Dollman, J. (2007). Fatness, fitness, and cardiovascular disease risk factors in children and adolescents. *Medical Science Sports Exercise, 39(8*), 1251-1256.

Ekelund, U., Brage, S., Froberg, K., Harro, M., Anderssen, S.A., Sardinha, L.B., Riddoch, C., & Andersen, L. B. (2006). TV viewing and physical activity are independently associated with metabolic risk in children: the European Youth Heart Study. *PLoS Medicine 3*(12), e481. doi:10.1371/journal.pmed.0030481

Ewart, C. K., Young, D. R. & Hagberg, J. M. (1998). Effects of school-based aerobic exercise on blood pressure in adolescent girls at risk for hypertension. *American Journal of Public Health*, *88*, 949-951.

Eyre, H., Kahn, R., & Robertson, R. M. (2004). Preventing cancer, cardiovascular disease, and diabetes. *Diabetes Care 27,* 1812-1824.

Falkner, B., & Sadowski, R. H. (1995).Hypertension in children and adolescents. *American Journal of Hypertension, 8*, 106-110.

Festinger, L. (1954). A theory of social comparison processes. Human Relations, Vol. 7, No. 2, 117-140. Retrieved from http://hum.sagepub.com/content/7/2/117.extract

Fitzgibbon, M.L., Strolley, M.R. (2004). Environmental changes may be needed for the prevention of overweight in minority children. *Pediatric Annals*, *33*(1), 45-49.

Flynn, J.T. (2005). Hypertension in adolescents. *Adolescent Medical Clinic*, *16*, 11-29. Retrieved from

www.uspharmacist.com/content/t/cardiovascular/c/10378

Forster-Scott, L. (Oct. 2007). Combating obesity in K-12 learners: Sociological factors affecting childhood obesity. *Journal of Physical Education, Recreation and Dance*, *78* (8), 29-47.

French, S. A., Story, M., & Jeffery, R.W. (2001). Environmental influences on eating and physical activity. *Annual Reviews in Public Health*, *22,* 309–335.

Fulton, .J. E., McGuire, M.T., Caspersen, C. J.,& Dietz, W.H.(2001).Interventions for weight loss and weight gain prevention among youth: current issues. *Sports Medicine, 31*(3),153-65.

Gable, S., Chang, Y., & Krull, J. L. (2007). Television watching and frequency of family meals are predictive of overweight onset and persistence in a national sample of school-aged children. *Journal of American Dietetic Association, 107(*1), 53-61.

Gerrard, M., Gibbons, F. X., Benthin, A. C., & Hessling, R. M. (1996). A longitudinal study of the reciprocal nature of risk behaviors and cognitions in adolescents: What you do shapes what you think, and vice versa. *Health Psychology, 15*, 344–354.

Gidding, S. S., Dennison, B. A., Birch, L. L., Daniels, S. R., Gilman, M. W., Lichtenstein, A. H., Rattay, K. T., Steinberger, J., Stettler, N., & Van Horn, L. (2005). Dietary recommendations for children and adolescents: A guide for practitioners: consensus statement from the American Heart Association. *Circulation,* 112, 2061-2075.

Gidding, S. S., Barton, B. A. Dorgan, J. A. Kimm, S.Y.S, Kwiterovich, P. O., Lasser, N. L., Robson, A. M., Stevens, V. J., Van Horn, L. P., & Simons-Morton, D. G. (2006). Higher Self-reported Physical Activity Is Associated With Lower Systolic Blood Pressure: The Dietary Intervention Study in Childhood (DISC). *Pediatrics, 118*(6), 2388-2393.

Glanz, K., Rimer, B. K., & Lewis, F. M. (2002). *Health behavior and health education: Theory, research and practice*. San Francisco, CA: Jossey-Bass.

Gosliner, W & Madsen, K. A. (2007). Marketing foods and beverages: why licensed commercial characters should not be used to sell healthy products to children. *Pediatrics, 119*(6), 1255-6.

Graf, C. (2006). *Childhood obesity CVD- Step two helps overweight children*. Vienna, Austria: European Society of Cardiology. Retrieved from http://www.escardio.org/about/press/press-releases/congress-06/Pages/chidhood-obesity-step-two.aspx

Hanevold, C., Waller, J., Daniels, S., Portman, R. & Sorof, J. (2004). The effects of obesity, gender, and ethnic group on left ventricular hypertrophy and geometry in hypertensive children: a collaborative study of the International Pediatric Hypertension Association. *Pediatrics,* 113, 328-333.

Harper, M.G. (2006). Childhood obesity: Strategies for prevention. *Family Community Health, 29*(4), 288-298.

Harrell, J.S., McMurray, R. G., Gansky, S. A., Bangdiwala, S. I. & Bradley, C. B. (1999). A public health vs a risk-based intervention to improve cardiovascular health in elementary school children: the Cardiovascular Health in Children Study. *American Journal of Public Health, 89*(10), 1529-1535.

Harris, K. C., Kuramoto, L. K., Schulzer, & Retallack, J. E. (2009). Effect of school-based physical activity interventions on body mass index in children: a meta-analysis. *Canadian Medical Association Journal, 180* (7).

Hayman, L. I., Merringer, J. C., Daniels, S. R., McCrindle, B. W., Ross, J., Steinberger, J., & Williams, C. L. (2007). Primary prevention of cardiovascular disease in nursing practice: Focus on children and youth. *Circulation, 116*, 344-357.

Hayman, L. L., Meininger, J. C., Daniels, S. R., McCrindle, B. W., Helden, L., Ross, J., Dennison, B. A., Steinberger, J. & Williams, C. L. (2007). Primary prevention of cardiovascular disease in nursing practice: focus on children and youth. *Circulation,* 116, 344-357.

Henderson, V. R. (2007). Longitudinal associations between television viewing and body mass index among white and black girls. *Journal of Adolescent Health, 4*1(6):523-524.

Heras, P., Kritikos, K., Hatzopoulos, A., Kritikos, N. & Mitsibounas, D. (2008). Smoking among high school students. *American Journal of Drug and Alcohol Abuse, 34*(2), 219-224.

Hu, G., Barengo, N. C., Tuomilehto, J., Lakka, T. A., Nissinen, A., & Jousilahti, P. (2004). Relationship of physical activity and body mass index to the risk of hypertension: a prospective study in Finland. *Hypertension, 43*, 25-30.

Ingelfinger, J. R. (2004). Pediatric antecedents of adult cardiovascular disease: Awareness and intervention. *New England. Journal of Medicine, 350*, 2123-2126.

Institute of Medicine (Sep. 2005). Preventing childhood obesity: Health in the balance. Retrieved from http://www.iom.edu.

Israeli, E., Schochat, T., Korzets, Z., Tekes-Manova D., Bernheim, J. & Golan, E. (2006). Prehypertension and obesity in adolescents: A population study. *American Journal of Hypertension, 19*, 708–712.

Kaplan, N. M., Gidding, S. S., Pickering, T. G., & Wright, J. T. (2005). 36th Bethesda conference: Task forces. Task Force 5: Systemic hypertension. *Journal of American College of Cardiology*, *45*,1346-1348.

Kavey, R., Daniel, S., Lauer, R., Atkins, D., Hayman, L., & Taubert, K. (2003). American Heart Association. American Heart Association guidelines for primary prevention of

atherosclerotic cardiovascular disease beginning in childhood. *Circulation, 107*, 1562–1566.

Kimm, S. Y. S., Glynn, N. W., Kriska, A. M., Barton, B. A., Kronsberg, S. S., Daniels, S.R., Crawford, P. B., Sabry, Z. I. & Liu, K. (2002). Decline in physical activity in black girls and white girls during adolescence.*New England Journal of Medicine, 347(10)*, 709-715.

Kipping, R.R., Jago, R. & Lawlor, D.A. (2008). Obesity in children. Part 1: Epidemiology, measurement, risk factors, and screening. *British Medical Journal, 337*, 824.

Knowler, W.C., Barrett-Connor, E. & Fowler, S.E. (2002). Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *New England Journal of Medicine, 346*, 393-403.

Krebs, N. F., Himes, J. H., Jacobson, D., Nicklas, T. A., Guilday, P., & Styne, D. (2007). Assessment of Child and Adolescent Overweight and Obesity. *Pediatrics, 120*, S193-S228.

Kruger, J., M., Blanck, H. M., & Gillespie, C. (2008). Dietary practices, dining out behavior, and physical activity correlates of weight loss maintenance. *Preventing Chronic Diseases*, 5(1), A11. www.cdc.gov/pcd/issues/2008/jan/06_0158.htm?s_cid=pcd51a11_

Klein, C. T. F., & Helweg-Larsen, M. (2002). Perceived control and the optimistic bias: A meta analytic review. *Psychology and Health, 17*, 437-446.

Kumanyika S, Grier S. (2006).Targeting interventions for ethnic minority and low-income populations. *Future of Children*, 16(1):187-207. Retrieved from www.ncbi.nlm.nih.gov/pubmed

Kwiterovich, P. O. Jr. (2008). Recognition and management of dyslipidemia in children and adolescents. *The Journal of Clinical Endocrinology & Metabolism, 93*(11), 4200-4209.

Lauer, R. M., Clarke, W. R. (1989). Childhood risk factors for high adult blood pressure: the Muscatine Study. *Pediatrics, 84*, 633-41.

Li, S., Chen, W., Srinivasan, S. R., Bond, M. G., Tang, R., Urbin, E. M., & Berenson, G. (2003). Childhood cardiovascular risk factors and carotid vascular changes in adulthood: the Bogalusa Heart Study. *Journal of American Medical Association, 290*, 2271-2278.

Lobstein T, Baur L, Uauy R. (2004). Obesity in children and young people: a crisis in public health. *Obesity Review, 5*(Suppl 1), 4-104.

Lorch, S. M., & Sharkey, A. (2007). Myocardial velocity, strain, and strain rate abnormalities in healthy obese children. *Journal of Cardiometabolic Syndrome, 2*(1), 30-34.

Luma, G. B. & Spiotta, R. T. (2006). Hypertension in children and adolescents. *American Family Physician, 73*, 1158-68.

Lurbe, E., Redon, J., Kesani, A., Pascual, J.M., Tacons, J., Alvarez, V. & Batlle, D. (2002). Increase in nocturnal blood pressure and progression to microalbuminuria type 1 diabetes. *New England Journal of Medicine, 347*, 797–805.

Lurbe, E., Sorof, J.M. & Daniels, S.R. (2004). Clinical and research aspects of ambulatory blood pressure monitoring in children. *Journal of Pediatrics, 144*, 7–16.

Malmberg, M., Overbeek, G., Kleinjan, M., Vermulst, A., Monshouwer, K., Vollebergh, W. A. Engels, R. C. (2010). Effectiveness of the universal prevention program "Healthy School and Drugs": Study protocol of a randomized clustered trial. *British Medical College of Public Health, 10*, 541. doi:10.1186/1471-2458-10-541McGarvey, E., Keller, A., Forrester, M., Williams, E., Seward, D., & Suttle, D.E. (2004). Feasibility and benefits of a parent-focused preschool child obesity intervention. *Journal of Public Health, 94*, 1490-1495.

McGill, H. C. Jr., McMahan, C. A., Zieske, A. W., Malcolm, G. T., Tracy, R. E., & Strong, J. P. (2001). Effects of non-lipid risk factors on atherosclerosis in youth with a favorable lipoprotein profile. *Circulation, 105*, 1546-1550.

McManus, T., Chyen, D., Shanklin, S., Lim, C., Grunbaum, J. A., & Weschler, H. (2006). Childhood obesity: public-health crisis, common sense cure. *Lancet, 360,* 473-482.

McNaughton, S. A., Ball, K., Mishra, G. D. & Crawford, D. A. (2008). Dietary patterns of adolescents and risk of obesity and hypertension. *Journal of Nutrition, 138*, 364-370.

Miller, S.A., Taveras, E.M., Rifas-Shiman, S.L.& Gillman, M.W. (2008). Association between television viewing and poor diet quality in young children. *International Journal of Pediatric Obesity, 3*(3), 168-76.

Miller, P. M., Raymond, F., AntonBrent, M., Egan, J. B. & Nguyen, S. A. (2007). Excessive alcohol consumption and hypertension: clinical implications of current research. *The Journal of Clinical Hypertension*, *7*(6), 346-351.

Mississippi State Department of Health. (2007). Chronic disease fact sheet. Retrieved from http://www.msdh.state.ms.us/msdsite/_statistic/43.1160.91.214.html.

Mitchell, B. M., Gutin, B., Kapuku, G., Barbeau, P., Humphries, M.C., & Owens, S. (2002). Left ventricular structure and function in obese adolescents: relations to cardiovascular fitness, percent body fat, and visceral adiposity, and effects of physical training. *Pediatrics, 109*, E73-3.

Mone, S. M., Gillman, M. W. Miller, T. L., Herman, E. H., & Lipshultz, S. E. (2004). Effects of environmental exposures on the cardiovascular system: prenatal period through adolescence. *Pediatrics, 113*(4), 1058-1069.

Morello, P., Duggan, A., Adger, H. Jr, Anthony, J. C., & Joffe, A. (2001).Tobacco use among high school students in Buenos Aires, Argentina. *American Journal of Public Health, 91*(2), 623-639.

Muntler, P., He, J., Cutler, J. A., Wildman, R. P.,& Whelton, P. K. (2004). Trends in blood pressure among children and adolescents. *Journal of American Medical Association, 291*, 2107-2113.

Nanchahal, K., Ashton, W. D. & Wood, D. A. (2000). Alcohol consumption, metabolic cardiovascular risk factors and hypertension in women. *In*ternati*on*al *Journal* of Epidemiology, *29,* 57-64.

National High Blood Pressure Education Program Working Group on High Blood Pressure in Children and Adolescents (NHBPEP). (2004). The fourth report on the diagnosis, evaluation, and treatment of high blood pressure in children and adolescents. *Pediatrics, 114*(2 suppl 4th report), 555 –576.

National Institutes of Health (NIH). (2008). Alcohol and tobacco use prevention. Retrieved from http://www.enotalone.com/article/11309.html.

Newby, P. K. (2009). Plant foods and plant-based diets: protective against childhood obesity? *American Journal of Clinical Nutrition, 89*(5), 1572S-1587S.

NHLBI. (2007). Working group report on future research directions in childhood obesity prevention and treatment. Information for Researchers. Retrieved from www.nhlbi.nih.gov/meetings/workshops/child-obesity/index.htm#recommendationsprevention.

Nielsen, S. J., Popkin, B. M. (2004). Changes in beverage intake between 1977 and 2001. *American Journal of Preventive Medicine, 27*(3*)*, 205–210.

Nikpay, M., Seda, O., Tremblay J., & Hamet, P. (2007). Genome-wide scan for genomic determinants of alcohol and tobacco use in French Canadian families. Alcohol *American Journal of Preventive Medicine, 27*, 205–210.

Ogden, C. L., Carroll, M. D., Curtin, L.R ., McDowell, M.A., Tabak, C. J., & Flegal, K.M. (2006). Prevalence of overweight and obesity in the United States, 1999–2004. *Journal of American Medical Association, 295*, 1549 –1555.

Parker, E. D., Schmitz, K. H., Jacobs, Jr, D. R., Dengel, D. R., & Schreiner, P. J. (2007). Physical Activity in Young Adults and Incident Hypertension Over 15 Years of Follow-Up: The CARDIA Study. *American Journal of Public Health, 97*(4), 703-709.

Parsons, T. J., Power, C., & Manor, O. (2005). Physical activity, television viewing and body mass index: a cross-sectional analysis from childhood to adulthood in the 1958 British cohort. *International Journal of Obesity (London), 29*(10):1212-21.

Patrick, K., Norman, G. J. & Calfas, K. J. (2004). Diet, physical activity, and sedentary behaviors as risk factors for overweight in adolescence. *Archives of Pediatric Adolescent Medicine, 158*, 385–390.

1. Portman, R.J., McNiece, K.L., Swinford, R.D., Braun, M.C. & Samuels, J.A. (2005). Pediatric hypertension: diagnosis, evaluation, management, and treatment for the primary care physician. *Current Problems in Pediatric Adolescent Health Care, 35*, 262 –294. Retrieved from www.sciencedirect.com/science/journal/15385442

Prochaska, J.O. & Velicer, W.F. (1997). The Transtheoretical model of health behavior change. *American Journal of Health Promotion*, *1*, 38-48.

Resnicow, K. & Vaughan, R. A chaotic view of behavior change: a quantum leap for health promotion. (2006). *International Journal of Behavioral Nutrition and Physical Activity, 12*(3):25-30.

Raosoft. (2002). Sample size calculator from Raosoft, Inc. Retrieved from http://www.raosoft.com/samplesize.html

Rodriquez, B. L., Fujimoto, W. Y., Mayer-Davis, E. J., Imperatore, G., Williams, D. E., Bell, R. A., Wadwa, R. O., Palla, S. L., Liu, L. L., Kershar, A., Daniels, S. R., & Linder, B. (2006). Prevalence of cardiovascular disease risk factors in US children and adolescents with diabetes: the SEARCH for diabetes in youth study. *Diabetes Care, 29(8)*, 1891-6.

Rosentock, I.M., Strecher, V.J. & Becker, M.H. Social Learning Theory and the Health Belief Model. *Health Education Quarterly, 15*(2), 173-183.

SAMHSA. (2006). State estimates of underage drinking. Retrieved from http://oas.samhsa.gov/2k6/stateUnderageDrinking/underageDrinking.htm.

Saremi, A., Hanson, R. L., Tulloch-Reid, M., Williams, D. E., & Knowler, W. C. (2004).Alcohol consumption predicts hypertension but not diabetes. *Journal of Student Alcoholism, 65*,184-190.

Sega, R., Facchetti, R., Bombelli, M., Cesana, G., Corrao, G., Grassi, G. & Mancia, G. (2005). Prognostic value of ambulatory and home blood pressures compared with office blood pressure in the general population: follow-up results from the Pressioni Arteriose Monitorate e Loro Associazioni (PAMELA) study. *Circulation, 111*, 1777–1783.

Shariff, Z. M., Bukhari, S. S., Othman, N., Hashim, N., Ismail, M., Jamil, Z., Kasim, S. M., Paim, L., Samah, B. A., & Hussain, Z. Z. M. (2008). Nutrition education intervention knowledge improves nutrition knowledge, attitudes, and practices of primary school children: A pilot study. *International Electronic Journal of Health Education, 11*, 119-132. Retrieved from www.aahperd.org/aahe/publications/iejhe/loader.cfm?cs.

Sesso, H. D., Cook, N. R., Buring, J. E., Manson, J. E. & Gaziano, J. M. (2008). Alcohol consumption and the risk of hypertension in women and men. *Hypertension,* 51, 1080.

Society for Nutrition Education, Weight Realities Division (2003). Guidelines for Childhood Obesity Prevention Programs: *Promoting Healthy Weight in Children*. Retrieved from www.dairycouncilofca.org/HealthProfessionals/Nutrition

Sorof, J. M., Lai, D., Turner, J., Poffenbarger, T., & Portman, R.J. (2004). Overweight, ethnicity, and the prevalence of hypertension in school-aged children. *Pediatrics, 113*(3 pt 1), 475-82.

Sorof, J. M., Alexandrov, A.V., Cardwell, G., & Portman, R. J. (2003).Carotid artery intimal-medial thickness and left ventricular hypertrophy in children with elevated blood pressure. *Pediatrics, 111*, 61-6.

Sorof, J. M., Lai, D., Turner, J., Poffenbarger, T., & Portman, R.J. (2004). Overweight, ethnicity, and the prevalence of hypertension in school-aged children. *Pediatrics, 113*, 475-482.

Stabouli, S., Kotsis, V., Papamichael, C., Constantopoulos, A. & Zakopoulos, N. (2005). Adolescent obesity is associated with high ambulatory blood pressure and increased carotid intimal-medial thickness. *Journal of Pediatrics, 147*, 651-656.

Stevens, J., Taber, D.R., Murray, D.M., & Ward, D.S. (2007). Advances and controversies in the design of obesity prevention trials. *Obesity, 15*(9), 2163-70.

Szamosi, A, Czimmer, A, Szamosi, T, Sallai, A, Hartunie, M, Berla, Z, Tomsits, E, Almassy, Z., & Nolan, J. J. (2008). Effect of diet and physical exercise on insulin resistance syndrome of school children. *Journal of the American College of Nutrition, 27*(1), 177-183.

Thom, T., Haase, N., & Rosamond, W. (2006). Heart disease and stroke statistics: 2006 update—a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation, 113*, e696.

Treviño, R. P., Yin, Z., Hernandez, A., Hale, D. E., Garcia, O. A., & Mobley, C. (2005).Impact of the Bienestar school-based diabetes mellitus prevention program on fasting capillary glucose levels: a randomized controlled. *Archives of Pediatric Adolescent Medicine, 59*, 341.

Tuomilehto, J., Lindström, J. & Eriksson, .JG. (2001). Prevention of type 2 diabetes *mellitus* by changes in lifestyle among subjects with impaired glucose tolerance. *New England Journal of Medicine, 344*, 1343-1350.

US Department of Agriculture. Dietary Guidelines for Americans. 6th ed. (2005). Washington, DC: US Department of Health and Human Services /US Government Printing Office. Retrieved from www.health.gov/dietaryguidelines/dga2005/document

U.S. Department of Health and Human Services. (1994). *Preventing tobacco use among young people: A report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention.

Waltenbaugh, A. W., & Zagummy, M. J. (2004). Optimistic bias and perceived control among cigarette smokers. *Journal of Alcohol & Drug Education*. Retrieved from http://www.highbeam.com/doc/1G1-94159008.html.

Wang, Y. C., Bleich, S. N., & Gortmaker, S. L. (2008). Increasing caloric contribution from sugar-sweetened beverages and 100% fruit juices among us children and adolescents, 1988–2004. *Pediatrics, 121*(6), e1604-e1614.

Wang Y., & Kumanyika S. (2007). *Descriptive epidemiology of obesity in the United States.* Chapter 3, in Kumanyika SK, Brownson RC. (Eds.). Handbook of Obesity Prevention. New York: Springer Publishing Co., 45-71.

Wang, Y. & Boeydoun, M.A. (2007) The Obesity epidemic in the United States—Gender, Age, Socioeconomic, racial/ethnic, and geographic characteristics: A sytematic review and meta-regression analysis. *Epidemiologic Reviews 29*(1):6-28.

Wang Y, Lobstein T. (2006). Worldwide trends in childhood overweight and obesity. *International Journal of Pediatric Obesity, 1*, 11-25.

Whelton, S.P., Chin, A., Xin, X. & He, J. (2002). Effect of aerobic exercise on blood pressure: A meta-analysis of randomized, controlled trials. *Annals of Internal Medicine, 136*, 493-503.

Wickrama, K.A., Wickrama, K.A.S., & Bryant, C.M. (Aug2006). Community influence on adolescent obesity: race/ethnic differences. *Journal of Youth and Adolescence; 35*(4), 647-657.

Williams, D, E,, Cadwell, B, L., & Cheng Y. J. (2005). Prevalence of impaired fasting glucose and its relationship with cardiovascular disease risk factors in US adolescents, 1999–2000. *Pediatrics, 116*, 1122 –1126.

Wing, R. R., & Hill, J. O. (2001).Successful weight loss maintenance. *Annual Review of Nutrition, 21*,323-41.

Wright, J. D., Wang, C. Y., Kennedy-Stephenson, J., & Ervin, R. B. (2003). Dietary intake of ten key nutrients for public health, United States 1999-2000. *ADV. Data*, 1-4.

Young, E.M., Fors, S.W., & Hayes, D.M. (2004). Associations between perceived parent behaviors and middle school student fruit and vegetable consumption. *Journal of Nutrition Education Behavior, 36*, 2–8.

Appendix A: Questionnaire

Student Health History Survey (SHHS)

ID NO: _____

This survey is about health behavior. It has been developed so you can tell us about things you do that may affect your health. The information will be used to develop better health education for young people like you.

The answers you give will be kept private and your name will not be revealed to anyone. Answer the questions based on what you really do.

Completing the survey is voluntary. However, it will help us answer several questions if you answer all of the questions.

The questions that ask about your background will be used only to describe the types of students completing this survey. No names will ever be reported.

Make sure to read every question. Completely erase any errors. When you are finished, follow the instructions of the person giving you the survey.

1. What is your sex?
    A. Male
    B. Female
2. How old are you?
    A. 14 years old or younger
    B. 15 – 16 years old
    C. 17 --18 years old
    D. 19 years old or older
3. What grade are you in?
    A. 9th grade
    B. 10th grade
    C. 11th grade

D. 12th grade

4. How do you describe yourself? (Select one or more responses).

   A. American Indian or Alaska Native

   B. Asian

   C. Black or African American

   D. Hispanic or Latino

   E. Native Hawaiian or Other Pacific Islander

   F. White or Caucasian

5. During the past 12 months, how would you describe your grades in school?

   A. Mostly A's

   B. Mostly B's

   C. Mostly C's

   D. Mostly D's

   E. Mostly F's

   F. Not sure

6. How tall are you without your shoes on? _____

7. How much do you weigh without your shoes on? _____

8. During the past 7 days, how many times did you eat salad?

   A. I did not eat green salad during the past 7 days

   B. 1 to 3 times during the past 7 days

   C. 4 to 6 times during the past 7 days

   D. 1 time per day

   E. 2 times per day

   F. 3 times per day

   G. 4 or more times per day

9. During the past 7 days, how many times did you consume fried foods?

A. I did not eat any fried foods.

B. 1 to 3 times during the past 7 days

C. 4 to 6 times during the past 7 days

D. 1 time per day

E. 2 times per day

F. 3 times per day

G. 4 or more times per day

10. How often do you consume soft drinks?

A. With every meal

B. With two meals out of the day

C. With one meal out of the day

D. Not with every meal but in between meals

E. With some meals and in between meals

F. With every meal and in between meals

11. How much water do you drink every day?

A. I do not drink water.

B. 1 glass

C. 2-4 glasses

D. More than 4 glasses

12. During the past 7 days, how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice? (Do not count Punch, Kool-Aid, Sports Drinks, or other fruit-flavored drinks.)

A. I did not drink 100% fruit juice during the past 7 days

B. 1 to 3 times during the past 7 days

C. 4 to 6 times during the past 7 days

D. 1 time per day

E. 2 times per day

F. 3 times per day

G. 4 or more times per day

13. Do you drink alcoholic beverages? Yes or No

14. If yes, I mostly drink_____.

A. Beer

B. Wine

C. Wine coolers

D. Liquor (such as rum, gin, whiskey)

E. Champagne

F. 2 or More of the above

15. When going out with friends, do you feel it is necessary to drink to have a good time? Yes or No

16. How much alcohol do you consume on a weekly basis?

A. None

B. 1-3 drinks

C. 4-8 drinks

D. 9 or more drinks

17. Do you smoke? Yes or No

18. If yes, how old were you when you started smoking?

A. I don't smoke C. 9 to 13 years

B. 8 years or younger D. 14+ years

19. On how many of past 7 days did you exercise or participate in hard physical activity for at least 30 minutes (e.g. basketball, soccer, running, swimming laps, fast bicycling, fast dancing, or similar aerobic activities)?

A. 0 days

B. 1-2 days

C. 3-4 days

D. 5 or more days

20. On how many of the past 7 days did you participate in moderate physical activity for at least 30 minutes, (e.g. fast walking, slow bicycling, skating, pushing a lawn mower, or mopping floors)?

A. 0 days

B. 1-2 days

C. 3-4 days

D. 5 or more days

21. On how many of past 7 days did you do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?

A. 0 days

B. 1-2 days

C. 3-4 days

D. 5 days or more

22. On an average school day, how many hours do you watch TV?

A. I do not watch TV on an average school day

B. Less than 1 hour per day

C. 1-2 hours per day

D. 3-4 hours per day

23. In an average week when you are in school, how many days do you go to Physical Education (PE) classes?

A. 0 days

B. 1-2 days

C. 3-4 days

D. 5 or more days

24. During an average physical education (PE) class, how many minutes do you actually spend exercising or playing sports?

A. I do not take PE

B. Less than 10 minutes

C. 10 to 20 minutes

D. 21 to 30 minutes

E. More than 30 minutes

25. On the average, how many hours of sleep do you get every night?

A. less than six hours

B. 6-8 hours

C. more than 8 hours

26. Do you believe that your daily practices and behaviors place you at an increased risk for developing chronic diseases?

1. Yes 2. No

This is the end of the survey

Thank you very much for your participation

Curriculum Vitae

Monique S. White, BS, MPH

EDUCATION

2005-2010	Walden University Minneapolis, MN Doctorate, Public Health
2002-2005	Jackson State University Jackson, MS Master Degree, Public Health School of Public Health
1999-2001	Jackson State University Jackson, MS B.S. Social Work
1996-1988	A.A. Social Work Hinds Community College Jackson, MS

Additional Training

2005	American Red Cross Certified HIV/AIDS Educator
2004	SPARK PE Training Certified SPARK PE Trainer Memphis, TN
2004	American Heart Association "Fighting Heart Disease and Stroke" Search Your Heart Train- The –Trainer

EMPLOYMENT

Hinds Community College — 01/2005 to Present
Jackson/Pearl Branch
Instructor
Community and Personal Health

Breast Feeding Coalition — 01/2005 to Present
Jackson, MS
Consultant

Project Health/Jackson Heart Study — 01/2002 to Present
Health Education Coordinator — Jackson, MS
Planning, Implementing CVD Prevention Programs in Schools
Organizing Health Fairs for Area Residents/Schools in JPS
Orienting Teachers to Prevention Curriculum

Presentation of Research at National Conferences
Data Entry, Maintaining Records

Jackson State University — 6/2003—8/2003
McNair Scholars Program — Jackson, MS
Instructor/Mentor/Research Facilitator for
Students in the McNair Scholar Program

Jackson State University — 2003- 2005
Guest Lecturer
Statistics & Research
School of Education
EDFL 797(PhD Course)
EDFL 732 (PhD Course)

Atty. Edna Stringer — 12/2002-8/2003
Law Secretary, — Jackson, MS
Providing Paralegal Assistance

Catholic Charities — 01/2001-12/2001
Volunteer — JACKSON, MS
Interaction with foster parents, foster children,
and refugee minors. Counseling and
Consultation on issues relating to daily problems
and orientation

Boys and Girls Club — 8/2000- 08/2001
Counseling tutor — JACKSON, MS