

**CORRELATIONS BETWEEN COLLEGE STUDENTS' PERCEPTION AND GOAL OF
BODY WEIGHT, AND THEIR CONSUMPTION BEHAVIORS OF SUGAR-
SWEETENED BEVERAGES AND FRIED POTATOES**

by

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Abstract

The number of overweight and obese college students in the United States has remained high, which could be related to the comfort food and beverages consumed. Sugar-sweetened beverages and fried potatoes are beverages and comfort food commonly consumed by college students. Furthermore, people's behavior is affected by their perceptions and goals. Thus, this study aimed to assess the correlations between the perception, goal of body weight, and sugar-sweetened beverages and fried potatoes consumption behaviours of college students. A cross-sectional survey of 371 college students was conducted via a self-reporting questionnaire that included information related to sugar-sweetened beverages and fried potato consumption behavior in the past month. The involved students also described their body weight perception and future goal. Spearman correlation and Chi-square analyses were performed to examine the associations. There were significant associations ($p < 0.0001$) between perception of body weight and goal of body weight, regular soda consumption and other sweetened beverage consumption, regular soda consumption and fried potato consumption, and other sweetened beverage consumption and fried potatoes consumption. In addition, there were significant correlations between goals of body weight and other sweetened beverage consumption ($p = 0.0370$). These findings confirmed that perception of body weight was associated with goal of body weight and provided a significant importance for educational intervention to students on improving awareness of healthy body weight and eating.

Keywords: comfort food, body weight perception, body weight goals, sugar-sweetened beverages, college students

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Dedication

This thesis is dedicated to my family, teachers, professors and former students. Thank you for motivating and inspiring me to keep learning and sharing knowledge. May the Lord reward you!

Chapter 1 - Literature Review

Introduction

As college students start their life away from their parents, they are challenged to be more independent and to balance their lives between academic and social activities.¹ At this stage of life, young adults reported eating food outside of the home quite often.^{2,3} Sugar-sweetened beverages and fried potatoes were beverages and food commonly consumed by college students.⁴⁻⁷

Unfortunately, most food bought outside the home has big portions,⁸ high calories, high fat, low fiber, and low micronutrients.^{9,10} Based on a systematical review, eating out-of the home showed a positive relationship with weight gain.³ In addition, the more frequent consumption of fast-food from restaurants that served french fries and burgers was correlated to higher risks for overweight or obesity, higher intake of total energy, sugar-sweetened beverages, and fat but lower intake of healthy food.⁷

The number of overweight and obese college students in the United States have not only remained high in 2013,¹¹ there even a comprises rising trend when compared to 2008 data.¹² Furthermore, overweight and obesity have been linked to the increased risk of some degenerative diseases. Based on a cohort study of US adults, the risk of death from cardiovascular disease, cancer, or other diseases increased throughout the range of moderate and severe overweight for both genders in all age groups.¹³ The increase of body weight was also associated with the increase of death rates for all cancers combined and for different types of cancer.¹⁴ Overweight college students were three times more likely to have at least one of the metabolic syndromes, particularly abnormal glucose and insulin metabolism, and dyslipidemia.¹⁵

In developing strategies to improve people's eating habits, understanding some fundamental theories of behavior is needed. Behavior is mediated by what people know and think, and in turn, that would affect how they act. While knowledge is necessary for most behavioral changes, this is not sufficient. Perceptions and motivations are other important influences on behavior.¹⁶

Some studies on body weight reported that there were relationships between weight perception and weight control behavior.^{17,18} In addition, people's behavior is affected by their goal.¹⁹ People who were actively engaged in goal pursuit, compared with those who were not pursuing the goal, automatically evaluated goal-relevant objects as relatively more positive than goal-irrelevant objects.²⁰ Wanting to lose weight was correlated to participation in weight control activities, such as vigorous physical activity, strengthening exercises and limiting high-fat food consumption.²¹

College Students

The transition from adolescence to young adulthood is a critical time when young people establish their independence and adopt lasting health behavior patterns. Young adults experience situations that are different from other life stages in the formulation of health behavior patterns, including identity development and shifting interpersonal influences. At this stage, they experience transitions such as leaving home and increasing autonomy in decision-making.²² They are challenged to be more independent and balance their lives between academic and social activities.¹ On the other hand, their adult responsibilities such as financial and residential independences and employment stability are still in flux.²²

Eating Behaviors of College Students

Young adults eat out as often as three to four times a week.^{2,3,7} Unfortunately, most foods eaten outside the home are associated with big portions,⁸ high calories, high fat, low fiber, and low micronutrients.^{9,10} Based on a systematical review, frequent dining out showed a positive relationship with weight gain.³

Some food and beverages commonly consumed by college students are sugar-sweetened beverages and fried potatoes.⁴⁻⁷ Young adults aged 18-24 years are the highly desirable market for fast food and soft drink companies.²²

Research shows fast food consumption starts to increase during adolescence, the stage before young adulthood.²³ This behavior might occur because fast food is relatively affordable for them.²⁴ Another study indicated adults and children who reported eating fast food showed higher consumption of energy, fat, saturated fat, sodium, and carbonated soft drinks than those who did not report eating fast food.²⁵ Pereira et al. found fast-food consumption was positively associated with weight gain and insulin resistance.²⁶ This finding suggested that fast food might increase the risk of obesity and type 2 diabetes.

Additionally, fast-food consumers had lower consumption of milk, vitamins C, fruits and vegetables.²⁵ Milk is a good source of calcium, potassium, vitamin D, and protein that are needed to build bones and teeth and maintain bone mass peak during this stage and could prevent osteoporosis. Vitamin C is also important for growth, repairing body tissues, and keeps gums healthy. Additionally, fruits and vegetables are good source of fiber and calcium that can reduce the risk of heart disease, obesity, cancers, and type 2 diabetes.²⁷

Sugar-sweetened beverages are beverages that contain added caloric sweeteners such as sucrose, high-fructose corn syrup or fruit-juice concentrates. They include carbonated soft drinks, fruitades, fruit drinks, sports drinks, energy and vitamin water drinks, sweetened iced tea,

cordial, squashes, and lemonade. These beverages are collectively the largest contributor to added sugar intake in the US.²⁸

The frequency of sugar-sweetened beverages and fast-food consumption were negatively correlated with Protective Factors Index, an index which sums selected protective meal routines and practices that are positively associated with fruit/vegetable consumption. On the other hand, the Risky Factors Index showed significant positive associations with fast food and sugar-sweetened beverage consumption.²⁹ From a systematical review, findings from large cross-sectional studies indicated positive associations between greater intakes of sugar-sweetened beverages and weight gain and obesity. Additionally, the results from short-term intervention, showed positive energy balance and weight gain after the intake of sugar-sweetened sodas.³⁰ The consumption of sugar-sweetened soda was also associated with a higher risk of kidney stone formation.³¹

Limiting the consumption of sugar-sweetened beverages can assist with weight loss or unwanted weight gain.³² This behavior was also recommended over short-term weight loss programs for reducing the prevalence of obesity. This might be due to the fact that once an individual becomes obese, it is difficult to lose weight and keep it off.²⁸

Overweight and Obesity in College Students

Overweight is the product of positive energy balance because of relatively low energy expenditure and/or relatively high-energy intake. When energy intake exceeds energy expenditure, the excess is stored in the adipose tissue. Excess body fat has been associated with the increase of mortality and morbidity.³³ In the United States, more than two-third of adults have been either overweight or obese since 2003.³⁴ The number of overweight and obese

college students has also remained high. There were 23% and 12% of overweight and obese college students, respectively.¹¹

Overweight and obesity have been linked to the increased risk of some degenerative diseases. Based on a cohort study of US adults, the risk of death from cardiovascular disease, cancer, or other diseases increased throughout the range of moderate and severe overweight for both genders in all age groups.¹³ The increase of body weight was also positively associated with rates of death for all cancers combined and for different types of cancer, including cancer of the esophagus, liver, gallbladder, colon and rectum, pancreas, and kidney in genders.¹⁴ Overweight college students were three times more likely to have at least one of the metabolic syndromes, particularly dyslipidemia and abnormal glucose and insulin metabolism.¹⁵ Dyslipidemia is a disorder in lipid metabolism, i.e. high levels of triglycerides, low-density lipoprotein (LDL) cholesterol, and inflammation, and low levels of high-density lipoprotein (HDL) cholesterol. These metabolic syndromes could increase the risk of cardiovascular disease (CVD) and diabetes mellitus.³⁵

Health Behavior Theories

Behavior is mediated by what people know and think, and that would affect how they act. While knowledge is necessary for most behavioral changes, this is not sufficient. Perceptions and motivations are other important influences on behavior.¹⁶

A theory presents a set of concepts, definitions, and propositions that explain or predict these events or situations by illustrating the relationships between variables. In addition to exploring behavior, individual-level theories also need to focus on intrapersonal factors. Individual-level theories exist or occur within the individual self or mind while intrapersonal

factors include knowledge, attitudes, beliefs, motivation, self-concept, developmental history, past experience, and skills.¹⁶

Humans utilize and process information systematically and then regulate their own behavior.³⁶ At the individual and interpersonal levels, contemporary theories of health behavior can be broadly categorized as “Cognitive-Behavioral.” There are three important concepts on these theories.¹⁶

- Behavior is mediated by cognitions; that is, what people know and think affects how they act.
- Knowledge is necessary for most behavior changes but it is not sufficient to produce the changes.
- Perceptions, motivations, skills, and the social environment are key influences on behavior.¹⁶

Some global theoretical frameworks related to health behaviors are Fishbein and Ajzen’s Theory of Reasoned Action (TRA), Ajzen’s Theory of Planned Behavior (TPB), and Bandura’s Social Cognitive Theory (SCT).

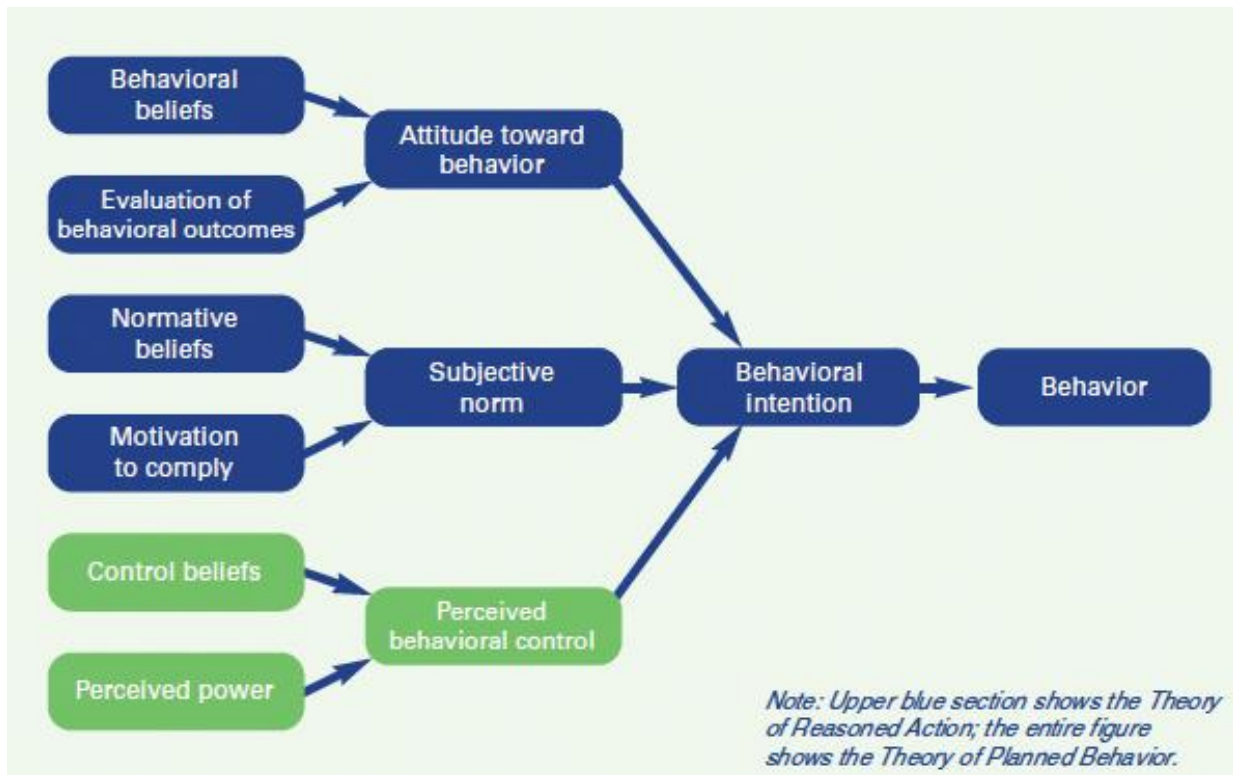
The TRA and TPB explore the correlation between behavior and beliefs, attitudes, and intentions (Figure 1.1). These theories assume behavioral intention is the most important factor of behavior and it is influenced by a person’s attitude toward performing a behavior, and by beliefs whether individuals who are important to the person approve or disapprove of the behaviors, or subjective norm.^{16,36,37} According to these theories, all other factors, such as culture and the environment, play roles through the models’ constructs, and do not independently explain the way people will behave. Thus, it is believed that there is a causal chain of beliefs, attitudes, and intentions that drives behavior.¹⁶

The TPB includes another construct from those of TRA, which is the perceived and actual behavioral control that has to do with people's beliefs if they are able to control certain behaviors.¹⁶ This theory also explores that attitudes toward behavior are shaped by beliefs on what is entailed in performing the behavior and outcomes of the behavior, such as skills and abilities.^{16,36}

The third theory, Bandura's SCT, assumes that personal factors, environmental factors, and human behavioral factors influence each other (Figure 1.2). Main factors influence people to change a health behavior are their self-efficacy, goals, and outcome expectancies. When somebody starts to adopt new behaviors, this would lead changes in both the environment and the person. So, behavior is not simply a product of the environment and the person. Vice versa, environment is not simply a product of the person and behavior.¹⁶

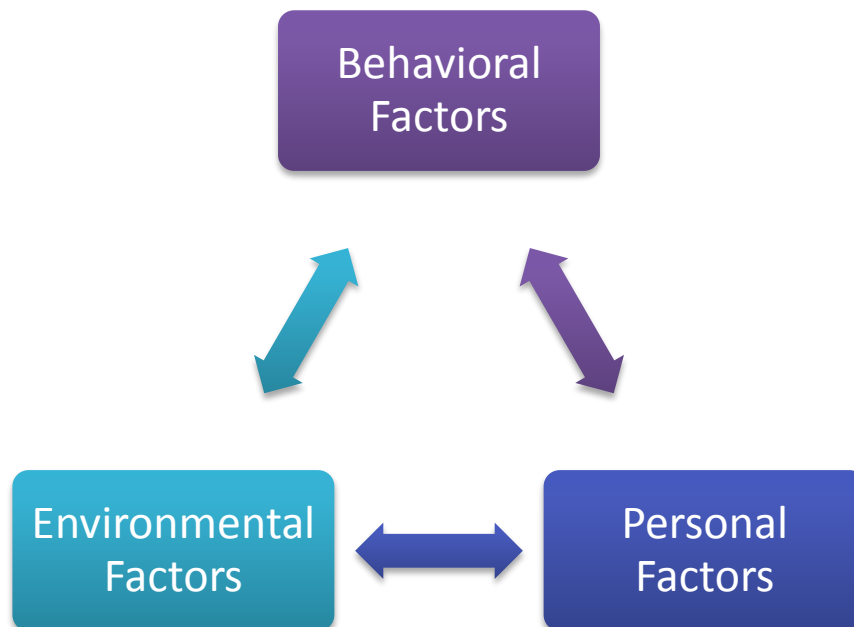
Some studies on body weight reported that there were relationships between weight perception and weight control behavior.^{17,18} In addition, people's behavior is affected by their goal.¹⁹ Goals are the cognitive representations of expected results that potentially influence evaluations and emotions as well as behavior. The non-conscious activation of a goal might activate a set of operations to handle information relevant to the goal.³⁸ People who were actively engaged in goal pursuit, compared with those who were not pursuing the goal, automatically evaluated goal-relevant objects as relatively more positive than goal-irrelevant objects.²⁰ Wanting to lose weight was correlated to participation in weight control activities, such as vigorous physical activity, strengthening exercises and consumption of ≤ 2 portions of high-fat food.²¹ Perception of weight status was also correlated with weight maintenance intentions as well as self-reported actions to prevent weight gain than weight status based on Body Mass Index.¹⁸

Figure 1.1 Theory of Reasoned Action and Theory of Planned Behavior



(Source: National Cancer Institute, 2005¹⁶)

Figure 1.2 Social-Cognitive Theory



Purpose of Study

Understanding factors that might influence college students' eating behaviors would help nutrition educators develop and improve resources that address college students' dietary intake. These resources could possibly serve as an essential component in a successful health and nutrition promotion campaign.

Research supports the need for more studies to be conducted in the college population regarding their life transitions. Nevertheless, the determinants of eating habits during this stage are still understudied.^{22,39} Study that investigated commonly consumed food and beverage consumption in this group has only correlated with demographic characteristics⁴, such as gender, race, or age. Other studies looked at the relationship between consumption behavior and Body Mass Index.^{40,41} Meanwhile, intention and actions to avoid weight gain showed stronger correlations with perception of body weight than with Body Mass Index.¹⁸

Thus, the aim of this study was to assess the correlations between college students' perception and goal of body weight, and their consumption behaviors of sugar-sweetened beverages and fried potatoes.

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Chapter 2 - College Students' Correlations between Perception and Goal of Body Weight, and Their Consumption Behaviors of Sugar-Sweetened Beverages and Fried Potatoes

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Abstract

- **Objective:** Assess correlations between college students' perception and goal of body weight, and their consumption behaviors of sugar-sweetened beverages and fried potatoes.
- **Design:** A cross-sectional convenient survey
- **Participants:** A total of 371 students in health and non-health majors from a Mid-western university basic nutrition class.
- **Main Outcome Measure(s):** Sugar-sweetened beverage consumption, fried potato consumption, body weight perception, and body weight goal.
- **Analysis:** Spearman correlation and Chi-square analyses were performed to examine the associations.
- **Results:** There were significant associations ($P < .0001$) between perception of body weight and goal of body weight, regular soda consumption and other sweetened beverage consumption, regular soda consumption and fried potato consumption, and sweetened beverage consumption and fried potatoes consumption. In addition, there were significant correlations between goals of body weight and other sweetened beverage consumption ($P < 0.0370$)
- **Conclusions and Implications:** The results confirmed that perception of body weight was associated with goal of body weight and there was a positive association between fried potatoes and sugar-sweetened beverage consumption behaviors. There was no correlation between perception of body weight and consumption behaviors. Nutrition education resources are needed for college students to address body image and dietary behaviors.

Keywords: comfort food, body weight perception, sugar-sweetened beverages, body weight goals, college students

Introduction

As college students start their life away from their parents, they are challenged to be more independent and to balance their lives between academic and social activities.¹ At this stage of life, young adults reported eating food outside of the home quite often,^{2,3} around three to four times a week.²⁻⁴ Unfortunately, most food outside the home are associated with big portions,⁵ high calories, high fat, low fiber, and low micronutrients.^{6,7} Based on a systematical review, frequent dining out showed a positive relationship with weight gain.³

Sugar-sweetened beverages and fried potatoes were beverages and food commonly consumed by college students^{4,8-10} as they are the highly desirable market for fast food and soft drink companies.¹¹ Fast food is also relatively affordable for them.¹² Another study indicated adults and children who reported eating fast food showed higher consumption of energy, fat, saturated fat, sodium, and carbonated soft drinks than those who did not report eating fast food.¹³ In a prospective study, fast-food consumption was positively associated with weight gain and insulin resistance¹⁴ that might increase the risk of obesity and type 2 diabetes.

In addition, the more frequent consumption of fast-food from restaurants that served french fries and burgers was correlated to higher sugar-sweetened beverages, fat but lower intake of healthy food.⁴ Sugar-sweetened beverages are beverages that contain added caloric sweeteners such as sucrose, high-fructose corn syrup or fruit-juice concentrates. They include carbonated soft drinks, fruitades, fruit drinks, sports drinks, energy and vitamin water drinks, sweetened iced tea, cordial, squashes, and lemonade. These beverages are collectively the largest contributor to added sugar intake in the US.¹⁵ From a systematical review, findings from large cross-sectional studies indicated positive associations between greater intakes of sugar-sweetened beverages and weight gain and obesity. The consumption of sugar-sweetened soda was also associated with a higher risk of kidney stone formation.¹⁶

The number of overweight and obese college students in the United States has remained high.¹⁷ Furthermore, overweight and obesity have been linked to the increased risk of some degenerative diseases. Based on a cohort study of US adults, the risk of death from cardiovascular disease, cancer, or other diseases increased throughout the range of moderate and severe overweight for both genders in all age groups.¹⁸ The increase of body weight was also positively associated with rates of death for all cancers combined and for different types of cancer, including cancer of the esophagus, liver, gallbladder, colon and rectum, pancreas, and kidney in genders.¹⁹ Overweight college students were three times more likely to have at least one of the metabolic syndromes, particularly dyslipidemia and abnormal glucose and insulin metabolism.²⁰ Dyslipidemia is a disorder in lipid metabolism, i.e. high levels of triglycerides, low-density lipoprotein (LDL) cholesterol, and inflammation, and low levels of high-density lipoprotein (HDL) cholesterol. These metabolic syndromes could increase the risk of cardiovascular disease (CVD) and diabetes mellitus.²¹

In developing strategies to improve people's eating habits, understanding some fundamental theories of behavior is needed. Behavior is mediated by what people know and think, and in turn, that would affect how they act. While knowledge is necessary for most behavioral changes, this is not sufficient. Perceptions and motivations are other important influences on behavior.²²

The Theory of Planned Behavior (TPB) explores the correlation between behavior and beliefs, attitudes, and intentions. This theory assume behavioral intention is the most important factor of behavior and it is influenced by a person's attitude toward performing a behavior, and by beliefs whether individuals who are important to the person approve or disapprove of the behaviors, or subjective norm.²²⁻²⁴ According to these theories, all other factors, such as culture

and the environment, play roles through the models' constructs, and do not independently explain the way people will behave. Thus, it is believed that there is a causal chain of beliefs, attitudes, and intentions that drives behavior. ²² This theory also explores that attitudes toward behavior are shaped by beliefs on what is entailed in performing the behavior and outcomes of the behavior, such as skills and abilities. ^{22,24}

Understanding factors that might influence college students' eating behaviors would help nutrition educators develop and improve resources that address college students' dietary intake. These resources could possibly serve as an essential component in a successful health and nutrition promotion campaign.

Research supports the need for more studies to be conducted in the college population regarding their life transitions. Nevertheless, the determinants of eating habits during this stage are still understudied. ^{11,25} Study that investigated commonly consumed food and beverage consumption in this group has only correlated with demographic characteristics ⁸, such as gender, race, or age. Other studies looked at the relationship between consumption behavior and Body Mass Index. ^{26,27} Meanwhile, intention and actions to avoid weight gain showed stronger correlations with perception of body weight than with Body Mass Index. ²⁸

Thus, the aim of this study was to assess the correlations between college students' perception and goal of body weight, and their consumption behaviors of sugar-sweetened beverages and fried potatoes.

Methods

Study Design and Participants

In this study, authors used the cross-sectional design to examine correlations among variables. The participants were students of a Mid-western university. The study was conducted on the first day of a basic nutrition class for college students so the course would not affect the results of the study. Students were from different majors, including health and non-health majors.

Survey Instrument

The data collection was self-reported through filling out a questionnaire (see Appendix A). The questionnaire asked participants about their sugar-sweetened beverages and fried potatoes consumption, perception of body weight and goal of body weight. Demographic information was also asked related to their age, gender, race, year in school, and residency.

Prior to enrollment into the study, participants had options either to participate or not after being explained about the purpose and nature of this study. Informed consent form approved by the university's institutional review board (IRB) was also attached on the first page of the questionnaire.

To assess the consumption behavior, participants were asked about the frequency of their sugar-sweetened beverages and fried potatoes consumption in the past month according to the self-administered dietary screener questionnaire (DSQ) of the National Health and Nutrition Examination Survey (NHANES)/ National Cancer Institute (NCI) (available at <http://appliedresearch.cancer.gov/nhanes/dietscreen/questionnaires.html>).

The National Health and Nutrition Examination Survey (NHANES) is designed to assess the health and nutritional status of adults and children in the United States. The survey combines interviews and physical examinations to collect detailed information about food, nutrient, and

supplement intake and other dietary behaviors. The DSQ is a short dietary assessment instrument or screener that has been evaluated in cross-sectional general population studies and in self-selected samples in intervention research, and in some large studies.²⁹ The screener may be useful to assess the interrelationships between diet and other variables.³⁰

As screeners are shorter and less detailed than a total dietary assessment, some quantitative accuracy is sacrificed. However, calibrating a screener against the more precise 24-hour recall can help ensure that a screener is providing the best and most accurate estimates possible. The calibration is carried out using a set of scoring algorithms developed for each component of the DSQ. The scoring algorithms will enable researchers using the DSQ in their own studies to improve the accuracy of estimates of dietary factors assessed.²⁹

The participants were asked to answer these following questions.

- “During the past month, how often did you drink regular soda or pop that contains sugar? Do not include diet soda.”
- “During the past month, how often did you drink sweetened fruit drinks, sport or energy drinks, such as Kool-Aid, lemonade, Hi-C, cranberry drink, Gatorade, Red Bull or Vitamin Water? Include fruit juices you made at home and added sugar to. Do not include diet drinks or artificially sweetened drinks. ”
- “During the past month, how often did you eat any kind of fried potatoes, including french fried, home fries, or hash brown potatoes?”

These questions had multiple response options, including “never”, “1 time last month”, “2-3 times last month”, “1 time per week”, “2 times per week”, “3-4 times per week”, “5-6 times per week”, “1 time per day”, “2-3 times per day”, “4-5 times per day”, and “6 or more times per day” for the first two questions. For the fried potato consumption behavior, the response options were the same, except for “2-3 times per day”, “4-5 times per day”, and “6 or more times per day” were just “2 or more times per day” instead.

In addition, participants were asked to describe their body weight and their goals related to body weight. The questions for those were “How would you describe your weight?” and “Are you trying to do any of the following about your weight?”, respectively. The options for the questions on perception of body weight were “very underweight”, “slightly underweight”, “at the right weight”, “slightly overweight”, “very overweight” and “choose not to answer”. For the question on goals of body weight, the options were “I am not trying to do anything”, “stay the same weight”, “lose weight”, “gain weight” or “choose not to answer.”

Outcome Measures

Some response categories for each question were merged into three categories because there were no statistical differences between some of the response options. The response options of “never”, “1 time last month”, “2-3 times last month” were merged into “0-3 times per month”. The categories for “1 time per week”, “2 times per week”, “3-4 times per week”, “5-6 times per week” were merged into “1-6 times per week”. Lastly, of the categories for “1 time per day”, “2-3 times per day”, “4-5 times per day”, and “6 or more times per day” were merged into “1 or more times per day.”

Likewise, the response categories for body weight perception were also merged into three categories. The response options of “very underweight” and “slightly underweight” were merged into an “underweight” category. The response option of “at the right weight” remained unchanged, while those of “slightly overweight” and “very overweight” were merged into an “overweight” category.

For the question related to goal of body weight, the response options “I am not trying to do anything” and “stay the same weight” were merged into “no change” category. For goal of body weight, while the “lose weight” and “gain weight” categories remained unchanged.

Data Analysis

All missing data and “choose not to answer” responses were excluded. Thus, data analysis consisted of descriptive statistics, including frequency and percentages, to describe the population. Moreover, Spearman correlation tests were performed to find the associations between consumption behavior variables. Also, Chi-square tests were used to determine the correlations between perception of body weight or goal of body weight and consumption behavior. The same tests were also used to analyze the correlation between perception of body weight and goal of body weight.

All data were analyzed with SAS 9.4 (2013, SAS Institute Inc., Cary, NC) statistical software. A critical value of $\alpha = 0.05$ was used to determine statistical significance for all analysis.

Results

The total number of participants in this study was 371. The characteristics of the participants are shown in Table 2.1. The participants were predominantly females (67%), non-Hispanic or Latinos (95%), and white (89%). All of the participants were undergraduate students, and primarily sophomores (35%) and freshmen (33%). Most participants lived off campus (47%) or in the residence hall (34%).

Frequency of Perception and Goal of Body Weight, and Consumption Behaviors

The results from the descriptive analysis showed 66% of students perceived they were at the right weight, however, 46% of them wanted to lose weight (Table 2.2). Regular soda and other sugar-sweetened beverages were mostly consumed 0-3 times per month (62% and 52%, respectively). Meanwhile, 63% of students consumed fried potatoes 1-6 times per week.

Correlation between Perception of Body Weight and Consumption Behaviors

Results from correlation tests (Table 2.3) suggested that perception of body weight was not correlated significantly with regular soda beverages consumption ($p = 0.6769$, $r = 0.0608$). Furthermore, there were no associations between perception of body weight and other sweetened beverages ($p = 0.4243$, $r = 0.0759$) and fried potatoes consumption ($p = 0.6058$, $r = 0.0637$).

Correlation between Goal of Body Weight and Consumption Behaviors

According to the analysis (Table 2.3), there were not any correlations between goal of body weight and regular soda consumption ($p = 0.4965$, $r = 0.0746$) as well as with fried potatoes consumption ($p = 0.9655$, $r = 0.0299$). However, the goal of body weight was associated significantly with other sweetened beverages consumption ($p = 0.0370$, $r = 0.1254$).

Correlation between Perception of Body Weight and Goal of Body Weight

In assessing the correlation between perception of body weight and goals of body weight (Table 2.3), the result indicated that there was significant relationship between two variables ($p < .0001$, $r = 0.4633$).

Correlation among Consumption Behaviors

Based on correlation analysis (Table 2.3), there was a significant correlation between regular soda consumption and other sweetened beverages consumption ($p < .0001$). There was also a significant relationship between regular soda consumption and fried potatoes consumption among the participants ($p < .0001$, $r = 0.25552$) and between other sweetened beverages consumption and fried potatoes consumption ($p < .0001$, $r = 0.25379$).

Table 2.1 Characteristics of Participants

| Characteristics | Frequency | Percentage (%) |
|----------------------------------|------------------|-----------------------|
| <i>Gender</i> | | |
| Male | 116 | 33 |
| Female | 235 | 67 |
| <i>Age (y)</i> | | |
| 18 | 97 | 28 |
| 19 | 103 | 29 |
| 20 | 73 | 21 |
| 21and over | 77 | 22 |
| <i>Hispanic or Latino</i> | | |
| Yes | 14 | 4 |
| No | 332 | 95 |
| Don't know/ choose not to answer | 5 | 1 |
| <i>Year in school</i> | | |
| Freshman | 114 | 33 |
| Sophomore | 122 | 35 |
| Junior | 80 | 23 |
| Senior | 33 | 9 |
| <i>Residency</i> | | |
| Campus residence hall | 119 | 34 |
| Sorority or fraternity | 43 | 12 |
| Other university/college housing | 14 | 4 |
| Off campus housing | 165 | 47 |
| Parent/ other | 9 | 2 |
| <i>Race</i> | | |
| White | 317 | 89 |
| Black or African American | 14 | 4 |
| Asian | 14 | 4 |
| Other minorities | 12 | 3 |

Table 2.2 Frequency of Perception and Goals of Body Weight, and Consumption Behavior

| Frequency of Variables | Frequency | Percent |
|---|------------------|----------------|
| <i>Perception of body weight</i> | | |
| Underweight | 28 | 8 |
| At the right weight | 223 | 66 |
| Overweight | 87 | 26 |
| <i>Goal of body weight</i> | | |
| No change | 133 | 41 |
| Lose weight | 152 | 46 |
| Gain weight | 43 | 13 |
| <i>Regular soda beverage consumption</i> | | |
| 0-3 times per month | 210 | 62 |
| 1-6 times per week | 93 | 27 |
| 1 or more per day | 38 | 11 |
| <i>Other sweetened beverage consumption</i> | | |
| 0-3 times per month | 190 | 52 |
| 1-6 times per week | 147 | 40 |
| 1 or more per day | 27 | 8 |
| <i>Fried potato consumption</i> | | |
| 0-3 times per month | 127 | 35 |
| 1-6 times per week | 228 | 63 |
| 1 or more per day | 6 | 2 |

Table 2.3 Correlations between Variables

| Correlations | p-Values | r |
|--|-----------------|----------|
| Perception of body weight and soda beverage consumption | 0.6769 | 0.0608 |
| Perception of body weight and other sweetened beverage consumption | 0.4243 | 0.0759 |
| Perception of body weight and fried potato consumption | 0.6058 | 0.0637 |
| Goals related body weight and soda beverage consumption | 0.4965 | 0.0746 |
| Goals related body weight and other sweetened beverage consumption | 0.0370* | 0.1254 |
| Goals related body weight and fried potato consumption | 0.9655 | 0.0299 |
| Perception of body weight and goals related body weight | <.0001* | 0.4633 |
| Regular soda consumption and other sweetened beverage consumption | <.0001* | 0.22269 |
| Regular soda consumption and fried potato consumption | <.0001* | 0.25552 |
| Other sweetened beverage consumption and fried potato consumption | <.0001* | 0.25379 |

* shows significance at $p \leq 0.05$

Discussion

This study was conducted to assess college students' perception and goal of their body weight, their sugar-sweetened beverage and potato consumption behaviors as well as the correlations among the variables. It was expected after doing this study that the researchers would find some patterns of college students' consumption behaviors to help develop health and nutrition promotion strategies in this group.

The results showed that majority students (66%) perceived that they were at the right weight and 26% of total participants perceived they were overweight. The percentage of students perceived they were at the right weight was higher compared to that of National College Health Assessment by American College Health Association,¹⁷ which was only 61% of college students had healthy weight. Meanwhile, the percentage of those who perceived they were overweight was lower. These differences might be due to different locations of study. The national assessment sampled participants from the whole nation while this study only being done in a university in Midwest. Another possible reason would be misperceived/ underestimation and overestimation of body weight as what previous studies had reported.²⁸

There were nearly half (46%) of participants who were trying to lose weight. This proportion was similar with the finding of previous study.³¹ Additionally, even though only 26% of total participants perceived they were overweight, 46% of them were trying to lose weight. Meanwhile, more students wanted to gain weight than those who perceived themselves as underweight. These findings indicated possible body dissatisfaction among participants. Kim and Lee reported that female students who misperceived their weight were more dissatisfied with their body and had correlations with risky lifestyles (such as smoking and drinking more often), weight control behaviors, and depression.³²

The consumption behaviors of participants in this study indicated they rarely consumed regular soda and other sweetened beverages. This result supported the facts that the consumption of sugar-sweetened beverages among adults had been decreasing.^{33,34} The number of students who had daily sugar-sweetened beverages was also lower than other study⁸ reported. The availability of water fountains might prevent students from consuming sugar-sweetened beverages as they are free, and price is one of the most important factors for college students when purchasing beverages.³⁵ Also, there may be a higher consumption of artificially sweetened beverages, especially by those who were concerned about body weight³⁶ or those who were already always at normal weight, and weight loss maintenance³⁷ as other studies found. In addition, underreporting sugar-sweetened beverage consumption³⁸ may reduce the true associations of sugar-sweetened beverage intake and other variables in this study.

The results also indicated the way students perceive themselves did not influence how they eat. This finding did not support the previous theory and research^{22,28} that perception correlated with eating behaviors. Their interest in taking the Basic Nutrition class might have biased them to respond in positive manner.

The goal of body weight was only significantly correlated with other sweetened beverages consumption, while it was not associated with regular soda beverages and fried potatoes. This might be due to the consumption of energy and sports drink in those who want to lose weight and engaging in physical activities or sports. Attila and Çakir⁹ found students who drank energy drink regularly engaged in sports and did not know the ingredients of energy drinks or their potential hazardous health effects

The body weight perception was associated with participants' goal of body weight. This finding confirmed the Theory of Planned Behavior (TPB).²³ Brug et al., also reported that

weight maintenance intentions were correlated with perception of body weight. The correlations were even stronger than when compared with Body Mass Index. ²⁸ Thus, providing the information about the right perception and its related goal might be included when giving nutrition education.

Moreover, there were significant correlations among consumption behavior of the comfort food. This finding supported previous study that showed a correlation between the frequent dining out at fast-food restaurants where fried potatoes were served and sugar-sweetened beverage consumption. ⁴ Fried potatoes were commonly consumed by college students as what previous study reported. ¹⁰ This might also indicate higher total calories, saturated fat and sodium intake and low in fruit and vegetable consumption, as these factors are correlated with fast-food consumption. ¹³ Consequently, the consumption could increase the risk of obesity and diabetes mellitus. ¹⁴ This finding emphasizes the need of programs to promote healthier eating behavior in this group of population.

Even though this study has some strengths such as correlating consumption behaviors with perception and goal that had not done before and included both health and non-health majors, this study had some limitations. First, participants were conveniently sampled. They were recruited from a basic nutrition class. Even though the study was conducted on the first day of the class, there are likely health-conscious individuals in this group and this would influence their responses.

Second, the data obtained in this research were self-reported without any observation. Thus, there might be some issues related to the validity of the data. By asking participants to recall their consumption behaviors, there might be recall bias on this.

Lastly, this study used cross-sectional design. Thus, the results cannot be used optimally investigate the direction of causal interferences.

The findings confirmed that there were relationships between fried potato and sugar-sweetened beverage consumption behaviors. Also, people's perception of body weight was associated with goal of body weight. However, this study did not support the notion that perception of body weight is correlated with consumption behavior

Implications for Research and Practice

The results of this research emphasize the need of promoting healthy eating and body weight. Future studies could explore different types of tools and methods that will be suitable and effective for delivering information about ideal body weight, healthy food choice and weight maintenance in college students. Developing methods to improve knowledge and practices on healthy eating and weight management such as peer leaders, social networks, or skill base (e.g. cooking and grocery shopping) might be beneficial. Examining food environment in college campuses to identify food availability, nutrition information, and price will also be helpful to understand other important factors that might influence college students when purchasing food. The findings can also be a basis for policy change on college campuses to promote healthier environments that support healthy dietary intake such as offering more nutrition classes for all students and providing healthier food options in campus buildings and food courts.

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Appendix A - Survey

Screening Questions

College Environmental Perceptions & Behaviors Survey *85 item*

SECTION A: College Environmental Perceptions Survey (CEPS) *27 item*

1. There are plenty of exercise classes offered at the rec center on campus.
 - (1) Strongly Agree
 - (2) Agree
 - (3) Neither Agree nor Disagree
 - (4) Disagree
 - (5) Strongly Disagree
 - (6) Choose not to answer

2. There are policies (e.g. no cars on campus) on campus that promote physical activity.
 - (1) Strongly Agree
 - (2) Agree
 - (3) Neither Agree nor Disagree
 - (4) Disagree
 - (5) Strongly Disagree
 - (6) Choose not to answer

3. There are policies (e.g. limits on sizes of sodas, minimum healthy items in vending machines) on campus that promote healthy eating.
 - (1) Strongly Agree
 - (2) Agree
 - (3) Neither Agree nor Disagree
 - (4) Disagree
 - (5) Strongly Disagree
 - (6) Choose not to answer

4. Green eating is:

Eating locally grown foods, limiting amounts of processed/fast foods, eating meatless meals at least one day a week, choosing organic foods as much as possible and limiting the amount of food you waste.

Based on the above definition, overall my campus promotes green eating.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) Choose not to answer

5. Healthy foods are on-hand at local grocery stores around campus.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) I don't know because I don't shop at grocery stores around campus
- (7) Choose not to answer

6. The university's exercise facilities and equipment are in good condition.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) Choose not to answer

7. There are low-cost healthy foods available on campus.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) I don't know because I don't eat on campus
- (7) Choose not to answer

8. The water in water fountains on campus tastes good.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) I don't know because I don't use water fountains on campus

- (7) Choose not to answer
9. There are safe places for me to walk.
- (1) Strongly Agree
 - (2) Agree
 - (3) Neither Agree nor Disagree
 - (4) Disagree
 - (5) Strongly Disagree
 - (6) Choose not to answer
10. The stairs in most buildings on campus are clean and well-lit.
- (1) Strongly Agree
 - (2) Agree
 - (3) Neither Agree nor Disagree
 - (4) Disagree
 - (5) Strongly Disagree
 - (6) Choose not to answer
11. There are signs in buildings encouraging people to use the stairs.
- (1) Strongly Agree
 - (2) Agree
 - (3) Neither Agree nor Disagree
 - (4) Disagree
 - (5) Strongly Disagree
 - (6) Choose not to answer
12. The campus living environment allows for quiet and restful sleep.
- (1) Strongly Agree
 - (2) Agree
 - (3) Neither Agree nor Disagree
 - (4) Disagree
 - (5) Strongly Disagree
 - (6) Choose not to answer
13. There are programs on campus that promote stress management.
- (1) Strongly Agree
 - (2) Agree
 - (3) Neither Agree nor Disagree

- (4) Disagree
- (5) Strongly Disagree
- (6) Choose not to answer

14. There are healthy foods available where I usually eat in food courts/snack bars on campus.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) I don't know because I don't eat in food courts/snack bars on campus
- (7) Choose not to answer

15. There are healthy foods available at restaurants on or around campus.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) I don't know because I don't eat at restaurants on or around campus
- (7) Choose not to answer

16. There are lots of healthy choices in vending machines on campus.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) I don't know because I don't use vending machines on campus
- (7) Choose not to answer

17. There are enough exercise facilities and equipment on campus.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) Choose not to answer

18. There are sports (Intramural or club) available to play on campus.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) Choose not to answer

19. There are enough bike racks on campus.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) Choose not to answer

20. It is safe to walk around campus at night.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) Choose not to answer

21. There are healthy foods available where I usually eat in dining halls on campus.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) I don't know because I don't eat in dining halls on campus
- (7) Choose not to answer

22. Healthy foods are on-hand at convenience stores on or around campus.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) I don't know because I don't shop at convenience stores on or around campus

- (7) Choose not to answer
23. There are signs telling me which foods are healthy in vending machines on campus.
- (1) Strongly Agree
 - (2) Agree
 - (3) Neither Agree nor Disagree
 - (4) Disagree
 - (5) Strongly Disagree
 - (6) I don't know because I don't use vending machines on campus
 - (7) Choose not to answer
24. There are clean water fountains in most buildings on campus.
- (1) Strongly Agree
 - (2) Agree
 - (3) Neither Agree nor Disagree
 - (4) Disagree
 - (5) Strongly Disagree
 - (6) I don't know because I don't use water fountains on campus
 - (7) Choose not to answer
25. There are plenty of opportunities on campus to be moderately or vigorously active on campus. (*Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal or make your heart beat much harder than normal. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal or make your heart beat somewhat harder than normal.*)
- (1) Strongly Agree
 - (2) Agree
 - (3) Neither Agree nor Disagree
 - (4) Disagree
 - (5) Strongly Disagree
 - (6) Choose not to answer
26. It is safe to bike around campus.
- (1) Strongly Agree
 - (2) Agree
 - (3) Neither Agree nor Disagree
 - (4) Disagree
 - (5) Strongly Disagree
 - (6) Choose not to answer

27. There are programs on campus that promote healthy eating.

- (1) Strongly Agree
- (2) Agree
- (3) Neither Agree nor Disagree
- (4) Disagree
- (5) Strongly Disagree
- (6) Choose not to answer

SECTION B: College Environmental Behavioral Survey- CEBS *10 item*

1. I look for healthy food options when I shop and eat (including in grocery stores, vending machines, dining halls, restaurants, convenience stores and food courts/snack bars).

Never 1 2 3 4 5 Frequently

2. I use the university's exercise facilities and equipment.

Never 1 2 3 4 5 Frequently

3. I use the stairs in most buildings on campus.

Never 1 2 3 4 5 Frequently

4. I walk on campus during the day.

Never 1 2 3 4 5 Frequently

5. I walk around on campus at night.

Never 1 2 3 4 5 Frequently

6. I participate in exercise classes offered at the rec center on campus.

Never 1 2 3 4 5 Frequently

7. I play sports (intramural or club) on campus.

Never 1 2 3 4 5 Frequently

8. I bike on campus.

Never 1 2 3 4 5 Frequently

9. I use water fountains on campus.

Never 1 2 3 4 5 Frequently

10. I participate in programs on campus that promote health (healthy eating, physical activity, stress management).

Never 1 2 3 4 5 Frequently

SECTION C: Physical Activity (IPAQ) 7 item

How Active Are You?

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal or make your heart beat much harder than normal. Think only about those vigorous physical activities that you did for at least 10 minutes at a time, such as running, aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate.

1) During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?

- (1) 0 days (Skip to question 3)
- (2) 1 day
- (3) 2 days
- (4) 3 days
- (5) 4 days
- (6) 5 days
- (7) 6 days
- (8) 7 days
- (9) Choose not to answer

2) How much time did you usually spend doing vigorous physical activities on one of those days?

- (1) Did not do vigorous physical activities
- (2) 10 minutes
- (3) 20 minutes
- (4) 30 minutes
- (5) 40 minutes
- (6) 50 minutes
- (7) 60 minutes
- (8) 70 minutes (1 hr 10 min)
- (9) 80 minutes (1 hr 20 min)
- (10) 90 minutes (1 hr 30 min)
- (11) 100 minutes (1 hr 40 min)
- (12) 110 minutes (1 hr 50 min)
- (13) 120 minutes (2 hrs)
- (14) 130 minutes (2 hrs 10 min)
- (15) 140 minutes (2 hrs 20 min)
- (16) 150 minutes (2 hrs 30 min)
- (17) 160 minutes (2 hrs 40 min)
- (18) 170 minutes (2 hrs 50 min)
- (19) 180 + minutes (3 hrs or more)
- (20) Don't know/not sure
- (21) Choose not to answer

Think about all the moderate activities that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal or make your heart beat somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time, such as brisk walking, bicycling, vacuuming, gardening, or anything else that causes some increase in breathing or heart rate.

3) During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

- (1) 0 days (Skip to question 5)
- (2) 1 day
- (3) 2 days
- (4) 3 days
- (5) 4 days
- (6) 5 days
- (7) 6 days
- (8) 7 days
- (9) Choose not to answer

4) How much time did you usually spend doing moderate physical activities on one of those days?

- (1) Do not do moderate physical activities
- (2) 10 minutes
- (3) 20 minutes
- (4) 30 minutes
- (5) 40 minutes
- (6) 50 minutes
- (7) 60 minutes
- (8) 70 minutes (1 hr 10 min)
- (9) 80 minutes (1 hr 20 min)
- (10) 90 minutes (1 hr 30 min)
- (11) 100 minutes (1 hr 40 min)
- (12) 110 minutes (1 hr 50 min)
- (13) 120 minutes (2 hrs)
- (14) 130 minutes (2 hrs 10 min)
- (15) 140 minutes (2 hrs 20 min)
- (16) 150 minutes (2 hrs 30 min)
- (17) 160 minutes (2 hrs 40 min)
- (18) 170 minutes (2 hrs 50 min)
- (19) 180 + minutes (3 hrs or more)
- (20) Don't know/not sure
- (21) Choose not to answer

Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise or leisure.

5) During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

- (1) 0 days (Skip to question 7)
- (2) 1 day
- (3) 2 days
- (4) 3 days
- (5) 4 days
- (6) 5 days
- (7) 6 days
- (8) 7 days
- (9) Choose not to answer

6) How much time did you usually spend walking on one of those days?

- (1) Did not walk
- (2) 0 minutes
- (3) 20 minutes
- (4) 30 minutes
- (5) 40 minutes
- (6) 50 minutes
- (7) 60 minutes
- (8) 70 minutes (1 hr 10 min)
- (9) 80 minutes (1 hr 20 min)
- (10) 90 minutes (1 hr 30 min)
- (11) 100 minutes (1 hr 40 min)
- (12) 110 minutes (1 hr 50 min)
- (13) 120 minutes (2 hrs)
- (14) 130 minutes (2 hrs 10 min)
- (15) 140 minutes (2 hrs 20 min)
- (16) 150 minutes (2 hrs 30 min)
- (17) 160 minutes (2 hrs 40 min)
- (18) 170 minutes (2 hrs 50 min)
- (19) 180 + minutes (3 hrs or more)
- (20) Don't know/not sure
- (21) Choose not to answer

This question is about the time you spent sitting on weekdays during the last 7 days. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading or sitting or lying down to watch television.

7) During the last 7 days, how much time did you spend sitting on a week day?

- (1) 10 minutes
- (2) 20 minutes
- (3) 30 minutes
- (4) 40 minutes
- (5) 50 minutes
- (6) 60 minutes
- (7) 70 minutes (1 hr 10 min)
- (8) 80 minutes (1 hr 20 min)
- (9) 90 minutes (1 hr 30 min)
- (10) 100 minutes (1 hr 40 min)
- (11) 110 minutes (1 hr 50 min)
- (12) 120 minutes (2 hrs)
- (13) 130 minutes (2 hrs 10 min)
- (14) 140 minutes (2 hrs 20 min)
- (15) 150 minutes (2 hrs 30 min)
- (16) 160 minutes (2 hrs 40 min)
- (17) 170 minutes (2 hrs 50 min)
- (18) 180 + minutes (3 hrs or more)
- (19) Don't know/not sure
- (20) Choose not to answer

SECTION D: Sleep (BRFSS Module 5: Inadequate Sleep) *1 item*

1. On average, how many hours of sleep do you get in a 24-hour period? Think about the time you actually spend sleeping or napping, not just the amount of sleep you think you should get.

SECTION E: Eating Rate *1 item*

1. What is your usual rate of eating?

| | | | | |
|------|------|--------|------|------|
| Very | Slow | Medium | Fast | Very |
| slow | | | | fast |
| 1 | 2 | 3 | 4 | 5 |

SECTION F: Dietary (NHANES/NCI DIETARY SCREENER QUESTIONNAIRE- DSQ

Self-administered) 28 item

1. During the past month, how often did you eat hot or cold cereals? Mark one .

- (1) Never -Go to question 4.
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

2. During the past month, what kind of cereal did you usually eat?

3. If there was another kind of cereal that you usually ate during the past month, what kind was it?

4. During the past month, how often did you have any milk (either to drink or on cereal)? Include regular milks, chocolate or other flavored milks, lactose-free milk, buttermilk. Please do not include soy milk or small amounts of milk in coffee or tea. Mark one .

- (1) Never -Go to question 8.
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2-3 times per day
- (10) 4-5 times per day
- (11) 6 or more times per day

5. During the past month, what kind of milk did you usually drink? Mark one .

- (1) Whole or regular milk

- (2) 2% fat or reduced-fat milk
- (3) 1%, ½%, or low-fat milk
- (4) Fat-free, skim or nonfat milk
- (5) Soy milk
- (6) Other kind of milk

6. During the past month, how often did you drink regular soda or pop that contains sugar?
Do not include diet soda. Mark one .

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2-3 times per day
- (10) 4-5 times per day
- (11) 6 or more times per day

7. During the past month, how often did you drink 100% pure fruit juices such as orange, mango, apple, grape and pineapple juices? Do not include fruit-flavored drinks with added sugar or fruit juice you made at home and added sugar to. Mark one .

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2-3 times per day
- (10) 4-5 times per day
- (11) 6 or more times per day

8. During the past month, how often did you drink coffee or tea that had sugar or honey added to it? Include coffee and tea you sweetened yourself and presweetened tea and coffee drinks such as Arizona Iced Tea and Frappuccino. Do not include artificially sweetened coffee or diet tea.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2-3 times per day
- (10) 4-5 times per day
- (11) 6 or more times per day

9. During the past month, how often did you drink sweetened fruit drinks, sports or energy drinks, such as Kool-Aid, lemonade, Hi-C, cranberry drink, Gatorade, Red Bull or Vitamin Water? Include fruit juices you made at home and added sugar to. Do not include diet drinks or artificially sweetened drinks.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2-3 times per day
- (10) 4-5 times per day
- (11) 6 or more times per day

10. During the past month, how often did you eat fruit? Include fresh, frozen or canned fruit. Do not include juices.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

11. During the past month, how often did you eat a green leafy or lettuce salad, with or without other vegetables?

- (1) Never

- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

12. During the past month, how often did you eat any kind of fried potatoes, including french fries, home fries, or hash brown potatoes?

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

13. During the past month, how often did you eat any other kind of potatoes, such as baked, boiled, mashed potatoes, sweet potatoes, or potato salad?

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

14. During the past month, how often did you eat refried beans, baked beans, beans in soup, pork and beans or any other type of cooked dried beans? Do not include green beans.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

15. During the past month, how often did you eat brown rice or other cooked whole grains, such as bulgur, cracked wheat, or millet? Do not include white rice.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

16. During the past month, not including what you just told me about (green salads, potatoes, cooked dried beans), how often did you eat other vegetables?

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

17. During the past month, how often did you have Mexican-type salsa made with tomato?

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

18. During the past month, how often did you eat pizza? Include frozen pizza, fast food pizza, and homemade pizza.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week

- (8) 1 time per day
- (9) 2 or more times per day

19. During the past month, how often did you have tomato sauces such as with spaghetti or noodles or mixed into foods such as lasagna? Do not include tomato sauce on pizza.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

20. During the past month, how often did you eat any kind of cheese? Include cheese as a snack, cheese on burgers, sandwiches, and cheese in foods such as lasagna, quesadillas, or casseroles. Do not include cheese on pizza.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

21. During the past month, how often did you eat red meat, such as beef, pork, ham, or sausage? Do not include chicken, turkey or seafood. Include red meat you had in sandwiches, lasagna, stew, and other mixtures. Red meats may also include veal, lamb, and any lunch meats made with these meats.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

22. During the past month, how often did you eat any processed meat, such as bacon, lunch meats, or hot dogs? Include processed meats you had in sandwiches, soups, pizza, casseroles, and other mixtures. Processed meats are those

preserved by smoking, curing, or salting, or by the addition of preservatives. Examples are: ham, bacon, pastrami, salami, sausages, bratwursts, frankfurters, hot dogs, and spam.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

23. During the past month, how often did you eat whole grain bread including toast, rolls and in sandwiches? Whole grain breads include whole wheat, rye, oatmeal and pumpernickel. Do not include white bread.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

24. During the past month, how often did you eat chocolate or any other types of candy? Do not include sugar-free candy.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

25. During the past month, how often did you eat doughnuts, sweet rolls, Danish, muffins, pan dulce, or pop-tarts? Do not include sugar-free items.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week

- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

26. During the past month, how often did you eat cookies, cake, pie or brownies? Do not include sugar-free kinds.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

27. During the past month, how often did you eat ice cream or other frozen desserts? Do not include sugar-free kinds.

- (1) Never
- (2) 1 time last month
- (3) 2-3 times last month
- (4) 1 time per week
- (5) 2 times per week
- (6) 3-4 times per week
- (7) 5-6 times per week
- (8) 1 time per day
- (9) 2 or more times per day

28. During the past month, how often did you eat popcorn?

- (1) Never
 - (2) 1 time last month
 - (3) 2-3 times last month
 - (4) 1 time per week
 - (5) 2 times per week
 - (6) 3-4 times per week
 - (7) 5-6 times per week
 - (8) 1 time per day
 - (9) 2 or more times per day
-

SECTION G: Demographics *11 item*

1) How old are you?

- (1) Less than 18 years old
- (2) 18
- (3) 19
- (4) 20
- (5) 21
- (6) 22
- (7) 23
- (8) 24
- (9) More than 24 years old
- (10) Choose not to answer

2) What is your gender?

- (1) Male
- (2) Female
- (3) Choose not to answer

3) Are you Hispanic or Latino?

- (1) Yes
- (2) No
- (3) Don't know / Not sure
- (4) Choose not to answer

4) Which one or more of the following would you say is your race?

- (1) White
- (2) Black or African American
- (3) Asian
- (4) Native Hawaiian or Other Pacific Islander
- (5) American Indian or Alaska Native
- (6) Other [specify]_____

5) What is your year in school?

- (1) Freshman
- (2) Sophomore
- (3) Junior
- (4) Senior
- (5) Graduate
- (6) Choose not to answer

- 6) Where do you live?
- (1) Campus residence hall
 - (2) Sorority or fraternity
 - (3) Other university/college housing
 - (4) Off campus housing
 - (5) Parent or guardian's home
 - (6) Other, specify _____

- 7) What is your height?
- (If you choose *not to answer*, leave blank)
- Feet _____
- Inches _____

- 8) What is your weight (in pounds)?**
- (If you choose *not to answer*, leave blank)
- _____

- 9) How much do you want to weigh (in pounds)?**
- (If you choose *not to answer*, leave blank)
- _____

- 10) How would you describe your weight?
- (1) Very Underweight
 - (2) Slightly Underweight
 - (3) About The Right Weight
 - (4) Slightly Overweight
 - (5) Very Overweight
 - (6) Choose not to answer

- 11) Are you trying to do any of the following about your weight?
- (1) I am not trying to do anything
 - (2) Stay the same weight
 - (3) Lose weight
 - (4) Gain weight
 - (5) Choose not to answer