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The Predictors of Obesity in Young Adults

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This is to certify that the doctoral dissertation by

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Walden University
2015

Abstract

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BS, Marist College, 2011

AS, Dutchess Community College, 2008

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Obesity is becoming an increasing health concern for young adults. There have been numerous studies on the potential predictors of obesity. However, few studies have researched the predictors of obesity in young adults. Guided by the health belief model, this quantitative cross sectional study investigated the potential predictors of obesity in young adults. The 2011 Behavioral Risk Factor Surveillance System was used to gather data on the potential predictors of obesity, including physical activity, health care coverage, excessive alcohol consumption, and demographic characteristics on 1,511 young adults, aged 18-34 years, who were living in New York State. Data were analyzed using a combination Pearson correlation and multiple regression analyses. The findings on physical activity were statistically significant and revealed that physical activity had the strongest association to young adult obesity. The study provides information for public health professionals that can be used to develop more effective obesity interventions targeting young adults. The implications for positive social change include improving young adult health through the reduction of obesity rates and the promotion of physical activity.

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Dedication

To my family, who are so supportive of my dreams.

Acknowledgments

I would like to thank my family, friends, and Walden for making this dissertation a reality.

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Chapter 1: Introduction to the Study

Background

The level of adult obesity has reached epidemic proportions (Centers for Disease Control and Prevention [CDC], 2013). Young adults in particular living in New York State are of great concern, due to obesity rates doubling within the young adult population (CDC, 2011). The aim of this study was to investigate the potential predictors of obesity in young adults living in New York State. The potential predictors of young adult obesity that were examined are physical activity, excessive alcohol consumption, and healthcare coverage. It is important to better understand the predictors that are causing obesity rates to reach epidemic proportions throughout the country and within the young adult population in New York State.

Obesity is a disease that has been linked to many other negative health consequences and more research is needed to better understand the potential predictors of obesity. With the attainment of more information on the predictors of young adult obesity, it may be possible to achieve positive social change. Positive social change may be achieved through the design and implementation of effective prevention and intervention programs to reverse the trend of young adult obesity in New York State and within the United States. In this chapter, the background, problem statement, and purpose of the study are discussed. This chapter further presents the research questions and hypotheses, theoretical framework, nature of the study, definitions, assumptions, limitations, and significance of the study.

There is extensive research on the potential predictors of obesity in young adults. Some of these potential predictors are a lack of physical activity, imbalance of calories from poor nutritional intake, lower SES, and chronic stress (CDC, 2013). Other potential predictors of obesity may be excessive alcohol consumption, and lack of health care coverage. Having a better understanding of the potential predictors of young adult obesity in New York State may help uncover why obesity rates have doubled with this population of 18-24 year olds to 25-34 year olds (CDC, 2011). In previous research, Biro and Wien (2010) investigated the interactions of genes, dietary intake, physical activity, and the environment on excessive weight gain. Similar research on young adults indicated that as adolescents grow into young adulthood, their lifestyles may change dramatically with increasing life stressors, including independent living, economic status, and becoming a parent, all of which may contribute to poor health habits (O'Neil et al, 2012). Dallman et al. (2003) found that the challenges of dealing with chronic stress may increase an individual's appetite for calorie dense comfort foods. In addition, Juonala et al. (2011) found that being an overweight and obese child significantly increased the risk of developing obesity as an adult, as well as developing related health consequences, such as type 2 diabetes, hypertension, dyslipidemia, and carotid artery atherosclerosis. These health consequences are largely supported by current literature (Movahed, Bates, Strootman, & Sattur, 2011; Wang & Peng, 2011; Whitmore, 2010).

One health consequence may be cholesterol. Wang and Peng (2011) investigated the mechanism of low high-density lipoprotein cholesterol in obese participants. The researchers found that obesity may be correlated with a higher lipoprotein count than

normal weight individuals. This finding supports the effects obesity has on cholesterol, which may be a result of poor lifestyle choices such as a lack of physical activity and a balanced nutritious diet. The researchers concluded that as obesity rates rise, cholesterol levels continue to rise. Another health consequence of obesity is hypertension. Movahed et al. (2011) based their research on the impact of obesity and hypertension with the effect of left ventricular hypertrophy (LVH). The results showed LVH was significantly more prevalent in obese participants. LVH may be a result of a lack of physical activity, which may be a significant predictor of young adult obesity. In addition, Spees et al. (2012) investigated the differences in the amounts and types of physical activity by obesity status in the United States. The researchers found that significantly more normal weight adults engaged in more physical activity at moderate and vigorous intensities than obese adults, indicating a potential relationship between physical activity and obesity. Also, SES has been found to be associated with obesity. Berry et al. (2010) investigated the relationship of body mass index (BMI) and different demographic and neighborhood characteristics. The researchers concluded that lower SES neighborhoods had higher BMIs. Some of the factors found to be associated with higher BMIs in lower SES neighborhoods may be due to the fact that lower SES neighborhoods have fewer places for safe or affordable physical activity (CDC, 2013). Further investigation is needed to fully understand the implications of the potential predictors that may contribute to the obesity epidemic in young adults living in New York State.

There has been a great deal of research on some of the potential predictors of obesity in the United States in general. However, little research has been done on the

potential predictors of obesity in young adults living in New York State. Young adults are important to investigate due to the unexplained dramatic increase in obesity between the two young adult age groups, from 9.5% in 18-24 year olds to 20.9% in 25-34 year olds (CDC, 2011). Studying young adult obesity in New York State, which has a wide geographic and demographic range, may help to better explain this epidemic. New York State is a densely populated state with over 19 million people (U.S. Census, 2011). The demographic make-up includes 71.5% Whites, 18% Hispanics, 17.5% Blacks, 7.8% Asians, 2.2% two or more races, and 1% American Indian/Alaska Native (U.S. Census, 2011). Having a better understanding of the most significant potential predictors of obesity in young adults living in New York State can help public health efforts in obesity prevention and may help reduce obesity-related health disparities in this population.

Problem Statement

The rate of obesity is growing in the United States. Obesity is classified as having a BMI $\geq$30kg/m^2 (CDC, 2013). Obesity rates between the two young adult age groups of 18-24 years of age and 25-34 years of age seem to have the most dramatic increase. It is estimated that 9.5% of 18-24 year olds and 20.9% of 25-34 year olds living in New York are obese (CDC, 2011). The rate of obesity more than doubles between these two age groups and then levels offs in about the 25th percentile in all other age groups in New York State (CDC, 2011). The rate of obesity increased in 2012 for 18-24 years to 12.7% and slightly decreased in 25-34 year olds to 19.5% (CDC, 2012). Overall the rate of obesity is increasing with age in New York State. A similar trend is occurring in neighboring states. New Jersey reported that 12.1% of 18-24 years are obese and 21.7%

of 25-34 year olds are obese and Connecticut reported16.1% of 18-24 year olds are obese and 23.3% of 25-34 year olds are obese (CDC, 2011). It is important to help young adults 18-24 years old to adopt lifelong healthier habits to help keep obesity rates under 10%. Understanding the predictors for the significant increase in obesity among young adults may help in reducing the prevalence of obesity in New York State.

Obesity is the second leading cause of preventable death and it is predicted to soon overtake tobacco as the leading cause of preventable death (CDC, 2013). Obesity is considered to have reached epidemic proportions and is putting a significant health burden on New Yorkers. Obesity has been shown to cause a number of health problems, including chronic diseases such as type 2 diabetes, dyslipidemia, hypertension, and coronary heart disease (Pi-Sunyer, 2012). It is reported that 1.5 million adults in New York have been diagnosed with diabetes, which is 10.4% of the state (CDC, 2011). High cholesterol or dyslipidemia has been reported to be a problem for 40% of adults, and 47% of adults living in New York State who are obese (CDC, 2011). Hypertension or high blood pressure was reported in 31% of adults overall and in 62% of adults over 65 years old in New York State (CDC, 2011). In addition, nearly 25% of New York adults reported some type of cardiovascular issue (CDC, 2011). Obesity overall in men and women is associated with an elevated risk of mortality from all causes and increases with weight (Hu, 2003). There are many different health consequences associated with obesity, especially diabetes and cardiovascular disease (Shepherd, 2009). More public health preventative programs are needed in order to help reverse the trend of obesity and the subsequent development of these chronic diseases (O'Neil et al., 2012).

There are many studies showing the increasing rate of obesity in the U.S. population. The prevalence and severity of obesity has dramatically increased in recent years, and may be a result of many different complex interactions between nutritional intake, physical activity, genetics, and the environment (Biro & Wien, 2010). Further research is needed to determine the exact components involved in excessive weight gain in young adults (Wang & Peng, 2011). Overall obesity rates since 1980 have more than doubled and continue to rise (Black & Macinko, 2009). Young adults in New York State seem to be of particular concern for obesity. Many factors such as diet, physical activity, and other health risk factors are understudied (O'Neil et al., 2012). For young adults living in New York State, physical activity, excessive alcohol consumption, and health care coverage may be the most influential predictors of obesity; however, limited research exists on how exactly these predictors may affect excessive weight gain and obesity. Few researchers have analyzed these variables and their potential relationship to excessive weight gain in young adults living in New York State. Further research is needed to help understand the predictors of obesity in young adults living in New York State in order to help reduce the burden of obesity-related health consequences.

Purpose of the Study

The purpose of this study was to examine the potential predictors of obesity in young adults living in New York State. A quantitative cross sectional study was conducted to investigate the extent to which physical activity, excessive alcohol consumption, and health care coverage influence obesity in young adults living in New York State. A lack of physical activity seems to be an influential predictor of obesity,

with significantly more normal weight adults engaged in physical activity at moderate and vigorous intensities than obese adults (Spees et al, 2012). Excessive alcohol consumption may also be a significant predictor of young adult obesity. Drinking alcohol is common in the United States but excessive alcohol consumption can increase the risk of many negative health conditions (CDC, 2013). Excessive alcohol consumption may lead to an increase of empty calories, putting an individual at risk for weight gain. Excessive alcohol consumption seems to be associated with obesity especially when combined with low physical activity levels (Kim & Jeon, 2011). Alcohol consumption may be especially important for the young adult age groups that report the highest rate of excessive alcohol intake. In addition, health care coverage may have an impact on obesity and be a significant predictor of young adult obesity (Finkelstein, Trogdon, Cohen, & Dietz, 2009). With millions of Americans without health care coverage, and the young adult population having the lowest rate of health care coverage, it is top priority to find a way to effectively improve the rate of coverage. Lack of health care coverage may affect individuals' ability to receive preventative care (Finkelstein, Trogdon, Cohen, & Dietz, 2009). Some of these preventative care options include yearly physicals to monitor BMI and other health indicators. Also, a lack of health care coverage may limit the ability of young adults to receive obesity-related treatments.

With obesity levels at epidemic proportions, and with such a dramatic increase in obesity within the young adult population in New York State, more research is needed to better understand these potential predictors of obesity. With the attainment of more information on the predictors of young adult obesity, it may be possible to design and

implement more effective prevention and intervention programs at the federal, state, and local level to reverse the trend of obesity in New York State and within the United States. In order to better understand the potential predictors of obesity in young adults living in New York State, the independent variables of physical activity, excessive alcohol consumption, and healthcare coverage were analyzed to see if these variables have a significant relationship with the dependent variable obesity. The covariate variables of age group, gender, and race/ethnicity were also analyzed to reduce confounding.

Research Questions and Hypotheses

RQ1: Is there a relationship between physical activity and obesity in the young adult age groups living in New York State?

$H1_0$: There is no relationship between physical activity and obesity in the young adult age groups living in New York State, as measured by X.

$H1_a$: There is a relationship between physical activity and obesity in the young adult age groups living in New York State.

RQ2: Is there a relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State?

$H2_0$: There is no relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State.

$H2_a$: There is a relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State.

RQ3: Is there a relationship between healthcare coverage and obesity in the young adult age groups living in New York State?

$H3_0$: There is no relationship between healthcare coverage and obesity in the young adult age groups living in New York State.

$H3_a$: There is a relationship between healthcare coverage and obesity in the young adult age groups living in New York State.

RQ4: Which potential predictor (physical activity, excessive alcohol consumption, or healthcare coverage) when factoring for gender and race/ethnicity has the strongest association with obesity prevalence between the two young adult age groups living in New York State?

$H4_0$: It is not expected that the potential predictor (physical activity, excessive alcohol consumption, or healthcare coverage) will contribute the most to the increase in obesity prevalence between the two young adult age groups.

$H4_a$: It is expected that the potential predictor (physical activity, excessive alcohol consumption, or healthcare coverage) will contribute the most to the increase in obesity prevalence between the two young adult age groups.

Data from the BRFSS were used to help answer the research questions and hypotheses. The independent variables in the study were physical activity levels, excessive alcohol consumption, and health care coverage in young adults living in New York State. The dependent variable was obesity.

Theoretical Framework

The theoretical framework of the study was the health belief model. The health belief model is one of the most frequently used health behavior theories in public health. The premise of the health belief model is that health-related action depends on the

occurrence of three factors: (a) the individual must perceive there is an existence of a health concern, (b) the individual must believe that he or she is vulnerable to a serious health problem or threat, and (c) the individual must believe that engaging or following a certain health recommendation will benefit him or her in reducing the perceived health threat (McKenzie, Neiger, & Thackeray, 2009). With the results generated from this study the health belief model can be used to further investigate why certain individuals are at higher risk of certain predictors of obesity. In addition, it is important for individuals to overcome their perceived barriers in following health recommendations. Some potential barriers an individual may face are financial and time barriers. Financial and time barriers may develop in the case of getting young adults living in New York State to engage in regular physical activity. For example, some young adults may perceive that there is an existence of a health threat and that they are vulnerable to this threat, and they may also believe that following certain physical activity guidelines would be beneficial, but they may think that they do not have the time or money to exercise.

Nature of the Study

The nature of the study was quantitative. The quantitative method was the most effective method for investigating the potential predictors of obesity in young adults (Tang, Kushner, Thompson, & Baker, 2010). Data for the study were secondary data from the 2011 BRFSS. Data collected from the CDC BRFSS was representative of all geographic and demographic ranges in New York State, which includes rural areas and urban areas. The New York BRFSS consists of data gathered by an annual statewide telephone survey administered to New York civilian and institutionalized residents, aged

18 years and over. This survey was developed by the CDC in Atlanta and was administered by the New York State Department of Health. Data collected by the BRFSS consist of information on high risk behaviors, the risk factors associated with those behaviors, and the utilization of health and prevention services to address the key causes of chronic and infectious diseases, disabilities and injuries, and deaths.

The research is a cross sectional study using data from the BRFSS to investigate the predictors of physical activity levels, excessive alcohol consumption, and health care coverage in obesity among young adults living in New York State. The use of secondary data was the ideal approach for this study particularly because the access to reliable data for statistical analyses has allowed the research questions to be answered quickly and efficiently (Rabinovich & Cheon, 2011). Other methods involving original data collection would be more time consuming and costly (Castle, 2003). For that reason, the CDC's BRFSS data on New York State were chosen.

Data used in this study were in accordance with the Walden University Institutional Review Board (IRB) requirements for use of human subjects and with permission from the CDC. All procedures adhered to the CDC policies for the use of data made available for public use. The statistical analyses of the study were conducted with the SPSS 21 software package. SPSS is a statistical processing and analysis software system used for data set formation and statistical analysis.

Definitions

Dependent Variable

The dependent variable for this study is obesity. Obesity is defined as having an excessive amount of body fat in relation to lean body mass (Stunkard & Wadden, 1993). The BMI is the measure used to express body fat in relation to lean body mass and is expressed as a ratio of weight to height. BMI is calculated by dividing self-reported weight in kilograms by the square of self-reported height in meters According to the CDC, adults with a BMI of 25 to 29.9 are considered overweight, while individuals with a BMI of 30 or more are considered obese For the purpose of this research, obesity was determined by the calculation of the BMI using the following questions: "About how tall are you without shoes?" and "About how much do you weight without shoes?" (CDC, 2011). The responses were given in (pounds & ounces .The metric formula was used to calculate BMI by converting pounds to kilograms divided by converting height in inches to meters squared BMI = (kg/m^2).

Independent Variables

The primary independent variable1s were physical activity, excessive alcohol consumption, and health care coverage. Participants were asked the question "Have you participated in enough aerobic and muscle strengthening exercises to meet guidelines?" (CDC, 2011). Responses were either yes or no. The CDC guidelines for physical activity are

> participating in 150 minutes of moderate intensity aerobic activity like brisk walking every week, and muscle strengthening activities on 2 or more days a

> week that work all major muscle groups, or 75 minutes of vigorous intensity aerobic activity like jogging or running every week, and muscle strengthening activities that work all major muscle groups 2 or more days a week. (CDC, 2011, p. 1)

For excessive alcohol consumption, participants were asked the question "Do you consume five or more drinks on one occasion" if the participate was Male and "do you consume four or more drinks on one occasion" if the participate was Female. The responses were either yes or no. For health care coverage, participants were asked the question "Do you have any kind of health care coverage, including health insurance, prepaid plans such as Health Maintenance Organizations (HMOs), or government plans such as Medicare?" (CDC, 2011). Responses were either yes or no.

Covariates

The covariates are age groups, gender, and race/ethnicity. For age groups, participants were asked "what is your age?" (CDC, 2011). Responses were given in numerical form. For gender, participants were asked "What is your sex?" (CDC, 2011). Responses were either male or female. For race/ethnicity, participants were asked "Which one of these groups would you say best represents your race (White/Black or African American/Asian/Native Hawaiian or Pacific Islander/American Indian or Alaska Native/Other?" (CDC, 2011). Responses were given based on racial/ethnic group. Participants were also asked in a separate question "Are you Hispanic or Latino?" (CDC, 2011). Responses were either yes or no.

Assumptions

The assumptions were that the participants who were surveyed gave accurate and honest answers. Other assumptions were that secondary archived data would provide accurate information on the demographics, obesity rates, physical activity, excessive alcohol consumption, and health care coverage rates of young adults living in New York State. These assumptions are important to this study in order to make accurate interpretations of the results. These assumptions may also help public health officials make informed decisions on obesity prevention.

Scope and Delimitations

Obesity rates between the two young adult age groups of 18-24 years of age and 25-34 years of age seem to have the most dramatic increase. It is estimated that 9.5% of 18-24 year olds and 20.9% of 25-34 year olds living in New York are obese (BRFSS, 2011). Understanding the predictors for the significant increase in obesity between these two young adult age groups may help in reducing the incidence of obesity in New York State. The inclusion criteria for the study is living in New York State and being between the ages of 18-34 years old. The exclusion criteria for the study is not living in New York State and either being younger than 18 years of age or older than 34 years of age. The study was designed to investigate potential predictors of obesity in young adults 18-34 years of age living in New York State. The data may not be generalized to other age groups or those who live in different geographic parts of the United States.

Limitations

This study may have some limitations on researching the potential predictors of young adult obesity. Obesity is defined as an abnormal or excessive fat accumulation (WHO, 2013). Obesity is also considered a major risk factor for many other chronic diseases such as cardiovascular disease, cancer, and diabetes (WHO, 2013). Some of the challenges of conducting quantitative studies on obesity are consistent with studying other chronic diseases. Unlike other health problems chronic diseases have multiple and interrelated causes often developing earlier in life and related behavioral risk factors (Remington, Brownson, & Wegner, 2010). One of the biggest challenges is gathering accurate epidemiological data on the determinants of obesity.

Some of the potential determinants of obesity may be demographic profile, age, gender, race, and ethnic background. The main challenge with gathering accurate data is that many quantitative studies use self-reported questionnaires that may increase the risk of participant bias in the study and weaken the validity of the study. Self-reported data collection could influence the outcome of the data in a number of ways. Self-reported data may have certain threats to validity. Some of these threats to the validity could be comprehension of the question being asked, retrieval of information, and response generation (McKenzie et al., 2009). Selection bias may also be a challenge in that the group being studied is not an actual representation of the true population in question. Other limitations in this study may be due to the fact that secondary archival data was used. The data for the study was from the BRFSS. There may be some limitations with this data in the form of recall bias, due to the self -reported process of the data (McKenzie

et al., 2009). In order to help address some of the limitations of the study a higher statistical power of 90% was used. In addition, the study used a large sample size of 1,511 participants.

Significance

With obesity levels at epidemic proportions it is important to have a better understanding of the potential predictors of obesity, especially for young adults (O'Neil et al., 2012). Few researchers have investigated the specific variables that may increase the risk of excessive weight gain in the young adult population. This research was conducted to help fill the gap in the current body of literature on the predictors of obesity in young adults living in New York State. This may possibly improve the knowledge base of certain predictors and risk factors that influence the development of obesity in young adults. By analyzing and comparing the variables of physical activity, excessive alcohol consumption, and healthcare coverage between the two young adult age groups living in New York State, I hope to provide new insight on what is causing the increase of obesity within the young adult population. This study's potential identification of the most influential predictors of obesity in young adults can help achieve positive social change. Positive social change can occur by developing more improved obesity prevention programs in order to reduce obesity related health consequences in millions of young adults living in New York State.

Summary

Obesity in the U.S. has reached epidemic proportions affecting all age groups (CDC, 2011). Obesity presents a serious health problem within the U.S. population,

leading to an increased risk of many other diseases such as cardiovascular disease, cancer and diabetes (CDC, 2011). However, with all age groups affected by obesity there is little research on young adult obesity. Young adult obesity in New York State is of particular concern due to the fact that this age group has had a greater increase in obesity prevalence than any other age group in the state. Further investigation is needed in order to better under what predictors may be associated with the dramatic increase in obesity within the young adult population. In Chapter 2, a review of the literature is presented on some of the potential predictors of young adult obesity.

Chapter 2: Literature Review

Introduction

There is increasing evidence that obesity is a huge concern for the health status of the United States. Obesity levels are at epidemic proportions, affecting nearly one third of the adult population (CDC, 2013). Many factors have been shown to contribute to the rising rate of obesity. With obesity continually rising and having such a negative effect on the health of millions of young adults, better obesity prevention strategies are needed. Obesity prevention programs at the local level may be an effective option in reducing obesity levels. Researchers have been trying to better understand the associated risk factors of obesity for decades. A better understanding of these risk factors may help public health efforts in reversing the trend of obesity.

Purpose of the Study

The purpose of this study was to examine the potential predictors of obesity in young adults living in New York State. Young adults are classified as 18-34 years of age (CDC, 2011). In this study, young adults were separated into two young adult age groups for comparison. The two young adult age groups were 18-24 years of age and 25-34 years of age. The comparison of these two young adult age groups may help fill a gap in the literature on the dramatic increased prevalence of obesity between the two young adult age groups living in New York State.

This chapter provides a review of the literature on obesity trends within the adult population as well as individual factors that are thought to contribute to the increasing prevalence of obesity. The available research demonstrated the importance of individual

factors and how they relate to general adult obesity within the United States. This chapter further presents the potential risk factors of young adult obesity and the gaps in the literature.

Literature Search Strategy

There is a wide array of research on the topic of adult obesity. However, few researchers have looked at obesity in young adults between the ages of 18-34 years of age, and even fewer have studied the potential predictors of obesity in young adults living in New York State specifically. I searched scholarly literature from 2007 to 2014 through the Walden University Library using CINAHL Plus with full text, Google Scholar, and Medline. Others sources of literature included PubMed, WHO, the CDC, and the New York State Department of Health. The terms used to search the literature were *young adult obesity, risk factors of obesity, obesity, adult obesity in New York State, predictors of young adult obesity, obesity risk factors, physical activity and young adult obesity, excessive alcohol consumption and young adult obesity, healthcare coverage and young adult obesity, age and obesity,* and *obesity interventions.* The literature was obtained digitally and in a few cases through print versions.

Theoretical Foundation

The theoretical foundation of the study was the health belief model (Rosenstock, 1966). The health belief model is one of the most frequently used health behavior theories in public health. The health belief model used in this research is the original model, which is based on the notion that health-related action depends on the occurrence of three classes of factors (Rosenstock, 1966): The first factor is that the individual must

perceive there is an existence of a health concern. The second factor is that the individual must believe that they are vulnerable to a serious health problem or threat. The third factor is that the individual must believe that engaging or following a certain health recommendation would benefit them in reducing the perceived health threat (McKenzie, et al., 2009).

Previous research has shown that the health belief model is effective in helping to understand the concerns young adults have on weight gain and obesity. LaRose, Gorin, Clarke, and Wing (2012) researched the beliefs about weight gain among young adults in college and the potential challenges to prevention. The researchers found that men in general were less concerned about weight gain than women and were less likely to participate in a prevention program based on diet and exercise. Understanding the risk factors of young adult obesity and effective ways for prevention is an important concept to further investigate.

Risk Factors of Obesity

Some of the more significant predictors of obesity in young adults living in New York State may be physical activity levels, excessive alcohol consumption, and health care coverage. These three potential predictors of young adult obesity may be influenced by many other risk factors. Some of these risk factors may be dyslipidemia, insulin resistance, lack of physical activity, and low SES. These risk factors are also supported by Wang and Peng (2011). The researchers investigated the mechanism of low high-density lipoprotein cholesterol in obese participants. Data from the National Health and Nutrition Examination Survey (NHANES) were used to compare the relationship of

lipoprotein and obesity. The researchers found that obesity seems to be correlated with a higher lipoprotein count than normal weight individuals (Wang & Peng, 2011). This finding supports the effects obesity has on cholesterol. The authors concluded that as obesity rates rise cholesterol levels continue to rise. Type 2 diabetes is also a potential risk factor of obesity. Whitmore (2010) used a systematic review to come to the conclusion that there is a strong correlation between obesity and type 2 diabetes.

Psychological

Other risk factors for obesity may be psychological. Grossniklaus et al. (2010) used a descriptive cross-sectional correlation study to investigate the eating habits and psychological factors. The researchers found that 21% of the participant's experienced depressive symptoms associated with excessive calorie intake and determined that depressive symptoms seem to correlate with overeating. Other negative psychological emotions that may impact young adult obesity may be sadness and fear developed from early stages in life. These negative emotions may have been triggered from a lack of proper child care and physical or emotional abuse (Vamosi, Heitman, & Kyvik, 2010). These triggers are of concern because they may lead to unhealthy lifestyle choices such as sedentary behavior, increased calorie consumption, and eating to relax or feel better (Vamosi, et al., 2010). Negative emotions and psychological stress also seems to affect a significant portion of the hypothalamic-pituitary-adrenal system. In overweight women, perceived stress and waist circumference were about equal importance in predicting adrenal cortisol secretion (Farag, 2008). Cortisol as well as other hormones such as leptin may contribute to obesity. Leptin levels tend to follow a circadian rhythm, which seems

to be regulated by insulin levels and the circadian rhythm of cortisol (Lazreg, 2007). There also seems to be a significant connection between leptin levels and an increased BMI (Lazreg, 2007). It has been shown that people who report having psychological issues consume more calorie dense foods than those less stressed (Grossniklaus et al., 2010). Obesity is a complex chronic disease with potentially many different contributing factors (CDC, 2012). Many other factors may influence the three potential predictors of young adult obesity physical activity, excessive alcohol consumption, and healthcare coverage in this study.

Unhealthy Lifestyle

Unhealthy lifestyle choices of a poor diet high in sugar, sodium, and saturated fats and lack of physical activity may be one of the most influential factors associated with adult obesity (WHO, 2011). The etiology of how unhealthy lifestyle factors contribute to young adult obesity is mainly from unhealthy lifestyle choices like an increase in energy dense foods high in fat and sodium, along with a decrease in physical activity (WHO, 2011). Poor dietary habits are another potential risk factor for obesity. Smith et al. (2010) used a longitudinal observational study to investigate the relationship of skipping breakfast and cardio-metabolic risk factors for obesity. The researchers analyzed the data of breakfast eating or skipping breakfast in childhood compared to adulthood within the same study group. The researchers found that participants who skipped breakfast in childhood and adulthood had higher waist circumferences, fasting insulin and total cholesterol (Smith et al., 2010). With these findings it seems that skipping breakfast from childhood to adulthood may have negative health effects.

Lack of physical activity also seems be a risk factor for obesity. Spees et al. (2012) investigated the differences in the amount and types of physical activity by obesity status in the U.S. The researchers used a secondary study of collected data from 7,695 participants from the NHANES 1999-2006. The researchers found that significantly more normal weight adults engaged in more physical activity at moderate and vigorous intensities than obese adults (Spees et al., 2012). It seems that weight status is a predictor of the frequency, intensity and type of physical activity. This is an important concept on young adult obesity. In this study weight status and physical activity will be further investigated.

Socioeconomic Status

SES may contribute to obesity. Berry et al. (2010) investigated the relationship of BMI and different demographic and neighborhood characteristics. The researchers used a longitudinal study of 500 adults between 18-90 years of age in 2002. The researchers concluded that lower SES neighborhoods had higher BMIs. Some of the factors that may contribute to higher BMI's in lower SES neighborhoods are possibly traffic and other factors making it difficult to exercise (Berry et al., 2010).

There are an increasing number of studies investigating the contributing risk factors of obesity. Some socioeconomic risk factors that may affect young adult obesity are events and behaviors exposed to during childhood. Having a low SES at birth and infancy may play a role in obesity into young adulthood. Breast feeding at infancy seems to have some protective benefits to obesity (Koubaa et al., 2008). Lower SES mothers may not always breast feed for the recommended duration. The protective factors of

breast feeding are not clear, but it may be due to proper nutrition and the early development of metabolism. Also, young adults growing up in lower SES homes may have unhealthy eating habits, like larger portions sizes of poor quality foods high in fat and sugar (Colapinto, Fitzgerald, Taper, & Veugeles, 2007). With there being an increasing trend of risk factors associated with obesity. Further investigation is needed to fully understand the implications of the associated risk factors that contribute to the obesity epidemic.

Obesity Trends in America

The Center for Disease Control and Prevention (2011) reported that the current estimate of obese adults in America is about 33.8%. In the last 20 years, obesity rates have risen dramatically. As of 2010, there is now no state with an obesity prevalence of under 20%, and 36 states have prevalence's higher than 25% (CDC, 2011). This increasing trend of adult obesity in America is becoming a great concern as the U.S. population ages. Many researchers defined adult obesity in their studies as people 18 years of age or older. The prevalence of adult obesity is now considered to be at epidemic proportions. Flegal, Carroll, Ogden, and Curtion, (2010) researched the prevalence of obesity in the United States from 1999-2008. They analyzed the height and weight measurements of 5,555 participants of the NHANES and concluded that the prevalence of obesity was 32.2 % among men and 35.5% among women. The researchers also stated that many factors may be contributing to the high prevalence of obesity in the United States. Some of these factors are behavioral, psychosocial, and environmental. With the increase in these contributing factors throughout the past decades there has been a rise in

the incidence of adult obesity. Wang and Beydoun (2007) researched the current trends of obesity in the U.S. by gender, age, socioeconomic status, racial/ethnic groups, geographic location, peer reviewed studies, and the NHANES. In their findings, they concluded that the incidence of obesity has increased 32% from 1960 to 2004 (Wang & Beydoun, 2007).

The increasing trend of adult obesity is significant to the health of millions of Americans. Wang and Beydoun (2007) predict that by 2015, 75% of adults may be overweight and 41% may be obese. Obesity has been defined as having a body mass index (BMI) $\geq$ 30. Having a BMI of 30 or higher puts an individual at a greater risk for heart disease, type 2 diabetes, Cancers, hypertension, dyslipidemia, stroke, liver and gallbladder disease, sleep apnea, respiratory problems, and osteoarthritis (CDC, 2011). These health risks are significant to the growing adult obese population in America. Also obesity related conditions are associated with higher healthcare costs. Over the last few decades healthcare costs have been on the rise and so have preventable diseases like obesity. It is estimated that the annual healthcare cost for obesity related conditions is about $147 billion (CDC, 2011). This is a huge financial strain on the national healthcare system. More needs to be done in order to relieve that strain on the health of many obese adults and healthcare centers. One method to help alleviate the problems of obesity is to address the contributing factors.

Age Factor

Age seems to be an important risk factor for obesity. Children under the age of 18 have an estimated prevalence of obesity at about 17%, and adults over the age of 18 have an estimated prevalence of obesity at about 35.7% (CDC, 2012). There seems to be a

significant increase in obesity prevalence with increasing age. This increasing prevalence of obesity with age can also be seen within the young adult population living in New York State. It is estimated that the obesity prevalence of 18-24 year olds is about 9.5%, and for 25-34 year olds the obesity rate doubles to about 20.9% (CDC, 2011). Obesity rates between these two age groups in New York State have had the most dramatic increase.

Obesity rates in New York as well as the U.S. and other industrialized nations tend to increase and peak with age. Low, Chin, and Deurenburg-Yap (2009) found that the obesity prevalence increases with age, and peaks at round 50 to 60 years of age. The prevalence of obesity for adults has also been found to increase with age for both men and women (Flegal, Carroll, Ogden, & Curtin, 2010). It is important to further investigate what may be causing such a dramatic increase in obesity for young adults living in New York State.

Excessive Alcohol Consumption

Drinking alcohol is common in the U.S. but excessive alcohol consumption can increase the risk of many negative health conditions (CDC, 2012). Excessive alcohol consumption may lead to an increase of empty calories putting an individual at risk of weight gain. Excessive alcohol consumption seems to be associated with obesity especially when combined with low physical activity levels (Kim & Jeon, 2011). Excessive alcohol consumption in the form of heavy drinking is considered more than two drinks a day on average for men and more than one drink a day on average for women (CDC, 2013). Excessive alcohol use in the form of binge drinking, which is

considered consuming five or more drinks at a sitting for men and four or more drinks at a sitting for women, may lead to serious health problems such as liver disease, unintentional injuries, and increase in empty calories (CDC, 2013).

According to the BRFSS about 6.6% of the U.S. population drinks heavily and 18.3% of the population binge drinks (CDC, 2011). In New York State, according to the BRFSS 6.2% of the population drinks heavily which is slightly less than the national average. Binge drinkers in New York State were higher than the national average at 19.6% (CDC, 2011). In the U.S., the majority of the population reported to have had at least one serving of alcohol within the past 30 days at about 57.1%. In New York State, 60.1% of the population reported having at least one serving of alcohol within the past 30 days (CDC, 2011). This data on alcohol use is very important to public health efforts in New York State to reduce excessive alcohol consumption which may increase the risk of harmful health conditions and put young adults especially, at risk of developing a calorie imbalance. Schroder et al. (2007) investigated excessive alcohol consumption as a possible risk factor for adult obesity. The researchers found that 19.3% of men and 2.3% of women reported alcohol consumption of more than three drinks a day, which was directly related with total energy intake and abdominal obesity (Schroder et al., 2007). For many young adults a positive calorie imbalance from excessive alcohol consumption may lead to unhealthy weight gain and obesity.

Physical Activity

There are many different types of exercises available to improve the health of people suffering from chronic diseases associated with obesity. In this study physical

activity is measured on participating in enough physical activity to meet CDC guidelines. The CDC guidelines for physical activity is 150 minutes of moderate intensity aerobic activity like brisk walking every week, and muscle strengthening activities on two or more days a week that work all major muscle groups, or 75 minutes of vigorous intensity aerobic activity like jogging or running every week, and muscle strengthening activities that work all major muscle groups 2 or more days a week (CDC, 2011).

One of the most common types of exercise that seems to have the greatest effect on improving health is aerobic exercise. According to the American College of Sports Medicine (ACSM) aerobic exercise requires the presence of oxygen, and anaerobic exercise occurs in the absence of oxygen (ACSM, 2013). Aerobic exercise is any activity that is sustained for more than two minutes, uses large muscle groups and is continuous and rhythmical. At this point the body switches from Adenosine Triphosphate (ATP) to oxygen for energy (ACSM, 2013). It is also called cardiovascular exercise, because aerobic exercise increases the heart rate in order to provide the body with oxygen. The ACSM (2013) has also published some examples of moderate intensity aerobic exercises. Some of the more common exercises include, brisk walking at 3-4 mph, home care and cleaning, mowing the lawn with a push mower, sweeping, and cleaning gutters. Some examples of anaerobic exercises are activities that last between 20 seconds to 2 minutes, such as a 40 yard dash. With aerobic cardiovascular exercise being one of the most important types of exercise for chronic disease prevention and weight management, resistance exercise is also important.

Resistance exercises are exercises that use skeletal muscle to help increase muscular strength and endurance. The benefits of resistance exercise are mainly to help improve muscular skeletal conditions, by increasing lean muscle mass. Lean muscle mass also has an important function in weight management due to the fact that lean muscle burns more calories than fat (ASCM, 2013). Just as important as engaging in physical activity is educating the public on the benefits of exercise. Resistance exercise may also help to improve muscle strength and endurance. Also with using resistance exercise to improve bone and muscle health may further help to improve the health of young adults. It seems that the most benefits may be achieved by incorporating multiple types of exercises. Also all types of physical activity have been shown to reduce the risk of many obesity related preventable chronic diseases (CDC, 2013).

Today however a sedentary lifestyle has been linked to an increased rate of mortality. Overall, physical activity and cardio respiratory fitness are important to help prevent premature death. The problem lies that most Americans do not exercise regularly. According to the 2008 National Health Interview Survey, 59% of adults who responded reported engaging in no vigorous activity that caused an increase heart rate or sweating (NHIS, 2008).

Within the last decade there has been an abundance of research on the health benefits of physical exercise. Reports from the CDC have confirmed that Americans participating in regular physical exercise have lower reports of chronic diseases (CDC, 2013). It seems that people of all ages both male and female benefit from physical exercise. Also throughout all population groups there are significant health benefits from

engaging in 30 minutes of brisk walking on most days of the week. Most experts believe that exercise on most days of the week is the most beneficial. One of the major finds about physical activity is that it helps reduce the risk of premature mortality in general, and of coronary heart disease, hypertension, colon cancer, diabetes mellitus, and obesity (CDC, 2013).

Physical activity is also important on the strengthening of muscles, ligaments, tendons, fascia and cartilage (WHO, 2013). One of the primary factors for growing strong healthy muscular tissue is mechanical stress during resistance exercise. Physical activity may just about benefit everyone in some way, no matter age or gender. Wareham (2007) found that the increased prevalence of obesity occurred simultaneously with the decreased rate of physical activity. Physical activity seems to have an impact on weight status in all age groups, and is a key component to proper weight management (Wareham, 2007). In addition, overweight or obese young adults who participant in physical activity that meets guidelines have a better chance to reduce their weight by 10%, which greatly reduces the risk of many obesity related chronic conditions (Donnelly et al., 2009). Research continues to show the overwhelming positive relationship physical activity has on the weight status of the American people, and is important to develop during young adulthood.

Healthcare Coverage

Another potential predictor of young adult obesity is lack of affordable healthcare coverage. There is a growing problem in the increasing cost for healthcare in the U.S. Fortuna, Robbins, Mani, and Halterman (2010) found that most young adults are relying

on emergency care due to a lack of affordable healthcare. It is also estimated that about 17% of adults did not have a primary care physician due to a lack of healthcare coverage (Pleis, Ward, and Lucas, 2009). Other researchers have reported young adults to have the lowest rate of healthcare coverage than any other age group (Park et al., 2006). One reason why young adults have the lowest rate of healthcare coverage is that many young adults go through a transition were they become ineligible for their parents health coverage and public coverage that covers adolescents (Park et al., 2006). This is an important finding and may be an influential factor why young adults living in New York State are the age groups with the lowest rate of healthcare coverage as well. The transition that many young adults go through may also affect their ability to afford the increasing cost of healthcare coverage.

One of the main reasons for this price increase is due to the increasing number of American's with health disparities. Despite the modern advancement in medical science, the U.S. is still one of the unhealthiest countries in the industrialized world, with an increasing number of U.S. citizens living with chronic health disparities, like hypertension, type 2 diabetes, high cholesterol, strokes, and heart disease (Beaglehole et al., 2011). With the U.S. being a modernized country one would think that its citizens would have better healthcare coverage and lower costs, but unfortunately the opposite is true. Improvements need to be made to prevent the U.S. healthcare costs from exceeding trillions of dollars, and at the same time improve the health insurance coverage to millions of uninsured Americans. This is a financial dilemma that young adults cannot afford. When comparing other industrialized countries on health, the U.S. ranked thirty-

seventh in the world on healthcare system performance (WHO, 2013). With the rising cost of healthcare coverage many young adults simply cannot afford it, and millions of U.S. citizens go without healthcare coverage. This is an unacceptable number and improved public health policies are needed in order to make sure every American has affordable healthcare coverage in order to reduce the growing rate of chronic health disparities.

With millions of young adults without healthcare coverage it is top priority to find a way to effectively reduce the cost of health insurance. The health of this nation is of great concern, with the increasing rate of chronic health disparities. There is also an equal concern with the rise of health insurance costs. The U.S. compared to other industrialized countries spent more than double on healthcare. The U.S. also has one of the highest healthcare costs in the world. It is estimated that the U.S. spends $6,423 per person each year (Sartor, 2005). This is an extremely high cost for healthcare, yet the U.S. ranks relatively low in quality compared to other industrialized countries. In 2002 the median costs of healthcare per person in most industrialized countries was $2,193 (John Hopkins University, 2005).

The U.S. healthcare system is complex and is faced with an overwhelming task of providing health services to an increasing number of Americans suffering from chronic health disparities. One huge contributing factor to the increase in health insurance costs is the dramatic rise in chronic health disparities associated with overweight and obesity. The national healthcare costs of obesity alone were estimated in 2008 to be $147 billion (Finkelstein, Trogdon, Cohen, & Dietz, 2009). Many other factors seem to contribute to

the rising costs to operate the healthcare system. The increase in chronic diseases, the aging population and the large number of uninsured may all be a factor. In recent years the cost of the U.S. healthcare system has reached historic highs. In 2008 the cost of the U.S. health care system was estimated at 15.2% of the nation's GDP and rising, which is considered the highest in the world (Keehan et al., 2008). In 2009 the cost of the healthcare system increased to 17.3% of GDP which is about $2.5 trillion. If the U.S. healthcare system continues to rise at its current rate it is estimated that by 2017 the U.S. will be spending close to 19.5% of GDP (Keehan et al., 2008). This is an alarming figure and more needs to be done by policy makers to greatly reduce the cost of operating the healthcare system. Clinically proven preventative health services could save more than 2 million life years annually, and save $3.7 billion in personal healthcare spending (Maciosek et al., 2010). This solution may be effective in addressing the significant predictors of young adult obesity. Further investigation is needed on the relationship between healthcare coverage and young adult obesity.

Prevention and Intervention

With obesity rates continually rising improved prevention and intervention programs are needed. Currently there is an increasing amount of evidence that supports obesity intervention programs. Obesity intervention programs that use a 12-month lifestyle intervention, promoting a healthier diet and physical activity have shown a clinically significant reduction in weight and cardio metabolic risk factors (Goodpaster et al., 2010). Also early childhood intervention to prevent obesity has been associated with weight reduction. Getting parents involved early on to promote physical activity with

their children has been shown effective in behavioral change (McGarvey et al., 2004). This is an important step in obesity intervention programs. Early prevention may be a key component in preventing young adults from developing obesity. One obesity intervention strategy that is associated with weight reduction is family based programming. Including the parents and the children together in a healthy lifestyle program based on nutrition, exercise, and behavior modification for a 24-month period has shown a 4.2% decrease in body fat, along with a decrease in fat mass, total cholesterol and improved insulin resistance (Savoye et al., 2011). In addition, local health departments that have obesity prevention programs report having a lower rate of obesity (Zhang et al., 2010).

One strategy to help implement an obesity prevention programs is through local health departments. It is estimated that nearly half of all health departments have an obesity prevention program (Zhang et al., 2010). This is a good start but, more needs to be done to help reduce obesity. Local health department intervention programs may be too broad and not specific enough. A three stage approach of primary, secondary and tertiary obesity prevention may be the most affective.

Primary prevention in the form of healthy lifestyle promotion may help prevent young adult obesity. Healthy lifestyle seminars educating and informing the young adult population on proper nutrition and exercise and effective ways to incorporate these activities into their daily lives may help many live a healthier life. Living a physically active lifestyle has been associated with a 40% reduction in obesity (Li et al., 2010). Also secondary prevention in the form of obesity screening programs from local health departments may help to reduce young adult obesity for those at risk. Obesity screening

may help young adults better understand the health risks of obesity by measuring associated risk factors like body mass index, height, weight, blood pressure, cholesterol levels, glucose levels, health history, family history, nutritional information and activity level. With monitoring these risk factors local health departments in conjunction with community health professionals can help reduce the risk of obesity. It is estimated that about 56% of local health departments have an obesity prevention program (Zhang et al., 2010). The researchers also suggested that increasing the percentage of obesity prevention programs in local health departments will help to reduce obesity rates by determining obesity risk factors. Along with primary and secondary obesity prevention programs, tertiary prevention in the form of intervention programs may be effective. Intervention programs may be effective in helping those suffering with obesity reverse the disease. An advantage of an intervention program that offers a multiple stage approach is that in these intervention programs may have nutritional, psychological and physical exercise planning which may be more effective in treating obesity then programs without these components. Intervention programs from local health departments that incorporate a nutritional and physical exercise component may help reduce obesity (Zhang et al., 2010).

In addition, obesity prevention programs that provide social support may also help increase the willingness of young adults to participate in obesity treatment and prevention. It seems that for younger obese adult's social contacts and normative beliefs can influence weight status and willingness for weight control (Leahey, LaRose, Fava, & Wing, 2011). Social support in worksites may also be an important factor in obesity

reduction. Since many adults spend a large portion of their day at work, offering weight loss social support at the worksite may help in encouraging healthier behaviors like increased physical activity (Tamers et al., 2011). Social support networks may be a key component in obesity prevention. Having social support form a network of people seems to have a positive effect on an individual's health.

Also using a state plan index to evaluate the quality of state plans to prevent obesity and other chronic diseases seem to be effective (Dunet, Butterfoss, Hamre, & Kuester, 2005). State based plan may be even more effective when state health departments help coordinate technical assistance and support to strengthen local community prevention efforts (Cousins, Langer, Thomas, & Rhew, 2011). Dunet, Butterfoss, Hamre, and Kuester, (2005) describe the importance of public health planning models in addressing the obesity epidemic within the U.S. With there being a lack in program evaluations within states, the researchers tested the state plan index to evaluate the quality of nine state obesity prevention plans. The state plan index was developed in conjunction with the CDC and various public health experts. The state plan index has 55 items based on quality, and each item was rated on a Likert scale from 0 to 5. Each item rated was then averaged and calculated with the SPSS statistical program. The results showed a mean average score for items of all plans at 2.4 out of 5.0. The range of average items was 1.0 to 3.0. The highest mean score within the state plan index was 3.3, and the lowest component score was plan implementation at 0.7. It seems that plan quality scores were higher when based on the single overall plan quality score. The researchers concluded that program evaluations can help strengthen obesity and chronic disease

prevention programs (Dunetet al., 2005). With millions affected by obesity and rates continuingly increasing, it is becoming a State as well as a National health crisis. Even with increased public health efforts obesity levels in children and young adults are on the increase. More certainly needs to be done in order to help stop the obesity epidemic. Obesity prevention programs along with public health policies may be more effective in finding a solution to obesity. Improved health behavior change intervention may be the next step in helping to reduce the prevalence of young adult obesity. Focusing on a state based obesity prevention program may help to reduce the incidence of young adult obesity in New York State. Prevention programs focusing on young adult obesity may also have residual effects on reducing the incidence of obesity statewide. If young adults are able to learn the skills and knowledge they need to manage a healthy weight, they may be more inclined to keep a healthy body weight throughout their lives.

Summary

Young adult obesity is a growing public health concern and the risk factors associated with the disease. Form the second half of the 20th century public health practitioners have been studying obesity and its associated risk factors in the adult population. Some of the risk factors of adult obesity are dyslipidemia, insulin resistance, and family history (CDC, 2011). Other risk factors may also include unhealthy dietary habits, lack of sleep, medication use and other risk factors not covered in this research, due to time and scope of questions used in the dataset. The CDC also stated that about a third of the U.S. adult population is obese and rising. Despite efforts to help reduce the rate of adult obesity, more young adults become obese each year. More needs to be done

in order to reverse the trend of increasing obesity rates. With better public awareness and improved health literacy on the negative health effects of obesity, and its associated risk factors may help be the first step in reducing young adult obesity rates. Also, offering more prevention options may be effective, because the disease is considered to be a chronic preventable disease linked to lifestyle choices.

It is known that obesity in the young adult population is on the rise, and that there are many potential risk factors (CDC, 2011). The literature has studied many of these potential risk factors of young adult obesity, but none have studied these risk factors on young adults living in New York State alone. There is more that needs to be further investigated to better understand what is causing the spike in obesity rates between the two young adult age groups in New York. With more of the public informed about the health implications of obesity and healthy effective ways to manage the disease, may help bring about positive social change to obesity prone individuals in New York State. These actions may start a new trend of decreasing the rate of young adult obesity. Chapter 3 provides the methodology used to further investigate the potential predictors for the dramatic increase in obesity rates between the two young adult age groups living in New York State.

Chapter 3: Research Method

Introduction

This chapter provides an overview of the research design and study concept. The data collection and data analysis process is described in detail. In addition, the reliability of the data is discussed. This section of the study allows the reader to better understand the viewpoints of the researcher in investigating the potential predictors of obesity in young adults living in New York State. There are many predictors that may contribute to the significant increase in obesity rates between the two age groups of young adults. Information and rationale on choosing the most appropriate research methods are further explained.

Purpose of the Study

The purpose of this study was to examine the potential predictors of obesity in young adults living in New York State, including physical activity, excessive alcohol consumption, and healthcare coverage. With obesity levels at epidemic proportions throughout the country, and with such a dramatic increase in obesity within the young adult population in New York State, more research is needed to better understand these potential predictors of obesity. With the attainment of more information on the predictors of young adult obesity, it may be possible to design and implement more effective prevention and intervention programs to reverse the trend of obesity in New York State and within the United States.

This chapter presents the cross sectional research design and approach used for the study. Further, this chapter details the methodology of the study, including the

instrumentation and operationalization of constructs, which was the 2011 BRFSS. The BRFSS is one of the largest telephone surveys gathered monthly in all 50 states and U.S. territories including Puerto Rico, U.S. Virgin Islands, and Guam. The BRFSS also gathers data by interviewing more than 350,000 adults each year. Data from the BRFSS were used to help answer the research questions and hypotheses. In addition, the research questions and hypotheses are presented, along with the data analysis procedures. Finally, threats to external validity and any ethical concerns are addressed.

Research Design and Approach

Variables

The independent variables in the study were physical activity levels, excessive alcohol consumption, and health care coverage for young adults living in New York State. The dependent variable was obesity. The covariates are age groups, gender, and race/ethnicity.

Research Design

This study was aimed at analyzing obesity predictors that may significantly contribute to the increasing prevalence of obesity in young adults in New York State. The study design was cross sectional due to time constraints. A cross sectional design was the most appropriate for this study because it is based on collecting prior data on participants of a similar group. The nature of the study was quantitative. The quantitative method was the most effective method for investigating the potential predictors of obesity in young adults. Prior researchers used a quantitative design to effectively study the incidence of

weight gain in young adults and this design was the most effective design in helping to answer the research questions (Tang, Kushner, Thompson, & Baker, 2010).

The study also used secondary data to investigate potential obesity predictors. In the study, it was a cohort of young adults living in New York State. The use of secondary data was the ideal approach for the study. The access to reliable data and statistics for analysis allowed the research questions to be answered quickly and efficiently. Other research methods would not have allowed the research questions to be answered as quickly and efficiently. Other methods involving original data collection would be more time consuming and costly (Castle, 2003). For this study the CDC's BRFSS data on New York State was used.

The BRFSS

The CDC's BRFSS is a U.S. based health survey system that collects information on health risk behaviors, disease prevention practices, and healthcare access (CDC, 2013). The data that is collected by the BRFSS is gathered monthly in all 50 states and U.S. territories including Puerto Rico, U.S. Virgin Islands, and Guam. The BRFSS also gathers data by interviewing more than 350,000 adults each year. Some of the important uses of the BRFSS are to help local and state health departments identify developing health issues, track health objectives, and develop and evaluate public health programs and policies (CDC, 2013). The BRFSS data was used because it contains crucial information on the potential predictors of young adult obesity. This informational data was thought to help explain if there were certain predictors of obesity in young adults living in New York State.

Methodology

Population

The population of the study was young adults living in New York State. The target population was the two young adult age groups of 18-24 years of age and 25-34 years of age. It is estimated that the two young adult age groups make up about 16% of the state population (BRFSS, 2011). The 16% make-up of young adults in New York State's total population of 19,378,104 is estimated to be about 3,100,496 (U.S. Census, 2010).

Sampling Procedures

The sampling procedures of the study was from the BRFSS. The BRFSS uses a randomized telephone survey of adults living in the U.S. and U.S. territories. The sample used in this study was based on data from participants who live in New York State. The inclusion criteria for the study is living in New York State and being between the ages of 18-34 years old. The exclusion criteria for the study is not living in New York State and either being younger than 18 years of age or older than 34 years of age.

Power Analysis

For the minimum sample size to achieve an effect size = .02 alpha = .05 and have a statistical power of 90%, 341 participants are needed (Rosner, 1995). In the study obtaining more than 341 participants was achieved by using 1,511 participants from the 2011 BRFSS to have a statistical power of 90%. The power is using a test value of 90% to show the expectation of finding a real effect 90% of the time (Rosner, 1995).

Procedures for Recruitment, Participation, and Data Collection

Recruitment and participation

The BRFSS recruits participants through state health departments conducting randomized telephone interviews based on numbers provided by the CDC in all U.S. States and territories (CDC, 2012). The interview is based on a member of a household 18 years or older to answer questions and participate in the survey. Participants were also advised that they can stop at any time or refuse to answer any questions. At the end of interview the data are than inputted in a database where the health departments further check the data to ensure validity.

Data collection

Data available at the CDC from the BRFSS on physical activity levels, excessive alcohol consumption, and health care coverage was examined. Data extracted from this source was from 2011. Data collected from the BRFSS was collected based on person to person interviews and personal surveys administered by the New York State Department of Health.

The data extracted was electronically accessed at the primary data collection source through the internet. The secondary data used from the BRFSS is available on the internet for public use. In addition, written authorization for data use was obtained. The CDC letter can be seen in Appendix A. The data used in this study was in accordance with the requirements for use of human subjects of the Internal Review Board (IRB) of Walden University and with permission from the CDC. IRB approval number 07-07-14-

0307955. All procedures have adhered to CDC policies for the use of data collection made available for public use.

Instrumentation and Operationalization of Constructs

BRFSS Instrument

The BRFSS was first developed by the CDC in 1984, with 15 states participating in monthly data collection (CDC, 2013). The BRFSS has provided appropriate data on physical activity, excessive alcohol consumption, healthcare coverage, age, gender, and race/ethnicity. With permission from the CDC the BRFSS instrument used in this study has reduced the potential for participant bias, which may sometimes occur in other data collection methods, as well as researcher bias. The permission letter from the CDC is shown in Appendix B. The BRFSS is known to be one of the largest ongoing telephone health surveys systems that tracks the health of the U.S population (BRFSS, 2011). This system started collecting data in 1984 and is conducted by state health departments in all 50 states and U.S. territories. Also, the BRFSS has been found to be a reliable and valid instrument in collecting health data (Stein, Lederman, & Shea, 1993). The researchers assessed the BRFSS in Massachusetts based on a re-interview on a random sample of adults n=122 and a separate sample of Black and Hispanic adults n=200. The results showed no statistically significant differences in distribution of demographic or risk factor variables, and reliability coefficients for behavioral risk factors were mainly above 0.70 (Stein et al., 1993). The BRFSS has the ability to provide helpful and important data on obesity rates in young adults living in New York State, as well as many potential predictor of obesity.

The first phase of the research was based on data collected from the BRFSS, and exported into SPSS. The data that was exported into SPSS was obesity rates of the two young adult age groups of 18-24 and 25-34 years of age. In addition, the three potential predictors of obesity physical activity level, excessive alcohol consumption, and health care coverage were exported into SPSS based on the two young adult age groups. Once the data was exported into SPSS, several techniques were used to analyze the data.

Operationalization

Dependent variable

The primary dependent variable was obesity. Obesity was classified as having a body mass index (BMI) $\geq 30 kg/m^2$ (CDC, 2013). BMI was calculated based on self-reported height and weight. Participants were asked to answer "About how tall are you without shoes?" (CDC, 2011). Responses were given in inches. Participates were also asked "About how much do you weight without shoes?" (CDC, 2011). Responses were given in pounds.

Independent Variables

The primary independent variables were physical activity, excessive alcohol consumption, and health care coverage.

Physical Activity

According to the CDC (2011), physical activity is engaging the body's large muscles such that they move in a rhythmic manner for a sustained period of time. Some examples of physical activity include walking, running, and swimming, and biking. Physical activity was measured in the BRFSS by asking participants to respond to the

following questions. Participants were asked the question “Have you participated in enough aerobic and muscle strengthening exercises to meet guideline?” (CDC, 2011a). Responses were either yes or no. The CDC guidelines for physical activity are “Participating in 150 minutes of moderate intensity aerobic activity like brisk walking every week, and muscle strengthening activities on 2 or more days a week that work all major muscle groups, or 75 minutes of vigorous intensity aerobic activity like jogging or running every week, and muscle strengthening activities that work all major muscle groups 2 or more days a week” (CDC, 2011a).

Excessive Alcohol Consumption

Is defined by CDC, as the taking of any drink that contains 0.6 ounces (14.0 grams or 1.2 tablespoons) of pure alcohol. Generally, this amount of pure alcohol is found in 12-ounces of regular beer or wine cooler. 8-ounces of malt liquor, 5-ounces of wine and a 1.5-ounces of 80-proof distilled spirits or liquor (e.g., gin, rum, vodka, whiskey). Excessive alcohol consumption was measured in the study by asking the survey participants the question “Do you consume five or more drinks on one occasion” if the participate was Male, and “Do you consume four or more drinks on one occasion” if the participate was a female. The Responses are either yes or no.

Healthcare Coverage

CDC defines health coverage as having private health insurance plans, prepaid plans or government plans like Medicare. Participants were asked the question “Do you have any kind of health care coverage, including health insurance, prepaid plans such as

HMOs, or government plans such as Medicare?" (CDC, 2011a). Responses were either yes or no.

Covariates

The covariates were age groups, gender, and race/ethnicity.

Age factor

For age two groups were used in this study to further investigate why the prevalence of obesity doubles within the young adult age groups of 18-24 year olds to 25-34 year olds. Participants were asked "What is your age?" (CDC, 2011a). Responses were in numerical form.

Gender factor

For gender, participants were asked "What is your sex?" (CDC, 2011a). Responses were either male or female.

Race/Ethnicity

For race/ethnicity, participants were asked "Which one of these groups would you say best represents your race (White/Black or African American/Asian/Native Hawaiian or Pacific Islander/American Indian or Alaska Native/Other?" (CDC, 2011a). Responses were based on racial/ethnic group. Participants were also asked in a separate question "Are you Hispanic or Latino?" (CDC, 2011a). Responses were either yes or no.

Data Analysis Plan

For the data analysis all data was weighted. The mean obesity percentage of the two young adult age groups was calculated and compared. Secondly, the mean percentage of young adults who engage in physical activity, excessive alcohol

consumption, and have health care coverage was calculated and compared. Third a Pearson correlation analysis was used to show the relationship between each potential predictor variable to the dependent variable obesity and compared by age group. Finally, a multiple regression analysis was conducted on physical activity, excessive alcohol consumption, and health care coverage to determine which potential predictor contributes the most to the increased prevalence of obesity between the two young adult groups living in New York State.

The statistical analyses of the study was conducted with the SPSS 21 software package. SPSS is a statistical processing and analysis software system, which was used for data set formation and statistical analysis. The text using SPSS for Windows and Macintosh: Analyzing and understanding data 6th edition was used for assistance in the statistical analysis process. Univariate statistics were calculated (frequencies and means) and variables were recoded as necessary to prevent skewed distributions. Bivariate analysis was used to compare the two young adult age groups to the independent variables. Multivariate tests were performed: Pearson correlation and multiple regression analysis was used to test the hypotheses. Demographics of age groups, gender and race/ethnicity were included as covariates to adjust for potential confounding. The results of the tests were based on a 95% probability value and an alpha = .05.

Research Questions and Hypotheses

RQ1: Is there a relationship between physical activity and obesity in the young adult age groups living in New York State?

$H1_0$: There is no relationship between physical activity and obesity in the young adult age groups living in New York State.

$H1_a$: There is a relationship between physical activity and obesity in the young adult age groups living in New York State.

RQ2: Is there a relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State?

$H2_0$: There is no relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State.

$H2_a$: There is a relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State.

RQ3: Is there a relationship between healthcare coverage and obesity in the young adult age groups living in New York State?

$H3_0$: There is no relationship between healthcare coverage and obesity in the young adult age groups living in New York State.

$H3_a$: There is a relationship between healthcare coverage and obesity in the young adult age groups living in New York State.

RQ4: Which potential predictor (physical activity, excessive alcohol consumption, or healthcare coverage when factoring for gender and race/ethnicity has the strongest association with obesity prevalence between the two young adult age groups living in New York State?

$H4_0$: It is not expected that the potential predictor (physical activity, excessive alcohol consumption, or healthcare coverage) will contribute the most to the increase in obesity prevalence between the two young adult age groups.

$H4_a$: It is expected that the potential predictor (physical activity, excessive alcohol consumption, or healthcare coverage) will contribute the most to the increase in obesity prevalence between the two young adult age groups.

Threats to Validity

Data reliability and validity was assessed by the data source the CDC, to be reliable with minimal threats to external and internal validity. This data source has developed procedural methods that account for participation rates, and dropout rates (CDC, 2011a). The BRFSS is conducted through one on one interviews, and the data collected by this source is considered very reliable. Other studies have shown that the BRFSS is reliable and valid (Stein, Leberman, and Shea, 1993). Nelson et al. (2001) reviewed and summarized reliability and validity studies of measures on the BRFSS and measures form other similar surveys. The researchers found that the core questions of the BRFSS were at the least moderately reliable and valid (Nelson et al., 2001). The BRFSS has continued to prove to be a very important and valid resource in public health research.

Ethical Considerations

All components of the study were carefully planned to avoid any potential ethical conflicts. Ethical considerations were practiced in respect to human subjects, as noted by the Internal Review Board (IRB) of Walden University. Consent from the IRB was

obtained prior to collecting any data. In addition, permission to use the BRFSS data was acquired by the CDC prior to data collection and analysis. The identity of the participants were protected by the fact the BRFSS is anonymous. I have personally handle all information imported to SPSS from my password protected laptop. I am the only one who will have access to the information. The data will be stored in a secure location in my home for a 5 year period, after which it will be destroyed.

Summary

This chapter presented the research design and methodology of the study. The study was a quantitative cross sectional aimed at investigating what predictors may be significantly contributing to the increasing prevalence of obesity in young adults. The independent variables were physical activity, excessive alcohol consumption, and health care coverage, and the dependent variable was obesity. Randomized data from the BRFSS was used to respond to the research questions as it contains the independent and dependent variables. The population of the study was the two young adult age groups of 18-24 years of age, and 25-34 years of age. The results of the study will be presented in detail in Chapter 4.

Chapter 4: Data Collection and Analysis

Introduction

This quantitative cross sectional study was conducted to examine the relationship of some potential predictors of obesity in young adults living in New York State. The purpose of this study was to examine the potential predictors of obesity in young adults living in New York State physical activity, excessive alcohol consumption, and healthcare coverage. It is estimated that 9.5% of 18-24 year olds are obese, and 20.9% of 25-34 year olds living in New York are obese (CDC, 2011). I examined the three potential predictors of young adult obesity, physical activity, excessive alcohol consumption, and healthcare coverage. Data from the CDC's 2011 BRFSS was imported into SPSS version 21. The data from a sample of 1,511 participants was analyzed using SPSS. It was also used to name, recode, and define the variables. The quantitative data imported into SPSS database consisted of 1,511 rows, which corresponded to the number of participants. This chapter presents the data collection procedures, data analysis, results, research questions and hypotheses, and summary.

Data Collection

The populations used for this study were the two young adult age groups of 18-24 and 25-34 years living in New York State. All data utilized was open and available to the public. Data used for this study was collected during the 2011 calendar year. Originally the BRFSS data consisted of 7,736 participants. Data from all adults over the age of 34 years (n = 6,225) were excluded from the final sample. All data were coded in order to

present nominal structure for database analysis. All data was also collected based on the original plan described in Chapter 3.

The first phase of the research was based on data collected from the 2011 BRFSS and imported into SPSS. The data that was imported into SPSS was for the two young adult age groups of 18-24 and 25-34 years of age. The variables for the three potential predictors of obesity physical activity, excessive alcohol consumption, and healthcare coverage were used, as well as the covariates of age group, gender, and race/ethnicity. The inclusion of the covariates were used to help reduce confounding in the study.

Dependent Variable Data Collection

Obesity

Obesity was classified as having a body mass index (BMI) ≥30kg/m² (CDC, 2013). BMI was calculated based on self-reported height and weight. Participants were asked to answer "about how tall are you without shoes?" (CDC, 2011). Responses were given in inches. Participates were also asked "about how much do you weight without shoes?" (CDC, 2011). Responses were given in pounds. A higher percentage of 25-34 year olds were obese (17%) compared to (9.6%) for 18-24 year olds.

Independent Variable Data Collection

Physical Activity

The question asked for physical activity that was used to define the physical activity variable was "have you participated in enough aerobic and muscle strengthening exercises to meet guideline" (CDC, 2011). The CDC guidelines for physical activity are "participating in 150 minutes of moderate intensity aerobic activity like brisk walking

every week, and muscle strengthening activities on 2 or more days a week that work all major muscle groups, or 75 minutes of vigorous intensity aerobic activity like jogging or running every week, and muscle strengthening activities that work all major muscle groups 2 or more days a week" (CDC, 2011). Similar, results were found for the age groups. Approximately 22% of both the 18-24 year olds and 25-34 year olds indicated that they had participated in enough aerobic and muscle strengthening exercises to meet the guidelines.

Excessive Alcohol Consumption

For excessive alcohol consumption, participants were asked the question "Do you consume five or more drinks on one occasion" if the participate was a male, and "Do you consume four or more drinks on one occasion" if the participate was a female. A higher percentage of the 18-24 year old group indicated that they consumed five or more drinks on one occasion (35.9%) than the 25-34 year old group (18.7%).

Healthcare Coverage

The question asked for health care coverage is "Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?" (CDC, 2011). Participants who were 18-24 year olds had a slightly higher rate of healthcare coverage (79.5%) compared to 25-34 years (79.1%).

Covariate Data Collection

The covariates are age groups, gender, and race/ethnicity.

Age Groups

For age groups, participants were asked "What is your age?" (CDC, 2011). Responses were given in numerical form. For gender, participants were asked "What is your sex?" (CDC, 2011). There was a higher percentage of females for both age groups (60.6%) of 18-24 year olds, and (62.2%) of 25-34 year olds. There were more male participants for the age group 18-24 years old (39.4%) as compared to males from 25-34 years old (37.8%).

Race/Ethnicity

For race/ethnicity, participants were asked "Which one of these groups would you say best represents your race (White/Black or African American/Asian/Native Hawaiian or Pacific Islander/American Indian or Alaska Native/Other?" (CDC, 2011). Responses were given based on racial/ethnic group. Of the 18-24 year olds, 87.6% were White, 6.9% Black/African American, 4% Asian, .02% Native Hawaiian/Pacific Islander, .04% American Indian/Alaska Native and .09% other. Of the 25-34 year olds, 83% were white, 6.9% Black/African American, 3.2% Asian, .03% Native Hawaiian/Pacific Islander, 1.3% American Indian/Alaska Native, and none reporting other. To determine ethnicity, participants were asked "Are you Hispanic or Latino?" (CDC, 2011). The results were that more of the 25-34 year olds (10.6%) were Hispanic compared to the 18-24 year olds (4.9%). The population used in this study is considered to be a valid representation of the state population (Nelson et al., 2001). The variables associated with these questions were imported into SPSS based on the two young adult age groups.

Data Analysis

Once the data was exported into SPSS, several techniques were used to analyze the data. First, descriptive statistics on the demographic of the two young adult age groups were calculated and compared. Next the mean obesity percentage of the two young adult age groups were calculated and compared. Then, the mean percentage of young adults who engage in physical activity, excessive alcohol consumption, and have health care coverage were calculated and compared. In addition, a Pearson correlation analysis was used to show the relationship between each potential predictor variable to the dependent variable obesity. Finally, a multiple regression analysis was conducted on physical activity level, excessive alcohol consumption, and healthcare coverage to determine which potential predictor contributes the most to young adult obesity. The findings based on the data analysis are further discussed in this chapter.

Results

Descriptive Statistics: Demographic Data

The descriptive statistics of the demographics of the two young adult age groups were calculated and compared and mostly seems to be a valid representation of only young adults living in New York State (U.S. Census, 2013). Majority of the samples were from the White population while a small portion of the samples was African Americans and Hispanics which reflects the overall sample within the state of New York. In the final analytical sample, there were 1,511 total participants. Of those, the vast majority were 25-34 year olds (n = 1,041), while the remaining 470 participants were 18-

24 years old. This is the analytical sample based on the original sample of 7,736 participants after excluding adults 35 years or older.

For gender, 39% of the 18-24 year olds were male and 61% were female. For 25-34 year olds, 38% were male and 62% were female. For race, 87.6% of the 18-24 year olds were White, 6.9% were Black/African American, 4% were Asian, .02% were Native Hawaiian/Pacific Islander, .04% were American Indian/Alaska Native, and .09% were other/Mixed race. In the 25-34 year olds, 83% were White, 12.2% were Black/African American, 3.2% were Asian, .03% were Native Hawaiian/Pacific Islander, 1.3% were American Indian/Alaska Native, and no recording of other/mixed race. In examining the ethnicity of the group, 4.9% of the 18-24 year olds and 10.6% 25-34 year olds were Hispanic, as displayed in Table 1.

Table 1

Demographics

Age groups	Gender		Race	
18-24	Male	39%	White	87.6%
	Female	61%	Black/African American	6.9%
			Asian	4%
			Native Hawaiian/Pacific Islander	.02%
			American Indian/Alaska Native	.04%
			Other/Mixed	.09%
			Hispanic	4.9%
25-34	Male	38%	White	83%

Female	62%	Black/African American	12.2%
		Asian	3.2%
		Native Hawaiian/Pacific Islander	.03%
		American Indian/Alaska Native	1.3%
		Other/Mixed	N/A
		Hispanic	10.6%

The mean obesity prevalence of the two young adult age groups were calculated and compared. The obesity mean for the 18-24 year old age group (M = 9.6; SD=2.19) was considerably less than the 25-34 year old age group (M=17; SD=2.19), displayed in Table 2.

Table 2

Mean Obesity Prevalence

Age Groups	*M*	*SD*
18-24	9.6	2.19
25-24	17	2.19

Research Questions and Hypotheses

RQ1**.** Is there a relationship between physical activity and obesity in the young adult age groups living in New York State?

*H*1**0:** There is no relationship between physical activity and obesity in the young adult age groups living in New York State.

$H1_a$**:** There is a relationship between physical activity and obesity in the young adult age groups living in New York State.

The results of the study indicated that there is sufficient evidence to reject the null hypothesis, which stated that there is no relationship between physical activity and obesity in the young adult age groups living in New York State.

The BRFSS question asked on physical activity was "participated in enough aerobic and muscle strengthening exercises to meet guidelines" (CDC, 2011). A descriptive analysis was preformed to compare the rate of physical activity between the two young adult age groups. The rate of physical activity was slightly higher in the 18-24 year old age group (M = 22.1; SD = .415) compared to the 25-34 year old age group *(*M = 22; SD = .414).

Table 3

Mean Percentage of Young Adults Who Participate in Physical Activity

Age Groups	*M*	*SD*
18-24	22.1	.415
25-34	22	.414

The Pearson correlation analysis showed that there was a statistically significant relationship between physical activity and obesity between the two age groups r(.230) = -.001; $p < .05$, for 18-24 year olds. r(.328) = .015; $p < .05$, for 25-34 year olds. This supports the alternative hypothesis that there is a relationship between physical activity and obesity in the young adult age groups living in New York State.

Table 4

Results of the Pearson Correlation-Physical Activity

Age Groups	*R*	*P*
18-24	r(.230)	.001*
25-34	r(.328)	.015*

Note. *denotes significance (p <. 05).

RQ2**.** Is there a relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State?

*H*2$_0$**:** There is no relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State.

*H*2$_a$**:** There is a relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State.

The results of the analysis indicted that there is insufficient evidence to reject the null hypothesis that there is no relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State.

The BRFSS question asked on excessive alcohol consumption was "Do you consume five or more drinks on one occasion" if the participate was a male, and "Do you consume four or more drinks on one occasion" if the participate was a female (CDC, 2011). A descriptive analysis was performed to compare the rates of excessive alcohol consumption between the two young adult age groups. The rate of excessive alcohol consumption was higher for the 18-24 year old age group (*M* = 39.5; *SD* = .480) compared to the 24-34 year olds (*M* = 18.7; *SD* =.390).

Table 5

Mean Percentage of Young Adults Who Consume Excessive Alcohol

Age Groups	*M*	*SD*
18-24	39.5	.480
25-34	18.7	.390

The Pearson correlation analysis failed to show a statistically significant relationship between excessive alcohol consumption and obesity for 18-24 year olds $r(.230) = -.120$; $p < .05$, and for 25-34 year olds $r(.328) = -.567$; $p < .05$. This result fails to support the alternative hypothesis that there is a relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State.

Table 6

Results of the Pearson Correlation-Excessive Alcohol Consumption

Age Groups	*R*	*P*
18-24	r(.230)	-.120
25-34	r(.328)	-.567

Note. *denotes significance ($p < .05$).

RQ3. Is there a relationship between healthcare coverage and obesity in the young adult age groups living in New York State?

$H3_0$: There is no relationship between healthcare coverage and obesity in the young adult age groups living in New York State.

$H3_a$: There is a relationship between healthcare coverage and obesity in the young adult age groups living in New York State.

The results of the analysis indicted that there is insufficient evidence to reject the null hypothesis that there is no relationship between healthcare coverage and obesity in the young adult age groups living in New York State.

The BRFSS question to measure healthcare coverage was "Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?" (CDC, 2011). A descriptive analysis was performed to compare the rates of healthcare coverage between the two young adult age groups. The rate of healthcare coverage was slightly higher for the 18-24 year old age group (M = 79.5; SD = .404) compared to the 24-34 year olds (M = 79.1; SD = .407).

Table 7

Mean Percentage of Young Adults Who Have Healthcare Coverage

Age Groups	*M*	*SD*
18-24	79.5	.404
25-34	79.1	.407

The Pearson correlation analysis failed to show a statistically significant relationship between healthcare coverage and obesity between the two age groups $r(.230) = .457$; $p < .05$, for 18-24 year olds. $r(.328) = .073$; $p < .05$, for 25-34 year olds. The results of the analysis indicated a lack of support for the hypothesis that there is a relationship between healthcare coverage and obesity in the young adult age groups living in New York State.

Table 8

Results of the Pearson Correlation-Healthcare Coverage

Age Groups	*R*	*P*
18-24	r(.230)	.457
25-34	r(.328)	.073

Note. *denotes significance (p <. 05).

RQ4**.** Which potential predictor (physical activity, excessive alcohol consumption, or healthcare coverage) when factoring for gender and race/ethnicity has the strongest association with obesity prevalence between the two young adult age groups living in New York State?

*H*4$_{0}$**:** It is not expected that the potential predictor (physical activity, excessive alcohol consumption, or healthcare coverage) will contribute the most to the increase in obesity prevalence between the two young adult age groups.

*H*4$_{a}$**:** It is expected that the potential predictor (physical activity, excessive alcohol consumption, or healthcare coverage) will contribute the most to the increase in obesity prevalence between the two young adult age groups.

The results of the analysis indicated that there is sufficient evidence to reject the null hypothesis that it is not expected that the potential predictor (physical activity, excessive alcohol consumption, or healthcare coverage) will contribute the most to the increase in obesity prevalence between the two young adult age groups.

A multiple regression analysis was performed in order to determine which of the potential predictors had the strongest association with obesity prevalence between the

two young adult age groups living in New York State. The results of the analysis showed that physical activity had statistically significant associations with obesity prevalence in 18-24 year olds β = -.030; $p < .05$, $R^2 = .250$, and in 25-34 year old young adults living in New York State β = .022; $p < .05$. $R^2 = .335$, $p < .05$. The results showed that physical activity had the strongest association with obesity in both age groups.

Examination of standardized betas for individual predictors in 18-24 year olds, physical activity (β = -.030), excessive alcohol consumption (β = .173), and healthcare coverage (β = -.483), for 25-34 year olds physical activity (β = .022), excessive alcohol consumption (β = -.573), and healthcare coverage (β = .107). This supports the alternative hypothesis that it is expected that one of the potential predictors (physical activity, excessive alcohol consumption, or healthcare coverage) has contributed the most to the increase in obesity prevalence between the two young adult age groups. In this study, physical activity was the greatest predictor.

Table 9

Multiple Regression Analysis for Predicting Obesity Prevalence

Age Groups	Predictors	B(SE)	β	Partial r	T
18-24	Physical Activity	-.102(.201)	-.030*	-.034*	-.506
	Alcohol Consumption	-.517(.181)	-.173	-.184	-2.86
	Healthcare Coverage	4.06(.494)	.483	.481	8.22
25-34	Physical Activity	.101(.160)	.022*	.027*	.632
	Alcohol Consumption	-2.81(.173)	-.573	-573	-16.245

Healthcare Coverage	1.58(.522)	.107	.130	3.04

Note. R^2 = .250, .335. *denotes significance ($p < .05$).

Summary

This quantitative, cross sectional study examined the relationship of three potential predictors of young adults living in New York State. Each potential predictor was examined independently as well as collectively. The data source used was from the 2011 CDC's BRFSS. All data was exported into SPSS 21 and coded. Each research question and hypothesis was addressed. The mean percentage of each potential predictor was analyzed to determine the comparative differences between the two young adult age groups. A Pearson's correlation analysis was conducted to determine the relationship of each potential predictor to young adult obesity rates. In addition, a multiple regression analysis was performed in order to determine if the potential predictors collectively had a statistically significant relationship in young adult obesity rates. In Chapter 5, the findings have been discussed and interpreted. Conclusions will be drawn based on the results of the study, and recommendations for action and further research will be presented.

Chapter 5: Summary, Conclusion, and Recommendations

Introduction

The purpose of this study was to investigate the potential predictors of obesity in young adults living in New York State. The potential predictors of young adult obesity examined were physical activity, excessive alcohol consumption, and healthcare coverage. It is of great concern to better understand which predictors may be causing obesity rates to reach epidemic proportions throughout the country, and within the young adult population in New York State. Obesity has been linked to many other negative health disparities, and more research is needed to better understand the potential predictors of obesity. With the attainment of more information on the predictors of young adult obesity, it may be possible to design and implement effective prevention and intervention programs to reverse the trend of young adult obesity in New York State and within the United States. In this final chapter, the findings of this quantitative cross sectional study are discussed. This chapter provides the limitations and assumptions of the study. In addition, implications for social change and recommendations for future research are presented.

Interpretation of the Findings

In this quantitative cross sectional study, I examined the relationship of the three potential predictors (physical activity, excessive alcohol consumption, and healthcare coverage) of obesity in young adults living in New York State. Quantitative data from the 2011 BRFSS were collected and analyzed. The research questions and hypotheses were

based on the three potential predictors of young adult obesity. This study revealed which potential predictors had a significant relationship between the two young adult age groups living in New York State. Descriptive statistics were analyzed for the sample (n = 1,511) in relation to each potential predictor.

Each predictor in the study was analyzed separately using a Pearson's correlation analysis to determine whether there is a significant relationship between young adult obesity and potential predictors such as physical activity, excessive alcohol consumption, and healthcare coverage. The results indicated that the potential predictor of physical activity was significantly related to obesity in both young adult age groups. However, potential predictors such as excessive alcohol consumption and healthcare coverage were not significantly related to young adult obesity.

Physical Activity

Physical Activity Hypothesis

RQ1**.** Is there a relationship between physical activity and obesity in the young adult age groups living in New York State?

$H1_0$**:** There is no relationship between physical activity and obesity in the young adult age groups living in New York State.

$H1_a$**:** There is a relationship between physical activity and obesity in the young adult age groups living in New York State.

The analysis for this study indicated that there is sufficient evidence to reject the null hypothesis, which stated that there is no relationship between physical activity and obesity in the young adult age groups living in New York State.

Interpretation and Analysis: Physical Activity

In this study, only the predictor variable of physical activity was determined to be a significant predictor of young adult obesity in both age groups (β = -.030; $p < .05$, R^2 = .250, $F(6, 225)$ for 18-24 years old and β = .022; $p < .05$. R^2 =.335, $p < .05$ for 25-34 year old young adults living in New York State. Both age groups reported similar rates of physical activity at approximately 22%. The analysis showed that there was a statistically significant relationship between physical activity and obesity between the two age groups after factoring in race and gender as covariates, $r(.230) = -.001$; $p < .05$, for 18-24 year olds. $r(.328) = .015$; $p < .05$, for 25-34 year olds. This finding was consistent with previous research from Wareham (2007), who found that physical activity had an impact on weight status for all age groups and is a key component for healthy weight management. According to Wareham, younger individuals are more engaged in physical extraneous activities because they are more willing to explore their physical strength. Moreover, the more individuals exert effort on physical activities, the more they lose weight. Physical activities such as fitness exercise allow individuals to burn calories, which would then lower their weight. Thus, obesity is significantly affected by physical activities of individuals (Wareham, 2007).

Other researchers have also found physical activity to have a significant relationship to obesity. For example, Spees et al. (2012) investigated the differences in the amount and types of physical activity by obesity status in the U.S. The obesity status is based on the classification of individuals as older adults, young adults, children, and infants. The researchers found that significantly more normal weight adults engaged in

more physical activity at moderate and vigorous intensities than obese adults did, which supports the findings from this study that physical activity has a significant influence on weight status. Based on the results of this study, findings of existing studies such as Wareham (2007) and Spees et al., (2012) are supported in terms of determining the relationship of obesity and physical activities. This study determined that younger adults are more engaged in physical activities and that it is significantly related to prevalence of obesity among young adults. One of the major finds about physical activity is that it helps reduce the risk of premature mortality in general, and of coronary heart disease, hypertension, colon cancer, diabetes mellitus, and obesity (CDC, 2013). This important finding is based on previous research from Donnelly et al. (2009), who found that individuals who met physical activity guidelines had a better chance of reducing their weight by 10%, which greatly reduced their risk of related chronic conditions. Physical activity can also help increase lean muscle mass, which is an important function in weight management because lean muscle burns more calories than fat does (ACSM, 2013).

In view of the previously mentioned research, Spees et al. (2012), on the significance of physical activity on obesity, the findings show some supporting evidence. Physical activity has been shown in the literature to have multiple health benefits including weight management. This is an important factor in obesity prevention. With obesity rates increasing in the young adult populations, physical activity seems to be a strong factor in an individual's body weight. Obesity is a complex issue involving physiological, psychological, and environmental factors (Colapinto, Fitzgerald, Taper, &

Veugeles, 2007). The complexity of obesity is an important concept to understand when developing obesity prevention programs. The finding in this study suggests that physical activity may be an important component in developing weight reduction programs for young adults living in New York State. Because younger adults are more engaged in physical activities, as indicated in the results of this study, weight reduction programs should understand what type of physical activities are appropriate for each age group. Similarly, the supporting evidence of this study to the relationship of obesity and physical activities indicated that younger adults have less prevalence of obesity because they engage more in physical activities (Spees et al., 2012). Thus, this also justifies the need to promote physical activities within the state of New York to lessen the prevalence of obesity. The findings may also be supported by conducting future studies based on the health belief model, by showing a relationship that the older age group has a perceived barrier towards physical activity.

Excessive Alcohol Consumption

Excessive Alcohol Consumption Hypothesis

RQ2. Is there a relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State?

$H2_0$**:** There is no relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State.

$H2_a$**:** There is a relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State.

The analysis of this study indicated that there is insufficient evidence to reject the null hypothesis, which stated that there is no relationship between excessive alcohol consumption and obesity in the young adult age groups living in New York State.

Interpretation and Analysis: Excessive Alcohol Consumption

Excessive alcohol consumption when analyzed alone failed to show a significant correlation between excessive alcohol consumption and obesity for 18-24 year olds $r(.230) = -.120$; $p < .05$, and for 25-34 year olds $r(.328) = -.567$; $p < .05$. This was an unexpected result based on the study conducted by Schroder et al. (2007) who concluded that excessive alcohol consumption of more than three drinks a day was directly related to total energy intake and abdominal obesity. Thus, it was expected in this study that excessive alcohol consumption would be associated with the prevalence of obesity. However, the results were negated because insignificant correlations were observed between the variables. This was an unexpected result, considering that the 25-34 year old age group had an obesity prevalence of 17%, which was nearly twice that of the 18-24 year old age group at 9.6%. The findings in the study showed a much higher rate of excessive alcohol consumption for 18-24 year olds of 39.5%, compared to 18.7% for 25-34 year olds. This is also an unexpected finding, as the older age group had the higher obesity rate (9.6% for younger age group and 17% for older age group). One explanation of the insignificance of the relationship of excessive alcohol intake and obesity prevalence is based on research from Kim and Jeon (2011) who found that excessive alcohol consumption may be associated with obesity when combined with low physical activity levels. According to the BRFSS about 6.6% of the U.S. population drinks heavily

and 18.3% of the population binge drink (CDC, 2011). According to the CDC (2011), 6.2% of the population drinks heavily which is slightly less than the national average. Binge drinkers in New York State were higher than the national average at 19.6% (CDC, 2011). Therefore, based on the results of this study, there is insufficient evidence to attribute the obesity prevalence in New York to excessive alcohol intake of young adults. Instead, this indicates that other factors should be considered to address the issue of obesity in New York.

One possible explanation for the mixed results on excessive alcohol consumption on the obesity rate of young adults living in New York State may be due that the younger age group has a higher metabolism due to increased physical activity levels (Goodpaster et al., 2010). Even though drinking alcohol is common in the U.S. excessive alcohol consumption can increase the risk of many negative health conditions (CDC, 2011). It may also be possible that excessive alcohol consumption in the form of heavy drinking or binge drinking may lead to an increase of empty calories putting an individual at risk of weight gain with age. Because young adults have the highest rate of excessive alcohol consumption and may lead to negative health consequences future studies using the health belief model may help better understand the barriers young adults have in reducing alcohol intake.

Healthcare Coverage

Healthcare Coverage Hypothesis

RQ3**.** Is there a relationship between healthcare coverage and obesity in the young adult age groups living in New York State?

*H*3**0:** There is no relationship between healthcare coverage and obesity in the young adult age groups living in New York State.

*H*3**a:** There is a relationship between healthcare coverage and obesity in the young adult age groups living in New York State.

The analysis of this study indicated that there is insufficient evidence to reject the null hypothesis, which stated that there is no relationship between healthcare coverage and obesity in the young adult age groups living in New York State.

Interpretation and Analysis: Healthcare Coverage

The potential predictor of healthcare coverage was determined to be insignificantly related to obesity for both age groups. The analysis failed to show a significant correlation between healthcare coverage and obesity between the two age groups $r(.230) = .457$; $p > .05$, for 18-24 year olds, and $r(.328) = .073$; $p > .05$, for 25-34 year olds. This study showed that the older age group had a slightly lower rate of healthcare coverage at 79.1% compared to the younger adult age group at 79.5%. This was an unexpected finding based on previous research on healthcare coverage. Pleis, Ward, and Lucas (2009) stated that about 17% of adults do not have a primary care physician, which may lead to undiagnosed health disparities. Improvements need to be made to increase the rate of health insurance coverage to millions of uninsured young adults, and prevent U.S. healthcare costs from exceeding trillions of dollars. Beaglehole et al., (2011) suggested that despite the modern advancement in medical science, the U.S. is still one of the unhealthiest countries in the industrialized world, with an increasing number of U.S. citizens living with obesity-related chronic health disparities. Some of

these health disparities tend to be hypertension, type 2 diabetes, high cholesterol, strokes, and heart disease (Beaglehole et al., 2011). The U.S. also has one of the highest healthcare costs in the world. It is estimated that the U.S. spends $6,423 per person each year (Sartor, 2005). With the rising cost of healthcare coverage, many young adults simply cannot afford it, and millions of adults go without healthcare coverage, and do not have access to preventative health services that could help prevent and treat obesity and related conditions (Maciosek et al., 2010). This is especially important for 25-34 year olds living in New York State, as they have the lowest healthcare coverage rate of any age group (CDC, 2011).

One contributing factor to the increase in health insurance costs is the dramatic rise in chronic health disparities associated with overweight and obesity. The national health care costs of obesity alone were estimated to be $147 billion in 2008 (Finkelstein et al., 2009). Other researchers have found that obesity and chronic disease prevention could reduce cost and improve quality of life. Maciosek et al. (2010) found that clinically proven preventative health services could save more than 2 million life years annually, and save $3.7 billion in personal health care spending. This solution may be effective in addressing the significant predictors of young adult obesity. Even though healthcare coverage in this study failed to show a significant relationship with obesity, young adults' healthcare coverage in the coming years could have a positive impact on reducing young adult obesity, with more health plans offering and covering obesity prevention and treatment. Thus, the result of this study supported the inexistence of healthcare coverage among younger adults in the past years. Individuals are more likely to get healthcare

coverage when they become older adults. Thus, the awareness of young adults to the prevalence of obesity through healthcare coverage is insufficient to be significantly related to obesity. The result also indicated the lack of support for obesity in current healthcare coverage plans. With young adults having the lowest rate of healthcare coverage than any other age group the health belief model in future studies may help to better understand the perceived barriers young adults have in gaining access to healthcare coverage (Maciosek et al., 2010).

Obesity

Strongest Association with Obesity Hypothesis

RQ4**.** Which potential predictor (physical activity, excessive alcohol consumption, or healthcare coverage) when factoring for gender and race/ethnicity has the strongest association with obesity prevalence between the two young adult age groups living in New York State?

$H4_0$**:** It is not expected that the potential predictor (physical activity, excessive alcohol consumption, or healthcare coverage) will contribute the most to the increase in obesity prevalence between the two young adult age groups.

$H4_a$**:** It is expected that the potential predictor (physical activity, excessive alcohol consumption, or healthcare coverage) will contribute the most to the increase in obesity prevalence between the two young adult age groups.

A multiple regression analysis was used in the study to test the fourth hypothesis. The results of the analysis showed that the potential predictor of physical activity had the strongest association of obesity prevalence in 18-24 year olds $\beta = -.030$; $p < .05$, and in

25-34 year old young adults living in New York State $\beta = .022$; $p < .05$. This research study rejects the null hypothesis, which stated that it is not expected that the potential predictor (physical activity, excessive alcohol consumption, or healthcare coverage) will contribute the most to the increase in obesity prevalence between the two young adult age groups.

Interpretation and Analysis: Strongest Association with Obesity

This study found that there was a substantial difference in obesity prevalence of 7.4% between the two young adult age groups, 9.6% for 18-24 year olds and 17% for 25-34 year olds. This finding was consistent with results from previous research by Low, Chin, and Deurenburg-Yap (2009) which stated that obesity prevalence increases with age, and peaks at round 50 to 60 years of age. When factored with all other independent variables (excessive alcohol consumption and healthcare coverage) and covariates (gender and race/ethnicity) physical activity showed the strongest association to young adult obesity in both age groups. The study found that physical activity had the strongest association of obesity prevalence in 18-24 year olds -.030; $p < .05$, $R^2 = .250$, $F(6, 225)$ and in 25-34 year old young adults living in New York State .022; $p < .05$. $R^2 = .335$, $p < .05$. This finding was expected based on prior research by Wareham (2007) who found that the increased prevalence of obesity occurred simultaneously with the decreased rate of physical activity. The findings in this study are import to help understand obesity rates. Other researchers like Wang and Beydoun (2007) conclude that obesity rates have increased 32% from 1960 to 2004, and predict that 41% of adults may become obese in the near future if obesity trends do not change.

There seems to be many potential influential factors on obesity based on research by Wang and Peng (2011) who state that some factors of obesity may be dyslipidemia, insulin resistance, and lack of physical activity. Even though there are many factors that may affect obesity rates physical activity has been shown in this study to have a strong association with obesity prevalence. Based on the findings in this study and prior scientific research on a decrease in physical activity levels and an increase on obesity rates. One reason for this is that many individual may not be able to overcome their perceived barriers in following health recommendation like adequate physical activity (LaRose, Gorin, Clarke, & Wing, 2012). Future studies on young adult obesity using the health belief model may help to better understand the perceived barriers young adults face in achieving recommended physical activity levels, which may greatly help reduce the prevalence of obesity below 5%. Which would be a large improvement compared to the current obesity rates which are 9.6% for 18-24 year olds, and 17% for 25-34 year olds.

Analysis of Theoretical Framework

The theoretical framework used in the study is the health belief model. The findings of this study supported the theoretical framework considered in this study that suggests a negative relationship between physical activities and obesity among young adults. Based on the findings of this study, engaging in physical activities lessened the prevalence of obesity. Thus, young adults should be more exposed to physical activities on a day-to-day basis.

Limitations of the Study

This study has some limitations on researching the potential predictors of young adult obesity. Some of the challenges of conducting quantitative studies on obesity are consistent with studying other chronic diseases. Unlike other health problems chronic diseases have multiple and interrelated causes often developing earlier in life and related in behavioral risk factors (Remington, Brownson, & Wegner, 2010). One of the biggest challenges is gathering accurate epidemiological data on the determinants of obesity. Some of the potential determinants of obesity may be age, gender, race, ethnic background, physical activity level, BMI, and demographic profile.

Another challenge was gathering accurate data for this study is the use of self-reported surveys which has the potential to increase the risk of participant bias in the study and weaken the validity of the study. Self-reported data collection may have influenced the outcome of the data in a number of ways. Data that is self-reported may have certain threats to validity. Some of these threats to the validity could be comprehension of the question being asked, retrieval of information, and response generation. Selection bias may also be a challenge in that the young adult age group being studied is not an exact but close representation of the true population in question.

Other limitations in this study may be due to the fact that secondary archival data was used. The data for the study was from the Center for Disease Control and Preventions Behavioral Risk Factor Surveillance System. There are some limitations with this data in the form of recall bias, due to the self-reported process of the data. In

addition, the findings of the study cannot be generalized beyond the two young adult age groups living in New York State.

Recommendations for Action

If the prevalence of obesity is to change significantly within a generation, people who are empowered to make a difference must get involved. Public policy should be invested, and incentives given to those who educate and those who embrace healthy behaviors and reduce their risks of obesity and other related health disparities. It seems that for younger obese adult's social contacts and normative beliefs can influence weight status and willingness for weight control (Leahey et al., 2011). Currently there is an increasing amount of evidence that supports obesity intervention programs. Obesity intervention programs that use a 12-month lifestyle intervention, promoting a healthier diet and physical activity have shown a clinically significant reduction in weight and cardio metabolic risk factors (Goodpaster et al., 2010). It is recommended that local and state health departments adopt a comprehensive obesity prevention program based on physical activity to help prevent and treat obesity, especially for young adults. For communities with existing programs, it is suggested that the programs be enhanced to ensure that individuals are able to sustain and follow each activity or task. A comprehensive obesity prevention program involves a step-by-step procedure of what individuals should go through on a day-to-day basis. The program should provide details as well as support to allow individuals to practice a healthy lifestyle. The comprehensive program may include daily activities in which individuals must engage to reduce their

weight. Existing weight loss programs or obesity prevention programs could be improved based on the results of this study.

Based on the results of this current study, which showed physical activity to be a significant predictor of obesity in the young adult age groups, obesity interventions for young adults living in New York State may be more effective if physical activity is a main component. I would also recommend a further investigation on the differences of obesity rates on gender and race, as well as differences on physical activity levels based on gender and race. Furthermore, other variables should be investigated that may be potential predictors of obesity in young adults like socioeconomic status which may influence a healthy lifestyle.

Interpretation of the Findings

The results of this study are needed for effective social change. This study determined that the most significant predictor of obesity for young adults living in New York State is physical activity. Based on the results of this study, both young adult age groups would benefit from increased levels of physical activity to help manage weight and reduce the risk of obesity. This research may help develop specific strategies for obesity preventions geared towards physical activity in the public health community, both locally and statewide, to help accomplish obesity interventions for social change in young adults. Obesity interventions can help provide social change by empowering young adults to adopt healthier lifestyle behaviors for life. This, in turn, may lead to enhancements in the overall quality of life for young adults who are obese as well as start a trend of

maintaining a healthy body weight, which may reduce the prevalence of obesity in a generation.

Conclusion

There is a large body of research on adult obesity prevalence and some of the reasons for the current high prevalence of young adult obesity. However, much of the existing research is based on the general adult population. Rarely did a study address specific adult age groups living in a specific location. In this study both, a specific adult age group (young adults) and specific location (New York State) were analyzed based on three potential predictors of obesity, physical activity, excessive alcohol consumption and healthcare coverage. This research study yielded important information on significant aspects of young adult obesity. For example, this study was able to demonstrate that young adult obesity prevalence is higher in young adult's age 25-34 years living in New York State. It was further found that young adults 25-34 years of age engaged in slightly less physical activity. This finding supported prior research on increased obesity rates with age and decreasing levels of physical activity, which is detrimental to the health of young adults. Focusing on improving these levels may help dramatically reduce the prevalence of young adult obesity.

It is important to help young adults live a healthy lifestyle and adopt new health behaviors to reduce the prevalence and health burdens of obesity. Obesity levels are at epidemic proportions effecting nearly one third of the adult population, and 24.5% of the New York state population (CDC, 2011). Many factors have been shown to contribute to the rising rate of obesity. With obesity continually rising and having such a negative

effect on the health of millions of young adults, better obesity prevention strategies are needed. Initiatives to prevent and reduce the prevalence of obesity in a generation may be the most effective as state and local strategies.

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Appendix A: Letter to the Center for Disease Control and Prevention

Dominic R. Tarinelli
October 30, 2013
Dear CDC,

I am a student at Walden University in pursuit of my PhD in Public Health specializing in Epidemiology. I am currently working on my dissertation and I am at the point where I am planning my research data collection. I have chosen to do my research on the predictors of obesity in young adults. I plan to collect data from the CDC's BRFSS site. I am hereby requesting your permission to use previously published data that is available to the public on the CDC site in order to enhance my research.
I thank you in advance for your response to this request. Please send your response to my e-mail address.

Sincerely,

Dominic R. Tarinelli

Letter of Response

Subject: RE: CDC-INFO: Inquiry [ref:_00DU0YCBU._500U09LL7e:ref]
Date: 10/31/2013 11:42:41 A.M. Eastern Daylight Time
From: cdcinfo@cdc.gov
To: Me

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Thank you for contacting CDC-INFO. For more information, please call 1-800-CDC-INFO (800-232-4636) or visit www.cdc.gov/info.

Appendix B:Analysis Worksheets

```
FREQUENCIES VARIABLES=Gender Race Hispanic BMI_Group Physical_Activity
Alcohol_Consumption Healthcare_Coverage
  /STATISTICS=STDDEV VARIANCE SEMEAN MEAN
  /ORDER=ANALYSIS.
```

Frequencies

Notes

Output Created		19-JUN-2014 13:39:15
Comments		
Input	Data	C:\Users\Owner\Documents\Walden University\PUBH9000 Dissertation 5\Revised 2011 BRFSS data.sav
	Active Dataset	DataSet2
	Filter	<none>
	Weight	<none>
	Split File	Age_Group
	N of Rows in Working Data File	1511
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=Gender Race Hispanic BMI_Group Physical_Activity Alcohol_Consumption Healthcare_Coverage /STATISTICS=STDDEV VARIANCE SEMEAN MEAN /ORDER=ANALYSIS.
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.02

[DataSet2] C:\Users\Owner\Documents\Walden University\PUBH9000 Dissertation 5\Revised 2011 BRFSS data.sav

Statistics

Age_Group			Gender	Race	Hispanic	BMI_Group	Physical_Activity
18-24	N	Valid	470	450	470	470	417
		Missing	0	20	0	0	53
	Mean		1.61	1.22	1.95	2.63	1.78
	Std. Error of Mean		.023	.033	.010	.101	.020
	Std. Deviation		.489	.704	.216	2.194	.415
	Variance		.239	.496	.047	4.812	.172
25-34	N	Valid	1041	983	1034	1040	919
		Missing	0	58	7	1	122
	Mean		1.62	1.25	1.89	2.53	1.78
	Std. Error of Mean		.015	.021	.010	.068	.014
	Std. Deviation		.485	.653	.308	2.190	.414
	Variance		.235	.427	.095	4.794	.172

Statistics

Age_Group			Alcohol_Consumption	Healthcare_Coverage
18-24	N	Valid	276	458
		Missing	194	12
	Mean		1.64	1.21
	Std. Error of Mean		.029	.019
	Std. Deviation		.480	.404
	Variance		.231	.163
25-34	N	Valid	659	1036
		Missing	382	5
	Mean		1.81	1.21
	Std. Error of Mean		.015	.013
	Std. Deviation		.390	.407
	Variance		.152	.166

Frequency Table

Gender

Age_Group			Frequency	Percent	Valid Percent	Cumulative Percent
18-24	Valid	Male	185	39.4	39.4	39.4
		Female	285	60.6	60.6	100.0
		Total	470	100.0	100.0	
25-34	Valid	Male	393	37.8	37.8	37.8
		Female	648	62.2	62.2	100.0
		Total	1041	100.0	100.0	

Race

Age_Group			Frequency	Percent	Valid Percent	Cumulative Percent
18-24	Valid	White	394	83.8	87.6	87.6
		Black/African American	31	6.6	6.9	94.4
		Asian	18	3.8	4.0	98.4
		Native Hawaiian/Pacific Islander	1	.2	.2	98.7
		American Indian/Alaska Native	2	.4	.4	99.1
		Other	4	.9	.9	100.0
		Total	450	95.7	100.0	
	Missing	7	20	4.3		
	Total		470	100.0		
25-34	Valid	White	816	78.4	83.0	83.0
		Black/African American	120	11.5	12.2	95.2
		Asian	31	3.0	3.2	98.4
		Native Hawaiian/Pacific Islander	3	.3	.3	98.7

		American Indian/Alaska Native	13	1.2	1.3	100.0
		Total	983	94.4	100.0	
	Missing	7	58	5.6		
	Total		1041	100.0		

Hispanic

Age_Group			Frequency	Percent	Valid Percent	Cumulative Percent
		Yes	23	4.9	4.9	4.9
18-24	Valid	No	447	95.1	95.1	100.0
		Total	470	100.0	100.0	
		Yes	110	10.6	10.6	10.6
	Valid	No	924	88.8	89.4	100.0
		Total	1034	99.3	100.0	
25-34		Refused answer	1	.1		
	Missing	No answer	6	.6		
		Total	7	.7		
	Total		1041	100.0		

BMI_Group

Age_Group			Frequency	Percent	Valid Percent	Cumulative Percent
		Obese	45	9.6	9.6	9.6
18-24	Valid	Not obese	376	80.0	80.0	89.6
		Refused Answer	49	10.4	10.4	100.0
		Total	470	100.0	100.0	
		Obese	177	17.0	17.0	17.0
25-34	Valid	Not obese	759	72.9	73.0	90.0
		Refused Answer	104	10.0	10.0	100.0
		Total	1040	99.9	100.0	

	Missing	System	1	.1		
	Total		1041	100.0		

Physical_Activity

Age_Group			Frequency	Percent	Valid Percent	Cumulative Percent
		Yes	92	19.6	22.1	22.1
	Valid	No	325	69.1	77.9	100.0
18-24		Total	417	88.7	100.0	
	Missing	Rfused anwer	53	11.3		
	Total		470	100.0		
		Yes	202	19.4	22.0	22.0
	Valid	No	717	68.9	78.0	100.0
25-34		Total	919	88.3	100.0	
	Missing	Rfused anwer	122	11.7		
	Total		1041	100.0		

Alcohol_Consumption

Age_Group			Frequency	Percent	Valid Percent	Cumulative Percent
		yes	99	21.1	35.9	35.9
	Valid	no	177	37.7	64.1	100.0
		Total	276	58.7	100.0	
18-24		don't no	3	.6		
	Missing	none	189	40.2		
		refused	2	.4		
		Total	194	41.3		
	Total		470	100.0		
25-34	Valid	yes	123	11.8	18.7	18.7
		no	536	51.5	81.3	100.0

		Total	659	63.3	100.0	
	Missing	don't no	10	1.0		
		none	370	35.5		
		refused	2	.2		
		Total	382	36.7		
Total			1041	100.0		

Healthcare_Coverage

Age_Group			Frequency	Percent	Valid Percent	Cumulative Percent
18-24	Valid	Yes	364	77.4	79.5	79.5
		No	94	20.0	20.5	100.0
		Total	458	97.4	100.0	
	Missing	Refused answer	12	2.6		
	Total		470	100.0		
25-34	Valid	Yes	819	78.7	79.1	79.1
		No	217	20.8	20.9	100.0
		Total	1036	99.5	100.0	
	Missing	Refused answer	5	.5		
	Total		1041	100.0		

```
REGRESSION
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  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA CHANGE ZPP
  /CRITERIA=PIN(.05) POUT(.10) CIN(95)
  /NOORIGIN
  /DEPENDENT BMI_Group
  /METHOD=ENTER Physical_Activity Alcohol_Consumption Healthcare_Coverage
Gender Race Hispanic
  /SAVE MCIN.
```

Regression

Notes

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	Filter	<none>
	Weight	<none>
	Split File	Age_Group
	N of Rows in Working Data File	1511
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /DESCRIPTIVES MEAN STDDEV CORR SIG N /MISSING LISTWISE /STATISTICS COEFF OUTS CI(95) R ANOVA CHANGE ZPP /CRITERIA=PIN(.05) POUT(.10) CIN(95) /NOORIGIN /DEPENDENT BMI_Group /METHOD=ENTER Physical_Activity Alcohol_Consumption Healthcare_Coverage Gender Race Hispanic /SAVE MCIN.
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Variables Created or Modified	LMCI_1	95% Mean Confidence Interval Lower Bound for BMI_Group

UMCI_1	95% Mean Confidence Interval Upper Bound for BMI_Group

[DataSet2] C:\Users\Owner\Documents\Walden University\PUBH9000 Dissertation 5\Revised 2011 BRFSS data.sav

Descriptive Statistics

Age_Group		Mean	Std. Deviation	N
18-24	BMI_Group	2.27	1.441	232
	Physical_Activity	1.78	.418	232
	Alcohol_Consumption	1.64	.482	232
	Healthcare_Coverage	1.03	.171	232
	Gender	1.64	.482	232
	Race	1.19	.745	232
	Hispanic	1.97	.183	232
25-34	BMI_Group	2.49	1.887	548
	Physical_Activity	1.78	.414	548
	Alcohol_Consumption	1.82	.384	548
	Healthcare_Coverage	1.02	.127	548
	Gender	1.65	.478	548
	Race	1.21	.584	548
	Hispanic	1.93	.254	548

Correlations

Age_Group			BMI_Group	Physical_Activity	Alcohol_Consumption	Healthcare_Coverage	Gender
18-24	Pearson Correlation	BMI_Group	1.000	.001	-.120	.457	.024
		Physical_Activity	.001	1.000	-.082	.034	-.082
		Alcohol_Consumption	-.120	-.082	1.000	.133	.179

		Healthcare_Coverage	.457	.034	.133	1.000	.133
		Gender	.024	-.082	.179	.133	1.000
		Race	.088	-.041	-.202	-.046	-.117
		Hispanic	.036	.068	.054	.033	-.093
		BMI_Group	.	.495	.034	.000	.359
		Physical_Activity	.495	.	.106	.301	.106
		Alcohol_Consumption	.034	.106	.	.022	.003
	Sig. (1-tailed)	Healthcare_Coverage	.000	.301	.022	.	.022
		Gender	.359	.106	.003	.022	.
		Race	.091	.270	.001	.243	.038
		Hispanic	.294	.150	.205	.307	.078
		BMI_Group	232	232	232	232	232
		Physical_Activity	232	232	232	232	232
		Alcohol_Consumption	232	232	232	232	232
	N	Healthcare_Coverage	232	232	232	232	232
		Gender	232	232	232	232	232
		Race	232	232	232	232	232
		Hispanic	232	232	232	232	232
		BMI_Group	1.000	.015	-.567	.073	-.014
		Physical_Activity	.015	1.000	.006	-.036	-.019
		Alcohol_Consumption	-.567	.006	1.000	.060	-.033
25-34	Pearson Correlation	Healthcare_Coverage	.073	-.036	.060	1.000	-.025
		Gender	-.014	-.019	-.033	-.025	1.000
		Race	-.074	.032	.078	-.022	.061
		Hispanic	.022	-.058	-.034	.035	-.095
		BMI_Group	.	.364	.000	.044	.369
	Sig. (1-tailed)	Physical_Activity	.364	.	.442	.202	.329

		Alcohol_Consumption	.000	.442	.	.079	.218
		Healthcare_Coverage	.044	.202	.079	.	.276
		Gender	.369	.329	.218	.276	.
		Race	.041	.230	.034	.305	.077
		Hispanic	.303	.089	.216	.205	.013
		BMI_Group	548	548	548	548	548
		Physical_Activity	548	548	548	548	548
		Alcohol_Consumption	548	548	548	548	548
	N	Healthcare_Coverage	548	548	548	548	548
		Gender	548	548	548	548	548
		Race	548	548	548	548	548
		Hispanic	548	548	548	548	548

Correlations

Age_Group			Race	Hispanic
		BMI_Group	.088	.036
		Physical_Activity	-.041	.068
		Alcohol_Consumption	-.202	.054
	Pearson Correlation	Healthcare_Coverage	-.046	.033
		Gender	-.117	-.093
		Race	1.000	-.141
		Hispanic	-.141	1.000
18-24		BMI_Group	.091	.294
		Physical_Activity	.270	.150
		Alcohol_Consumption	.001	.205
	Sig. (1-tailed)	Healthcare_Coverage	.243	.307
		Gender	.038	.078
		Race	.	.016
		Hispanic	.016	.
	N	BMI_Group	232	232

		Physical_Activity	232	232
		Alcohol_Consumption	232	232
		Healthcare_Coverage	232	232
		Gender	232	232
		Race	232	232
		Hispanic	232	232
		BMI_Group	-.074	.022
		Physical_Activity	.032	-.058
		Alcohol_Consumption	.078	-.034
	Pearson Correlation	Healthcare_Coverage	-.022	.035
		Gender	.061	-.095
		Race	1.000	-.111
		Hispanic	-.111	1.000
		BMI_Group	.041	.303
		Physical_Activity	.230	.089
		Alcohol_Consumption	.034	.216
25-34	Sig. (1-tailed)	Healthcare_Coverage	.305	.205
		Gender	.077	.013
		Race	.	.005
		Hispanic	.005	.
		BMI_Group	548	548
		Physical_Activity	548	548
		Alcohol_Consumption	548	548
	N	Healthcare_Coverage	548	548
		Gender	548	548
		Race	548	548
		Hispanic	548	548

Variables Entered/Removed[a]

Age_Group	Model	Variables Entered	Variables Removed	Method

18-24	1	Hispanic, Healthcare_Coverage, Physical_Activity, Race, Gender, Alcohol_Consumption[b]	.	Enter
25-34	1	Hispanic, Alcohol_Consumption, Physical_Activity, Healthcare_Coverage, Gender, Race[b]	.	Enter

a. Dependent Variable: BMI_Group

b. All requested variables entered.

Model Summary[b]

Age_Group	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics
						R Square Change
18-24	1	.500[a]	.250	.230	1.265	.250
25-34	1	.579[c]	.335	.328	1.547	.335

Model Summary[b]

Age_Group	Model	Change Statistics			
		F Change	df1	df2	Sig. F Change
18-24	1	12.515[a]	6	225	.000
25-34	1	45.500[c]	6	541	.000

a. Predictors: (Constant), Hispanic, Healthcare_Coverage, Physical_Activity, Race, Gender, Alcohol_Consumption

b. Dependent Variable: BMI_Group

c. Predictors: (Constant), Hispanic, Alcohol_Consumption, Physical_Activity, Healthcare_Coverage, Gender, Race

ANOVA[a]

Age_Group	Model		Sum of Squares	df	Mean Square	F	Sig.
18-24	1	Regression	120.080	6	20.013	12.515	.000[b]
		Residual	359.812	225	1.599		
		Total	479.892	231			
25-34	1	Regression	652.984	6	108.831	45.500	.000[c]
		Residual	1294.000	541	2.392		
		Total	1946.984	547			

a. Dependent Variable: BMI_Group

b. Predictors: (Constant), Hispanic, Healthcare_Coverage, Physical_Activity, Race, Gender, Alcohol_Consumption

c. Predictors: (Constant), Hispanic, Alcohol_Consumption, Physical_Activity, Healthcare_Coverage, Gender, Race

Coefficients[a]

Age_Group	Model		Unstandardized Coefficients		Standardized Coefficients	t
			B	Std. Error	Beta	
18-24	1	(Constant)	-1.736	1.172		-1.482
		Physical_Activity	-.102	.201	-.030	-.506
		Alcohol_Consumption	-.517	.181	-.173	-2.862
		Healthcare_Coverage	4.064	.494	.483	8.229
		Gender	.004	.179	.001	.022
		Race	.155	.116	.080	1.340
		Hispanic	.334	.464	.042	.720
25-34	1	(Constant)	6.207	.914		6.790
		Physical_Activity	.101	.160	.022	.632
		Alcohol_Consumption	-2.818	.173	-.573	-16.245
		Healthcare_Coverage	1.586	.522	.107	3.040
		Gender	-.115	.139	-.029	-.825

	Race	-.087	.114	-.027	-.759
	Hispanic	-.040	.263	-.005	-.154

Coefficients[a]

Age_Group	Model		Sig.	95.0% Confidence Interval for B		Correlations
				Lower Bound	Upper Bound	Zero-order
		(Constant)	.140	-4.045	.573	
		Physical_Activity	.614	-.498	.295	.001
		Alcohol_Consumption	.005	-.873	-.161	-.120
18-24	1	Healthcare_Coverage	.000	3.090	5.037	.457
		Gender	.982	-.349	.357	.024
		Race	.182	-.073	.383	.088
		Hispanic	.472	-.580	1.249	.036
		(Constant)	.000	4.411	8.003	
		Physical_Activity	.528	-.213	.416	.015
		Alcohol_Consumption	.000	-3.159	-2.477	-.567
25-34	1	Healthcare_Coverage	.002	.561	2.611	.073
		Gender	.410	-.389	.159	-.014
		Race	.448	-.312	.138	-.074
		Hispanic	.878	-.558	.477	.022

Coefficients[a]

Age_Group	Model		Correlations	
			Partial	Part
		(Constant)		
		Physical_Activity	-.034	-.029
		Alcohol_Consumption	-.187	-.165
18-24	1	Healthcare_Coverage	.481	.475
		Gender	.001	.001
		Race	.089	.077
		Hispanic	.048	.042
		(Constant)		
25-34	1	Physical_Activity	.027	.022
		Alcohol_Consumption	-.573	-.569

	Healthcare_Coverage	.130	.107
	Gender	-.035	-.029
	Race	-.033	-.027
	Hispanic	-.007	-.005

a. Dependent Variable: BMI_Group

Residuals Statistics[a]

Age_Group		Minimum	Maximum	Mean	Std. Deviation	N
18-24	Predicted Value	1.59	6.09	2.27	.721	232
	Std. Predicted Value	-.949	5.292	.000	1.000	232
	Standard Error of Predicted Value	.133	.668	.197	.096	232
	Adjusted Predicted Value	1.52	6.87	2.27	.737	232
	Residual	-4.087	6.565	.000	1.248	232
	Std. Residual	-3.232	5.192	.000	.987	232
	Stud. Residual	-3.530	5.243	.001	1.027	232
	Deleted Residual	-4.874	7.173	.002	1.356	232
	Stud. Deleted Residual	-3.623	5.583	.009	1.076	232
	Mahal. Distance	1.559	63.500	5.974	9.277	232
	Cook's Distance	.000	.886	.013	.071	232
	Centered Leverage Value	.007	.275	.026	.040	232
25-34	Predicted Value	1.60	4.89	2.49	1.093	548
	Std. Predicted Value	-.819	2.197	.000	1.000	548
	Standard Error of Predicted Value	.103	.533	.158	.075	548
	Adjusted Predicted Value	1.58	4.94	2.49	1.095	548
	Residual	-2.895	7.139	.000	1.538	548
	Std. Residual	-1.872	4.616	.000	.995	548
	Stud. Residual	-1.885	4.640	.000	1.006	548
	Deleted Residual	-2.937	7.213	.000	1.573	548
	Stud. Deleted Residual	-1.890	4.731	.001	1.011	548
	Mahal. Distance	1.428	63.859	5.989	9.304	548

Cook's Distance	.000	.258	.003	.016	548
Centered Leverage Value	.003	.117	.011	.017	548

a. Dependent Variable: BMI_Group

Curriculum Vitae

Dominic R. Tarinelli

EDUCATION

Walden University, Minneapolis, MN
Ph.D. expected May, 2015
Public Health/Epidemiology
Dissertation title: The Predictors of Obesity in Young Adults

Marist College, Poughkeepsie, NY
Bachelor of Science
Major: Integrated Studies
Minor: Biology, Psychology

Dutchess Community College
Associates of Science
Major: Exercise Science & Wellness

Roy C. Ketcham High School, Wappingers Falls, NY
High School Diploma
General Studies

CERTIFICATIONS

- NIH Research Certified
- ACSM Certified Health Fitness Specialist
- CPR/AED Certified
- ACSM Member

SKILLS AND ABILITIES

- Health assessments,
- Taking vital signs, blood pressure, pulse, health history,
- Large data management,
- Developing statistical reports,
- Health/medical record filing, managing sales reports,
- Office management, answering phones,
- Strong skills in organization, communication,
- Proficient in SPSS, Epi Info, Microsoft Word, Excel, and Power Point.

WORK HISTORY

Health Fitness Specialist
Crunch Fitness, Poughkeepsie, NY
Employment: June 2014 - Current

Office Manager/Health Coach
Global Health Network, Wappingers Falls, NY
Employment: July, 2010-June, 2014

Health Fitness Specialist
New York Sports Club, Carmel, NY
Employment: July 2013- May 2014

Physical Therapy Aide
Center for Physical Therapy, Wappingers Falls, NY
Employment: January 2012 – September 2012

Physical Therapy Aide
Moriarty Physical Therapy Poughkeepsie, NY
Employment: May 2008-July 2009