

The Relationship Between Insufficient Sleep and Obesity Related Health Complications
in College Students

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Abstract

Americans have seen an increase in obesity and insufficient sleep. The reasons behind the increase in obesity have been intensively studied with new evidence suggesting that sleep plays a vital role in weight regulation. The main purpose of this study was to determine the correlation and effects of insufficient sleep and obesity in college students. Also studied is the effect that diet habits and exercise make in relation to Body Mass Index (BMI) and sleep. All of these variables were looked at in relation to gender and rank in class.

An extant data set previously collected and answered by Middle Tennessee State University students was used. A significant correlation was found between the amount of adequate sleep received and decrease in BMI. Insufficient sleep was also linked to problems completing daily tasks. It was found that the more servings of fruits and vegetables consumed were correlated with a lower BMI and more sufficient sleep. Exercise also showed an increase in sufficient sleep and aerobic exercise was associated with lower BMI values. A clear connection between insufficient sleep and obesity needs to be addressed. The reasons for this connection need to be researched further for the wellbeing of all college students and Americans.

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CHAPTER I

Introduction

Rationale:

Insufficient sleep is a problem that most Americans face at some point in their lives. This is especially true in the 21st century. America has begun to move away from the traditional 40 hour workweek. Employees are expected to devote more time and energy to their jobs, as well as balance the tasks at home. Many individuals are on call or find themselves busy with tasks 24 hours a day. Sleep in America conducts frequent polls on Americans' sleeping habits. In 2011, "The poll surveyed a random sample of 1,508 Americans between the ages of 13 and 64. A whopping 63 percent of participants claimed that their sleep needs were not met during the week" (1). Insufficient sleep makes daily life difficult, simple tasks become challenging, and individuals become irritable more quickly. Recent research shows that sleep is important to the general public because it is linked to motor vehicle crashes, industrial disasters, and many human errors (2).

The consequences of insufficient sleep are alarming. In addition to functional problems, severe health complications are associated with insufficient sleep. Individuals experiencing sleep insufficiency are more likely to suffer from chronic diseases (2). Chronic conditions increase the risk of death and decrease the quality of an individual's life; the common chronic diseases include diabetes, hypertension, cancer, and obesity (2). The diagnoses of obesity and chronic disease are currently on the rise. Insufficient sleep and its related health complications are extremely costly for the healthcare system and America as a whole. According to the Center for Disease Control (CDC), "The medical care costs of obesity in the United States are staggering. In 2008 dollars, these costs totaled about \$147 billion" (3).

Research estimates:

Medical costs associated with treating obesity-related diseases in the United States could increase as much as \$66 billion annually by 2030 based on current trends, according to a study by the health care policy group Trust for America's Health (4).

Obesity related health care costs are on the rise and will continue to grow as long as obesity remains a problem. There has been an increase in the prevalence of obesity in the United States from 1990 through 2012, and these numbers are increasing each year (5).

College students get the first taste of sleepless nights due to papers, projects, and the transition into independence. The big question is whether or not the pattern of sleep deprivation started in college leads to obesity. This study investigates the relationships between amount of sleep in university students and obesity and obesity-related health problems.

Research Questions:

1. What is the relationship between self reported days of sufficient sleep per week and overweight and obesity as determined by Body Mass Index (BMI)?
2. What is the relationship between reported diet habits in relation to self reported days of sufficient sleep per week and overweight and obesity as determined by BMI?
3. What is the relationship between exercise habits in relation to self reported days of sufficient sleep per week and overweight and obesity as determined by BMI?

4. What is the relationship between self reported days of sufficient sleep per week and self reported sleepiness during daytime activities?
5. What is the relationship between rank in class and BMI, self reported days of sufficient sleep per week, fruit and vegetable intake, exercise habits, and self reported sleepiness during daytime activities?
6. What is the relationship between gender and BMI, self reported days of sufficient sleep per week, fruit and vegetable intake, exercise habits, and self reported sleepiness during daytime activities?

Definition of Terms:

ACHA-National College Health Assessment (NCHA): Is a nationally recognized research survey that assists universities in collecting data about students in order to determine a general overview of the universities health (6).

Body Mass Index (BMI): A definition of the degree of weight calculated based on weight in (kg)/height (m)² (7).

Cancer: Term used for a disease in which abnormal cells divide without control and can spread throughout the body (8).

Chronic Diseases: Illnesses that are long in duration and time and are usually slow in advancement and progression (9).

Diabetes: A disease where the pancreas either does not produce enough insulin or does not use the insulin it produces properly (10).

Desirable dietary habits: The diet habits of an individual include the amount of fruits and vegetables eaten per day. The Dietary Guidelines for Americans recommend two or more cups of fruit per day and two and a half cups of vegetables daily (11).

Ghrelin: A hormone produced by the stomach which stimulates hunger (7).

Hypertension: The term used to describe continuously high blood pressure, systolic blood pressure above 140 mm Hg or diastolic blood pressure above 90 mm Hg (7).

Leptin: A hormone correlated with the percent of body fat located in the body that is associated with appetite (7).

Non-Rapid Eye Movement (Non-REM): The form of sleep where restoration occurs (12).

Obesity: A term for weight meaning a BMI of 30 or higher (13).

Overweight: A term for weight considered to be a predictor of health complications. An adult who has a body mass index between 25 and 29.9 is considered overweight (13).

Polysomnography: A sleep study that watches the individual in order to determine the quality of sleep (14).

Rapid Eye Movement (REM): The form of sleep where dreams occur and thoughts are processed (12).

Sleep apnea: A condition that affects breathing during sleep, causing snoring, and exhaustion during daily activities (15).

Sufficient sleep: The amount of sleep most adults need; generally seven hours or more each night (16).

Waist circumference: The measurement around the middle of the stomach region that is used to determine health related conditions associated with obesity (7).

CHAPTER II

Review of the Literature

Defining Sleep, its Importance, and How Much is Needed:

Sleep is one of the most essential forms of replenishment for the body. A good night's sleep leaves one refreshed, renewed, and ready to tackle his or her day. After all, humans spend approximately one-third of their lives asleep (17). The amount of sleep needed per night varies at different points of the life stage, as well as from individual to individual. However, according to The National Sleep Foundation, adults need between seven to nine hours of sleep on average (18).

According to research, some adults can function fine on four hours of sleep; however, this is extremely rare, and no human has ever shown signs of not needing sleep (15). Sleep is a subject about which researchers are discovering new things daily. Researchers are beginning to find out what happens during sleep and why humans cannot function well without it.

The actual process of sleep involves many complex cycles. These stages of sleep are what ultimately determine the quality of sleep obtained (15). Pascualy states in *Snoring and Sleep Apnea, Sleep Well, Feel Better*, "There are two kinds of sleep: REM (rapid eye movement) sleep and non-REM (or NREM) sleep. REM and NREM sleep alternate with each other during the night" (15). These two sleep cycles are very different, non-REM sleep is considered a quiet stage of sleep with little to no dreaming and very little brain activity (15). REM sleep is known as the active form of sleep (15). This stage of sleep is where the majority of the dreaming, as well as brain activity and changes to the body occur (15). At the beginning of sleep, the NREM cycle is present

during the first hour (15). After this time, the shorter cycle of REM sleep begins, followed by NREM sleep again (15). This 90 minute cycle continues throughout the night (15). Despite sleep being so important, Americans' 24/7 lifestyle has dramatically changed the amount of sleep that they are getting.

Unfortunately, most Americans are not getting enough sleep because of an increase in responsibilities at work and home. The amount of hours spent on the job is increasing and some workers, like those in healthcare, have to work irregular shifts or even throughout the night (19). According to *The Harvard Medical School Guide to A Good Nights Sleep*, "Americans average 6.9 hours of sleep a night—less than the 7.5 to 8 hours sleep experts believe most people need to function at their best" (20). The most common symptoms that one may face due to lack of sleep include exhaustion, lack of focus, and frustration. Exhaustion plays a negative role in daily life and research is emerging about the complications of habitual sleep deprivation.

The obvious complications of not getting enough sleep are things that everyone has faced at some point. Research shows that sleep is very important to the body in terms of the production of energy and tissue recovery, as well as regeneration and rejuvenation (19). Research studies found that individuals restricted to five or fewer hours of sleep for three consecutive nights had a higher chance of developing problems such as headaches, stomach issues, and achy sore joints (20). In terms of an individual's mental state, sleep is important in memory and cognitive performance (19). Inadequate sleep can lead to problems with hand eye coordination, which has caused impairment similar to intoxication or drunkenness (20).

According to the Harvard Medical School Guide to A Good Nights Sleep:

Nearly one in five drivers admits to having fallen asleep at the wheel, and the National Highway Traffic Safety Administration conservatively estimates that one hundred thousand police-reported crashes are caused by drowsy drivers each year, causing seventy-six thousand injuries and fifteen thousand deaths (20).

History has seen its fair share of accidents stemming from lack of sleep. The Harvard Medical School Guide to A Good Nights Sleep found, “Sleep deprivation played a role in catastrophes such as the Exxon Valdez oil spill off the coast of Alaska, the space shuttle Challenger disaster, and the nuclear accident at Three Mile Island” (20). The issue of lack of sleep is becoming more common, and the causes of this issue are being explored.

The known causes of inadequate sleep include medical as well as personal problems. Some common problems with sleep include falling asleep, staying asleep, as well as finding the time to sleep. According to *The Harvard Medical School Guide to a Good Nights Sleep*, “A 2004 study found that women who averaged five hours of sleep a night were 39 percent more likely to develop heart disease than women who got eight hours” (20). In addition to heart disease, some other important medical problems associated with lack of sleep include sleep apnea. This is a disorder in which the person stops breathing during sleep. According to *Snoring and Sleep Apnea: Sleep Well, Feel Better*, the three types of sleep apnea include obstructive, central, and mixed apneas (15). Obesity is one of the most common causes of obstructive sleep apnea which disrupts sleep cycles and produces a poor night’s rest. These disruptions cause the individual to feel exhausted despite having slept even longer than the recommended timeframe. There are many known causes of sleep deprivation and problems. The number of Americans

who are dealing with sleep problems is expected to increase within the coming years. The main reason why these numbers are rising is because of the increasing responsibilities of life and the rising prevalence of obesity (20). Research shows that there is a connection between long-term sleep debt and obesity related complications that can lead to heart problems, diabetes, and an overall shorter length of life (20). One connection that needs more research is the prevalence of obesity and the effect lack of sleep has in terms of weight gain.

Defining Obesity, Understanding its Implications, and Causes:

Similar to the increase in sleep deprivation, Americans are experiencing a rise in overweight and obesity. Obesity has increased dramatically over the past decade. Recent research states, “More than one-third of adults and almost 17% of youth were obese in 2009–2010” (21). If the increase in obesity continues to rise, the problems in America will only grow larger.

Obesity can be measured with many different methods. The most obvious is by visual appearance. More accurate measurements include the waist to hip circumference, and the most commonly used and recognized, the BMI scale developed by Adolphe Quételet, which is weight in kilograms in proportion to height in meters squared (22). The values of BMI are classified as underweight, which that is BMI less than 18.5, normal BMI, which that is 18.5 to 24.9, overweight BMI, which that is 25-29.9, and obesity, which is 30 or greater (22). With the increase in the number of obese individuals, health care costs and complications are becoming more apparent.

Obesity is known to cause many health complications that ultimately increase the health care costs of the nation. Research estimates:

Medical costs associated with treating obesity-related diseases in the United States could increase as much as \$66 billion annually by 2030 based on current trends, according to a study by the health care policy group Trust for America's Health" (4).

This places a large burden on the national debt and health care system. Many of these illnesses caused by obesity can be prevented. This makes obesity one of the most common causes of preventable illness in the United States. Research states:

Overweight and obesity are the fifth leading risk for global deaths. At least 2.8 million adults die each year as a result of being overweight or obese. In addition, 44% of the diabetes burden, 23% of the ischemic heart disease burden and between 7% and 41% of certain cancer burdens are attributable to overweight and obesity"(23).

There are many known causes for obesity. The first and most common cause is the combination of an increase in food consumption and decrease in activity. The typical American diet consists of high calorie foods. High calorie foods leave little room for intake of nutritionally dense foods with important vitamins, and minerals (23). In addition to the changes in food intake, a decrease in activity is becoming a problem, as well. The use of automobiles and public transit has led to our sedentary lifestyle by replacing walking and bike riding (23). The decrease in activity contributes to obesity, because Americans are now eating more and moving less.

The media may also play a role in the increase in the amount and types of foods consumed (24). In addition to advertisements' role on food consumption, it may also play a role in the amount of exercise an individual gets.

Research studies suggest that increasing fruit and vegetable intake may protect against weight gain. According to the *International Journal of Obesity*, middle aged women who consumed more fruits and vegetables over a 12 year study had a lower BMI than those who did not (25). Participants who consumed significantly lower amounts of fruits and vegetables had a larger link to weight gain and obesity (25). Additional studies have also suggested a direct correlation between fruit and vegetable intake and obesity. *In The Potential Association between Fruit Intake and Body Weight – a Review*, several studies about fruit and vegetable intake and weight were analyzed. Eleven of these studies showed a connection between increased fruit intake and reduction in weight, and a decrease in the link between fruit consumption and overweight and obesity (26). The reasons behind why fruit and vegetable intake decreases the risk of obesity are conflicting. Some research studies suggest the fiber in the fruit and vegetable provides fullness and therefore promotes satiety. According to the *Health Benefits of Dietary Fiber*, foods that contain pectin delay gastric emptying and this in turn results in satisfaction with the meal and no desire to continue consumption (27). There is no doubt that fruits and vegetables are good for the body and provide it with nutrients in order to keep it running efficiently. Americans unfortunately are not getting enough of these nutrients and instead reach for high calorie nutrient deficient foods, leading to overweight and obesity.

The recent rise in obesity has also increased the rise in many different health complications associated with this epidemic. Research states, “This rise in obesity has been accompanied by increases in a host of other chronic illnesses, including type 2 diabetes, cardiovascular disease, hypertension, and cancer” (24). In addition to these

common illnesses more recent research is suggesting the connection between lack of sleep and obesity.

The Relationship Between Lack of Sleep and Obesity:

Eating and sleeping are two very important actions in our daily lives. Americans unfortunately have been eating too much and sleeping too little. This imbalance is becoming more common, and research suggests that it is taking a toll on weight. The following are research studies that examine this connection.

According to the *Harvard Medical School Guide to a Good Night's Sleep*, "Lack of sleep is directly linked to poor health, with new research suggesting it increases the risk of diabetes, heart disease, and obesity" (20). A recent study found the connection between women sleeping approximately five hours per night and a higher association with heart disease (20).

Research points to a link between obesity and sleep deprivation in connection to exercise. The increase in obesity is caused by both behavior and diet in relation to a decrease in exercise (28). Research suggests that when including exercise in an individual's routine, sleep disturbances and fatigue will improve (28). The importance of including exercise is what improves obesity and sleep disturbances, not the time spent exercising or the intensity of the workout (28).

Research suggests there is a strong connection between sleep and energy homeostasis, which increases the risk of obesity if sleep disturbance is present (29). The first connections between sleep and obesity were discovered in the 1960s when a link between the change in body weight and common sleep disorders was discovered (29). Current research conducted still shows a connection between sleep and body weight (29).

Acute sleep deprivation has been linked to weight gain and metabolic rate decrease. Benedict et al., conducted a research study on men and how sleep affects metabolic rates (30). The study compared the effects of regular sleep and total sleep deprivation (TSD) on energy expenditures measured by indirect calorimetry (IC) before and after breakfast (30). The subjects ($n = 14$) were healthy males with normal sleep cycles (30). The mean age was 22.6 years old (30). The results showed that resting metabolic rates were reduced during sleep deprivation leading to a 20% decrease in metabolic rate (30). In addition morning hunger rates were increased (30). This study shows a connection between sleep deprivation and metabolic rate suggesting that chronic sleep deprivation could in fact contribute to obesity.

In addition to the direct link between sleep deprivation and obesity, there are studies that have shown a link between night time eating and obesity. Arble, Bass, Laposky, Vitaterna, and Turek researched this topic in mice (31). At nine weeks old, mice were divided into two groups ($n = 6$ per group) equaling a total of ($n = 12$) (31). They were fed a high fat diet for six weeks, consisting of 60% of kcal from fat (31). One group was fed during the 12 hour circadian light phase and the other during the 12 hour circadian dark phase (31). The results of the study showed a significant increase in weight in the nocturnal mice that fed during the light phase (daytime) (31). The results support the hypothesis that eating food during human's dark phase, or at night, may be a direct link to weight gain, and, over long-term periods, may lead to obesity (31).

Research suggests that shortened sleep may cause excess consumption of food. A research study conducted by Nedeltcheva, Kilkus, Imperial, Kasza, Schoeller, and Penev suggests that continuous bedtime restriction by three hours per night will increase food

intake, particularly snacks, thus leading to obesity (32). The study had eleven participants including women ($n = 5$), and men ($n = 6$) (32). The age range was 39 plus or minus 5 years (32). Each participant stayed for 14 days in a sleep research laboratory with unlimited access to food (32). The sleep times were between five and a half and eight and a half hours in length, and the total amount of calorie consumption was measured (32). The results showed restriction in sleep times to be associated with an increase in the amount of calories consumed through snack foods (32). These foods usually consisted of higher carbohydrate content, and were eaten particularly during the time of 7 P.M. to 7 A.M. (32). The results paint a clear picture that reduced sleep can cause an increase in snacking and excess caloric consumption leading to obesity (32).

Research has found that hormonal changes including decreases in leptin and increases in ghrelin cause an increase in hunger due to sleep deprivation associated with obesity (20). Taheri, Lin, Austin, Young, and Mignot conducted research on continuous sleep deprivation and the association with increased BMI in relation to the role of metabolic hormones (33). The researchers had volunteer participants from the Wisconsin Sleep Cohort Study (longitudinal study of sleep disorders) ($n = 1,024$) (33). The subjects participated in a six day sleep diary, and the overnight sleep studies were conducted in a lab (33). After each night's rest, a blood test to measure hormone levels was taken in order to determine any changes in hormone levels of leptin and ghrelin (33).

Polysomnography was used to determine sleep quality and to monitor the participants' sleep processes each night (33). The research concluded that a direct association between sleep duration and BMI was observed (33). The participants who slept less than eight hours had an increase in BMI (33). In addition to an increase in BMI, those with shorter

sleep lengths had low leptin hormone levels (33). The leptin levels were 15.5% lower for continuous sleep deprivation of five hours versus eight hours (33). In addition to the leptin hormone levels, a change in ghrelin levels was observed (33). The ghrelin levels increased by 14.9% which suggests a stimulation in appetite (33). This study shows a direct correlation between sleep reduction and the change in hormone levels (33). These hormone level changes are known causes of hunger and appetite stimulation (33). This study is a direct link between sleep deprivation and the metabolic hormones associated with an increase in BMI.

Research studies have shown a connection between sleep deprivation or shortened sleep and obesity. Chaput, Despre's, Bouchard, and Tremblay conducted research on the extended effects of shortened sleep and obesity (34). The subjects were participants in the Quebec Family Study (34). The participants included short term sleepers (individuals sleeping less than six hours) ($n = 43$) aged 18 through 64 (34). The six year study was based on a longer three phase study; phase two which consisted of the years 1989-1994 and phase three, years 1995-2001 were the only phases included (34). In addition to the short sleepers, participants who reported that they slept a total of seven to eight hours each day at both the start of the study and the 6th year of study ($n = 173$) were included as a control group (34). The group of participants who were short term sleepers were further broken down into two groups based upon future sleep duration (34). The first group of participants ($n = 23$) consisted of the individuals who changed their sleeping habits to the recommended seven to eight hours each night (34). The second group of participants ($n = 21$) consisted of those who maintained the same sleep pattern of six hours or less a night (34). The study found that those who increased their sleep from less than six hours to

seven to eight hours per night did not experience any increase in weight gain (34). The other experimental group who continued to sleep less than six hours per night saw an increase in weight and BMI ($p < 0.05$) (34). This study shows a direct link between an increase in sleep and its association with a healthy BMI. The increase in sleep proved to decrease the chances of weight gain in the future (34).

Conclusion:

Sleep deprivation and obesity are two major issues with which Americans are currently dealing. The connection between the two is becoming more common, and unfortunately a lot of these issues begin during early adulthood. College is a time of freedom and increase in responsibility that many individuals have not experienced. Along with these freedoms comes responsibility in the form of work, classes, and balancing a busy schedule. In addition to these responsibilities, college students also have to balance their social life with their academic life. College students find that they are faced with so many obstacles to juggle, so usually the first to be sacrificed is sleep. In addition to this sleep reduction, students are faced with learning how to care for themselves. Meal preparation can be difficult, and fast food and unhealthy food choices become easy and convenient options. Students may find themselves sacrificing their health through improper meals, infrequent exercise, and reduced amounts of sleep. Research has indicated that the increase in sleep deprivation and weight gain are linked. This study will address the research of college students and the relationship between sleep and obesity and how diet and exercise play an important role.

CHAPTER III

Methods

This study was conducted to investigate the correlation between insufficient sleep and obesity related health complications in college students. A quantitative study design was used to determine what effect insufficient sleep has on obesity, fruit and vegetable intake, exercise, and daytime activities. In addition to these factors rank in class and gender was analyzed for each question.

The hypothesis suggests that there will be an increase in BMI as days of sufficient sleep decreases. In addition to increase in BMI as days of sufficient sleep decrease, daily fruit and vegetable intake will be lower. An increase in exercise in the form of both moderate and vigorous aerobic and strength training will correlate to more days of sufficient sleep and a decrease in BMI. The more days of sufficient sleep will be related to fewer problems with daytime sleepiness. Gender will not be correlated with BMI, rank in class, amount of self reported sufficient sleep, or sleepiness in daytime activities. Gender will be correlated with males participating in more strength training, and females participating more in both moderate and vigorous aerobic exercise. Gender will be correlated with females consuming more servings of fruits and vegetables per day. The higher the rank in class will be associated with a higher BMI, more fruit and vegetable intake, lower amounts of exercise, fewer days of restful sleep, and more problems with daytime sleepiness. Approval for use of the data for this study was granted by Middle Tennessee State University Institutional Review board. (Appendix A).

Participants:

This study used a portion of a previously administered survey that was given to 745 female and male Middle Tennessee State University college students. 6000 students were randomly selected by the registrar's office and stratified by class level to correspond to university demographics with 745 final participants. For the purpose of this study a sub sample was drawn from the survey that includes those who put in a height and weight. The participants that answered questions based on the amount of restful sleep per week, fruit and vegetable intake, exercise, and the impact sleep has on daytime activities were used. Subjects who answered that they were transgender were removed from the sample because of a low response rate. Those who ranked their class as not seeking a degree or other were not included in the survey.

Measurements and Instrumentation:

Data for this study were collected using the ACHA- National College Health Assessment II (ACHA-NCHA II).

Developed by an interdisciplinary team of college health professionals, the ACHA-NCHA was pilot tested in 1998-1999 and systematically evaluated with reliability and validity analyses comparing common survey items with national studies such as the National College Health Risk Behavior Survey (CDC) (35).

The researchers used an online self administered survey to collect data (appendix C). The survey consisted of questions regarding demographics and student characteristics such as age, gender, and rank in class. For the purpose of this study not all areas were analyzed, only specific questions pertaining to the current study about sleep and its link to obesity were included. The survey was created in order to help college

students, educators, and other members of the university collect and analyze data pertaining to their universities' students. This particular survey was developed in order to give health educators a bird's eye view of their students to see what specific behaviors and habits are present. The benefit to this study above other research tools is the ability to cover multiple areas of interests in terms of the students well being. The topics that are covered are decided upon by the university and can include alcohol, tobacco, drugs, sexual health, weight, nutrition, exercise, mental health, personal safety, violence, and many more (6). This survey assesses large populations with different demographics in order to get a clear picture of the university as a whole.

Procedure for Data Collection:

The original survey asked a wide variety of questions in order to determine a general overview of each student. The students that received an email inviting them to participate in the survey were randomly selected by the registrar's office and were stratified by class level to correspond to the university demographics. The email provided students with a hyperlink to access the survey. The selected participants were given from the middle of February 2010 through the school's spring break (approximately three to four weeks) to complete the survey. Participants were not obligated to take part in the survey, and all of their answers were kept confidential. In addition the participants were made aware that they could leave any question that they desired blank.

Statistical Analysis:

Descriptive statistics such as percentages, means, BMI and BMI range were previously obtained and were evaluated for the present data set. The Statistical Package

for Social Sciences (version 21, 2012, SPSS Inc.) was used to analyze the following research questions.

What is the relationship between reported hours of sleep and overweight and obesity as determined by BMI? Spearman correlation, which tests the correlation between multiple variables was used for all ordinal data. Ordinal data indicates that the data has an order to it, and it can be ranked from highest to lowest or most desirable to least desirable. Spearman correlation was specifically used to analyze the following hypotheses: (1) there will be an increase in BMI as the amount of days of sufficient sleep decreases; (2) there will be an increase in BMI as days of sufficient sleep decreases, and daily fruit and vegetable intake are lower; (3) with the increase in exercise in the form of both moderate and vigorous aerobic and strength training BMI will decrease; (4) more days of sufficient sleep will provide fewer problems with daytime sleepiness; and (5) the higher the rank in class will be associated with a higher BMI, more fruit and vegetable intake, lower amounts of exercise, fewer days of restful sleep, and more problems with daytime sleepiness.

Gender was also analyzed. Gender is a nominal value meaning values can not be ranked. Gender can not be divided into categories to determine which is the more desirable outcome. Chi-Square test (X^2) compares two independent variables so it was used to answer the hypotheses: (1) that there is no correlation between gender and BMI, rank in class, amount of perceived adequate sleep, or sleepiness in daytime activities; (2) gender will be correlated with males participating in more strength training, and females participating more in both moderate and vigorous aerobic exercise; and (3) gender will be correlated with females consuming more servings of fruits and vegetables on average each day.

CHAPTER IV

Results

Demographic Data:

In the present study insufficient sleep and BMI health-related complications were analyzed in order to determine if there was a correlation. The participants in the study were college students age 18 and older. The gender for males ($n = 259$) includes a mean age of 23. Females ($n = 464$) includes a mean age of 22.9. Both males and females were analyzed for each category. The mean male height was 70.80 inches tall, the female average height was 65.05 inches tall. The weight range for males was between 110-375 pounds, whereas for females it varied between 90-380 pounds. BMI was calculated in the previous study using the calculation of weight in kg/height in meters ².

Sleep and Weight-Related Health Complications:

The second portion of the research instrument included six questions pertaining to the participants' sleep habits, diet and exercise in relation to height and weight. The purpose of these questions was to determine the significance between sleep habits and obesity-related health complications.

The first question was “*On how many of the past 7 days did you get enough sleep so that you felt rested when you woke up in the morning?*” The mean number of days with sufficient sleep was 4 for men ($n = 52$) and 2 for women ($n = 88$). Spearman correlation was used to determine if there was a correlation between sleep and BMI; table 1 presents the findings. There was a significant statistical correlation between BMI and sufficient sleep ($P = .026$) the strength of the correlation was (-.083).

Table 1: Spearman Correlation: BMI, Sufficient Sleep

		BMI
Amount of Sufficient Sleep per 7 days	Correlation Coefficient	-.083
	Sig. (2 tailed)	.026
	N	718

The second question on the survey stated “*How many servings of fruits and vegetables do you usually have per day?*” Between 1-2 servings of fruits and vegetables each day was consumed by 66.2 % of survey participants. This question was used in addition to “*On how many of the past 7 days did you get enough sleep so that you felt rested when you woke up in the morning?*” and BMI. In order to determine the correlation between diet and sleep in relation to BMI, Spearman correlation was used. The findings are presented in table 2. The previous data obtained about sufficient sleep and BMI indicated a significant correlation ($p = .026$). Data showed a significant correlation between diet habits and sufficient sleep ($p = .003$) with a strength of .111. A significant correlation between diet and BMI was observed ($p = .047$) with a strength of -.074.

Table 2: Spearman Correlation: BMI, Sufficient Sleep, Fruit and Vegetable intake

		BMI	Amount of Sufficient Sleep per 7 days
Amount of Sufficient Sleep per 7 days	Correlation Coefficient	-.083	
	Sig. (2 tailed)	.026	
	N	718	
Amount of average fruit and vegetables eaten daily	Correlation Coefficient	-.074	.111
	Sig. (2 tailed)	.047	.003
	N	719	719

The third question was “*On how many of the past 7 days did you: do moderate intensity cardio or aerobic exercise for at least 30 minutes?*” A total of 28.4% of subjects reported 0 days of exercise per week. This survey question is used along with “*On how many of the past 7 days did you get enough sleep so that you felt rested when you woke up in the morning?*” and BMI values. Spearman correlation was used to determine the relationship between exercise habits and adequate days of sleep per week and overweight and obesity as determined by BMI. Table 3 shows a detailed description of the results. The previous data obtained about sufficient sleep and BMI indicated a significant correlation ($p = .026$). The statistical data suggested a significant correlation between moderate aerobic exercise and sufficient sleep ($p = .017$) with a correlation strength of .089. The data also showed a significant correlation between moderate aerobic exercise and BMI ($p = .044$) with a correlation strength of -.075.

Table 3: Spearman Correlation: BMI, Sufficient Sleep, Moderate Aerobic Exercise

		BMI	Amount of Sufficient Sleep per 7 days
Amount of Moderate intensity aerobic exercise in the past 7 days	Correlation Coefficient	-.075	.089
	Sig. (2 tailed)	.044	.017
	N	717	717

The fourth question was “*On how many of the past 7 days did you: Do vigorous Intensity cardio or aerobic exercise for at least 20 minutes?*” The survey showed that 48.2 % of participants said they exercised 0 days per week. This survey question was used along with “*On how many of the past 7 days did you get enough sleep so that you felt rested when you woke up in the morning?*” and BMI. Spearman correlation was used to determine what the relationship between exercise habits and adequate days of sleep per week and overweight and obesity as determined by BMI. A detailed description of the data is in table 4. The previous data obtained about sufficient sleep and BMI indicated a significant correlation ($p = .026$). The statistical data suggests a significant correlation between vigorous aerobic exercise and sufficient sleep ($p = .001$) with a correlation strength at .125. The amount of vigorous aerobic exercise in relation to BMI showed no significant correlation at ($p = .280$) with a correlation strength of -.041.

Table 4: Spearman Correlation: BMI, Sufficient Sleep, Vigorous Aerobic Exercise

		BMI	Amount of Sufficient Sleep per 7 days
Amount of vigorous intensity aerobic exercise in the past 7 days	Correlation Coefficient	-.041	.125
	Sig. (2 tailed)	.280	.001
	N	714	714

The fifth question was “*On how many of the past 7 days did you: Do 8-10 strength training exercises for 8-12 repetitions each?*” The survey showed that 61.8 % of participants said 0 days per week. This survey question was used along with “*On how many of the past 7 days did you get enough sleep so that you felt rested when you woke up in the morning?*” and BMI. Spearman Correlation was used to determine the relationship between exercise habits in relation to adequate days of sleep per week and overweight and obesity as determined by BMI. The detailed data are in table 5. The previous data obtained about sufficient sleep and BMI indicated a significant correlation ($p = .026$). The statistical data showed a significant correlation between strength training and days of sufficient sleep ($p = .001$) with a correlation strength at .127. The statistical data does not show a significant correlation between strength training and BMI ($p = .558$) with a correlation strength at -.022.

Table 5: Spearman Correlation: BMI, Sufficient Sleep, Strength Training

		BMI	Amount of Sufficient Sleep per 7 days
Amount of Strength training in the past 7 days	Correlation Coefficient	-.022	.127
	Sig. (2 tailed)	.558	.001
	N	713	713

The sixth question was “*In the past 7 days, how much of a problem have you had with sleepiness during your daytime activities?*” The survey showed that 48.2 % of participants said they had a little problem. This survey question was used along with “*On how many of the past 7 days did you get enough sleep so that you felt rested when you woke up in the morning?*” Spearman correlation was used to determine the relationship between self-reported adequate days of sleep per week and self-reported sleepiness during daytime activities. The data are illustrated in table 6. The statistical data shows a significant correlation between sufficient sleep and problems with sleepiness ($p = .000$) with a correlation strength value of $-.448$.

Table 6: Spearman Correlation: Sufficient Sleep, Daytime Sleepiness

		Amount of Sufficient Sleep per 7 days
In the past 7 days how much of a problem did you have with Sleepiness	Correlation Coefficient	-.448
	Sig. (2 tailed)	.000
	N	718

The third portion of the research instrument included two questions pertaining to the participant's gender and rank in class along with sleep habits, diet, and exercise in relation to height and weight. The purpose of these questions was to determine the significance between sleep habits and obesity-related health complications in male and females and rank in class.

The first question analyzed was "*What is your year in School?*" The choices ranged from 1st year undergraduate to Graduate or Professional. Of the participants responding, 25.7% reported being 1st year undergraduate students, and 21% were 2nd year undergraduate students. Of the participants responding, 15.1% were 4th year undergraduates, and 7.9% were 5th year undergraduates. The remaining 5.1% of participants responding reported that they were graduate or professional students.

Spearman correlation was used to determine what the relationship was between adequate days of sleep per week, BMI, average number of fruits and vegetables daily, moderate and vigorous aerobic exercise, strength training, and problems with daytime sleepiness. The data representing significant correlations can be found in table 7 below. The statistics showed no significant correlation between class and sufficient sleep ($p = 2.15$) with a correlation strength of .046 meaning that no single rank reported having more sleep than another.

There was a significant correlation between class and BMI ($p = .003$) with a correlation strength of .109. There was a significant correlation between class and fruit and vegetable intake ($p = .014$) with a correlation strength .092. There was no significant correlation between class and moderate aerobic exercise ($p = .526$) with a correlation strength of -.024. There was no significant correlation between class and vigorous aerobic exercise ($p = .281$), with a correlation strength at -.040. There was no significance between class and strength training ($p = .423$), with a correlation strength at .030. There was no significant correlation between class and daytime sleepiness ($p = .098$), with a correlation value at -.062

Table 7: Spearman Correlation: Rank in Class and All Variables

		BMI	Fruit and Vegetable
Rank In Class	Correlation Coefficient	.109	.092
	Sig. (2 tailed)	.003	.014
	N	721	721

Gender was the last question to be analyzed, “What is your gender?” The survey showed that 63% of participants were female ($n = 464$), and 35.3 % of participants were male ($n = 256$). A X^2 test was used to determine the relationship between adequate days of sleep per week, BMI, average number of fruits and vegetables daily, moderate and vigorous aerobic

exercise, strength training, problems with daytime sleepiness, and class. A significant association was found between gender and adequate sleep ($X^2 = 15.725$ with $(DF = 7)$, and a $(p= .028)$. The highest percentages include the following; 19.0% of females stated that just two days within the last seven they received enough sleep to feel rested, and 20.3% of males stated that only 4 days within the last seven they received enough sleep to feel rested. No significant association was found between gender and BMI ($X^2 = 9.715$ with $(DF = 5)$, and a $(p= .084)$. The survey showed that 50.5% of females are in the desired weight range, and 46.9% of males are in the desired weight range. Classification of weight percentages for males and females is presented in table 8.

Table 8: Gender and BMI Classification Percentages

	Female	Male
Under weight	6.9%	2.7%
Desired weight	50.5%	46.9%
Overweight	22.9%	30.6%
Class I Obese	11.4%	11.6%
Class II Obese	5.0%	5.0%
Class III Obese	3.2%	3.1%

No significant association was found between gender and the amount of fruit and vegetable intake ($X^2 = 3.458$ with $(DF = 3)$, and a $(p= .326)$. The most common answer between both males (64.3%) and females (67.2%) was one to two servings of fruits and vegetables per day. No significant association was found between gender and moderate

aerobic exercise ($X^2 = 12.770$ with $(DF = 7)$, and a $(p = .078)$. The most common answer between both males (31.0%) and females (26.9%) was zero days of moderate exercise within the past 7 days. A significant association was found between gender and the amount of vigorous exercise for at least 20 minutes ($X^2 = 14.285$ with $(DF = 7)$, and a $(p = .046)$. The most common answer between both males (42.2%) and females (51.5%) was zero days within the last seven days. A significant association was found between gender and strength training ($X^2 = 31.073$ with $(DF = 7)$, and a $(p = .000)$. The most common answer between both males (51.6%) and females (67.5%) was zero days within the last seven days. A significant association was found between gender and problem with daytime sleepiness ($X^2 = 18.744$ with $(DF = 4)$, and a $(p = .001)$. The most common answer between both males (53.1%) and females (45.5%) was a little problem with sleepiness during the day. A significant association was found between gender and rank in class ($X^2 = 11.325$ with $(DF = 4)$, and a $(p = .045)$. The most common answer for females was 1st year undergraduate (24.6%). The most common answer for males was 3rd year undergraduate (30.1%).

CHAPTER V

Discussion

Findings:

The purpose of this study was to determine if there is a correlation between insufficient sleep and obesity related health complications. The data showed a significant correlation between BMI and the amount of days of sufficient sleep. The correlation suggests more sleep is associated with a lower BMI. The current research shows the correlation between insufficient sleep and weight gain and obesity similar to what has already been reported (20,29,30,31,32,34). This suggests that sleep alone is correlated with overweight and obesity.

There was a statistically significant correlation between the amount of fruits and vegetables consumed, BMI, and sufficient sleep. These findings suggest that the more fruits and vegetables eaten per day correlates to an increase in sufficient sleep obtained and a lower the BMI value. The increase in fruit and vegetable intake is suggested to lower hunger cravings and provide satiety (27). Frequent fruit and vegetable intake aids in weight maintenance and decrease in overweight and obesity as seen in past findings (25,26).

The statistical data suggests a significant correlation between moderate aerobic exercise, sufficient sleep, and BMI. The data suggests a correlation between an increase in weekly aerobic exercise and an increase in the number of days of self-reported sufficient sleep. In addition to more sufficient sleep, the data suggests that the more aerobic exercise per week the lower BMI. The statistical data suggests a significant correlation between

all forms of exercise and sufficient sleep including moderate aerobic, vigorous aerobic, and strength training supporting other similar research findings (28).

The statistical data shows a significant correlation between insufficient sleep and problems with sleepiness. It is no surprise that insufficient sleep leads to problems completing daily tasks. Not receiving enough sleep is not only important to physical health but also mental clarity. Previous research (15,17,19,20) suggests how important sleep is in maintaining hand-eye coordination and overall general safety. This suggests that an increase in days of sufficient sleep is associated with a decrease in problems with daytime sleepiness.

Rank in class is analyzed with all of the variables showing a significant correlation between BMI and fruit and vegetable intake. The correlation shows that the higher the Class the higher the BMI. Research has shown similar results that suggest that higher education equals more income (36). These findings claim the more educated the individual, the higher the income therefore, the healthier the diet (36).

Gender is analyzed with all other variables showing no significant associations except with gender and sufficient sleep. Females had significantly less restful sleep during the week compared to males. The reasons for this correlation should be researched further. A significant association was found between gender and the amount of vigorous and strength training exercise per week, with females participating significantly less than males. A significant association between gender and problems with daytime sleepiness suggests males had a tougher time coping with insufficient sleep. Finally, an association between gender and rank in class was observed. Most females

reported being 1st year undergraduates where most males reported being 3rd year undergraduates.

Limitations:

1. The survey used an extant data set so the survey questions were put into categories and were not specific.
2. The survey questions about days of self-reported adequate sleep was difficult to quantify. It would have been better to ask the participants about the average hours of sleep per night.
3. The data gathered in this study including heights, weights, and other information were self-reported which may challenge its accuracy.
4. The study consisted of more female participants than male participants so the data is limited in that aspect.
5. The survey category of fruits and vegetables is a limited method for determining overall healthy diet habits.

Implications:

The study suggests a significant correlation between insufficient sleep and obesity in college students. More research should be conducted on exactly why students lack sufficient sleep, as well as other factors involving both sleep and obesity. One important factor to be addressed is if the findings are based solely on insufficient sleep, or poor diet and exercise habits associated with the insufficiency. Educational programs should be developed focusing on the value of sleep and how it reflects in exam scores and obesity.

Research on why only moderate aerobic exercise had the most effect on BMI, and vigorous and strength training showed no significant correlations should be

researched further. Some possible reasons for this answer could be the vague description of what the difference is between the types of exercises.

More research needs to be conducted on increases in both fruit and vegetable intake and obesity with rank in class. It is known that an increase in education generally means a healthier diet. The research does not explain why more fruit and vegetable intake did not decrease BMI. This topic warrants further research.

Reasons for why females state they receive significantly less sleep than males should be further researched. At first glance family responsibilities may be to blame however, males actually reported having a harder time dealing with sleepiness during the day than females did.

Conclusion:

Now that research shows a clear correlation between sleep and obesity this problem needs to be addressed. Americans need to prioritize and place special emphasis on proper sleep. Along with sufficient sleep, fruit and vegetable intake, and exercise should all make up a more balanced and healthy lifestyle. Unfortunately the problems with sleep and obesity will not disappear anytime soon unless these factors are addressed. Learning exactly why sleep and obesity are connected and how the biggest impact can be made is vital for the health and wellbeing of all Americans.

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APPENDICES

Appendix A Institutional Review Board Exemption Letter**MIDDLE
TENNESSEE**
STATE UNIVERSITY

February 25, 2013

Lacey Decker, Dr. Lisa Sheehan-Smith
Department of Human Sciences
lmd2w@mtmail.mtsu.edu Lisa_Sheehan-Smith@mtsu.edu

Protocol Title: "The Relationship Between Insufficient Sleep and Obesity Related Health Complications in College Students"

Protocol Number: 13-232

Dear Investigator(s).

The exemption is pursuant to 45 CFR 46.101(b) (4). This is because the research being conducted involves the use of existing data being recorded by the investigator in such a manner that subjects cannot be identified.

You will need to submit an end-of-project report to the Compliance Office upon completion of your research. Complete research means that you have finished collecting data and you are ready to submit your thesis and/or publish your findings. Should you not finish your research within the three (3) year period, you must submit a Progress Report and request a continuation prior to the expiration date. Please allow time for review and requested revisions. Your study expires on **February 25, 2016**.

Any change to the protocol must be submitted to the IRB before implementing this change.

According to MTSU Policy, a researcher is defined as anyone who works with data or has contact with participants. Anyone meeting this definition needs to be listed on the protocol and needs to provide a certificate of training to the Office of Compliance. **If you add researchers to an approved project, please forward an updated list of researchers and their certificates of training to the Office of Compliance before they begin to work on the project.** **Once your research is completed, please send us a copy of the final report questionnaire to the Office of Compliance.** This form can be located at www.mtsu.edu/irb on the forms page.

Also, all research materials must be retained by the PI or **faculty advisor (if the PI is a student)** for at least three (3) years after study completion. Should you have any questions or need additional information, please do not hesitate to contact me.

Sincerely,



Compliance Office
615-494-8918
Compliance@mtsu.edu

Appendix B Permission to Use Survey Data Letter

Student Health Services
MTSU Box 237
Murfreesboro, TN 37132
o: 615-898-2988
f: 615-898-5004

**MIDDLE
TENNESSEE**
STATE UNIVERSITY

Lacey Decker
Human Sciences
MTSU Box 86
Murfreesboro, TN 37132

December 12, 2012

Dear Lacey:

With this letter, I grant you permission to utilize the data gathered in MTSU's National College Health Assessment for secondary data analysis. This agreement applies to data gathered in the Spring 2010 semester under IRB protocol #10-160.

I do ask to see results of your analysis when your research is complete.

Please let me know if there are other ways I can assist you in your project. Good luck in your research endeavors!

Sincerely,



Lisa Schrader, MPH, MCHES
Director of Health Promotion



Instructions:

The following questions ask about various aspects of your health.

To answer the questions, fill in the oval that corresponds to your response.

Select only one response unless instructed otherwise.

Use a No. 2 pencil or blue or black ink pen only. Do not use pens with ink that soaks through the paper.

CORRECT: ● INCORRECT: ✓ ✗ ○ ●

This survey is completely voluntary. You may choose not to participate or not to answer any specific question. You may skip any question you are not comfortable in answering.

Please make no marks of any kind on the survey which could identify you individually.

Composite data will then be shared with your campus for use in health promotion activities.

Thank you for taking the time and thought to complete this survey. We appreciate your participation!



American College Health Association

National College Health Assessment

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PAGE ONE

PLEASE DO NOT WRITE IN THIS AREA



SERIAL #

3/8" spine perf

1. How would you describe your general health?

- Excellent
 Very good
 Good
 Fair
 Poor
 Don't know

2. Have you received information on the following topics from your college or university?

3. Are you interested in receiving information on the following topics from your college or university?

(Please mark the appropriate column for each question to the right)

	No	Yes	No	Yes
Alcohol and other drug use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cold/Flu/Sore throat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depression/Anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eating disorders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grief and loss	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to help others in distress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Injury prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nutrition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pregnancy prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Problem use of Internet/computer games	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationship difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sexual assault/Relationship violence prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sexually transmitted disease/infection (STD/I) prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sleep difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stress reduction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Suicide prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tobacco use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Violence prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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4. Within the last 12 months, how often did you:

(Please mark the appropriate column for each row)

	N/A, did not do this activity within the last 12 months	Never	Rarely	Sometimes	Most of the time	Always
Wear a seatbelt when you rode in a car?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wear a helmet when you rode a bicycle?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wear a helmet when you rode a motorcycle?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wear a helmet when you were inline skating?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Within the last 12 months:

(Please mark the appropriate column for each row)

	No	Yes
Were you in a physical fight?	<input type="radio"/>	<input type="radio"/>
Were you physically assaulted (do not include sexual assault)?	<input type="radio"/>	<input type="radio"/>
Were you verbally threatened?	<input type="radio"/>	<input type="radio"/>
Were you sexually touched without your consent?	<input type="radio"/>	<input type="radio"/>
Was sexual penetration attempted (vaginal, anal, oral) without your consent?	<input type="radio"/>	<input type="radio"/>
Were you sexually penetrated (vaginal, anal, oral) without your consent?	<input type="radio"/>	<input type="radio"/>
Were you a victim of stalking (e.g., waiting for you outside your classroom, residence, or office; repeated emails/phone calls)?	<input type="radio"/>	<input type="radio"/>

9. Within the last 30 days, how often do you think the typical student at your school used:

(State your best estimate; Please mark the appropriate column for each row)

Have used, but not in last 30 days
 Never used
 1-2 days
 3-5 days
 6-9 days
 10-19 days
 20-29 days
 Used daily

Cigarettes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tobacco from a water pipe (hookah)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cigars, little cigars, clove cigarettes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smokeless tobacco	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alcohol (beer, wine, liquor)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marijuana (pot, weed, hashish, hash oil)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cocaine (crack, rock, freebase)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Methamphetamine (crystal meth, ice, crank)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other amphetamines (diet pills, bennies)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sedatives (downers, ludes)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hallucinogens (LSD, PCP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anabolic steroids (Testosterone)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opiates (heroin, smack)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inhalants (glue, solvents, gas)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MDMA (Ecstasy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other club drugs (GHB, Ketamine, Rohypnol)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other illegal drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

One drink of alcohol is defined as a 12 oz. can or bottle of beer or wine cooler, a 4 oz. glass of wine, or a shot of liquor straight or in a mixed drink.

10. The last time you "partied"/socialized how many drinks of alcohol did you have? (If you did not drink alcohol, please enter 00. If less than 10, enter 01, 02, 03, etc.)

D	<input type="text"/>	<input type="text"/>
R	<input type="text"/>	<input type="text"/>
I	<input type="text"/>	<input type="text"/>
N	<input type="text"/>	<input type="text"/>
K	<input type="text"/>	<input type="text"/>
S	<input type="text"/>	<input type="text"/>

11. The last time you "partied"/socialized over how many hours did you drink alcohol? (If you did not drink alcohol, please enter 00. If less than 10, enter 01, 02, 03, etc.)

H	<input type="text"/>	<input type="text"/>
O	<input type="text"/>	<input type="text"/>
U	<input type="text"/>	<input type="text"/>
R	<input type="text"/>	<input type="text"/>
S	<input type="text"/>	<input type="text"/>

12. How many drinks of alcohol do you think the typical student at your school had the last time he/she "partied"/socialized? (If you think the typical student at your school does not drink alcohol, please enter 00. If less than 10, enter 01, 02, 03, etc.)

D	<input type="text"/>	<input type="text"/>
R	<input type="text"/>	<input type="text"/>
I	<input type="text"/>	<input type="text"/>
N	<input type="text"/>	<input type="text"/>
K	<input type="text"/>	<input type="text"/>
S	<input type="text"/>	<input type="text"/>

13. Over the last two weeks, how many times have you had five or more drinks of alcohol at a sitting?

- N/A, don't drink
- 2 times
- 5 times
- 8 times
- None
- 3 times
- 6 times
- 9 times
- 1 time
- 4 times
- 7 times
- 10 or more times

14. Within the last 30 days, did you:

(Please mark the appropriate column for each row)

Yes
 No
 N/A, don't drink
 N/A, don't drive

Drive after drinking any alcohol at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drive after drinking five or more drinks of alcohol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. During the last 12 months, when you "partied"/socialized, how often did you:

(Please mark the appropriate column for each row)

- Alternate non-alcoholic with alcoholic beverages
- Avoid drinking games
- Choose not to drink alcohol
- Determine, in advance, not to exceed a set number of drinks
- Eat before and/or during drinking
- Have a friend let you know when you have had enough
- Keep track of how many drinks you were having
- Pace your drinks to 1 or fewer per hour
- Stay with the same group of friends the entire time you were drinking
- Stick with only one kind of alcohol when drinking
- Use a designated driver

	Rarely		Sometimes	
	Never	Most of the time	Always	
N/A, don't drink	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alternate non-alcoholic with alcoholic beverages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avoid drinking games	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Choose not to drink alcohol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determine, in advance, not to exceed a set number of drinks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat before and/or during drinking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Have a friend let you know when you have had enough	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Keep track of how many drinks you were having	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pace your drinks to 1 or fewer per hour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stay with the same group of friends the entire time you were drinking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stick with only one kind of alcohol when drinking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a designated driver	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Within the last 12 months, have you experienced any of the following when drinking alcohol?

(Please mark the appropriate column for each row)

- Did something you later regretted
- Forgot where you were or what you did
- Got in trouble with the police
- Someone had sex with me without my consent
- Had sex with someone without their consent
- Had unprotected sex
- Physically injured yourself
- Physically injured another person
- Seriously considered suicide

	Yes	
	No	
N/A, don't drink	<input type="radio"/>	<input type="radio"/>
Did something you later regretted	<input type="radio"/>	<input type="radio"/>
Forgot where you were or what you did	<input type="radio"/>	<input type="radio"/>
Got in trouble with the police	<input type="radio"/>	<input type="radio"/>
Someone had sex with me without my consent	<input type="radio"/>	<input type="radio"/>
Had sex with someone without their consent	<input type="radio"/>	<input type="radio"/>
Had unprotected sex	<input type="radio"/>	<input type="radio"/>
Physically injured yourself	<input type="radio"/>	<input type="radio"/>
Physically injured another person	<input type="radio"/>	<input type="radio"/>
Seriously considered suicide	<input type="radio"/>	<input type="radio"/>

17. Within the last 30 days, what percent of students at your school used:
State your best estimate. (If less than 10, please enter 00, 01, 02, etc.)

Cigarettes % Used	Alcohol % Used	Marijuana % Used
<input type="text" value="0"/> 0	<input type="text" value="0"/> 0	<input type="text" value="0"/> 0
<input type="text" value="1"/> 1	<input type="text" value="1"/> 1	<input type="text" value="1"/> 1
<input type="text" value="2"/> 2	<input type="text" value="2"/> 2	<input type="text" value="2"/> 2
<input type="text" value="3"/> 3	<input type="text" value="3"/> 3	<input type="text" value="3"/> 3
<input type="text" value="4"/> 4	<input type="text" value="4"/> 4	<input type="text" value="4"/> 4
<input type="text" value="5"/> 5	<input type="text" value="5"/> 5	<input type="text" value="5"/> 5
<input type="text" value="6"/> 6	<input type="text" value="6"/> 6	<input type="text" value="6"/> 6
<input type="text" value="7"/> 7	<input type="text" value="7"/> 7	<input type="text" value="7"/> 7
<input type="text" value="8"/> 8	<input type="text" value="8"/> 8	<input type="text" value="8"/> 8
<input type="text" value="9"/> 9	<input type="text" value="9"/> 9	<input type="text" value="9"/> 9

18. Within the last 12 months, have you taken any of the following prescription drugs that were not prescribed to you?

(Please mark the appropriate column for each row)

- Antidepressants (e.g., Celexa, Lexapro, Prozac, Wellbutrin, Zoloft)
- Erectile dysfunction drugs (e.g., Viagra, Cialis, Levitra)
- Pain killers (e.g., OxyContin, Vicodin, Codeine)
- Sedatives (e.g., Xanax, Valium)
- Stimulants (e.g., Ritalin, Adderall)

Yes
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>



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19. Within the last 12 months, with how many partners have you had oral sex, vaginal intercourse, or anal intercourse? (If you did not have a sex partner within the last 12 months, please enter 00. If less than 10, enter 01, 02, 03, etc.)

P		
A	①	①
R	①	①
T	②	②
N	③	③
E	④	④
R	⑤	⑤
S	⑥	⑥
	⑦	⑦
	⑧	⑧
	⑨	⑨

20. Within last 12 months, did you have sexual partner(s) who were:

(Please mark the appropriate column for each row)

	No	Yes
Female	<input type="radio"/>	<input type="radio"/>
Male	<input type="radio"/>	<input type="radio"/>
Transgender	<input type="radio"/>	<input type="radio"/>

21. Within the last 30 days, did you have:

(Please mark the appropriate column for each row)

- Oral sex?
- Vaginal intercourse?
- Anal intercourse?

	No, have never done this sexual activity	No, have done this sexual activity in the past but not in the last 30 days	Yes
Oral sex?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vaginal intercourse?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anal intercourse?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. Within the last 30 days, how often did you or your partner(s) use a condom or other protective barrier (e.g., male condom, female condom, dam, glove) during:

- Oral sex?
- Vaginal intercourse?
- Anal intercourse?

	N/A, never did this sexual activity during the last 30 days	Have not done this sexual activity during the last 30 days	Never	Rarely	Sometimes	Most of the time	Always	CONDOM/BARRIER USE
Oral sex?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vaginal intercourse?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anal intercourse?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23A. Did you or your partner use a method of birth control to prevent pregnancy the last time you had vaginal intercourse?

- Yes (continue to item 23B)
- N/A, have not had vaginal intercourse (skip to item 24)
- No, have not had vaginal intercourse that could result in a pregnancy (skip to item 24)
- No, did not want to prevent pregnancy (skip to item 24)
- No, did not use any birth control method (skip to item 24)
- Don't know (skip to item 24)

23B. Please indicate whether or not you or your partner used each of the following methods of birth control to prevent pregnancy the last time you had vaginal intercourse. (Please mark the appropriate column for each row)

	No	Yes		No	Yes
Birth control pills (monthly or extended cycle)	<input type="radio"/>	<input type="radio"/>	Diaphragm or cervical cap	<input type="radio"/>	<input type="radio"/>
Birth control shots	<input type="radio"/>	<input type="radio"/>	Contraceptive sponge	<input type="radio"/>	<input type="radio"/>
Birth control implants	<input type="radio"/>	<input type="radio"/>	Spermicide (e.g., foam, jelly, cream)	<input type="radio"/>	<input type="radio"/>
Birth control patch	<input type="radio"/>	<input type="radio"/>	Fertility awareness (e.g., calendar, mucous, basal body temperature)	<input type="radio"/>	<input type="radio"/>
Vaginal ring	<input type="radio"/>	<input type="radio"/>	Withdrawal	<input type="radio"/>	<input type="radio"/>
Intrauterine device (IUD)	<input type="radio"/>	<input type="radio"/>	Sterilization (e.g., hysterectomy, tubes tied, or vasectomy)	<input type="radio"/>	<input type="radio"/>
Male condom	<input type="radio"/>	<input type="radio"/>	Other method	<input type="radio"/>	<input type="radio"/>
Female condom	<input type="radio"/>	<input type="radio"/>			

24. Within the last 12 months, have you or your partner(s) used emergency contraception (“morning after pill”)?

- N/A, have not had vaginal intercourse in the **last 12 months**
- No
- Yes
- Don't know

25. Within the last 12 months, have you or your partner(s) become pregnant?

- N/A, have not had vaginal intercourse in the **last 12 months**
- No
- Yes, unintentionally
- Yes, intentionally
- Don't know

Weight, Nutrition, and Exercise

26. How do you describe your weight?

- Very underweight
- Slightly underweight
- About the right weight
- Slightly overweight
- Very overweight

27. Are you trying to do any of the following about your weight?

- I am not trying to do anything about my weight
- Stay the same weight
- Lose weight
- Gain weight

28. How many servings of fruits and vegetables do you usually have per day? (1 serving = 1 medium piece of fruit; 1/2 cup fresh, frozen, or canned fruits/vegetables; 3/4 cup fruit/vegetable juice; 1 cup salad greens; or 1/4 cup dried fruit)

- 0 servings per day
- 1–2 servings per day
- 3–4 servings per day
- 5 or more servings per day

29. On how many of the past 7 days did you:
(Please mark the appropriate column for each row)

- Do moderate-intensity cardio or aerobic exercise (caused a noticeable increase in heart rate, such as a brisk walk) for at least 30 minutes?
- Do vigorous-intensity cardio or aerobic exercise (caused large increases in breathing or heart rate, such as jogging) for at least 20 minutes?
- Do 8-10 strength training exercises (such as resistance weight machines) for 8-12 repetitions each?

	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
Do moderate-intensity cardio or aerobic exercise (caused a noticeable increase in heart rate, such as a brisk walk) for at least 30 minutes?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do vigorous-intensity cardio or aerobic exercise (caused large increases in breathing or heart rate, such as jogging) for at least 20 minutes?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do 8-10 strength training exercises (such as resistance weight machines) for 8-12 repetitions each?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Mental Health

30. Have you ever:

(Please mark the appropriate column for each row)

- Felt things were hopeless
- Felt overwhelmed by all you had to do
- Felt exhausted (not from physical activity)
- Felt very lonely
- Felt very sad
- Felt so depressed that it was difficult to function
- Felt overwhelming anxiety
- Felt overwhelming anger
- Intentionally cut, burned, bruised, or otherwise injured yourself
- Seriously considered suicide
- Attempted suicide

	No, never	No, not in last 12 months	Yes, in the last 2 weeks	Yes, in the last 30 days	Yes, in the last 12 months
Felt things were hopeless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt overwhelmed by all you had to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt exhausted (not from physical activity)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt very lonely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt very sad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt so depressed that it was difficult to function	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt overwhelming anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt overwhelming anger	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intentionally cut, burned, bruised, or otherwise injured yourself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seriously considered suicide	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attempted suicide	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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35. Have you ever received psychological or mental health services from your current college/university's Counseling or Health Service?

- No Yes

36. If in the future you were having a personal problem that was really bothering you, would you consider seeking help from a mental health professional?

- No Yes

37. Within the last 12 months, how would you rate the overall level of stress you have experienced?

- No stress
 Less than average stress
 Average stress
 More than average stress
 Tremendous stress

Physical Health

38. Within the last 30 days, did you do any of the following?

(Please mark the appropriate column for each row)

Exercise to lose weight

Diet to lose weight

Vomit or take laxatives to lose weight

Take diet pills to lose weight

No	Yes
<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>

39. Have you:

(Please mark the appropriate column for each row)

Had a dental exam and cleaning in the last 12 months?

(Males) Performed testicular self exam in the last 90 days?

(Females) Performed breast self exam in the last 90 days?

(Females) Had a routine gynecological exam in the last 12 months?

Used sunscreen regularly with sun exposure?

Ever been tested for Human Immunodeficiency Virus (HIV) infection?

No	Yes	Don't know
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

40. Have you received the following vaccinations (shots)?

(Please mark the appropriate column for each row)

Hepatitis B

Human Papillomavirus/HPV (cervical cancer vaccine)

Influenza (the flu) in the last 12 months (shot or nasal mist)

Measles, Mumps, Rubella

Meningococcal disease (meningococcal meningitis)

Varicella (chicken pox)

No	Yes	Don't know
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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51. What is your year in school?

- 1st year undergraduate
- 2nd year undergraduate
- 3rd year undergraduate
- 4th year undergraduate
- 5th year or more undergraduate
- Graduate or professional
- Not seeking a degree
- Other

52. What is your enrollment status?

- Full-time
- Part-time
- Other

53. Have you transferred to this college or university within the last 12 months?

- No
- Yes

54. How do you usually describe yourself?

(Mark all that apply)

- White
- Black or African American
- Hispanic or Latino/a
- Asian or Pacific Islander
- American Indian, Alaskan Native, or Native Hawaiian
- Biracial or Multiracial
- Other

55. Are you an international student?

- No
- Yes

56. What is your relationship status?

- Not in a relationship
- In a relationship but not living together
- In a relationship and living together

57. What is your marital status?

- Single
- Divorced
- Married/Partnered
- Other
- Separated

58. Where do you currently live?

- Campus residence hall
- Fraternity or sorority house
- Other college/university housing
- Parent/guardian's home
- Other off-campus housing
- Other

59. Are you a member of a social fraternity or sorority? (e.g., National Interfraternity Conference, National Panhellenic Conference, National Pan-Hellenic Council, National Association of Latino Fraternal Organizations)

- No
- Yes

60. How many hours a week do you work for pay?

- 0 hours
- 1–9 hours
- 10–19 hours
- 20–29 hours
- 30–39 hours
- 40 hours
- More than 40 hours

61. How many hours a week do you volunteer?

- 0 hours
- 1–9 hours
- 10–19 hours
- 20–29 hours
- 30–39 hours
- 40 hours
- More than 40 hours

62. What is your primary source of health insurance?

- My college/university sponsored plan
- My parents' plan
- Another plan
- I don't have health insurance
- I am not sure if I have health insurance

63. What is your approximate cumulative grade average?

- A
- B
- C
- D/F
- N/A

64. Within the last 12 months, have you participated in organized college athletics at any of the following levels?

	No	Yes
(Please mark the appropriate column for each row)		
Varsity	<input type="radio"/>	<input type="radio"/>
Club sports	<input type="radio"/>	<input type="radio"/>
Intramurals	<input type="radio"/>	<input type="radio"/>

65. Do you have any of the following?

	No	Yes
(Please mark the appropriate column for each row)		
Attention Deficit and Hyperactivity Disorder (ADHD)	<input type="radio"/>	<input type="radio"/>
Chronic illness (e.g., cancer, diabetes, auto-immune disorders)	<input type="radio"/>	<input type="radio"/>
Deafness/Hearing loss	<input type="radio"/>	<input type="radio"/>
Learning disability	<input type="radio"/>	<input type="radio"/>
Mobility/Dexterity disability	<input type="radio"/>	<input type="radio"/>
Partial sightedness/Blindness	<input type="radio"/>	<input type="radio"/>
Psychiatric condition	<input type="radio"/>	<input type="radio"/>
Speech or language disorder	<input type="radio"/>	<input type="radio"/>
Other disability	<input type="radio"/>	<input type="radio"/>

66. Are you currently or have you been a member of the United States Armed Services (Active Duty, Reserve, or National Guard)?

- No
- Yes and I **have** deployed to an area of hazardous duty
- Yes and I **have not** deployed to an area of hazardous duty

THANK YOU FOR COMPLETING THIS SURVEY

