EFFECTIVENESS OF AN UNDERGRADUATE CORE CURRICULA PHYSICAL ACTVITY AND OBESITY COURSE ON STUDENTS' HEALTH BEHAVIORS

A Dissertation Presented to the
Faculty of the College of Education
University of Houston

In Partial Fulfillment
of the Requirements for the Degree

Doctor of Education

by

Randi Weintraub Betts

May 2016

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An Abstract

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Abstract

With more than half of college students falling short of government guidelines for exercise and nutrition (ACHA, 2009), effective interventions targeting young adults during this transitional time are critical. Research on intervention components delivered by online college coursework is essential for developing easily utilized, valuable nutrition and physical activity knowledge delivery to students. The purpose of this study was to measure the baseline entry level health behaviors among the undergraduate students enrolled in an online Texas core curriculum course and to analyze the nature of the relationships between learned health knowledge and post-course health behaviors. Students recruited from an introductory public health issues in physical activity and obesity course completed measures of physical activity, nutrition and self-efficacy at baseline and post course follow-up. Social Cognitive Theory (Bandura, 1991), the Transtheoretical Model of Health Behavior Change (Prochaska & Diclemente, 1983), and the Health Action Process Approach (Schwarzer, 1992) were used to represent the most commonly applied empirically supported conceptual frameworks to promote behavior change in nutrition and physical activity.

Specifically, the study sought to answer the questions: (1) To what extent does completion of a lower level undergraduate course relating to issues in physical activity and obesity change college students’ health behaviors to reflect a healthy lifestyle? (2) Does being a kinesiology student, living on campus, or

having a meal plan affect the magnitude of change in health behaviors? (3) Does self-reported BMI affect the magnitude of change in health behaviors? (4) Does the level of self-efficacy affect the magnitude of change in physical activity? (5) Does the level of self-efficacy affect the magnitude of change in nutrition? (6) Does the academic performance in the course relate to better health behaviors?

This study compared each participant's pre-and post-questionnaire data to determine if there was a change in responses over the time period. Quantitative data was collected through three different questionnaires at the beginning and end of the semester. The health behavior theory questions were based on the participants' stages of self-efficacy towards physical activity and improved nutrition and were analyzed through the Berlin Risk Appraisal and Health Motivation Study (BRAHMS) developed by Schwarzer and Renner (1999, $\alpha = .88$); The food frequency questionnaire used was the Diet History Questionaire II (DHQ-II) created by the National Cancer Institute (2014, $\alpha = .86$) and the International Physical Activity Questionnaire (IPAQ) was given to measure physical activity (2003, $\alpha = .80$).

Findings indicated that all dependent variables, physical activity, daily calorie intake, daily fat intake, vegetable consumption, and fruit consumption decreased from pre course to post course. The awareness of self-reported BMI did significantly predict a change in calories ($F(4, 1260) = 3.00$, $p = .02$) and fruit consumption ($F(4, 1260) = 5.12$, $p < .001$) among students. An inverse relationship of significant findings existed among calories and self-efficacy ($F(4,1310) = 3.05$, $p = .02$), demonstrating a positive health behavior change confirming the notion that record keeping and energy expenditure exercises do make students aware of calorie balance which then influence health

behaviors. Regarding academic performance, total calories (F (4, 1310) = 3.19, p = .01) and fruit consumption (F (4, 1310) = 6.29, p < .001) were significantly associated causing positive health behavior change from self-awareness.

These results support the value of teaching courses focused on physical activity and obesity to all college students, but suggest that health education alone does not lead to positive health behavior change. The potential benefits of a required instructional course provide merit for faculty members, educational policy makers and researchers in terms of implementation of strategies to promote healthy behaviors in college students, but may need to include actual engagement in physical activity and improvement in nutritional intake throughout students' entire college career.

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Chapter I

Introduction

There is a nationwide obesity epidemic in America. According to the National Health and Nutrition Examination Survey (NHANES) conducted in 2011 - 2012, 75% of the adult population is either overweight or obese and 16.9% of children and adolescents aged 2-19 are obese, and another 14.9% are overweight. Obesity is caused by a range of genetic, metabolic, and behavioral interactions across a number of significant social, environmental and policy contexts that influence eating and physical activity (Faith & Kral, 2006).

Obesity has a far-ranging negative effect on health. Each year obesity-related conditions cause an estimated 300,000 premature deaths in the United States (Flegal, Williamson, Pamuk, & Rosenberg, 2004). People who are overweight or obese are at increased risk for developing many different health conditions, including heart disease, type 2 diabetes, high blood pressure, and bone and joint disease. Individual behavior plays a role in health outcomes. Positive changes in individual behavior can reduce the rates of chronic disease associated with obesity (Marmot et al., 2008).

The World Health Organization (WHO) confirms that health is a vigorous lifelong process in which the mental, physical, social, environmental and spiritual dimensions are considered fundamental and no longer refers just to the sheer deficiency of illness and disease. Rene Dubos, 1968 expanded the statement of the WHO definition "Health is a quality of life involving social, emotional, mental, spiritual and biological fitness on the part of the individual, which results from adaptations to the environment" (Donatelle & Davis, 1997, p. 3). Therefore, an individual's lifestyle and behavior choices

account for fifty-eight percent of the United States' population's inadequate health status (Donatelle & Davis, 1994). Factors that affect a person's health status are heredity, a predisposition to and reinforcement of unhealthy behaviors, and access to accurate information on how to achieve a healthy lifestyle (Insel & Roth, 1999). According to T. Adams (2007) the United States Surgeon General advocated that unhealthy dietary habits and sedentary living are responsible for the deaths and illnesses occurring from obesity at a rate comparable to poverty, smoking or alcoholism.

People can learn to adopt good health practices. In order to curtail the detrimental effects of obesity, there is a need to educate as many individuals as early as possible about making positive changes in healthy behavior choices. When an individual has the ability to understand, conduct self-assessments, and make voluntary changes, one can prevent, delay or reverse many of the health problems of today and the future (Payne & Hahn, 1995).

Healthy People 2020: A New Focus on Societal Determinants of Health (US Public Health Services, 2012) was published to identify the nationwide commitment to secure better health improvement priorities through disease prevention and assure positive health choices of Americans. This report describes the rationale for focusing on social determinants that affect the conditions in which people can be healthy and offers 10-year measurable goals for achieving these factors through engagement of society, namely education. Healthy People 2020 seeks to increase life expectancy and quality of life over the next 10 years by helping individuals gain the knowledge, motivation, and opportunities they need to make informed decisions about their health. For this reason, the importance of student enrollment and course offerings in conceptual health and

wellness that educate on these healthy behaviors of physical activity and nutrition help substantiate the documentation for initiatives to the Health People 2020. Obesity has emerged as a priority in chronic disease prevention in the adult population, so by educating the students of today about obesity and prevention for not only themselves but to be leaders for others of our future.

Results from several studies indicate that many students develop behaviors that increase the probability of adverse health outcomes later in life (Douglas et al., 1997). It is during the transition between adolescence and adulthood when the precipitous decline of physical activity occurs (Allison, Dwyer, & Makin, 1999; Grace, 1997). Decreasing the amount of weight gained during adolescence and young adulthood by increasing physical activity and improving dietary choices may help to reduce the risk of cardiovascular disease, cancer, stroke and diabetes in adulthood.

Back in 1985, the American College Health Association (ACHA) sponsored a task force on the National Health Objectives and joined this global effort to make higher education institution populations healthier. Then Healthy Campus 2000: Making It Happen (ACHA, 1994) indicated that to reduce college-age student health problems by the year 2000, higher education institutions need to include prevention in their educational philosophy. This text offered awareness about the key health factors of greatest significance to the college age student. The specified mission was to encourage universities and colleges to make health objectives a priority by recommending strategies, providing information, and promoting health programs.

The transition from high school to college marks a time in an adolescent's life when major changes occur in personal health behaviors. An important consideration for

health education is that young adults are at a crucial stage in their development as they transition from parental control over lifestyle behaviors to assuming responsibility for their own health choices (Cousineau, Franko, Ciccazzo, Goldstein, & Rosenthal, 2006). Between the freshman and senior years of college, the percent of students classified as overweight or obese increase from 15% to 23% (Racette, Deusinger, Strube, Highstein, & Deusinger, 2008). Most students do not continue previous physical activity patterns once they go to college (Racette et al., 2008). Gyurcsik, Bray, and Brittain (2004) reported that 47% of first year students do not meet the recommended amounts moderate physical activity guidelines, mostly due to institutional, interpersonal, intrapersonal reasons and lack of motivation. A previous study by Cousineau, Goldstein, and Franko (2004) suggests that college students may have minimal knowledge of healthy eating behaviors and nutritional requirements. Since the largest increase in obesity between 1990 and 2000 occurred in 18-29 year olds (Freedman, Khan, Serdula, Galuska, & Dietz, 2002) it stands to reason that college campuses are a prime setting where promotion of healthy lifestyle habits should occur. Freshmen are at a point in their lives where the time and place can be conducive to adopting healthy exercise habits (Silliman, Rodas-Fortier, & Neyman, 2004).

Physical inactivity, poor dietary choices, increased calorie consumption, high stress and interrupted sleep patterns, among other factors, contribute to obesity and health related issues in college students (Serlachius, Hamer, & Wardle, 2007). The top two leading health indicators are physical activity and overweight and obesity according to the Health People 2010 report. Furthermore, this report identified postsecondary institutions as settings where young adults, aged 18 to 24, should be targeted for physical

activity promotion (U.S. Department of Health and Human Services, 2000). Specifically, the national goals call for an increase in the proportion of college students who have received information on physical activity, dietary behaviors and nutrition and an increase in the proportion of college students who engage in physical activity, and reduce the proportion of college students who are overweight and obese. For example, there is evidence that college students do not understand the recommendation levels for moderate physical activity (L. H. McArthur & Raedeke, 2009). Behrens, Dinger, Heesch, and Sisson (2005) found that while college students understood the definition of physical activity, most were not sure about the specific frequency and duration required to meet the recommendations for moderate physical activity levels. A study of college students at one large university found that only 22% of students exercised vigorously three days per week (Petosa, Suminski, & Hortz, 2003). Haberman and Luffey (1998) found that 39% of students reported exercising three or more times a week, whereas 12.3% of students reported not exercising at all. Evidently, there is a need to increase physical activity in this population.

College students exhibit a low level of awareness of the three areas related to the 2010 Dietary Guidelines for Americans and the Food Pyramid. These areas include food composition, healthy eating and the relationship between diet and health (McArthur, Grady, Rosenberg, & Howard, 2000). In comparison to the general population in the United States, first-year college students score the lowest on wellness scales for nutrition (LaFountaine, 2006). Grace (1997) found that in comparison to the general population, college students' eating habits often worsen during college, rather than improve during this formative stage of life.

The Healthy Campus 2000: Making It Happen (ACHA, 1994) revealed that college students who completed a general health course made better decisions than students not enrolled in any health courses. The students in the general health course acquired health knowledge, obtained the ability to conduct self-assessments and developed the skills to change their own behaviors.

Achievement of these national goals will rely on instruction by individuals in the education and research profession trained in public health, kinesiology, and nutrition. As professionals, these key players will be concerned with helping the college students to identify both appropriate health behaviors and strategies to change undesirable nutrition and exercise practices, as well as helping these students monitor their progress toward improved health.

Purpose of the Study and Research Questions

In spite of increased research into the benefits of regular exercise, healthy eating, and other health promotion strategies, there continues to be an increased need to develop interventions that promote such behaviors. Making informed decisions about healthy behaviors may be difficult for students who may be used to relying on others for such information including parents, peers and the media (NIH, 2007). Although these sources may influence the adoption and maintenance of college students' healthy behaviors, it is important to realize that the university systems, appear to have the greatest influence in helping them to do so (Nahas, 1992). Given that professionals in both health and education have acknowledged the variety of foundations that influence learning and behavior, it seems practical to establish multiple interventions to foster the adoption of health enhancing behaviors. Students need to be equipped with skills and knowledge to

respond to the countless problems of obesity and poor health. Therefore, it is important that kinesiology and health educators address the impact of their institution's core curriculum in promoting students' knowledge of healthy behaviors. The decisions made now can have a significant influence on one's quality of life in the future (Allensworth, Symons, & Olds, 1994).

It is quite popular today for higher education institutions to offer general health, fitness, or wellness classes. Some research studies have observed the effect of only a nutrition education program or solely a physical activity program on weight maintenance and increased physical activity in small groups of college students. Research on whether these classes influence students' health attitudes and behaviors is discrepant (Koff & Bauman, 1997; Petosa, 1984). For example, literature suggests that a positive change in students healthy behaviors did not occur after taking a college level physical education class (Petosa, 1984) while Koff and Bauman (1997) and Cottrell, Carey, Tricker, and Zavela (1988) suggest otherwise.

This study was built upon previous research on physical education courses by examining a course designed to explore the public health issues associated with physical activity, obesity, and disease. Uniquely, this course offering is attractive to the general college student as one of about twenty-six that the Texas Coordinating Board agrees fulfills a student's social and behavioral science core curriculum requirement. This study sought to answer the following research questions: (1) To what extent does completion of a lower level undergraduate course relating to issues in physical activity and obesity change college students' health behaviors to reflect a healthy lifestyle? (2) Does being a kinesiology student, living on campus, or having a meal plan affect the magnitude of

change in health behaviors? (3) Does self-reported BMI affect the magnitude of change in health behaviors? (4) Does the level of self-efficacy affect the magnitude of change in physical activity? (5) Does the level of self-efficacy affect the magnitude of change in nutrition? (6) Does the academic performance in the course relate to better health behaviors?

Kinesiology faculty should learn to understand how their teaching curriculum is affecting their students' thoughts related to their own personal behaviors, and as a result they can modify their approach and contents of the curriculum to encourage students to adopt and maintain healthy behaviors (e.g., increased physical activity, better nutrition choices). University administrators can evaluate whether this core curricula could be used for development and implementation of new policies and programs designed to promote healthy behaviors. Instituting all incoming students with the possibility of working toward decreasing the risk for weight gain and poor nutritional behaviors and adopting healthier behaviors during the college years and encouraging the maintenance of these habits after graduation and into adulthood.

Definition of Terms

Healthy Behaviors. The four objectives listed under the nutrition, physical activity, and obesity topic by the Leading Health Indicators framework to "promote quality of life, health development, and health behaviors" for Healthy People 2020 are: (1) PA-2.4: Increase the proportion of adults who meet current federal physical activity guidelines for aerobic physical activity and for muscle-strengthening activity; (2) NWS-9: Reduce the proportion of adults who are considered obese (3) NWS-10.4: Reduce the proportion of children and adolescents (age 2-19) who are considered obese; and (4)

NWS 15.1: Increase consumption of total vegetables in population aged 2 years and older.

Physical Activity. "Any body movement carried out by the skeletal muscles and requiring energy" (p.29) according to Fahey, Insel, and Roth (2009). Exercise is a type of physical activity that requires planned, structured and repetitive bodily movement with the intent of enhancing one's health according to the U.S. Department of Health and Human Services.

Nutrition. According to American Dietetic Association the 2010 Dietary Guidelines recommend encouraging people to eat more wholes grains, vegetables, fruits, low-fat or fat free milk, yogurt, and cheese, vegetables oils and seafood. This 2010 Dietary Guideline recommends eating less added sugars, solid fats, refined grains, and sodium.

Summary

The purpose of this study was to measure the baseline entry level health behaviors among the undergraduate students enrolled in a Texas core curriculum course and to analyze the nature of the relationship between learned health knowledge and post-course health behaviors. More specifically, the study investigated pre- and post-change in students' nutrition and physical activity behavior. The next chapter includes a review of literature on behavioral change theories, including Stages of Change Model and Health Action Process Approach. The review of literature continues with the current health behaviors in college students concerning obesity, physical activity, and nutritional behaviors.

Chapter three covers the methods used to conduct this study including data collection, procedures, and data analysis. Chapter four presents the results of the study, including magnitude of change from the three administered surveys that were distributed to all student participants. Finally chapter five concludes with a discussion of the major findings, the limitations of the study, and recommendations for future research.

Chapter II

Literature Review

This chapter reviews the literature and illustrates the need for increased research in healthy behaviors among college students, specifically in the areas of physical activity and nutrition. The review of literature regarding the college age population is rich on information for developing healthy lifestyles using education as an intervention. It addresses the concepts of self-efficacy and the Health Belief Model as to how these perceptions guide health behaviors and their relationship to behavioral change. Also reviewed are the Stages of Change Model and the Health Action Process Approach as constructs to affect changes in behavior. In addition, the review of research addresses college student behavior change in both of the following areas: physical activity and nutrition. College age students are at risk of developing unhealthy lifestyles and often need to make behavioral changes to create a positive lifestyle change. Green, Kreuter, Deeds, Partridge, and Bartlett (1980) defined health education as a combination of learning experiences designed to facilitate changes in behavior that are enhancing.

Obesity Problem

Obesity is one of the greatest growing health threats and socioeconomic issue in the United States. The United States' population is heavier than ever and obesity has become a public health concern in the country (Polednak, 2006). It contributes significantly to a variety of serious diseases, including heart disease, diabetes, stroke, and certain cancers as well as poor general health. (CDC, 2012)

Obesity is a leading cause of preventable death in the United States, causing an estimated 200,000 deaths annually (Danaei et al., 2009). The national median of obese

adults is 29.4% (APHA, 2014). This means that more than one in four adults are obese in the United States — that is more than 66 million adults with a body mass index of 30.0 or higher. Self-reported data from U.S. college students indicated that 33.7% are reported to be overweight (21.9%) or obese (11.8%) (American College Health Association, 2013) and an average college freshman gains 7.5 to 18.2 pounds during their first year at school (Topp, Edward, Ridner, Jacks, & Newton, 2011). The effect of body mass index on mortality is higher among younger individuals (Stevens et al., 1998). Overweight college students are at-risk of becoming obese adults, since research shows that college students gain both weight and body fat throughout their college years (Gropper, Simmons, Connell, & Ulrich, 2012) thus prevention efforts targeting college age individuals are key to reducing adult obesity rates.

The causes of obesity are complex and include lifestyle and the social and physical environment, as well as genes and medical history. Poor diet and limited physical activity are key lifestyle contributors to obesity. Since the 1980s, energy intake has progressively climbed and energy expenditure has dropped, leading to a growing energy imbalance which closely reflects the obesity rates (Finkelstein, Ruhm, & Kosa, 2005). Obesity remains a leading public health concern with nutrition and physical activity being key factors in its development (Ogden et al., 2006). The relationship between physical activity and health has never been more clearly defined. Low calorie diet and increased physical activity are proven to promote weight loss carefully (Mahan & Escott-Stump, 2007).

New data revealed that the prevalence of obesity doubles from the 20s to the 30s, therefore there is an obvious need to create obesity prevention programs for this age

group (Laska, Murray, Lytle, & Harnack, 2012). There have been some successful interventions targeting a wide variety of populations with various strategies, from school based prevention programs to treatment interventions in mature adults (McTigue, Hess, & Ziouras, 2006; Shaya, Flores, Gbarayor, & Wang, 2008). While obesity is associated with an increased risk of developing numerous health conditions, weight loss is associated with an attenuation of those risks (Malnick & Knobler, 2006). Physical inactivity is the fourth leading cause of death (WHO, 2014a). In 1996, the Surgeon General of the United States issued a major report entitled *Physical Activity and Health: A Passport to Good Health for All Americans.* This document serves as a significant beginning contribution to our body of knowledge about physical activity and wellness. In the introduction, Donna E. Shalala, Secretary of Health and Human Services, urges families to "...weave physical activity into the fabric of their daily lives" (CDC, 1996).

Self-Efficacy and Health Behavior Theories

Social Determinants of Health. Social determinants of health are defined by the World Health Organization as conditions in the social, physical, and economic environment in which people are born, grow up, live, work, and age. These circumstances are shaped by other forces which consist of social policies, economics, and politics. Other aspects of the social structure, may include the government and private sector programming, as well as community factors. The Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020 uses the term "societal" to simplify those aspects of the social structure influence the health of populations through both social and the physical environments and the collaborations between these environments. Social environment includes family, friends, coworkers and

others in the community placed in settings such as schools, neighborhoods, workplaces, and recreation facilities which influence the life of an individual or community. Whereas, the physical environment can be thought of as that which can be seen, touched, heard, smelled, and tasted. It impacts health from the structure and function of the environment that encompasses both the natural, atmosphere or weather and built environments, buildings or transportation systems (US Public Health Services, 2012). Social determinants of health can be conceptualized as influencing health at multiple levels throughout the life course.

Perceived Self-Efficacy for Health Behaviors. The **s**elf-efficacy construct, as described by Bandura (1977), is the expectation that one has the ability to perform any action successfully. A social cognitive approach to behavior refers to behavioral, physiological, cognitive factors and environmental influences all functioning as interacting causal determinants of each other (Bandura, 1997a). Self-efficacy and outcome expectancy are related in that effective learners expect and usually receive positive outcomes for their actions (Schunk, 1995). Self-efficacy theory (Bandura, 1977) distinguishes between expectations of efficacy and outcome (Godin, 1994). Outcome expectancy involves a person's belief that a behavior will lead to a particular outcome regardless of whether the person is capable of performing the behavior (Rodgers & Brawley, 1991). In this context self-efficacy and outcome expectancy exist together in the individual's mind prior to the behavior being attempted. Prochaska, Norcross, and DiClemente (1994) related the concept of self-efficacy to self-esteem and self-confidence. Self-efficacy can support the evaluation of one's sense of control. Self-

efficacy affects how much effort is invested in a given task and what level of performance is reached.

Bandura (1997b) hypothesized that self-efficacy is learned in a variety of ways, from personal experiences to exhibiting others. In order for self-efficacy to influence behavior, the individual must have the requisite skill and incentive to perform the behavior. Self-efficacy for a particular behavior combined with the sense of belief must be present in an individual for change to occur.

Research has shown a link between self-efficacy and a variety of health behavior outcomes, from career choices to athletic performance (Schunk, 1995). Self-efficacy cognitions have been consistently offered as important determinants of sport (Feltz, 1992) and exercise behavior (McAuley, Pena, & Jerome, 2001) as well as social, clinical, and health-related behaviors (Bandura, 1997a). It is important to realize that self-efficacy is not concerned with the skills of an individual but rather with the decisions of what an individual can do with the skills he or she holds (Bandura, 1997a).

People with high levels of self-efficacy have been found to perform better on health related tasks than those with low levels of perceived self-efficacy (Bandura, 1977). Efficacy is more than just the motivation to try harder or a matter of strong "will power." It is created through a successful experience. Perceived self-efficacy is hypothesized to form a mediating link between knowledge and behavior.

Earlier reviews (McAuley, 1992) concluded that despite the use of diverse populations, sometimes inadequate operational definitions of exercise behaviors and a variety of methods for assessing personal expectations for success, the physical activity relationship appeared remarkably consistent. In addition, McAuley and Jacobson (1991)

found that self-efficacy to overcome barriers to exercise significantly predicted exercise behavior in sedentary adult women. McAuley summarizes the research in primary prevention as supporting self-efficacy theory, even though definitions of exercise differ, measurement remains an issue, and populations in the studies varied.

Past research shows that self-efficacy is a strong predictor of exercise behavior (Atkins, Kaplan, Timms, Reinsch, & Lofback, 1984; McAuley, 1992) and adherence to an exercise program (Desharnais, Bouillon, & Godin, 1986; Rodgers & Gauvin, 1998). For example, McAuley (1992) found that self-efficacy was a significant predictor of adoption of an exercise program; however, for maintaining subsequent exercise behavior, exercise history was found to be the strongest predictor of participation. These discoveries were further supported by Oman and Research on exercise behavior, which found exercise history to be the most significant predictor of exercise behavior (Dishman, Sallis, & Orenstein, 1985).

Perry, Baranowski, and Parcel (1990) found that the repetition of the performance of a single task built a person's self-efficacy, which in turn affected task persistence, initiation, and endurance, which in turn then promoted behavior change. To make use of self-efficacy in promoting behavior change, goals should be set in increments that approximate a given behavior and that are each possible to achieve, thereby allowing people to build self-efficacy each time they perform the desired behavior successfully. When individuals become successful at each step of the process, they can progressively put the steps together and build a greater sense of self-efficacy.

D'Alonzo, Stevenson, and Davis (2004) reported significant differences in self-efficacy for physical activity between high-attendee and low-attendee participants at post-

test (p = < .001). Gieck and Olsen (2007) stated significant pre to post-test increases in self-efficacy to service principles of holistic wellness among the intervention group (p = < .001; effect size .59). In addition, this study exhibited self-efficacy for physical activity was predictive of increases in resistance training (p = < .05; effect size .55).

Netz and Raviv (2004) studied the social-cognitive theory and how self-efficacy, outcome expectations, and self-evaluated satisfaction or dissatisfaction are reasons why individuals are motivated to engage in physical activity. Approximately 2,300 individuals were interviewed and given questionnaires. The three parts of the social-cognitive theory were weighed using various scales. Age, gender, level of physical activity and level of education were used as independent variables. The study measured self-efficacy by using the Marcus and Owen (1992) that assesses the reliability of efficacy expectations related to participation in physical activity despite specific obstacles. The participants also reported all physical activities during the two week period. The results of the study found that, "older adults are motivated to participate in physical activity for its health benefits, in contrast, it is due to health reasons that they refrain from participating in physical activity" (p. 44).

Key Models of Health Behavior Change

Theoretical foundations of health education are derived from the fields of pedagogy, psychology, sociology, biology, and anthropology. In health education exercise, health educators must apply related concepts, theories, and models, including but not limited to, the Health Belief Model, Social Cognitive Theory, Transtheoretical Model of Health Behavioral Change, known as the Stages of Change Model, and other various community organizing models. These models explain how people acquire and

maintain certain behavioral patterns, while also providing the basis for intervention strategies (Bandura, 1997a). Evaluating behavioral change depends on the factors environment, people, and behavior. The Health Belief Model and Stages of Change Model provide a framework for designing, implementing and evaluating programs. Health educators integrate and apply these learning and behavioral theories in relation to health concepts and skills, as a result empowering individuals to adopt positive health practices.

Health Belief Model. The Health Belief Model (HBM) is one of the earliest most widely used theoretical frame works developed for understanding and explaining health behavior. Developed in the early 1950s by Hochbaum, Rosenstock, and Kegels, the model has been used to describe why people did not engage in behaviors to prevent or detect disease early. The Health Belief Model concentrates on the attitudes and beliefs of individuals. The model was developed in reaction to the failure of a free tuberculosis health screening program. Since then, the HBM has been modified to explore a variety of long- and short- term health behaviors.

The Health Belief Model (HBM) was first applied to the understanding of disease prevention and in identifying unhealthy behaviors, and it has broadened its scope to preventive-health behaviors, sick-role behaviors, clinical utilization, and as a predictor of compliance with a variety of medical regimes (Janz & Becker, 1984). The HBM explains behavior change based on the value placed by an individual on a particular goal and on the individual's estimate of likelihood that a given action will achieve the goal (Janz & Becker, 1984).

Hochbaum, Rosenstock, and Kegels (1950) explains the desire to avoid becoming ill is a value, and belief that a specific health behavior can prevent an illness is an expectation. Perceived susceptibility is the perception of personal risk of developing a particular condition, and it involves a subjective assessment of risk rather than a meticulously resultant level of risk. Perceived severity is the amount to which a person attributes negative medical, clinical, or social significances to being identified with a disease. Together, perceived susceptibility and perceived severity provide motivation for decreasing or removing such dangers. The type of action taken depends on perceived benefits, those beliefs about the effectiveness of different actions and perceived barriers, the potential negative aspects of particular actions. People are believed to contemplate an action's effectiveness in decreasing a health risk against possible negative outcomes associated with that action.

The utilization of the Health Belief Model assists in changing individuals' beliefs and attitudes with respect to general health and exercise. The Health Belief Model is a framework for motivating people to take positive health actions that uses the desire to avoid a negative health consequence as the prime motivation. Therefore, the perceived threat of a heart attack can be used to motivate a person with high blood pressure to exercise more often. It is important to note that avoiding a negative health consequence is a key element of the HBM. For example, a person might increase exercise to look good and feel better. That example does not fit the model because the person is not motivated by a negative health outcome, even though the health action of getting more exercise is the same as for the person who wants to avoid a heart attack.

An essential contribution of the model is the acknowledgement that prevention requires people to take steps forward in the absence of illness. Perhaps the most critical of these is the lack of predictive value for some of its principal beliefs. For example, the perceived severity of a risk does not reliably predict protective health behaviors (Rimer, 1990). Moreover, the HBM is more descriptive than explanatory and does not assume or suggest a strategy for change (Rosenstock & Kirscht, 1974). The predictive utility of the HBM and its applicability to behavior change can be improved by adding variables, such as self-efficacy, or by integrating it with other models. Given this, the HBM can be an effective framework to use when developing educational strategies.

Stages of Change Model. The Transtheoretical Model of Health Behavior Change (Stages of Change Model) proposes a series of stages that lead to change. It is a model that focuses on the decision making of the individual. This model is an innovative theory that deals with an integrative view of intentional behavior change. It hypothesizes that behavior change is a multi-step process that involves progression through a series of stages. The Transtheoretical Model has been applied to numerous health behaviors, including physical activity and dietary practices (van Leer, Hapner, & Connor, 2008).

Most commonly used in physical activity promotion are the constructs related to stage of change. The stages of behavioral change include pre-contemplation (no current motivation to change), contemplation (recognize a problem), preparation (planning change to occur), action (implementation of behavior change), and maintenance (new behavior has been in place for some time). Each stage has a specific task that must be accomplished before progressing to the next stage, and certain tools play a primary role in accomplishing these stage-specific tasks by helping to develop skills and/or attitudes

needed to progress along a continuum. Individuals are believed to progress through these stages at various rates, and they may leave and reenter the continuum of change at various points. The model suggests that movement through the stages is not always linear but, instead, is cyclical, because many individuals must make several attempts at behavior change before they achieve their goals. It also takes into account actual behavior and intention to change and predicts that the amount of evolvement people make as an outcome of an intervention is a function of the stage at which their before treatment begins.

Developed by Prochaska and DiClemente to integrate several behavioral and psychotherapy theories into one that describes the progression of change and accompanying behaviors. Behavior is viewed as a multistep process which requires time and motivation whereby the individuals vary in their readiness to accept and make the change. The concerns for the model were addressed by Prochaska, Diclemente, Velicer, and Rossi (1992), and they reiterated that this model is like a spiral staircase and that a person can move up or down, depending on his or her attitude at that time. They acknowledged that there is no empirical data to show a person is moving successfully from one stage to the next but they have shown that a person cannot succeed if they move to action without adequately staying in the previous stages. Individuals who have sustained behavior change for less than six months are categorized in the action stage while those who have continued the behavior change for six months or longer are considered in maintenance (Prochaska et al., 1992). Other important constructs in this model include decisional balance (which is the weighting that occurs between the pros and cons of changing the behavior) and self-efficacy.

The theoretical validity of the Stages of Change Model for behavior change is a matter of debate (Budd & Rollnick, 1997). Although early cross-sectional studies provided support for the theory (DiClemente et al., 1991; Fava, Velicer, & Prochaska, 1995), recent longitudinal studies did not support the Transtheoretical Model (Herzog, Abrams, Emmons, Linnan, & Shadel, 1999). Multivariate analyses of several behavioral predictors demonstrate that the stages are weak predictors of cessation (Pierce, Farkas, & Gilpin, 1998) . Variables from cognitive social learning, such as, outcome expectancy, self-efficacy, and behavioral self-control, appear to be better predictors of change than are the stages and associated processes (Herzog et al., 1999) Given the challenges of altering long-standing unhealthy behaviors, many health educators are calling for dynamic theoretical models to encourage programs to change behavior.

The Transtheoretical Model for Behavior Change defines adoption and maintenance of health behaviors as a process that occurs through specific stages. Interventions targeted at changing cognitive components are designed to move subjects through the stages of precontemplation, contemplation, and preparation. Behavioral interventions are targeted to progress subjects through the phases of preparation, action, and maintenance. This approach has been used to understand the stages people progress through and the processes they use while changing unhealthy behaviors. A review of the literature identifies a wealth of articles demonstrating the efficacy of this model and its ability to elucidate volitional behavior. Marcus, Eaton, Rossi, and Harlow (1994) looked at the link between the Stages of Change and exercise self-efficacy. It was found that individuals at higher exercise behavior had higher levels of self-efficacy for exercise, further suggesting the benefit of using stage specific interventions (Marcus et al., 1994).

The costs and benefits of exercise have also been revealed to be related to exercise behavior, mediated by stage of readiness (Marcus et al., 1994). The stages of change approach has been applied to weight control (Marcus, Rossi, Selby, Niaura, & Abrams, 1992) and to consumption of high-fat diets (Rossi, 1993) in samples of college students. Students' beliefs about their abilities, their self-efficacy, has proven to be a significant predictor of their performance and efforts exerted (Gao, 2008). Given the difficulties encountered in getting adults to adopt and adhere to exercise programs, several national health objectives target adolescents and young adults in an effort to increase participation in exercise earlier in life (U.S. Department of Health and Human Services, 2000). Understanding the dynamics of the stages of change that college students are in respective to their health behaviors can assist colleges better to develop successful programs and improve the wellbeing of their students.

Despite questions about its theoretical validity, the model has contributed to the recognition that most potential recipients of health-related behavior change efforts are not motivated to change. Population surveys show 80% of the target group in the "precontemplation" or "contemplation" stages. That result draws attention to the possible methods that increase motivation for health promotion and illness prevention. The growth of new motivational programs to inspire less interested people to reflect on healthier lifestyles represents a new path in health and behavior change (Miller & Rollnick, 1995).

Health Action Process Approach. Based on social cognitive theory (Bandura, 1997a) this health behavior model was developed by Ralf Schwarzer (2001). This model assumes the study of the behavioral intention phase studied longitudinally with the phase

leading to an actual health behavior. In the initial motivation phase, a person develops an intention to act. However, the pattern of influence changes after goal-setting, when people enter into the self-regulation phase, whereby they pursue their details of goal of planning, action, investment effort, and persistence, possibly failing, and then either recovering or disengaging. Particular social-cognitive variables may play different roles in these two phases, but self-efficacy is the sole important predictor amongst both phases.

Interventions promoting behavior change should be built on tested theoretical frameworks to increase the probability of behavior modification or maintenance (Bauman, Sallis, Dzewaltowski, & Owen, 2002). By framing physical activity educational programs around grounded theories, applicable determinants positively influencing physical activity behaviors can be directed. Specifically, social cognitive theory had been most frequently used as the theoretical basis for the development of intervention content for face to face classroom format approaches (Calfas et al., 2000; Ha & Caine-Bish, 2009; Kelly, Mazzeo, & Bean, 2013). Bauman et al. (2002), documented positive association with physical activity to suggest that the social cognitive theory is closely associated with variables such as expected benefits, self-efficacy, activity during childhood, skills related to coping with barriers, and external influences including interpersonal relationships and social support. In addition to these variables, course content is often includes assignments related to developing self-regulatory skills such as goal setting and self-monitoring (Ferrara, 2009; Keating, Guan, Pinero, & Bridges, 2005; Kelly et al., 2013).

Additionally, a study by Grubbs and Carter (2002) found a significant relationship between benefits and barriers when they used the Health Belief Model to examine the

relationship of benefits versus barriers to physical activity. The sample contained 147 college students from a large southeastern university. A 43-item, 4- point Likert scale (strongly disagree to strongly agree) wased to measure the perceived benefits and barriers. The reported internal consistency of the measure was .95, and test-retest reliability was .89. Current exercise habits were measured by questioning students if they exercised using large muscle groups for at least 20 minutes, on three or more days per week, where the intensity was at least 60% of their maximum heart rate. The students who reported this activity level, were considered exercisers. The researchers found that students who were considered exercisers, 68.8% of the total sample, were more likely to score higher on the benefits scale and lower on the barriers scale, then the 31.2% who were not in this category.

According to Dzewaltowski (1989), self-efficacy is a reliable predictor of exercise determination and exercise behavior. He reported that college students with high efficacy continued to participate in an exercise program over a longer period of time. Regardless of the barriers, college students were found to exercise more days per week and to have a higher level of self-efficacy than college students without self-efficacy.

Leslie et al. (1999) completed a study with 2,729 college students based on the characteristics of sufficiently active versus insufficiently active college students in Australia. Instruments related to environment, exercise enjoyment, social support, self-efficacy, and a two-week physical activity recall was administered to all students. Self-efficacy was measured through a modified instrument containing a five-point Likert scale ("sure I cannot" to "sure I can") to address those barriers to exercise. The results were grouped into average self-efficacy (score = 3) or high self-efficacy (score > 3). Physical

activity was calculated using a 2- week physical activity recall that measured the following types of physical activity: physical activity as a mode of transportation, moderate activity, and vigorous activity. Duration of activity was converted to energy expenditure. Students were considered sufficiently active when they expended 800 kcals/week or greater and were considered insufficiently active when they expended less than 800 kcals/week. Self-efficacy did not affect either sufficiently or insufficiently active students.

The relationship between Social Cognitive Theory variables in predicting stage of change for exercise were tested by Wallace, Buckworth, Kirby, and Sherman (2000). This sample of college students (N=937), consisted of approximately 60% female, with a mean age of 22 (SD = 5.6 years). Females reported less hours of sedentary activity than males. The internal consistency for the stage of change measured .71. Self-efficacy for exercise was assessed using 5-point Likert scale for barriers to physical activity. The internal consistency for the instrument in a pilot study measured .74, and test retest reliability reported .94. Roughly 52% of the total sample described themselves as being inactive, or in pre contemplation or contemplation. Self-efficacy was found as a significantly discriminating variable for females. Taken further, a Tukey's post-hoc analysis showed a significant increase in self-efficacy through the different stages of change. For males, self-efficacy was also a significant discriminating function. After completing the Tukey's post-hoc test for males, it was determined that self-efficacy reported to be more important when comparing males within different stages.

Petosa et al. (2003) investigated the role of Social Cognitive theory constructs in predicting vigorous physical activity in 350 college students. Variables that were

included in the study were self-regulation, outcome expectancy value, exercise role identity, positive exercise experience, family and friend social support, and self-efficacy. Self-regulation was assessed using a 43-item instrument with acceptable validity and reliability (test-retest r = .92, α = .88). Vigorous physical activity was measured through a seven day recall that had been validated through expert panel review, and was found to be reliable (test-retest reliability, r = .72 for supervised activity). The researchers used a hierarchical multiple regression analysis to assess predictive capacity of the constructs on vigorous physical activity. Results of the study showed that the total model, consisting of all of the Social Cognitive Theory variables, accounted for 27.2% of the variance in vigorous physical activity.

Current Health Behaviors in College Students

College is an important time when students establish healthy and unhealthy behaviors (Pearman et al., 1997). The college career presents a time in an individual's life where new habits are established regarding health priorities (Newton, Kim, & Newton, 2006) and poor habits exacerbate at this time (Grace, 1997). Researchers view this time period as an opportunity to address how postsecondary institutions affect these behaviors. Many habits are set in late adolescence, colleges often stress educational programming for new students. Therefore it is important that institutions implement health or physical activity courses, which promote the development of health behaviors, knowledge and attitudes (Pearman et al., 1997).

Physical activity behaviors reported by American college students are a public health concern. The number of college students meeting the recommended amounts of moderate to vigorous physical activity was 48.8% (American College Health Association,

2013). This means that roughly half of all college students are not getting adequate physical activity. Using the 2013 College Student Health Survey, researchers gathered data from 13,459 undergraduate and graduate students enrolled in 29 postsecondary institutions in Minnesota (Boynton Health Survey, 2013). Their study reported 72.4% of surveyed students reported moderate (31.4%) to high (41.0%) amounts of PA, while 20.3% reported low and 7.3% with no PA. Bray and Born (2004) suggested that high school seniors entering into the freshman year of college decrease physical activity by about 20%. Pinto, Cherico, Szymanski, and Marcus (1998) reveal that a generous group (42%) of students were either inactive or exercising below the recommended levels of physical activity during the freshman year. Various studies indicate that a high percentage of college students' physical activity levels remain below the recommended standards and may decrease as the students age (Huang et al., 2003; Racette, Deusinger, Strube, Highstein, & Deusinger, 2005).

Silliman et al. (2004) identified barriers that students claim keep them from exercise. Lack of time was found to be the number one reason, followed by lack of motivation, lack of willpower and lack of energy (Silliman et al., 2004). Availability and locations of exercise facilities was determined to be another existing barrier keeping students from exercising (Reed & Phillips, 2005). Students' access to exercise is limited when there are no facilities available to them. Additionally, students may avoid goignt to overcrowded facilities or facilties with limited equipment. However, underclassmen tend to frequent on-campus facilities more than upperclassmen. This suggests that closer proximity of the facility, students living on or near campus can promote exercise (Reed & Phillips, 2005). Inconsistencies of findings related to living arrangements should be

investigated as well. Jung, Bray, and Ginis (2008) discovered that living on campus is associated with inactivity, but Dinger (1999) found that students living in residence halls or Greek housing exercised more. Brevard and Ricketts (1996) found no differences in exercise habits between students living on or off-campus.

Dietary behaviors are of concern with college students because of poor food selections and eating habits (Georgiou et al., 1997). Most students fail to meet the minimum recommended daily guidelines (Belaski, 2001) while exceeding their daily allowances for fats, sugar and sodium (Anding, Suminski, & Boss, 2001). One studycomprised of 2,600 collge students found that 40% of the students had not eaten any fruit in the last 24 hours and 55% of the students had not eaten any green salad or cooked vegetables (Dinger & Waigandt, 1997), while researchers Hiza and Gerrior (2002) report that only a small percentage are consuming the recommended intake for fruits, vegetables and dairy.

In 2008, the American College Health Assessment surveys revealed that 8.5% of students reported eating five or more servings of fruit and vegetables daily (American College Health Association, 2009). Other studies showed very few students meet the recommended servings for fruits and vegetables (Plesko, Cotugna, & Aljadir, 2000; Song, Schuette, Huang, & Hoerr, 1996). Adams and Colner (2008) suggested that certain students groups eat less fruits and vegetables, including single students, African American students, Hispanic students, and part time enrolled students. Nelson and Story (2009) also found that four-year college students ate more fruit and vegetables than 2-year college students and non-students, however, they still consumed more than three servings below the recommended amounts.

College students also adopt erratic eating patterns that coincide with their erratic lifestyles (Sneed & Holdt, 1991). The college student often skip meals, deals with daily lifestyle and schedule changes, has minimal source of funds, or little to no food preparation areas and has constant access to unhealthy food choices. Therefore, fast food appears to be a staple for most college students. College students' inadequate dietary intake is not surprising when students are eating meals at fast food restaurants six to eight times weekly (Driskell, Kim, & Goebel, 2005). Morse and Driskell (2009) reported that most undergraduate college students eat at a fast food restaurant one to three times a week. The same students surveyed reported that they ate breakfast, lunch, and dinner at a university cafeteria 43% of the time. Driskell, Meckna, and Scales (2006) reported similar findings, as their surveys showed that 89% of college students ate lunch at a fast food restaurant at least once a week, and more than 29% ate non-meal snacks at a fast food restaurant at least once a week.

Students are known to always be on the go with endless surrounding convenient and quick culinary options, it is easy to make less than nutritionally sound choices. Compounding this is the opportunity to select dining meal plans with fewer meals, or none at allbut with just a point cash value used at the convenience stores, vending machines, and fast-food restaurants that have now moved onto college campuses. The choices available from these sources are usually higher in fat and sugars while being low in fiber, fruits and vegetables (Belaski, 2001).

There is some evidence that living arrangements may also influence college students' eating behaviors and healthy food choices. Brunt and Rhee (2008) found that college students who lived on campus consumed larger variety of fruits, vegetables, and

dairy products than those who lived off campus. Adams and Colner (2008), along with Chung and Hoerr (2005), found that students in residence halls reported greater fruit and vegetable intakes. Meal plans may be the reason for the increased healthy food options, as suggested by Brown, Dresen, and Eggett (2005). However, there is conflicting information about Greek housing and healthy eating. Dinger (1999) found that students living in Greek housing consumed fewer servings of fruits and vegetables, while Adams and Colner (2008) found that students living in Greek housing consumed more fruits and vegetables than a student living in non-Greek off-campus housing. In addition to dining plans available in residence halls, students often keep a variety of foods in their rooms. Parents of these students also send more snack items, which typically are not as healthy as what the students would have selected for themselves (Nelson & Story, 2009).

First year students are most vulnerable to adopting unhealthy eating habits that lead to weight gain (Anderson, Shapiro, & Lundgren, 2003). These excesses, combined with sedentary lifestyles, can contribute to the "freshman fifteen", which refers to the number of pounds freshmen students are rumored to gain during their first year (Lang, 2003; Rodriguez, 1999). The "freshman fifteen" is not likely to be the product of poor dietary habits alone. One study done in 2004 of 471 students found that 25% of students have BMIs that placed them in the overweight category while 6% were classified as obese (Silliman et al., 2004). It is in close relation with the 1995 NCHRBS which reported that 35% of college students are categorized as either overweight or obese (Lowry et al., 2000). Overall, research shows that college students lack in healthy food consumption levels (Huang et al., 2003; Racette et al., 2005).

Classroom Instruction & Teaching Strategies

College learning environments, the interactive network of teaching strategies influencing student learning outcomes in the college setting is the primary resource for classroom instruction, either face to face or virtual, designed properly to increase functional health knowledge; improve health-enhancing attitudes; develop health-related skills and motivate students to prevent disease, reduce health risk behaviors, and increase health-promoting behaviors. Educators must be able to identify and recommend theory-driven and research-based instructional strategies and learning styles to educate this generation of college students on healthy educational principles.

The Net Generation includes traditional-aged college students who began attending higher education institutions in 2000 forward (Junco & Mastrodicasa, 2007). This generation, born after 1982, has several names, including Millennials, Generation Y, and Echo Boomers and is the largest in history, surpassing 80 million in number (Lancaster & Stillman, 2002). These consumers of high-speed technology, a reflection of their group name, are comfortable with using a wide range of technologically advanced tools that enhance their lives. The uniqueness of the Net Generation has caused educators to focus on how these students are different from previous generations and how they can meet these students' needs with services and expectations (Reesor & Schlabach, 2006). These different expectations regarding the delivery of content for courses these students are enrolled in have many institutions turning to distance education courses as the solution. Online learning has now evolved from a minor form of education to a commonly accepted and increasingly popular alternative to traditional face-to-face education (Gunawardena & McIsaac, 2004).

Distance education represents a strategic "inflection point" for higher education, signaling the fundamental transformation of education as we know it (Oblinger, 2000). Net Generation students are finding it difficult to engage in the educational environments that do not match their online world in terms of speed and communication styles (Tapscott, 1998). The word 'online' is a generic term that describes an educational modality in which teaching and learning take place within an Internet-based, virtual learning environment (Berge & Collins, 1995).

Online learning environments provide three ways to gain knowledge of the presented lecture information: listening to lectures, watching animations, and reading the lecture transcript. These ways accommodate the three ways in which students learn: auditory, visual, and textual (Lammers & Murphy, 2002). Visual animation enhances comprehension and recall. Students are no longer just passive consumers of learning, but also actively engaged in the learning environment through project based learning activities such as videos, experiments, fieldwork, and collaborative projects. Active engagement can help ensure that little to no learning material is missed or misunderstood through these extra activities. Students' learning experience shifts from consumables to produceables, presenting understanding and comprehension of material learned. Personal experiences show we understand better and remember longer what we see and do than what we hear and read.

Students' immersion in the digital or connected age has contributed to changes in their social and cognitive-connectedness schemata. According to Sontag (2009), students' new social-connectedness schema is comprised of three parts: link, lurk, and lunge. Students link up with others who have the digital knowledge they would like to

obtain. Next, students lurk or observe the digital expertise of others. Finally, students lunge at this new technology. The needs of the net generation are constantly evolving; however, it is clear that in order for a course to be successful in its key objective, it must incorporate technologically based approach. The primary dissemination for this form of instruction is online courses, which mirror familiar social media sites. The net generation of students relies heavily on social connectedness, which appears to also play a role in the success of students taking online courses.

The concept of affordance was developed by Wertsch (1998), who saw computers as a tool, a vehicle for combining motor skills, language, images and symbolic manipulation through practical activities. These practical activities reflect a series of often complex thought processes. They represent a cultural tool that enables the mediation of mental process. The technology enables these processes to be amplified and developed in ways which reflect the integration of technology and the enhancements that information and communication technologies, used as a tool, produce an environment that facilitates the process of knowledge building (Cuthell, 2002). Tapscott (1998) argues this newly wired interactive generation demands interactive learning implementations rather than one-way lectures. He believes that technology, if applied correctly, can be an extraordinary teaching tool. Mayer (2009) has suggested that the transfer of learning online succeeds better from narration and animation presented conversationally than by posting copious lecture notes and irrelevant elements, because simply reading lecture notes does not encourage engagement. Students often expect to use and learn with new technology as they complete their college education (Benson et al., 2002) because

computers support intuitive understanding and ways of knowing and learning (Cuthell, 2002).

Brooks (1997) and Jaffee (1997) argued that a major benefit of online learning is that it removes students from teacher dominated classrooms and creates a more inclusive online learning community. These online environments provide a community to foster opportunities for rich sensory immersive experiences, authentic contexts and activities for experiential learning, simulation and role-play, modeling of complex scenarios, a platform for data visualization and opportunities for collaboration and co-creation that cannot be easily experienced using other platforms. They provide the ability for students to engage in trial and error learning. Like all courses, they must be thoroughly well designed, adding something unique to meet the needs of the students for continued motivation. According to Dietz (2002), online learning communities can help students become further invested in their education.

The millennial students share seven core traits. These traits are special, sheltered, confident, team-oriented, conventional, pressured and achieving (Howe & Strauss, 2003). These traits are descriptive of the millennials needs and wants. For the college health professional, there would be an advantage to being knowledgeable about this population in order to develop and implement programs that would influence healthy habits. Education is a dynamic contributor to health as people must become knowledgeable about, create, and maintain a healthy lifestyle. The connection between education and health has been well documented and spans almost all health conditions (Ross & Wu, 1995).

College Interventions and Recent Research

Establishing good habits early makes it easier to maintain good behaviors as an adult rather than have to change later (Lau, Quadrel, & Hartman, 1990). Therefore, targeting healthy behavioral change intervention during this time should be cost effective in the long term. People's lifestyle habits do not change easily, but changing behavior is possible even though behavior typically changes slowly (Gifft, Washborn, & Harrison, 1972). Data has shown that health and wellness courses have the potential to positively influence the heath behaviors of college students as well as their physical activity performance (Cardinal, Jacques, & Levy, 2002). Implementation usually involves classroom instruction where a health educator attempts to increase the students' knowledge, foster positive attitudes toward the value of health, improve health related skills, and promote adoption of health enhancing behaviors.

For-credit activity courses require students to become active and study physical activity (Lockwood & Wohl, 2012). The results of a study to determine the short-term effects of a health promotion course for nursing students supported significant effects whereby students' increased their health promotion behaviors. This positive relationship between the course and the students' experience of a positive behavior changing process in nutrition and exercise established need that justified the continued use of this type of course as part of a regular nursing education (Hsiao et al., 2005).

The results from a comparative analysis study conducted by Brynteson and Adams (1993) indicated that students who were required to take a wellness course every semester, not only enhanced their knowledge of health related topics, but also placed greater value toward fitness and increased their exercise behavior. Research conducted

by McCormick and Lockwood (2006) on the perception and knowledge among college students enrolled in a lifetime wellness course exposed positive results, as well. Results of the study showed that students enrolled in the lifetime wellness course improved their knowledge and perception of fitness significantly. Similar results were obtained by Avans (2003) in her study of kinesiology majors and non-majors in reference to knowledge of basic fitness principles. The outcomes showed that for the non-majors 37% of the questions were incorrect from over 75% of the participants. However as hypothesized, the majors achieved results that were higher with over 54% answering correct questions. The post-test results indicated an increase in correct responses from all participants of both groups. These studies only looked at knowledge and did not measure changes in actual physical fitness.

Course work that includes physical activity participation has the potential to promote positive change in regular physical activity (Waldron & Dieser, 2010). College students enrolled in the fitness class that had 20 minutes of lecture and 20 minutes of activity equally twice a week exhibited the highest improvement in recovery heart rate over the other two types of courses which only had one lecture and one lab per week or three lectures and one lab in two weeks' time (Ermler & Kovar, 1993). Overall results indicated a significant improvement of all groups from pre-test to post-test. The study indicated that the way in which the curriculum is structured for physical activity courses will produce different outcomes. There have been other physical activity interventions reported as successfully implemented through credit-based classes at the college level (Raynor & Jankowiak, 2010).

The results of a study by Aaron and Avans (2004) provided strong support for conceptually-based physical activity courses in universities as a way to reach and educate this unique young adult population. The emphasis of transfer of knowledge to physical activity participation by students indicated by the experimental group that retained knowledge learned in a 16 week conceptual Health Related Fitness Course (HRF) does not prove to be statistically significant in activity, but was significant in student attitude toward physical fitness.

Class-based nutrition intervention focusing on prevention of chronic diseases is a cost-effective approach to increasing fruit and vegetable consumption among college students found by a study conducted by Ha and Caine-Bish (2009). The study observed improvements in total fruit and vegetable intake by college students following a college nutrition course. The course focused on nutrition knowledge related to prevention of chronic diseases, healthful dietary choices increasing fruit and vegetable consumption, dietary feedback, and interactive hands-on activities. Integrated feedback on dietary choices and inclusion of applied activities kept the students engaged throughout the course of the intervention. Not only was an overall decrease in consumption of french fries ($p < .05$) found significant, but intake of total all inclusive fruit and vegetables increased from the beginning to the end of the semester ($p < .05$). In addition, consumption of fresh produce specifically also increased ($p < .05$).

Strong, Parks, Anderson, Winett, and Davy (2008) conducted a study that included interviewing 30 college freshmen and sophomores. A major theme from these interviews was that students thought a healthy diet contained fruits, vegetables, grains, and meat or protein. Although the knowledge is there, college students' diets are

characteristically low in fruits and vegetables. These findings suggest that college students do have a general knowledge of the nutritional quality of foods, and that knowledge does not ensure sound dietary choices. This may be due to limited life experience that would lead them to internalize the long term implications of their dietary choices (S. J. Chung, Hoerr, Levine, & Coleman, 2006).

Another experimental group from a study that assessed the effectiveness of an 11-week nutrition class for college students to increase fruit and vegetable intake found an increase in their readiness for change in vegetable consumption. However, it appeared that an 11-week intervention alone did not appear to be sufficient for affecting the students' eating habits (Loman, 2011). This supports other research that indicated behavioral change takes time and a more in-depth approach has the potential to increase fruit and vegetable intake in a college population.

The method of instruction used by an institution can make a difference on the effectiveness of the course to provide knowledge and fitness to the students. Blaser (2005) conducted a study at Brigham Young University to assess the impact of three format types of physical education courses: conceptual based face to face lecture format, online format, and active participation format. The face to face format had the largest impact on both the nutrition and physical activity behavior improvements, whereas the online course had the smallest impact on students' nutrition and physical activity participation. However, limitations to this study could have resulted from the use of three self-reported surveys and the subject population may not have been representative of large city diverse college student populations.

The combination of an online general education nutrition course and additional supplemental material that included online vegetable demonstration videos and in-class tasting experiences resulted in a significant increase in readiness to increase vegetable consumption and self-efficacy of vegetable preparation among students enrolled in the course according to a study completed (L. B. Brown, Larsen, Nyland, & Eggett, 2013). Additionally, a study supporting the increase in fruit and vegetable intake by college students who enroll in health-related courses was conducted by Shah, Amirabdollahian, and Costa (2011).

Internet interventions might be particularly well-received within a college population. In fact, several studies have demonstrated the feasibility of various internet focused interventions targeting eating disorders among college students (Lowe et al., 2006; Zabinski et al., 2001). However, only one completely online study with first year college students has attempted to prevent weight gain (Levitsky, Garay, Nausbaum, Neighbors, & DellaValle, 2006). Gow, Trace, and Mazzeo (2010) evaluated this internet intervention with 170 first year college students who were randomly assigned to one of four treatment conditions: 1) no treatment, 2) 6-week online intervention 3) 6-week weight and caloric feedback only (via email), and 4) 6-week combined feedback and online intervention. The combined intervention group had lower BMIs at post-testing than the other three groups. This study demonstrated the effectiveness and feasibility of an online intervention to prevent weight gain among college students.

Franko et al. (2008) delivered an interactive online program, MyStudentBody.com, which included interactive and multimedia components to provide nutrition and physical activity education information geared toward college students.

Student participants assessed their own health practices and attitudes and set goals to improve their health behaviors. Those students randomized to the experimental group engaged with website content drawn from social cognitive theory had increased motivation for improving their diet and had an improved outlook towards physical activity compared to participants who did not receive the intervention. Experimental groups also increased their fruit and vegetable intake concluding the effectives of the internet based program to have wide applicability for college students for providing nutrition education and promoting change in health behaviors.

Summary

Healthy dietary habits and regular physical activity have both been associated with reducing risks of obesity, cardiovascular disease and other chronic diseases. Individuals that adopt both lifestyle behaviors, the benefits to health are strengthened. Nutrition education is an excellent approach to foster nutrition knowledge and to encourage changes in diet to promote health and wellness. Motivation and self-efficacy are key components of all education programming that attempts to foster change. Education must rely on needs assessment data and should be driven by the participants, college age students in order to address the issues affecting that target population to encourage any change in behavior.

Research has validated that college students face a number of health challenges, and that poor health habits during this period of life may have both short- and long-term consequences. College students are at a time and place in their lives where their behaviors are very conducive to change; the student's role as learner is largely defined by a readiness to change (Shive & Morris, 2006). Healthy management of diet and physical

activity during the college career is critical to battling the increasing rate of obesity in the college population. This can be changed by providing the right knowledge to students in a way they are receptive to receiving it to develop and maintain healthy behaviors throughout their lifetime. Past physical activity interventions have not focused on college students, and more college students then ever have adopted sedentary lifestyles (Keating et al., 2005). Most college students are not meeting dietary and physical activity standards, and there is a critical need for intervention studies within this population.

Evidence has demonstrated the importance of these health behaviors on preventing obesity and chronic illness, but there is limited research on the relationship of different sources of relevant information provided to college students. Previous research has identified intervention strategies that show promise for improving nutritional and physical activity knowledge and behaviors among college students. Variations of interventions may need to be made to fit the interests and lifestyles of college students. Future research should focus on interventions that address college student barriers to healthy behaviors, and are in a format that meet the preference and availability of these students. Therefore, this study adds to the existing literature by examining the relationship between learned health knowledge in an online core college curriculum course and post-course health behaviors of college students.

Chapter III

Methods

This study assessed undergraduate students' health behaviors at a large four year public urban university in the southwestern United States taking a lower level Texas core social science requirement course over a 15 week period. A pre-test and post-test design was used with a non-randomized control group assignment based on pre-existing course enrollment. The students who completed both the pre and post per individual questionnaires will be included in this study.

The purpose of this chapter is to describe the research methods involved in the study. The following topics are reported: (a) participants, (b) instrumentation, (c) data collection procedures, and (d) data analysis.

Participants

The data was comprised of 1316 participants. These participants were enrolled in KIN 1304: Public Health Issues in Physical Activity and Obesity during the fall 2013 and spring 2014 semesters (See Appendix B for course syllabus). This course is designed to explore the public health issues associated with physical activity, obesity, and disease. Upon successful completion of the course, students should be able to demonstrate knowledge in the area of physical activity, obesity and chronic disease. Additionally, the course objectives include an understanding of strategies that can be used to prevent the negative consequences associated with physical inactivity and obesity. These study participants are undergraduate students, majoring in a variety of disciplines who elect to enroll in this core social science requirement course. Since no limitations are given, the student participants vary in classification, ethnicity, residential status and BMI

measurements. Student participation was voluntary and there was no perceived or intended benefit for participating in the study. Confidentiality and anonymity are maintained by use of student identification numbers for survey completion and grades.

A cover letter describing the survey was distributed through the course learning module by the faculty member to all students. The student participants who agreed to complete all three surveys at the beginning and end of the semester were included in the study.

Instrumentation

The electronic and validated questionnaires included a cover letter describing the study, a demographic sheet, and three scales for the students to complete. The three scales: Berlin Risk Appraisal and Health Motivation Study (BRAHMS), Diet History Questionnaire II (DHQ-II), and International Physical Activity Questionnaire (IPAQ) each focus on a different area: self-efficacy, diet, and physical activity respectively. The information gained from the three scales together were used to analyze the nature of the relationship of health behaviors practiced and motivation for change. Each of these instruments is discussed below.

Demographic Data Sheet. The Demographic Data Sheet (see Appendix B) was used to collect all participant demographic information data (e.g., gender, ethnicity), college classification (e.g., freshman, sophomore), residential status (e.g., living on or off campus), university meal plan, as well as BMI calculations (e.g., height, weight).

Berlin Risk Appraisal and Health Motivation Study (BRAHMS). The relationship between self-efficacy and specific health behaviors was reviewed through a number of studies. These studies on adoption of health practices have measured self-

efficacy to assess its potential influences in initiating behavior change. Perceived self-efficacy has been found to be a major instigating force in forming intentions to exercise and in maintaining the practice for an extended time (McAuley, 1992). Chambliss and Murray (1979) found that people who were overweight were most responsive to behavioral treatment when they had a high sense of self-efficacy. Behavioral intentions and reported health behaviors are chosen as criteria for construct validity. According to social-cognitive theory (Bandura, 1997a) and the Health Action Process Approach perceived self-efficacy is regarded as a suitable predictor of behavioral intentions and reported health behaviors.

The BRAHMS was designed to measure the social-cognitive determinants of health behaviors, such as physical exercise and preventative nutrition. It was conducted by André Hahn, Britta Renner und Thomas von Lengerke under the supervision of Ralf Schwarzer (Schwarzer, Hahn, Lengerke, & Renner, 1996). It comprised two measurement points in time; one in April and one in October. Participants responded to a set of psychometric scales including the three predictors, and their blood pressure and cholesterol level were measured. These indices were used for a brief health counseling session. The treatment consisted of personalized feedback and individual face-to-face counseling. Half a year later behavioral indices were assessed.

Behavioral change self-efficacy for nutrition was measured by items such as "I am confident that I can stick to a healthy diet (low-fat, low-salt), even if initially food doesn't taste as good." Whereas, items that addressed physical activity were broken down into motivational, preactional, coping, and recovery self-efficacy. Motivational self-efficacy spoke to certain barriers which make it hard to begin exercising, as written in

one item “I can change to a physically active life style." Preactional self-efficacy items asked “How sure are you that you can start exercising regularly?” and coping self-efficacy referred to the confidence one has to manage to stay physically active. Finally, the recovery self-efficacy broached items regarding the confidence one has about restarting exercise if a relapse occurs, for example "I am sure I can be physically active again regularly, even if I postpone my plans several times." (See Appendix B for actual survey). Total scores were then obtained by adding the numbers indicated for all the items within the particular grouping, yielding a range of 6 to 44 with higher scores indicating a higher self-efficacy status.

Measures to assess perceived self-efficacy for preventive nutrition and physical activity were tested by R. Schwarzer and Renner (2000) by a large longitudinal study in Germany. The reliability of these scales turned out to be excellent, given the small number of items. The internal consistency (Cronbach’s alpha) for the nutrition self-efficacy scale was $\alpha = .87$ ($n = 1,722$ respondents) and the internal consistency for the exercise self-efficacy scale ($n = 1,726$ respondents) was $\alpha = .88$. Nutrition self-efficacy was the only scale that was used longitudinally. It was applied again six months later, which provides insight to its stability. The test-retest correlation was $r (tt) = .59$, based on 982 persons.

Diet History Questionnaire II (DHQ-II). The most practical and economical way to collect comprehensive dietary data in large nutritional epidemiologic studies is the food frequency questionnaire (FFQ). A FFQ is a limited checklist of foods and beverages with a frequency response section for subjects to report how often each item was consumed over a specified period of time, e.g., in the past month. Efforts to improve

the accuracy of FFQs are essential to improving our capability to measure dietary intake patterns and, in so doing, to better understand of the role of nutrition as a health behavior.

The DHQ-II is an updated FFQ consisting of 134 food items and 8 dietary supplement questions developed by the National Cancer Institute (see Appendix C for actual survey). The DHQ-I instrument was used in many previous research studies. Data shows that the instrument provides reasonable nutrient estimates, and the following study was conducted to assess its validity. The Eating at America's Table Study (EATS) was designed to validate the Diet History Questionnaire (DHQ), a new and improved FFQ developed by the National Cancer Institute, and to compare it against two other widely used FFQs. The DHQ was validated by assessing the correlations and attenuation coefficients between nutrient intakes estimated on the DHQ and "true" intakes estimated from the four 24-hour recalls using a measurement error model. In addition, the food frequency questionnaire validation study of foods, measured in pyramid servings, allowed for a measure of food intake consistent with national dietary guidance (Millen, Midthune, Thompson, Kipnis, & Subar, 2006). There have been no such validation studies with the DHQ-II, however, validation findings are unlikely to be greatly modified by the minimal modifications to the food list and the updated nutrient database according to the Applied Research Program in the National Cancer Institute's Division of Cancer Control and Population Sciences.

Mean energy-adjusted reliability coefficients ranged from .695 to .943 in a study conducted by Tayyem, Abu-Mweis, Bawadi, Agraib, and Bani-Hani (2014). A Cronbach's α for the total FFQ items resulted in .857. The modified FFQ has reasonable relative validity and reliability for energy, carbohydrate, and fat intakes in Jordanian

adults over a 1-year period. Whereas, Bittoni and Wilkins III (1994) study assessing the reliability of the DHQ showed moderate reliability coefficients for most of the 29 nutrients (r = .5-.8), therefore an average determinant for most of the nutrients, but overall a strong relationship for measuring intake of nutrients. Age and weight (standardized by height) showed no effect on reliability.

International Physical Activity Questionnaire (IPAQ). Accurate measurement of physical activity is a pre-requisite for monitoring population health and for evaluating effective interventions. The IPAQ is used as a comparable and standardized self-report measure of habitual physical activity of populations from different countries and socio-cultural contexts.

IPAQ has acceptable reliability and validity measurement properties for monitoring population levels of physical activity among 18- to 65- year old adults in diverse settings (Craig et al., 2003). The long version, 31 item survey (see Appendix D for actual survey) was designed to collect detailed information within the domains of job related activity, housework and yard work activities, transportation, and leisure-time physical activity as well as sedentary activity over the last 7 days.

Dinger, Behrens, and Han (2006) examined the validity and reliability of the self-administered IPAQ for one hundred twenty three undergraduate college students. These students wore an accelerometer and pedometer for seven consecutive days. Students completed the IPAQ at the end of the seven days and again a week later recalling their physical activity for that week. Criterion validity correlation coefficients ranged from 0.15 to 0.26 for total weekly time spent in physical activity from the IPAQ and measures from the accelerometer and pedometer. Test-retest reliability data for the two

administered questionnaires show Spearman correlation coefficients ranging from 0.71 to 0.89. Therefore, using this survey instrument for pre and post-test, participants will maintain their position in a sample with repeated measurements. Health education and promotion professionals can confidently use this questionnaire to compute college students' participation in physical activity.

Data Collection

Once approval was given from the Institutional Review Board to conduct this study, participants were asked to complete all questionnaires online through the Survey Monkey website. The survey was accessible online for the first and last weeks of the semester and participants completed the surveys at a self-designated time. All participants were given a description of the research and an electronic consent form (see Appendix E) that they acknowledged before beginning the survey. This consent form clearly stated that participant responses were completely anonymous, and participants were only identifiable through a student identification number during the surveys. Each subject's pre- and post-questionnaire data were compared to determine if there was a change in responses over the time period. The Kinesiology class was administered online.

Data Analysis

Internal reliability estimates were determined for each of the scales. Although the scales for the questionnaires have previously been found to be reliable, it was necessary to determine if these instruments are reliable using this sample within this particular study. Accordingly, the scales were tested for reliability and validity using Cronbach's

alpha. The mean and standard deviation were obtained from the BRAHMS, DHQ-II, and IPAQ scales to help provide insight on how these students perceive healthy behaviors.

The extent to which the course content of issues in physical activity and obesity has on the change in college students' health behaviors to reflect a healthy lifestyle were assessed through five separate paired sample T-tests. It would determine if there is change between the students' scores for physical activity (IPAQ) and total calories, vegetable consumption, total fruit consumption, and total fat percentage (DHQ) from pre-course completion to post-course completion for these two instruments. In order to determine the magnitude of change in healthy behaviors for students that live on and off campus, have a meal plan on campus, and are kinesiology majors, mixed between subject ANOVA was completed for each of the 5 dependent variables with 2 within points, pre and post measurements. These five dependent variables are (1) total physical activity score, (2) total calories, (3) total vegetable consumption, (4) total fruit consumption, and (5) total fat percentage from calories. These separate dependent variables were used to assess any interaction with three between subject predictor variables: (1) residential living, (2) meal plan, and (3) kinesiology major. This was determined to be the best method for investigating the degree of impact on course completion with student health behaviors. The total physical activity score was computed after scoring the IPAQ. The additional four nutritional variables were computed through the Diet Calc software by the National Cancer Institute. This Diet Calc analysis generates nutrient and food group intake estimates based on the food frequency data collected on the DHQ-II survey. In order to reduce the risk of Type 1 error, the Bonferroni adjustment was used. This

established .05/5 = .01 as the new cut-off value. Differences between the groups would need a probability value of less than .01 before considering them statistically significant.

Then, three individual multiple regressions were conducted to determine magnitude of change in health behaviors. First we looked at self–reported BMI and the affect it had on the same five individual dependent variables: (1) total physical activity score, (2) total calories, (3) total vegetable consumption, (4) total fruit consumption, and (5) total fat percentage from calories from pre and then post completion. The independent variable of height and weight computed to BMI were self-reported by the participant. Along with the appropriate demographic variables, semester did serve as a covariate.

Next, multiple regression looked at the change score of those dependent variables from pre and post to evaluate the level of self-efficacy and the affect on magnitude of change. The responses taken from the BRAHMS survey which were broken into four constructs. (1) Motivational self-efficacy, (2) Preactional self-efficacy, (3) Coping self-efficacy, and (4) Recovery self-efficacy are the four constructs measured and then summed to create one independent variable to predict the affect in change in total physical activity. Behavior change self-efficacy was used to predict change in total calories, total vegetable consumption, total fruit consumption, and total fat percentage from calories.

The final multiple regression analysis was used to determine if academic performance in the course had a relationship in improving health behaviors by using final number grades out of 100 possible points as the independent variable to predict course content learned for the original five dependent variables of physical activity and nutrition.

Table 1. Research methods

Research Question	**Dependent Variable**	**Independent Variable**	**Analytic Approach**
To what extent does completion of a lower level undergraduate course relating to issues in physical activity and obesity change college students' health behaviors to reflect a healthy lifestyle?	Time 1 (pre) and Time 2 (post) Total Physical Activity Score Total Calories Total Vegetable Consumption Total Fruit Consumption Total Fat (%) from Calories		Paired Sample T-Test
Does being a kinesiology student, living on campus, or having a meal plan affect the magnitude of change in health behaviors?	Change in Total Physical Activity Score Change in Total Calories Change in Total Vegetable Consumption	Residential Living Meal Plan Kinesiology Major	Mixed between with subjects ANOVA

	Change in Total Fruit Consumption Change in Total Fat (%) from Calories		
Does self-reported BMI affect the magnitude of change in health behaviors?	Change in Total Physical Activity Score Change in Total Calories Change in Total Vegetable Consumption Change in Total Fruit Consumption Change in Total Fat (%) from Calories	BMI	Multiple Regression
Does the level of self-efficacy affect the magnitude of change in physical activity?	Change in Total Physical Activity Score	1. Motivational Self-Efficacy 2. Preactional Self-Efficacy 3. Coping Self Efficacy	Multiple Regression

		4. Recovery Self-Efficacy	
Does the level of self-efficacy affect the magnitude of change in nutrition?	Change in Total Calories Change in Total Vegetable Consumption Change in Total Fruit Consumption Change in Total Fat (%) from Calories	Behavioral change Self-Efficacy	Multiple Regression
Does academic performance in the course relate to better health behaviors?	Change in Total Physical Activity Score Change in Total Calories Change in Total Vegetable Consumption Change in Total Fruit Consumption Change in Total Fat (%) from Calories	Final Number Grade	Multiple Regression

Summary

The methodology of this study is detailed in Chapter 3. Additionally, gender, age, ethnicity, and year in school were controlled independent variables in all data analysis. This chapter presented the general framework of the design, including the participants, instrumentation, and statistical procedures for analyzing the variables. The next chapter will discuss the analyses.

Chapter IV

Findings

This chapter presents the results of the analyses performed on the data collected to answer the following six research questions:

1. To what extent does completion of a lower level undergraduate course relating to issues in physical activity and obesity change college students' health behaviors to reflect a healthy lifestyle?
2. Does being a kinesiology major, living on campus, or having a meal plan affect the magnitude of change in health behaviors?
3. Does self-reported BMI affect the magnitude of change in health behaviors?
4. Does the level of self-efficacy affect the magnitude of change in physical activity?
5. Does the level of self-efficacy affect the magnitude of change in nutrition?
6. Does academic performance in the course relate to better health behaviors?

This chapter presents the sample characteristics, including demographic data, and then includes the results of the analyses performed to answer each of the six research questions.

Sample Characteristics

Descriptive statistics for the study sample are presented in Table 2. Overall, the study participants were comprised of a slightly higher percentage of females (n = 714, 54.3%) than males (n = 602, 45.7%) and the sample size of participants by semester was

similar in distribution for the spring 2014 (n = 694, 52.7%) with slightly more participants than the fall 2013 (n = 622, 47.3%). The racial composition of the sample was 33% Asian; 25.5% Hispanic; 23.9% White; 16% Black; 1.4% Native Hawaiian or Other Pacific Islander; and .3% American Indian or Alaska Native.

A series of two-way chi-square tests were run to explore whether significant semester differences in participants' responses were present across gender (X^2 (1, N = 1316) = .08, p = .79), classification X^2 (4, N = 1316) = 3.06, p = .55), and race. There were no significant semester differences across gender and college classification, but race X^2 (5, N = 1316) = 16.27, p < .05) did significantly vary by semester.

Table 2. Demographic data of survey participants (N=1316)

Survey Item	*n*	%
Gender		
Female	714	54.3
Male	602	45.7
Race		
Black	210	16.0
Hispanic	335	25.5
Asian	434	33.0
Native Hawaiian/Other Pacific Islander	19	1.4
American Indian/Alaska Native	4	.3
White	314	23.9
College Classification		
Freshman	181	13.8
Sophomore	350	26.6
Junior	382	29.0
Senior	385	29.3
Post-Bac	18	1.4
Semester		
Fall 2013	622	47.3
Spring 2014	694	52.7

Research Question 1: To what extent does completion of a lower level undergraduate course relating to issues in physical activity and obesity change college students' health behaviors to reflect a healthy lifestyle?

The descriptive statistics from the pre- and post-tests for the total physical activity, daily calories intake, daily fat intake, total vegetable consumption, and total fruit consumption variables are displayed in Table 3. Means of all variables decreased from pre to posttest.

Five paired-sample t-tests were conducted to evaluate the impact of the kinesiology course on students' total physical activity and four nutritional variables. There was no significant difference in the amount of total physical activity from pre-course (M = 6113.37, SD = 5287.29) to post course (M = 5813.08, SD = 4956.35), t (952) = 1.70, p = .09 (two-tailed). The mean decrease in total physical activity scores was 300.29 Metabolic equivalents (METS) with a 95% confidence interval ranging from -47.04 METS to 647.61 METS. The four nutritional variables as measured by My Pyramid Equivalents Database (MPED): calorie intake (Kilocalories), fat intake (grams), vegetable consumption and fruit consumption were all found significant as shown in Table 3. The eta squared statistic indicated a small effect size for daily calories (.02); moderate effect size for vegetable (.09) and fruit consumption (.09); and large effect size for fat intake (.15).

Table 3. Difference in pretest and posttest variable scores

		Pretest		Posttest			
Variables	*N*	*M*	*SD*	*M*	*SD*	Paired *t*	η_p^2
Physical Activity (METS)	953	6113.37	5287.29	5813.08	4956.35	1.70	
Daily Calorie Intake (Kcal)	1315	1562.72	819.84	1196.00	807.80	15.64**	.02
Daily Fat Intake (grams)	1315	58.52	33.36	45.39	31.01	15.05**	.15
Vegetable Consumption (MPED)	1315	1.25	1.00	.94	.89	11.10**	.09
Fruit Consumption (MPED)	1315	1.54	1.65	1.04	1.13	11.63**	.09

Note. *p<.05; **p<.01

Research Question 2: Does being a kinesiology student, living on campus, or having a meal plan affect the magnitude of change in health behaviors?

The descriptive statistics from the pre- and post-tests for the total physical activity, daily calories intake, daily fat intake, total vegetable consumption, and total fruit consumption variables are displayed in Table 4, 5, and 6. Although unexpected, physical activity, vegetable and fruit consumption decreased, but daily calorie and fat intake also decreased for all students regardless of being a kinesiology major, living on campus or having a meal plan. Interestingly, Table 4 shows the kinesiology majors displayed a larger standard deviation both pre and post test (*SD* =5206.75*)* than non-kinesiology majors (*SD* = 4899.06*)* for physical activity suggesting a wider distribution for total self-reported daily physical activity. Table 5 shows post test calorie intake for on campus students (*M* = 1163.54*)* lower than for off campus (*M* = 1204.59). Table 6 shows

students who have a meal plan consume lower amounts of vegetables (*M* vegetables = .90 MPED) and fruits (*M* fruits = .93 MPED) than students with no meal plan (*M* vegetables = .95 MPED, *M* fruits = 1.07 MPED).

Table 4. Pre and posttest participant demographic characteristics by major

	Kinesiology Major					Non Kinesiology Major				
		Pretest		Posttest			Pretest		Posttest	
Variables	*N*	*M*	*SD*	*M*	*SD*	*N*	*M*	*SD*	*M*	*SD*
Physical Activity (METS)	118	7529.21	5846.28	7024.83	5206.75	835	5913.28	5176.11	5641.84	4899.06
Daily Calorie Intake (Kcal)	187	1755.73	902.68	1260.93	726.84	1128	1530.72	801.24	1185.24	820.25
Daily Fat Intake (grams)	187	62.15	35.06	46.18	30.11	1128	57.92	33.04	45.25	31.17
Vegetable Consumption (MPED)	187	1.45	1.28	.92	.75	1128	1.21	.94	.94	.91
Fruit Consumption (MPED)	187	2.02	2.10	1.28	1.34	1128	1.46	1.55	1.01	1.08

Table 5. Pre and posttest participant demographic characteristics by residential status

	On Campus Living					Off Campus Living				
		Pretest		Posttest			Pretest		Posttest	
Variables	*N*	*M*	*SD*	*M*	*SD*	*N*	*M*	*SD*	*M*	*SD*
Physical Activity (METS)	211	7168.91	6042.91	5976.82	4916.24	742	5813.21	5015.91	5766.51	4970.01
Daily Calorie Intake (Kcal)	275	1635.85	950.85	1163.54	704.88	1040	1543.38	780.91	1204.59	832.99
Daily Fat Intake (grams)	275	60.66	39.29	43.43	29.17	1040	57.96	31.60	45.90	31.48
Vegetable Consumption (MPED)	275	1.22	.96	.88	.72	1040	1.26	1.01	.95	.93
Fruit Consumption (MPED)	275	1.53	1.57	.97	1.08	1040	1.55	1.68	1.06	1.14

Table 6. Pre and posttest participant demographic characteristics by meal plan

	Meal Plan					No Meal Plan				
		Pretest		Posttest			Pretest		Posttest	
Variables	*N*	*M*	*SD*	*M*	*SD*	*N*	*M*	*SD*	*M*	*SD*
Physical Activity (METS)	164	7519.54	6301.16	6165.37	4987.06	789	5821.08	5006.34	5739.85	4949.97
Daily Calorie Intake (Kcal)	216	1672.58	976.94	1166.89	719.10	1099	1541.13	783.99	1201.73	824.29
Daily Fat Intake (grams)	216	61.20	38.49	43.88	28.81	1099	58.00	32.25	45.90	31.69
Vegetable Consumption (MPED)	216	1.32	1.03	.90	.76	1099	1.23	1.00	.95	.92
Fruit Consumption (MPED)	216	1.58	1.73	.93	1.04	1099	1.54	1.64	1.07	1.14

All dependent variables significantly decreased over time. Because sphericity was violated based on the results using Mauchly's test and the Greenhouse-Geisser estimate was greater than .75, the Huynh-Feldt estimate was used. Physical activity showed a main effect for time, F (1, 945) = 7.50, $p < .01$, but there was no interaction between time and kinesiology major, time and living on campus or time and having a meal plan. Total calorie intake showed a main effect for time, F (1, 1307) = 68.41, $p < .01$, but there was no interaction between time and kinesiology major, time and living on campus or time and having a meal plan. Total fat intake showed a main effect for time, F (1, 1307) = 44.11, $p < .01$, but there was no interaction between time and kinesiology major, time and living on campus or time and having a meal plan. Total vegetable consumption showed a main effect for time, F (1, 1307) = 24.15, $p < .01$ but there was no interaction between timeand kinesiology major, time and living on campus or time and having a meal plan. Total fruit consumption showed a main effect for time, F (1, 1307) = 44.10, $p < .01$, and

showed a significant effect between time and kinesiology major, F (1, 1307) = 4.60, $p <$ .01). The partial eta squared = .03, suggesting a small effect. However, there was no interaction between time and living on campus or time and having a meal plan.

Research Question 3: Does self-reported BMI affect the magnitude of change in health behaviors?

Multiple regression was used to assess the ability of the control measure BMI to predict change in the five individual health behaviors: physical activity, calories, fat, vegetable, and fruit consumption, after controlling for the influence of gender, race, and semester. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. The results of the hierarchical multiple regression model suggest that BMI does not significantly affect the change in physical activity (F (4, 919) = 2.21, p = .07). BMI significantly predicted change in total calories (F (4, 1260) = 3.00, p = .02; see Table 7) accounting for 1% of the variance. The results of the model suggest that BMI does not significantly affect the change in total fat (F (4, 1260) = 1.52, p = .20) and change in vegetable consumption (F (4, 1260) = .86, p = .49). BMI significantly predicted change in fruit consumption (F (4, 1260) = 5.12, $p <$ .001; see Table 8) accounting for 2% of the variance.

Table 7. Summary of regression analyses predicting BMI (Calories)

Variable	*B*	B	*t* test	*P*
Race	3.84	.01	.20	.85
Gender	90.22	.05	1.86	.06
Semester	135.46	.08	2.86	.00
BMI	1.20	.01	.25	.81
Constant	-752.23		-4.14	.00

R^2 = .01, F (4, 1260) = 3.00, p = .02

Table 8. Summary of regression analyses predicting BMI (Fruit)

Variable	*B*	B	*t* test	*P*
Race	.03	.02	.85	.40
Gender	-.01	-.00	-.15	.88
Semester	.36	.12	4.16	.00
BMI	-.01	-.03	-1.16	.25
Constant	-.84		-2.57	.01

$R^2 = .02$, F (4, 1260) = 5.12, $p < .001$

Research Question 4: Does the level of self-efficacy affect the magnitude of change in physical activity?

Multiple regression was used to assess the ability of the control measure self-efficacy to predict change in physical activity after controlling for the influence of race, gender, and semester. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. The model was tested accounting for race, gender, and semester. Self-efficacy significantly predicted change in physical activity (F (4, 948) = 3.69, p = .01; see Table 9) accounting for 2% of the variance.

Table 9. Summary of regression analyses predicting self-efficacy (PA)

Variable	*B*	B	*t* test	*P*
Race	-305.18	-.07	-2.09	.04
Gender	128.38	.01	.36	.72
Semester	829.66	.08	2.34	.02
Self-Efficacy	-33.18	-.08	-2.35	.02
Constant	1201.84		.89	.13

$R^2 = .02$, F (4, 948) = 3.69, p = .01

Research Question 5: Does the level of self-efficacy affect the magnitude of change in nutrition?

Multiple regression was used to assess the ability of the control measure self-efficacy to predict change in the four individual nutrition behaviors: calories, fat, vegetable, and fruit consumption, after controlling for the influence of semester, gender, and race. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. Each model was tested accounting for race, gender, and semester. Self-efficacy significantly predicted change in total calories (F (4, 1310) = 3.05, p = .02; see Table 10) accounting for 1% of the variance. The results of the model suggest that self-efficacy does not significantly affect the change in total fat (F (4, 1310) = 2.10, p = .08) or vegetable consumption (F (4, 1310) = 1.49, p = .20). Self-efficacy significantly predicted change in fruit consumption (F (4, 1310) = 2.40, p < .001; see Table 11) accounting for 2% of the variance.

Table 10. Summary of regression analyses predicting self-efficacy (Calories)

Variable	*B*	B	*t* test	*P*
Race	2.74	.00	.14	.89
Gender	97.24	.06	2.07	.04
Semester	129.34	.08	2.76	.01
Self-efficacy	-1.13	-.01	-.35	.73
Constant	-686.48		-6.34	.00

R^2 = .01, F (4, 1310) = 3.05, p = .02

Table 11. Summary of regression analyses predicting self-efficacy (Fruit)

Variable	*B*	B	*t* test	*P*
Race	.03	.02	.83	.41
Gender	.02	.01	.22	.83
Semester	.35	.11	4.06	.00
Self-efficacy	-.01	.01	-1.80	.07
Constant	-.81		-2.87	.00

$R^2 = .02$, F (4, 1310) = 2.40, $p < .001$

Research Question 6: Does academic performance in the course relate to better health behaviors?

Multiple regression was used to assess the ability of the control measure final grades to predict change in the five individual health behaviors: physical activity, calories, fat, vegetable, and fruit consumption, after controlling for the influence of race, gender, and semester. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. The results of the model suggest that final grades do not significantly affect the change in physical activity (F (4, 948) = 2.32, p = .06). Final grade significantly predicted change in total calories (F (4, 1310) = 3.19, p = .01; see Table 12) accounting for 1% of the variance. The results of the model suggest that final grades do not significantly affect the change in total fat (F (4, 1310) = 1.65, p = .16) or vegetable consumption (F (4, 1310) = 1.18, p = .32). Final grade significantly predicted change in fruit consumption (F (4, 1310) = 6.29, $p < .001$; see Table 13) accounting for 2% of the variance.

Table 12. Summary of regression analyses predicting final grade (Calories)

Variable	*B*	B	*t* test	*P*
Race	2.13	.00	.11	.91
Gender	96.40	.06	2.05	.04
Semester	132.11	.08	2.81	.01
Final Grade	3.37	.02	.81	.42
Constant	-1039.86		-2.54	.01

$R^2 = .01$, F (4, 1310) = 3.19, $p = .01$

Table 13. Summary of regression analyses predicting final grade (Fruit)

Variable	*B*	B	*t* test	*P*
Race	.03	.02	.79	.43
Gender	.01	.00	.13	.90
Semester	.37	.12	4.26	.00
Final Grade	.02	.07	2.63	.01
Constant	-3.03		-4.06	.00

$R^2 = .02$, F (4, 1310) = 6.29, $p < .001$

Chapter V

Discussion and Conclusion

This chapter begins with an overview of the purpose and major objectives guiding the study. The chapter will continue with a discussion of the significant findings regarding the effectiveness of a college physical activity and obesity course on student health behaviors incorporating the conceptual framework of Bandura (1997). Finally, study limitations, implications for practice, as well as recommendations for future research and conclusions are discussed.

The purpose of this study was to measure the baseline entry level health behaviors among the undergraduate students enrolled in a Texas core curriculum course and to analyze the relationships among learned health knowledge and post-course health behaviors. More specifically, this study investigated pre- and post- changes in students' nutrition and physical activity behavior.

Learned Health Behaviors (Q1)

Social Cognitive Theory serves as a theoretical foundation for health interventions, such as college courses, which often result in positive health behavior changes (Hekler, Gardner, & Robinson, 2010; Emrich & Mazier, 2009). Social Cognitive Theory has been used to inform, enable, guide, and motivate people to adapt habits that promote health and to reduce habits that impair health (Bandura, 2004). Therefore, we expected physical activity to increase after the completion of the lower level kinesiology class. Although physical activity didn't significantly increase, daily calorie intake did significantly decrease. Early studies suggest that reciprocal determinism model (Bandura, 1999), as it is composed of three factors that influence behavior- the

environment, the individual, and the behavior itself- is needed to change behavior, which includes the changing of attitudes as well as increased knowledge. Similar to physical activity, vegetable and fruit consumption also significantly decreased, but daily fat intake significantly decreased as well. Earlier studies suggest that increasing fruit and vegetable consumption is often challenging. This study's findings are consistent with results from Mitchell (1990), Hekler et al. (2010), Skinner (1991), and Amstutz and Dixon (1986). Furthermore, Hekler et al. (2010) suggest that focusing on social, ethical, cultural, and environmental issues related to food is more successful in changing dietary behaviors in college students. Food-related social issues may be more motivating for the process of dietary change than health-related issues according to Robinson (2010). For example, strengthening college students' awareness of healthy food environments and other opportunities for healthy eating through other courses such as societal and public policy can lead to students making dietary improvements (Hekler et al., 2010). The mechanisms that lead to healthy behaviors are complex and warrant further examination, particularly among this population.

College Environment (Q2)

Kinesiology major, residential campus living, and meal plan were not significantly associated with physical activity and nutrition behaviors. These findings are supported by Dinger (1999), who also found no difference in fruit and vegetable intake based on living arrangements. Unfortunately, being a kinesiology major had no effect on physical activity, but it was significantly associated with fruit consumption, although the sample size of our kinesiology majors was less than ideal.

The study's findings suggest that on campus living and having a meal plan may not be supportive of dietary change behaviors. This was surprising, because meal plan adoption is typically associated with intake of fruit and vegetable consumption. Brown et al. (2005) found that having a meal plan increased healthy food options for students, however our findings suggest that having a meal plan did not affect any dietary change. This suggests that other non-environmental factors (Hekler et al., 2010) or other barriers exist that affect health behavior change among these students. Silliman et al. (2004), Majeed (2015), and Greaney et al. (2009) reported lack of time and time constraints as being the most frequently mentioned barriers to eating healthy and participating in regular physical activity among students. Another consideration, as acknowledged by Pliner and Saunders (2006), is stress as a barrier for adoption of healthy behaviors.

Although healthy options exist within the college environment to assist students with practicing healthier behaviors (e.g., meal plans, on campus amenities), these findings suggest that these factors did not affect any change. Daily fruit and vegetable consumption and daily physical activity declined significantly over the students' college semesters for both on and off campus students, as also found by Small, Bailey-Davis, Morgan, and Maggs (2012). Few differences in typical eating and physical activity habits were also observed by Driskell et al. (2005). Although not ideal, our data also supports Racette et al.'s (2008) claim that overweight and obesity increases throughout the college experience.

BMI (Q3)

The findings indicated that self-reported BMI significantly predicted a change in calories and fruit consumption among our students, but no other health behavior. Given

the students reported only their height and weight, BMI was calculated for statistical purposes, and therefore these students may not have had the understanding of BMI at the start of the course, leading to a lack of awareness of weight status.

Secondly, self-report measures of BMI can lead to underestimation of the prevalence of obesity and overestimation of the effects of obesity on health (Kooreman & Scherpenzeel, 2014), suggesting that BMI may not have been the best measure of weight status. However, by the completion of our course the knowledge of BMI as a measurement of overweight and obesity, would hopefully had lent itself to adoption of improved health behaviors.

Another factor why this self-reported measurement may not be the best measure of body composition is that the measure has been found to be less valid among certain sub-populations (e.g. some ethnic minorities, athletes). Our sample consisted of several sub-populations, including a higher percentage of ethnic minorities. BMI may not be the best predictor of health behavior change and might not lend toward a valid measure of body composition (Jackson, Ellis, McFarlin, Sailors, & Bray, 2009).

Similar to our findings, Lin and Morrison (2002) found that obese men and women consumed significantly less fruit than those with lower BMI categories. Additionally, Cluskey and Grobe (2009) reported that BMI increased among college students between October and December. Our results also showed an increase in mean total calories and a higher mean BMI over the semester.

Self-Efficacy (Q4 & Q5)

Our findings suggest that self-efficacy significantly affected the magnitude of change in physical activity but inversely. Self-efficacy is a person's belief in their ability to perform a certain behavior through controlling both their own performance and other events that affect that behavior (Bandura, 1991). Although this association was inversely related, the students' follow- through or motivation for daily physical activity adoption may be lacking even though they have a high self-efficacy. The Health Belief Model suggests people adopt a positive health action in order to avoid a negative health consequence(s). In this case, the students with higher self-efficacy may have the perceived ability to participate, but may lack the motivation to change. Other sample demographic characteristics could also have affected these associations.

For example, age is related to self-efficacy, which is based on past experiences, therefore higher self-efficacy amongst college students initially (McAuley & Blissmer, 2000) may lead to slowly decreasing levels of continued physical activity. This is supported by several earlier studies suggesting physical activity participation continues to decrease throughout the life span (Owen & Bauman, 1992). Further, Wilcox and Storandt (1996) found that age also interacts with exercise levels and that the belief that exercise is enjoyable and beneficial significantly decreased with increasing age.

Self-efficacy is also more effective with challenging situations, compared to habitual activity (e.g., physical activity, eating fruit, change in calorie intake). As mentioned earlier, other unmeasured cognitive, cultural and/or socioeconomic factors could have affected these associations, despite even a high level of self-efficacy. Lewis, Williams, Frayeh, & Marcus (2015) measured self-efficacy and perceived enjoyment as

predictors of increased physical activity. They concluded that motivational factors such as social support and time management facilitated adoption of habitual physical activity. In addition, enjoyment, when compared to self-efficacy, was a stronger predictor of physical activity. Our decrease in physical activity amongst our sample of college students could be due to a lack of time and increased enjoyment in participation of other college activities rather than physical activity.

Goal setting and health behavior record keeping could also have affected our results for these questions. An inverse relationship also existed among calories and self-efficacy, demonstrating a positive health behavior change. This could be because students acquired the knowledge of logging their calories through energy expenditure exercises that do make them aware of calorie balance during the semester. According to Janz and Becker (1984), logging and goal setting can lead to positive behavior change. Our students were not asked to log their physical activity or set goals related to physical activity. This could also be why we saw a significant decrease of physical activity over time but saw a positive health behavior change with a decrease in calorie intake. McAuley (1992) found self-efficacy as a significant predictor of beginning an exercise program, but not for maintaining continued exercise behavior. Instead, McAuley (1992) found exercise history to be the stronger predictor of maintenance physical activity. There was no mechanism for them to log progress or be held self-accountable and were less aware of their change in behavior.

Academic Performance (Q6)

Similar to learned health behaviors, the extent of demonstrated learning (i.e. academic performance) had no bearing on changing most health behaviors. Interestingly,

total calories and fruit consumption were associated with academic performance, unlike early studies. These findings could suggest that if you performed better in the class, then you are possibly more self-aware of your calorie intake and could have purposely changed that intake. This conclusion is well supported by several earlier studies. DeVoe and Kennedy (2000) suggest that students need to acquire accurate knowledge to make informed choices about their health behaviors. Because our class involved the tracking of consumed calories, students were more self-aware of what they ate and how much. Ha and Caine-Bish (2009) concluded that their class assignments not only made the students aware of their dietary behaviors, but they also generated opportunities to address weaknesses in their diets, which then increased awareness and need for dietary modifications. Kolodinsky, Harvey-Berino, Berlin, Johnson, & Reynold (2007) found that while nutrition knowledge predicted fruit intake in college students, there was no significant association with vegetable intake. Worsley (2002) concluded that knowledge is necessary, but is not the only predictor of behavior change. Further, Social Cognitive Theory suggests that skills are required, in addition to knowledge, in order to modify behavior. Increased self-awareness could have also led students to make smarter choices in purchasing fruit on campus, which could be more readily accessible compared to vegetables (Horacek et al., 2013).

Limitations

This research was not done without limitations. Due to class enrollment, the sample size of the students who lived on campus, were kinesiology majors and had a meal plan was relatively smaller compared the overall sample, limiting the generalizability of our findings. Our study also did not include a control group or a long-

term follow-up protocol. We were also unable to measure a baseline of academic performance, which could have affected analyses for Question 6. Further, because students were measured in both the Fall and Spring semesters, motivation and other personal factors could have affected academic performance and/or adherence to health behaviors.

Additionally, participants weren't classified in stages of change at the beginning or end of the semester. In addition to self-efficacy, students were not classified as (precontemplation, contemplation, preparation, action, or maintenance) that best described their readiness for involvement in physical activity or change in dietary habits. This study also utilized a self-report survey, which can cause recall bias, social desirability, and under- and over- reporting of behavior. Based on the results of the means and standard deviation for daily calorie intake, there appeared to be a gross underreporting. These surveys used in this study were meant to describe college students and estimate trends in current behaviors at a given time. However, they may be limited in their ability to detect possible associations.

Furthermore, the simple method of BMI was used for body measurement. BMI is not the most comprehensive measure of body composition and classification can hinder associations among certain health behavior changes. In addition, the current study used a convenience sample that may not have been typical of the population it represented, although care was taken to target a wide variety of students.

Implications

The results of this study have several implications for future professional practice. We learned that our current health promotion mechanisms are not as effective

as they could be given our results. Health education alone does not lead to positive health behavior change. Online delivery of information alone does not affect all necessary health related behaviors. Interactive courses might assist with adherence, rather than strictly online. Incorporating physical activity and/or an interactive lab component might help to improve physical activity retention among students.

The course curriculum activities included an individual diet analysis and food log. Providing time, content, and practice to increase knowledge and skills for preparing healthier foods can provide important information for college students. Courses could emphasize strategies and skill development to help students not only learn why, but also how to adopt healthy behaviors. Student need to get involved in the exemplified behavior. An option could be to develop hybrid courses to incorporate a lab component of exercise or nutrition, where class activities integrate simultaneous movement with knowledge acquisition.

There is also a great opportunity to increase accountability of students in this technology age. The use of technology, such as accelerometers or fitness trackers (e.g. FitBit, Jawebone Up, Garmin Vivofit) could provide immediate feedback and serve as motivational tools, potentially increasing physical activity. This study showed that having the knowledge and content understanding of calorie balance through energy expenditure exercises with the notion that logging of food intake can lead to decreased calorie consumption over time. The use of mobile logging applications (e.g., MyFitnessPal, FitDay, Edibles) could be implemented in health and physical activity college courses and/or university wellness programs to improve health behaviors.

Recommendations for Future Research and Conclusions

While this study helped to add new literature to the research on college health behaviors, new questions emerged that necessitate future research. Future studies should include interviews and/or focus groups with students. These qualitative methods offer specific thoughts and opinions on how the importance of health promotion classes affect the adoption of students' health behavior and attitudes throughout the semester. Also, focus groups and interviews can be especially helpful in discussing strategies for sustaining the new behaviors learned as part of the knowledge gained from these college courses. In addition, further studies should follow the students over a longer period of time, perhaps a cohort of students that start at the end of their freshman year, and continue each subsequent year during attendance at the institution to verify that students have made lifelong changes in their health behaviors.

Other future studies would work to address and measure individual attitudes related to health in addition to the teaching of knowledge. It is important to address any unique needs, challenges, and effective strategies for sub groups (ie. gender, ethnicity). Additionally, measuring cultural, socioeconomic and/or environmental factors related to health behaviors amongst college students need to be analyzed more in depth alongside courses related to health behaviors.

Although only small changes in behavior were evident by the data in this study, college health professionals can utilize the research to continue to find ways in improving students' health behaviors. The results indicated that application of exercises promoting a health behavior could benefit students. As a higher education administrator it is important to find repetitive ways to incorportate these learning by doing activities into additional courses throughout all students college career that continue to provide

knowledge and opportunities for participation in promoting healthy behaviors. The findings and relationships are of importance to probe the influence of the collegiate environment and its' effect on continued healthy behaviors throughout a students' college career and beyond.

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Appendix A

Course Syllabus

KIN 1304: Public Health Issues in Physical Activity and Obesity

Blackboard Online

INSTRUCTORS / DESIGNERS:

Dr. Whitney Breslin

Office Hours: By appointment

Melcher 123

Use Blackboard e-mail

Hawley Kunz

Office Hours: By appointment

Garrison 204

Use Blackboard e-mail

Text:

None

Course Description:

This course is designed to explore the public health issues associated with physical activity, obesity, and disease. It counts for your non-writing intensive social science core.

Course Objectives:

This course is offered in an online format, which is very different than a traditional class. You will be expected to watch online lectures and completed graded assignments on Blackboard. Upon successful completion of this course, students will:

1. Demonstrate knowledge in the area of physical activity, obesity, and chronic disease.
2. Demonstrate an understanding of strategies that can be used to prevent the negative consequences associated with physical inactivity and obesity.

Course Expectations:

1. This course offers you the flexibility to complete your assignments when you chose; however, such a structure requires you to take a lot of self-discipline to make sure that you do not miss deadlines.
2. If you have special learning needs, please inform me immediately.
3. If at any point during the semester you are unhappy with your performance in this class, please contact me **immediately**.
4. **Academic dishonesty** will not be tolerated (i.e., copying, plagiarism, cheating) and will result in a failing grade for the semester.

ADA Statement:

When possible, and in accordance with 504/ADA guidelines, we will attempt to provide reasonable academic accommodations to students who request and require them. Please call the Center for Students with Disabilities at ext. 3-5400 for more assistance.

Academic Dishonesty Policy (copying, plagiarism, cheating):

Students are expected to abide by the university's academic honesty policy in all matters concerning this course. (http://www.uh.edu/dos/hdbk/acad/achonpol.html). In particular, plagiarism, "Representing as one's own work the work of another without acknowledging the source," whether intentional or unintentional, will not be tolerated.

Evaluation:

Final grades will be determined based on the total number of points that you accumulate during the semester. Final letter grades will be determined using the grading scale provided below.

Component	**Points**
Blackboard Syllabus and LM Quizzes (10 quizzes, 20 pts each)	200
Class Discussions (3, 20 pts each)	60
Final Exam	160
Total	**420**

A: 378 – 420 pts

B: 336 – 377 pts

C: 294 – 335 pts

D: 252 – 293 pts

F: < 252 pts

Note: Students will not be allowed to take an Incomplete in this course due to poor planning on their part. If you find you do have a legitimate reason for an Incomplete, please talk with me as soon as possible to discuss the situation and to identify the documentation that will be required to support your request. Please consult the University of Houston catalog to review conditions under which an incomplete may be granted.

Blackboard Lectures:

Similar to a traditional classroom setting, you will need to watch lectures. The lectures are in voice narrated PowerPoint format, which has been converted to run on a standard web browser (i.e. Internet Explorer, Firefox, Safari, etc.). You may watch the lecture as many times as you like. A printable storyboard version of the lecture is also available for download in Word format (not compatible with Vista Word 2007) in the same folder where you will find the online lecture.

Blackboard Quizzes:

After you have watched the Blackboard Lecture for a given topic, you are required to take a Blackboard quiz (10 questions, 2 points per question) to test your level of knowledge. You will be allowed an unlimited number of attempts to take each quiz. Your grade will be reported as the "highest" of your attempts. Please note that each time you attempt the quiz you will be given a random set of questions from the quiz question bank, and you will not be provided the answer to the questions that you miss. All Blackboard quizzes must be taken by 11:59 pm on **5/7/13**. No extension will be granted

if errors arise in Blackboard, so it is recommended that you do not wait until the last minute to take quizzes. During the semester, you will take a total of 10 quizzes worth 20 points each. The table on page 3 of the syllabus provides the dates that each LM will become available.

Blackboard Discussions:

For the purposes of the topics in this class, it is useful to have regular class discussions on Blackboard. On the dates listed below the syllabus, a link to a discussion topic will be posted in the 'Discussions' folder. You must click on the link, read the topic and any additional articles/resources, and post your thoughts or opinions on the topic. Students in the course are expected to post responses to the original post or respond to posts of other students in the class. In order to receive full credit for each discussion, you need to make at least three separate, substantive posts per discussion. **If you miss a discussion, NO make-up will be offered.** During the discussion process, you should treat your peers and instructors in a respectful manner. **Students who do not observe this rule will be banned from the discussion forum without notice.** Discussions will be available beginning at 8:00 am and expire at 11:59 pm on the dates shown below.

Discussion Dates

Discussion One:	2/1/13 – 2/22/13
Discussion Two:	3/1/13 – 3/22/13
Discussion Three:	4/1/13 – 4/26/13

Blackboard Final Exam:

The final exam for this course is cumulative and will be composed entirely of questions from previous quizzes. The exam will be completed on Blackboard. The format will be similar in style to the quiz questions. The final exam will consist of 80 questions worth 2 points each. You will be allowed **two attempts** to take the final exam. Your grade will be reported as the "highest" of your attempts. You must take the final exam by **5/7/13 at 11:59pm. If you fail to complete the final exam by the due date, NO make-up will be offered.**

How do I get answers to my Questions?

Dr. Breslin is here to help you succeed in this class. Due to the high enrollment in this course, it is very difficult to reply to individual e-mail questions about course content. Also, there is a good chance that several of your classmates may have a similar question as you. Thus, if you have a question concerning lecture material or course structure, **please post these questions in the 'General Questions' forum on Blackboard**. This will allow all students in the course to view the responses to common questions. If you have grade-related questions, you are welcome to e-mail Dr. Breslin directly via Blackboard e-mail.

Order of Topics:

Topic	Lecture Available	Blackboard Quiz Due
Online Orientation	1/14/13	5/7/13*

& Syllabus		
Health Concerns of the 21st Century	1/14/13	5/7/13*
Your Family Health History	1/22/13	5/7/13*
Stress Management	1/28/13	5/7/13*
Sleep	2/4/13	5/7/13*
Exercise and Physical Activity	2/11/13	5/7/13*
Nutrition	2/18/13	5/7/13*
Body Weight, Composition, and Obesity	2/25/13	5/7/13*
Cardiovascular Disease Risk	3/4/13	5/7/13*
Cancer	3/18/13	5/7/13*
Final Exam	5/1/13 – 5/7/13	

* You will have until 11:59 PM on 5/7/13 to complete all quizzes for this course.

Note: The following information is designed to help the class run smoothly. The instructor reserves the right to make additions and adjustments as necessary. Some of the writings, lectures, films, or presentations in this course may include material that conflicts with the core beliefs of some students. Please review the syllabus carefully to see if the course is one that you are committed to taking. If you have a concern, please discuss it with me at your earliest convenience.

Appendix B

Demographic Data Sheet and Berlin Risk Appraisal and Health Motivation Study (BRAHMS)

Gender

- ◯ Male
- ◯ Female

Race/Ethnicity

- ☐ White (not of Hispanic Origin) Origins in the original people of Europe, North Africa, or the Middle East
- ☐ Black (not of Hispanic Origin) Origins in any of the black racial groups of Africa or the Caribbean
- ☐ Hispanic
- ☐ Asian
- ☐ Native Hawaiian/Other Pacific Islander
- ☐ American Indian/Alaska Native

Year in School

- ◯ Freshman
- ◯ Sophomore
- ◯ Junior
- ◯ Senior
- ◯ Post-Bac

Do you live in on-campus housing?

- ◯ Yes
- ◯ No

Where do you live?

- ◯ Cougar Village
- ◯ Moody Towers
- ◯ Quadrangles
- ◯ Bayou Oaks
- ◯ Calhoun Lofts
- ◯ Cougar Place
- ◯ Cullen Oaks
- ◯ Cambridge Oaks

Do you have a university meal plan?

- ◯ Yes
- ◯ No

What is your height?

Feet

Inches

What is your weight (in lbs.)?

Behavior change self-efficacy

Certain barriers make it hard to change one's nutrition habits. How sure are you that you can overcome the following obstacles?

I can stick to a healthy (low-fat or low-salt) diet even...

	Not at all true	Barely true	Mostly true	Exactly true
...if I have to learn much about nutrition.	○	○	○	○
...if I initially have to watch out in many situations.	○	○	○	○
...if my blood pressure doesn't improve immediately.	○	○	○	○
...if I have to start all over again several times until I succeed.	○	○	○	○
...if I initially have to make plans.	○	○	○	○
...if initially food doesn't taste as good.	○	○	○	○
...if I initially don't get much support.	○	○	○	○
...if I takes a long time to get used to it.	○	○	○	○
...if my cholesterol level doesn't improve immediately.	○	○	○	○
...if I have worries and troubles.	○	○	○	○
...if my partner/family don't change their nutrition habits.	○	○	○	○

Exercise self-efficacy
Motivational Self-Efficacy

Certain barriers make it hard to begin exercising.
How sure are you that you can begin exercising regularly

I am sure that...

	Not at all true	Barely true	Mostly true	Exactly true
I can change to a physically active life style.	○	○	○	○
I can be physically active once a week.	○	○	○	○
I can be physically active at least 3 times a week for 30 minutes.	○	○	○	○

Preactional Self-Efficacy

It is always hard to get started. How sure are you that you can start exercising regularly?
I am sure I can start being physically active immediately, even if...

	Not at all true	Barely true	Mostly true	Exactly true
...I initially have to reconsider my views on physical activity.	○	○	○	○
...the planning for this is very laborious.	○	○	○	○
...I have to force myself to start immediately.	○	○	○	○
...I have to push myself.	○	○	○	○

Coping Self-Efficacy

It is important to stay physically active. Are you confident you can manage that?
I am sure I can keep being physically active regularly, even if...

	Not at all true	Barely true	Mostly true	Exactly true
...it takes me long to make it a habit.	○	○	○	○
...I am worried and troubled.	○	○	○	○
...I don't see success at once.	○	○	○	○
...I am tired.	○	○	○	○
...I am stressed out.	○	○	○	○
...I feel tense.	○	○	○	○
...my blood pressure doesn't improve immediately.	○	○	○	○
...I won't get social support for my first attempts.	○	○	○	○
...I have to start all over again several times until I succeed.	○	○	○	○
...my partner/family isn't physically active.	○	○	○	○
...my cholesterol doesn't improve immediately.	○	○	○	○

Recovery Self-Efficacy

In spite of good intentions, smaller or larger relapses may occur. Imagine you stopped exercising for some time. How confident are you about restarting exercises?

I am sure I can be physically active again regularly, even if...

	Not true at all	Barely true	Mostly true	Exactly true
...I postpone my plans several times.	○	○	○	○
...I am not able to pull myself together sometimes.	○	○	○	○
...I have already paused for several weeks.	○	○	○	○

Appendix C

Diet History Questionnaire II (DHQ-II)

NATIONAL INSTITUTES OF HEALTH

Diet History Questionnaire II

1. Over the past month, how often did you drink **carrot juice**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1–2 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
☐ 6 or more times per day

2. Over the past month, how often did you drink **tomato juice** or **other vegetable juice**? *(Please do not include carrot juice.)*

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1–2 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
☐ 6 or more times per day

3. Over the past month, how often did you drink **orange juice** or **grapefruit juice?**

☐ NEVER (GO TO QUESTION 4)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1–2 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
☐ 6 or more times per day

3a. How often was the orange juice or grapefruit juice you drank **calcium-fortified**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

4. Over the past month, how often did you drink **other 100% fruit juice** or **100% fruit juice mixtures** (such as apple, grape, pineapple, or others)?

☐ NEVER (GO TO QUESTION 5)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1–2 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
☐ 6 or more times per day

4a. How often were the other 100% fruit juice or 100% fruit juice mixtures you drank **calcium-fortified**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

5. How often did you drink **other fruit drinks** (such as cranberry cocktail, Hi-C, lemonade, or Kool-Aid, diet or regular)?

☐ NEVER (GO TO QUESTION 6)

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1–2 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
- ☐ 6 or more times per day

5a. How often were your fruit drinks **diet** or **sugar-free**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

6. How often did you drink **milk as a beverage** (NOT in coffee, NOT in cereal)? *(Please do not include chocolate milk and hot chocolate.)*

☐ NEVER (GO TO QUESTION 7)

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1–2 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
- ☐ 6 or more times per day

6a. What kind of **milk** did you usually drink?

- ☐ Whole milk
- ☐ 2% fat milk
- ☐ 1 % fat milk
- ☐ Skim, nonfat, or ½% fat milk
- ☐ Soy milk
- ☐ Rice milk
- ☐ Other

Over the <u>past month</u>…

7. How often did you drink **chocolate milk** (including hot chocolate)?

☐ NEVER (GO TO QUESTION 8)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1–2 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
☐ 6 or more times per day

7a. How often was the chocolate milk **reduced- fat** or **fat-free**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

8. How often did you drink **meal replacement** or **high-protein beverages** (such as Instant Breakfast, Ensure, Slimfast, Sustacal or others)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1–2 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
☐ 6 or more times per day

9. How often did you drink **soda** or **pop**?

☐ NEVER (GO TO QUESTION 10)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1–2 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
☐ 6 or more times per day

9a. How often were these sodas or pop **diet** or **sugar-free**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

9b. How often were these sodas or pop **caffeine-free**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

10. How often did you drink **sports drinks** (such as Propel, PowerAde, or Gatorade)?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1–2 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
- ☐ 6 or more times per day

11. How often did you drink **energy drinks** (such as Red Bull or Jolt)?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1–2 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
- ☐ 6 or more times per day

12. How often did you drink **beer**?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1–2 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
- ☐ 6 or more times per day

Over the <u>past month</u>…

13. How often did you drink **water** (including tap, bottled, and carbonated water)?

☐ NO (GO TO QUESTION 14)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1–2 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
☐ 6 or more times per day

13a. How often was the water you drank **tap water**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

13b. How often was the water you drank **bottled, sweetened water** (with low or no-calorie sweetener, including carbonated water)?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

13c. How often was the water you drank **bottled, unsweetened water** (including carbonated water)?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

14. How often did you drink **wine** or **wine coolers**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1–2 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
☐ 6 or more times per day

15. How often did you drink **liquor** or **mixed drinks**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1–2 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
☐ 6 or more times per day

16. How often did you eat **oatmeal, grits,** or **other cooked cereal?**

☐ NEVER (GO TO QUESTION 17)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

16a. How often was **butter** or **margarine** added to your oatmeal, grits or other cooked cereal?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

17. How often did you eat **cold cereal**?

☐ NEVER (GO TO QUESTION 18)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

17a. How often was the cold cereal you ate **Total Raisin Bran**, **Total Cereal**, or **Product 19**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

17b. How often was the cold cereal you ate **All Bran**, **Fiber One**, **100% Bran**, or **All-Bran Bran Buds**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

Over the <u>past month</u>…

17c. How often was the cold cereal you ate **some other bran** or **fiber cereal** (such as Cheerios, Shredded Wheat, Raisin Bran, Bran Flakes, Grape-Nuts, Granola, Wheaties, or Healthy Choice)?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

17d. How often was the cold cereal you ate any **other type of cold cereal** (such as Corn Flakes, Rice Krispies, Frosted Flakes, Special K, Froot Loops, Cap'n Crunch, or others)?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

17e. Was **milk** added to your cold cereal?

- ☐ NO (GO TO QUESTION 18)
- ☐ YES

17f. What kind of **milk** was usually added?

- ☐ Whole milk
- ☐ 2% fat milk
- ☐ 1% fat milk
- ☐ Skim, nonfat, or ½% fat milk
- ☐ Soy milk
- ☐ Rice milk
- ☐ Other

18. How often did you eat **applesauce**?

- ☐ NEVER
- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

19. How often did you eat **apples**?

- ☐ NEVER
- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

20. How often did you eat **pears** (fresh, canned, or frozen)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

21. How often did you eat **bananas?**

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

22. How often did you eat **dried fruit** (such as prunes or raisins)? *(Please do not include dried apricots.)*

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

23. How often did you eat **peaches, nectarines,** or **plums**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

24. How often did you eat **grapes**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

Over the <u>past month</u>…

25. How often did you eat **cantaloupe**?

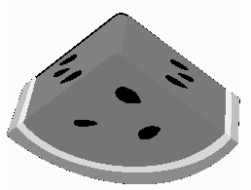
☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

26. How often did you eat **melon, other than cantaloupe** (such as watermelon or honeydew)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day



27. How often did you eat **strawberries**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

28. How often did you eat **oranges, tangerines,** or **clementines**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

29. How often did you eat **grapefruit**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

30. How often did you eat **pineapple**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

31. How often did you eat **other kinds of fruit**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

32. How often did you eat **COOKED greens** (such as spinach, turnip, collard, mustard, chard, or kale)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

33. How often did you eat **RAW greens** (such as spinach, turnip, collard, mustard, chard, or kale)? (*We will ask about lettuce later.)*

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

34. How often did you eat **coleslaw**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

35. How often did you eat **sauerkraut** or **cabbage** (other than coleslaw)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

Over the <u>past month</u>…

36. How often did you eat **carrots** (fresh, canned, or frozen)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

37. How often did you eat **string beans** or **green beans** (fresh, canned, or frozen)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

38. How often did you eat **peas** (fresh, canned, or frozen)?

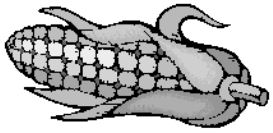
☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

39. How often did you eat **corn**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day



40. How often did you eat **broccoli** (fresh or frozen)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

41. How often did you eat **cauliflower** or **Brussels sprouts** (fresh or frozen)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

42. How often did you eat **asparagus** (fresh or frozen)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

43. How often did you eat **winter squash** (such as pumpkin, butternut, or acorn)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

44. How often did you eat **mixed vegetables**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

45. How often did you eat **onions**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

Over the <u>past month</u>…

46. Now think about all the **cooked vegetables** you ate in the <u>past month</u> and how they were prepared. How often were your vegetables **COOKED WITH** some sort of **fat**, including oil spray? *(Please do not include potatoes.)*

☐ NEVER (GO TO QUESTION 47)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

46a. Which fats were usually added to your vegetables **DURING COOKING**? *(Please do not include potatoes. **Mark all that apply.**)*

☐ Margarine (including low-fat)
☐ Butter (including low-fat)
☐ Lard, fatback, or bacon fat
☐ Olive oil
☐ Corn oil
☐ Canola or rapeseed oil
☐ Oil spray, such as Pam or others
☐ Other kinds of oils
☐ None of the above

47. Now, thinking again about all the **cooked vegetables** you ate in the <u>past month</u>, how often was some sort of fat, sauce, or dressing added **AFTER COOKING OR AT THE TABLE**? *(Please do not include potatoes.)*

☐ NEVER (GO TO QUESTION 48)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1-2 times per week
☐ 3-4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 times per day
☐ 3 or more times per day

47a. Which fats, sauces, or dressings were usually added **AFTER COOKING OR AT THE TABLE**? *(Please do not include potatoes.* ***Mark all that apply.****)*

- ☐ Margarine (including low-fat)
- ☐ Butter (including low-fat)
- ☐ Lard, fatback, or bacon fat
- ☐ Salad dressing
- ☐ Cheese sauce
- ☐ White sauce
- ☐ Other

48. How often did you eat **sweet peppers** (green, red, or yellow)?

- ☐ NEVER
- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

49. How often did you eat **fresh tomatoes** (including those in salads)?

- ☐ NEVER
- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

50. How often did you eat **lettuce salads** (with or without other vegetables)?

- ☐ NEVER (GO TO QUESTION 51)
- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

50a. How often did the lettuce salads you ate include **dark green lettuce**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

51. How often did you eat **salad dressing** (including low-fat) **on salads**?

- ☐ NEVER
- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

Over the <u>past month</u>…

52. How often did you eat **sweet potatoes** or **yams**?

- ☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

53. How often did you eat **French fries**, **home fries**, **hash browned potatoes**, or **tater tots**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

54. How often did you eat **potato salad**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

55. How often did you eat **baked, boiled,** or **mashed potatoes**?

☐ NEVER (GO TO QUESTION 56)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

55a. How often was **sour cream** (including low-fat) added to your potatoes, **EITHER IN COOKING OR AT THE TABLE**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

55b. How often was **margarine** (including low-fat) added to your potatoes, **EITHER IN COOKING OR AT THE TABLE**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

55c. How often was **butter** (including low-fat) added to your potatoes, **EITHER IN COOKING OR AT THE TABLE**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

55d. How often was **cheese** or **cheese sauce** added to your potatoes, **EITHER IN COOKING OR AT THE TABLE**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

56. How often did you eat **salsa**?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

57. How often did you eat **catsup**?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

58. How often did you eat **stuffing, dressing,** or **dumplings**?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

59. How often did you eat **chili**?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

Over the <u>past month</u>…

60. How often did you eat **Mexican foods** (such as tacos, tostados, burritos, tamales, fajitas, enchiladas, quesadillas, and chimichangas)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

61. How often did you eat **cooked dried beans** (such as baked beans, pintos, kidney, blackeyed peas, lima, lentils, soybeans, or refried beans)? *(Please do not include bean soups or chili.)*

☐ NEVER (GO TO QUESTION 62)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

61a. How often were the beans you ate **refried beans**, **beans prepared with any type of fat**, or **with meat added**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

62. How often did you eat **other kinds of vegetables**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

63. How often did you eat **rice** or **other cooked grains** (such as bulgur, cracked wheat, or millet)?

☐ NEVER (GO TO QUESTION 64)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

63a. How often was **butter**, **margarine**, or **oil** added to your rice or other cooked grains **IN COOKING OR AT THE TABLE**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

64. How often did you eat **pancakes, waffles,** or **French toast**?

☐ NEVER (GO TO QUESTION 65)

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

64a. How often was **margarine** (including low-fat) added to your pancakes, waffles, or French toast **AFTER COOKING OR AT THE TABLE**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

64b. How often was **butter** (including low-fat) added to your pancakes, waffles, or French toast **AFTER COOKING OR AT THE TABLE**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

64c. How often was **syrup** added to your pancakes, waffles, or French toast?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

65. How often did you eat **lasagna, stuffed shells, stuffed manicotti, ravioli,** or **tortellini**? *(Please do not include spaghetti or other pasta.)*

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

Over the <u>past month</u>…

66. How often did you eat **macaroni and cheese**?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

67. How often did you eat **pasta salad** or **macaroni salad**?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

68. Other than the pastas listed in Questions 65, 66, and 67, how often did you eat **pasta, spaghetti**, or **other noodles**?

☐ NEVER (GO TO QUESTION 69)

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

68a. How often did you eat your pasta, spaghetti, or other noodles with **tomato sauce** or **spaghetti sauce made WITH meat**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

68b. How often did you eat your pasta, spaghetti, or other noodles with **tomato sauce** or **spaghetti sauce made WITHOUT meat**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

68c. How often did you eat your pasta, spaghetti, or other noodles with **margarine, butter, oil,** or **cream sauce**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

69. How often did you eat **bagels** or **English muffins**?

☐ NEVER (GO TO INTRODUCTION TO QUESTION 70)

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

69a. How often were the bagels or English muffins you ate **whole wheat**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

69b. How often was **margarine** (including low-fat) added to your bagels or English muffins?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

69c. How often was **butter** (including low-fat) added to your bagels or English muffins?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

69d. How often was **cream cheese** (including low-fat) spread on your bagels or English muffins?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

Over the <u>past month</u>…

The next questions ask about your intake of breads other than bagels or English muffins. First, we will ask about bread you ate as part of sandwiches only. Then we will ask about all other bread you ate.

70. How often did you eat **breads** or **rolls AS PART OF SANDWICHES** (including burger and hot dog rolls)?
(Please do not include fast food sandwiches.)

☐ NEVER (GO TO QUESTION 71)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

70a. How often were the breads or rolls that you used for your sandwiches **white bread** (including burger and hot dog rolls)?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

70b. How often was **mayonnaise** or **mayonnaise-type dressing** (including low-fat) added to the breads or rolls used for your sandwiches?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

70c. How often was **margarine** (including low-fat) added to the breads or rolls used for your sandwiches?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

70d. How often was **butter** (including low-fat) added to the breads or rolls used for your sandwiches?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

71. How often did you eat **breads** or **dinner rolls**, **NOT AS PART OF SANDWICHES**?

☐ NEVER (GO TO QUESTION 72)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

71a. How often were the breads or rolls you ate **white bread**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

71b. How often was **margarine** (including low-fat) added to your breads or rolls?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

71c. How often was **butter** (including low-fat) added to your breads or rolls?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

71d. How often was **cream cheese** (including low-fat) added to your breads or rolls?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

72. How often did you eat **jam, jelly,** or **honey** on bagels, muffins, bread, rolls, or crackers?

- ☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

Over the <u>past month</u>…

73. How often did you eat **peanut butter** or **other nut butter**?

☐ NEVER

☐ 1 time in past month	☐ 3–4 times per week
☐ 2–3 times in past month	☐ 5–6 times per week
☐ 1 time per week	☐ 1 time per day
☐ 2 times per week	☐ 2 or more times per day

74. How often did you eat **roast beef** or **steak IN SANDWICHES**?

☐ NEVER

☐ 1 time in past month	☐ 3–4 times per week
☐ 2–3 times in past month	☐ 5–6 times per week
☐ 1 time per week	☐ 1 time per day
☐ 2 times per week	☐ 2 or more times per day

75. How often did you eat **turkey** or **chicken COLD CUTS** (such as loaf, luncheon meat, turkey ham, turkey salami, or turkey pastrami)? (*We will ask about other turkey or chicken later.)*

☐ NEVER

☐ 1 time in past month	☐ 3–4 times per week
☐ 2–3 times in past month	☐ 5–6 times per week
☐ 1 time per week	☐ 1 time per day
☐ 2 times per week	☐ 2 or more times per day

76. How often did you eat **luncheon** or **deli-style ham**? *(We will ask about other ham later.)*

☐ NEVER (GO TO QUESTION 77)

☐ 1 time in past month	☐ 3–4 times per week
☐ 2–3 times in past month	☐ 5–6 times per week
☐ 1 time per week	☐ 1 time per day
☐ 2 times per week	☐ 2 or more times per day

76a. How often was the luncheon or deli-style ham you ate **light**, **low-fat**, or **fat-free**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

77. How often did you eat **other cold cuts** or **luncheon meats** (such as bologna, salami, corned beef, pastrami, or others, including low-fat)? *(Please do not include ham, turkey, or chicken cold cuts.)*

☐ NEVER (GO TO QUESTION 78)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

77a. How often were the other cold cuts or luncheon meats you ate **light, low-fat**, or **fat-free**? *(Please do not include ham, turkey, or chicken cold cuts.)*

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

78. How often did you eat **canned tuna** (including in salads, sandwiches, or casseroles)?

☐ NEVER (GO TO QUESTION 79)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

78a. How often was the canned tuna you ate **water-packed**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

78b. How often was the canned tuna you ate **prepared with mayonnaise** or **other dressing** (including low-fat)?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

Over the <u>past month</u>…

79. How often did you eat **GROUND chicken** or **turkey**? *(We will ask about other chicken and turkey later.)*

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

80. How often did you eat **beef hamburgers** or **cheeseburgers** from a **FAST FOOD** or **OTHER RESTAURANT**?

☐ NEVER (GO TO QUESTION 81)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

80a. How often did you have **cheeseburgers** rather than **hamburgers**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

81. How often did you eat **beef hamburgers** or **cheeseburgers** that were **NOT FROM A FAST FOOD** or **OTHER RESTAURANT**?

☐ NEVER (GO TO QUESTION 82)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

81a. How often were these beef hamburgers or cheeseburgers made with **lean ground beef**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

82. How often did you eat **ground beef in mixtures** (such as meatballs, casseroles, chili, or meatloaf)?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

83. How often did you eat **hot dogs** or **frankfurters**? *(Please do not include sausages or vegetarian hot dogs.)*

☐ NEVER (GO TO QUESTION 84)

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

83a. How often were the hot dogs or frankfurters you ate **light** or **low-fat**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

84. How often did you eat **beef mixtures** (such as beef stew, beef pot pie, beef and noodles, or beef and vegetables)?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

Over the <u>past month</u>…

85. How often did you eat **roast beef** or **pot roast**? *(Please do not include roast beef or pot roast in sandwiches.)*

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

86. How often did you eat **steak** (beef)?
(*Please do not include steak in sandwiches*)

☐ NEVER (GO TO QUESTION 87)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

86a. How often was the steak you ate **lean steak**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

87. How often did you eat **pork** or **beef spareribs**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

88. How often did you eat **roast turkey, turkey cutlets,** or **turkey nuggets** (including in sandwiches)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

89. How often did you eat **chicken mixtures** (such as salads, sandwiches, casseroles, stews, or other mixtures)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

90. How often did you eat **baked, broiled, roasted, stewed,** or **fried chicken** (including nuggets)? *(Please do not include chicken in mixtures.)*

☐ NEVER (GO TO QUESTION 91)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

90a. How often was the chicken you ate **fried chicken** (including deep fried) or **chicken nuggets**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

90b. How often was the chicken you ate **WHITE meat**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

90c. How often did you eat chicken **WITH skin**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

91. How often did you eat **baked ham** or **ham steak**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

Over the <u>past month</u>…

92. How often did you eat **pork** (including chops, roasts, and in mixed dishes)? *(Please do not include ham, ham steak, or sausage.)*

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

93. How often did you eat **gravy** on meat, chicken, potatoes, rice, etc.?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

94. How often did you eat **liver** (all kinds) or **liverwurst**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

95. How often did you eat **bacon** (including low-fat)?

☐ NEVER (GO TO QUESTION 96)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

95a. How often was the bacon you ate **light, low-fat,** or **lean**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

96. How often did you eat **sausage** (including low-fat)?

☐ NEVER (GO TO QUESTION 97)

☐ 1 time in past month	☐ 3–4 times per week
☐ 2–3 times in past month	☐ 5–6 times per week
☐ 1 time per week	☐ 1 time per day
☐ 2 times per week	☐ 2 or more times per day

96a. How often was the sausage you ate **light, low-fat**, or **lean**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

97. How often did you eat **fried shellfish** (such as crab, lobster, shrimp)?

☐ NEVER

☐ 1 time in past month	☐ 3–4 times per week
☐ 2–3 times in past month	☐ 5–6 times per week
☐ 1 time per week	☐ 1 time per day
☐ 2 times per week	☐ 2 or more times per day

98. How often did you eat **shellfish** (such as crab, lobster, shrimp) **that was NOT FRIED**?

☐ NEVER

☐ 1 time in past month	☐ 3–4 times per week
☐ 2–3 times in past month	☐ 5–6 times per week
☐ 1 time per week	☐ 1 time per day
☐ 2 times per week	☐ 2 or more times per day

99. How often did you eat **salmon, fresh tuna or trout**?

☐ NEVER

☐ 1 time in past month	☐ 3–4 times per week
☐ 2–3 times in past month	☐ 5–6 times per week
☐ 1 time per week	☐ 1 time per day
☐ 2 times per week	☐ 2 or more times per day

Over the <u>past month</u>…

100. How often did you eat **fish sticks** or other **fried fish** (not including shellfish)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

101. How often did you eat **other fish that was NOT FRIED** (not including shellfish)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

Now think about all the meat, poultry, and fish you ate in the <u>past month</u> and how they were prepared.

102. How often was **oil, butter, margarine**, **or other fat** used to **FRY, SAUTE, BASTE, OR MARINATE** any meat, poultry, or fish you ate? *(Please do not include deep frying.)*

☐ NEVER (GO TO QUESTION 103)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

102a. Which of the following **fats** were regularly used to prepare your meat, poultry, or fish? ***(Mark all that apply.)***

☐ Margarine (including low-fat)
☐ Butter (including low-fat)
☐ Lard, fatback, or bacon fat
☐ Olive oil
☐ Corn oil
☐ Canola or rapeseed oil
☐ Oil spray (such as Pam or others)
☐ Other kinds of oils
☐ None of the above

103. How often did you eat **tofu, soy burgers,** or **soy meat-substitutes**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

104. How often did you eat **soups**?

☐ NO (GO TO QUESTION 105)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

104a. How often were the soups you ate **bean soups**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

104b. How often were the soups you ate **cream soups** (including chowders)?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

104c. How often were the soups you ate **tomato** or **vegetable soups**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

104d. How often were the soups you ate **broth soups** (including chicken) **with** or **without noodles** or **rice**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

Over the past month…

105. How often did you eat **pizza**?

☐ NEVER (GO TO QUESTION 106)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

105a. How often did you eat pizza with **pepperoni, sausage**, or **other meat**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

106. How often did you eat **crackers**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

107. How often did you eat **corn bread** or **corn muffins**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

108. How often did you eat **biscuits**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

109. How often did you eat **potato chips** (including low-fat, fat-free, or low-salt)?

☐ NEVER (GO TO QUESTION 110)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

109a. How often were the potato chips you ate **fat-free**? *(Please do not include reduced-fat chips.)*

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

110. How often did you eat **corn chips or tortilla chips** (including low-fat, fat-free, or low-salt)?

☐ NEVER (GO TO QUESTION 111)

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

110a. How often were the corn chips or tortilla chips you ate **fat-free**? *(Please do not include reduced-fat chips.)*

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

111. How often did you eat **popcorn** (including low-fat)?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

112. How often did you eat **pretzels**?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

113. How often did you eat **peanuts, walnuts, seeds,** or **other nuts**?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

Over the <u>past month</u>…

114. How often did you eat **energy, high-protein**, or **breakfast bars** (such as Power Bars, Balance, Clif, or others)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

115. How often did you eat **yogurt** (NOT including frozen yogurt)?

☐ NEVER (GO TO QUESTION 116)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

115a. How often was the **yogurt** you ate **low-fat** or **fat-free**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

116. How often did you eat **cottage cheese** (including low-fat)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

117. How often did you eat **cheese** (including low-fat; including on cheeseburgers or in sandwiches or subs)?

☐ NEVER (GO TO QUESTION 118)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

117a. How often was the cheese you ate **low-fat or fat-free**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

118. How often did you eat **frozen yogurt, sorbet,** or **ices** (including low-fat or fat-free)?

- ☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

119. How often did you eat **ice cream, ice cream bars,** or **sherbet** (including low-fat or fat-free)?

- ☐ NEVER (GO TO QUESTION 120)

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

119a. How often was the ice cream you ate **light, low-fat,** or **fat-free ice cream** or **sherbet**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

120. How often did you eat **cake** (including low-fat or fat-free)?

- ☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

121. How often did you eat **cookies** or **brownies** (including low-fat or fat-free)?

- ☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

Over the <u>past month</u>…

122. How often did you eat **doughnuts**, **sweet rolls**, **Danish**, or **pop-tarts**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

123. How often did you eat **sweet muffins** or **dessert breads** (including low-fat or fat-free)?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

124. How often did you eat **fruit crisp, cobbler,** or **strudel**?

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

125. How often did you eat **pie**?

☐ NEVER (GO TO QUESTION 126)

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

The next four questions ask about the kinds of pie you ate. Please read all four questions before answering.

125a. How often were the pies you ate **fruit pie** (such as apple, blueberry, others)?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

125b. How often were the pies you ate **cream, pudding, custard,** or **meringue pie**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

125c. How often were the pies you ate **pumpkin** or **sweet potato pie**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

125d. How often were the pies you ate **pecan pie**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

126. How often did you eat **chocolate candy**?

☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

127. How often did you eat **other candy**?

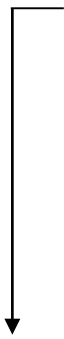
☐ NEVER

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day

128. How often did you eat **eggs, egg whites,** or **egg substitutes** (NOT counting eggs in baked goods and desserts)? *(Please include eggs in salads, quiche, and soufflés.)*

☐ NEVER (GO TO QUESTION 129)

- ☐ 1 time in past month
- ☐ 2–3 times in past month
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3–4 times per week
- ☐ 5–6 times per week
- ☐ 1 time per day
- ☐ 2 or more times per day



Over the <u>past month</u>…

128a. How often were the eggs you ate **egg substitutes** or **egg whites only**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

128b. How often were the eggs you ate **regular whole eggs**?

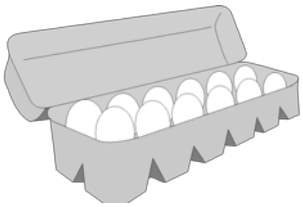
- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

128c. How often were the eggs you ate **cooked in oil, butter,** or **margarine**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

128d. How often were the eggs you ate part of **egg salad**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always



129. How many cups of **coffee**, caffeinated or decaffeinated, did you drink (including coffee drinks such as Latte, Mocha, Frappuccino, etc.)?

- ☐ NONE (GO TO QUESTION 130)
- ☐ Less than 1 cup in past month
- ☐ 1–3 cups in past month
- ☐ 1 cup per week
- ☐ 2–4 cups per week
- ☐ 5–6 cups per week
- ☐ 1 cup per day
- ☐ 2–3 cups per day
- ☐ 4–5 cups per day
- ☐ 6 or more cups per day

129a. How often was the coffee you drank **decaffeinated**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

130. How many glasses, cans, or bottles of **COLD** or **ICED tea,** caffeinated or decaffeinated, did you drink?

☐ NONE (GO TO QUESTION 131)

- ☐ Less than 1 glass, can or bottle in past month
- ☐ 1–3 glasses, cans or bottles in past month
- ☐ 1 glass, can or bottle per week
- ☐ 2–4 glasses, cans or bottles per week
- ☐ 5–6 glasses, cans or bottles per week
- ☐ 1 glass, can or bottle per day
- ☐ 2–3 glasses, cans or bottles per day
- ☐ 4–5 glasses, cans or bottles per day
- ☐ 6 or more glasses, cans or bottles per day

130a. How often was the cold or iced tea you drank **decaffeinated** or **herbal**?

- ☐ Almost never or never
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

130b. How often was the cold or iced tea you drank **presweetened with either sugar or artificial sweeteners** (such as Splenda, Equal, Sweet'N Low or others)?

- ☐ Almost never or never (GO TO QUESTION 131)
- ☐ About ¼ of the time
- ☐ About ½ of the time
- ☐ About ¾ of the time
- ☐ Almost always or always

130c. What kind of **sweetener** was added to your presweetened cold or iced tea most of the time?

- ☐ Sugar or honey
- ☐ Artificial sweeteners (such as Splenda, Equal, Sweet'N Low or others)

Over the <u>past month</u>…

131. How many cups of **HOT tea**, caffeinated or decaffeinated, did you drink?

☐ NONE (GO TO QUESTION 132)

☐ Less than 1 cup in past month
☐ 1–3 cups in past month
☐ 1 cup per week
☐ 2–4 cups per week
☐ 5–6 cups per week
☐ 1 cup per day
☐ 2–3 cups per day
☐ 4–5 cups per day
☐ 6 or more cups per day

131a. How often was the hot tea you drank **decaffeinated** or **herbal**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

132. Over the <u>past month</u>, did you add **sugar, honey or other sweeteners** to your tea or coffee (hot or iced)?

☐ NO (GO TO QUESTION 133)

☐ YES

132a. How often did you add **sugar** or **honey** to your coffee or tea (hot or iced)?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

132b. How often did you add **artificial sweetener** (such as Splenda, Equal, Sweet'N Low or others) to your coffee or tea?

☐ Almost never or never (GO TO QUESTION 133)
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

132c. What kind of **artificial sweetener** did you usually use?

☐ Equal or aspartame
☐ Sweet'N Low or saccharin
☐ Splenda or sucralose
☐ Herbal extracts or other kind

133. Over the past month, did you add **whiteners** (such as cream, milk, or non-dairy creamer) to your tea or coffee?

☐ NO (GO TO QUESTION 134)

☐ YES

133a. How often was **non-dairy creamer** added to your coffee or tea?

☐ Almost never or never (GO TO QUESTION 133c)
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

133b. What kind of **non-dairy creamer** did you usually use?

☐ Regular powdered
☐ Low-fat or fat-free powdered
☐ Regular liquid
☐ Low-fat or fat-free liquid

133c. How often was **cream** or **half and half** added to your coffee or tea?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

133d. How often was **milk** added to your coffee or tea?

☐ Almost never or never (GO TO QUESTION 134)
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

133e. What kind of **milk** was usually added to your coffee or tea?

☐ Whole milk
☐ 2% milk
☐ 1% milk
☐ Skim, nonfat, or ½% milk
☐ Evaporated or condensed (canned) milk
☐ Soy milk
☐ Rice milk
☐ Other

Over the <u>past month</u>…

134. How often was **sugar** or **honey** added to foods you ate? *(Please do not include sugar in coffee, tea, other beverages, or baked goods.)*

☐ NEVER

☐ 1 time in past month
☐ 2–3 times in past month
☐ 1 time per week
☐ 2 times per week
☐ 3–4 times per week
☐ 5–6 times per week
☐ 1 time per day
☐ 2 or more times per day

The following questions are about the kinds of margarine, mayonnaise, sour cream, cream cheese, and salad dressing that you ate. If possible, please check the labels of these foods to help you answer.

135. Over the <u>past month</u>, did you eat **margarine**?

☐ NO (GO TO QUESTION 136)

☐ YES

135a. How often was the margarine you ate **light**, **low-fat**, or **fat-free** (stick or tub)?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

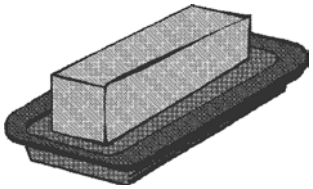
136. Over the <u>past month</u>, did you eat **butter**?

☐ NO (GO TO QUESTION 137)

☐ YES

136a. How often was the butter you ate **light** or **low-fat**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always



137. Over the past month, did you eat **mayonnaise** or **mayonnaise-type dressing**?

☐ NO (GO TO QUESTION 138)

☐ YES

137a. How often was the mayonnaise you ate **light, low-fat or fat-free**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

138. Over the past month, did you eat **sour cream**?

☐ NO (GO TO QUESTION 139)

☐ YES

138a. How often was the sour cream you ate **light, low-fat,** or **fat-free**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

139. Over the past month, did you eat **cream cheese**?

☐ NO (GO TO QUESTION 140)

☐ YES

139a. How often was the cream cheese you ate **light, low-fat,** or **fat-free**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

Over the <u>past month</u>…

140. Over the <u>past month</u>, did you eat **salad dressing**?

☐ NO (GO TO INTRODUCTION TO QUESTION 141)

☐ YES

140a. How often was the salad dressing you ate **light,** low-**fat** or **fat-free**?

☐ Almost never or never
☐ About ¼ of the time
☐ About ½ of the time
☐ About ¾ of the time
☐ Almost always or always

The following two questions ask you to summarize your usual intake of vegetables and fruits. Please do not include salads, potatoes, or juices.

141. Over the <u>past month</u>, how many servings of **vegetables** (not including salad or potatoes) did you eat per week or per day?

☐ Less than 1 per week
☐ 1–2 per week
☐ 3–4 per week
☐ 5–6 per week
☐ 1 per day
☐ 2 per day
☐ 3 per day
☐ 4 per day
☐ 5 or more per day

142. Over the <u>past month</u>, how many servings of **fruit** (not including juices) did you eat per week or per day?

☐ Less than 1 per week
☐ 1–2 per week
☐ 3–4 per week
☐ 5–6 per week
☐ 1 per day
☐ 2 per day
☐ 3 per day
☐ 4 per day
☐ 5 or more per day

143. Over the past month, which of the following foods did you eat **AT LEAST THREE TIMES?** ***(Mark all that apply.)***

- ☐ Avocado, guacamole
- ☐ Cheesecake
- ☐ Chocolate, fudge, or butterscotch toppings or syrups
- ☐ Chow mein noodles
- ☐ Croissants
- ☐ Dried apricots
- ☐ Egg rolls
- ☐ Granola bars
- ☐ Hot peppers
- ☐ Jell-O, gelatin
- ☐ Mangoes
- ☐ Milkshakes or ice-cream sodas
- ☐ Olives
- ☐ Oysters
- ☐ Pickles or pickled vegetables or fruit
- ☐ Plantains
- ☐ Pork neck bones, hock, head, feet
- ☐ Pudding or custard
- ☐ Veal, venison, lamb
- ☐ Whipped cream, regular
- ☐ Whipped cream, substitute
- ☐ NONE

144. For **ALL** of the past month, have you followed any type of **vegetarian diet**?

- ☐ NO (GO TO INTRODUCTION TO QUESTION 145)
- ☐ YES

144a. Which of the following foods did you **TOTALLY EXCLUDE** from your diet? ***(Mark all that apply.)***

- ☐ Meat (beef, pork, lamb, etc.)
- ☐ Poultry (chicken, turkey, duck)
- ☐ Fish and seafood
- ☐ Eggs
- ☐ Dairy products (milk, cheese, etc.)

The next questions are about your use of vitamin pills or other supplements.

145. Over the past month, did you take any **multivitamins**, such as One-a-Day-, Theragran-, Centrum-, or Prenatal-type multivitamins (as pills, liquids, or packets)?

☐ NO (GO TO INTRODUCTION TO QUESTION 147)

☐ YES

146. How often did you take **One-a-day-, Theragran-, or Centrum-type** multivitamins?

☐ 1–3 days in past month
☐ 1–3 days per week
☐ 4–6 days per week
☐ Every day

146a. Did your **multivitamin** usually contain **minerals** (such as iron, zinc, etc.)?

☐ NO
☐ YES
☐ Don't know

146b. Over the past month, did you take any **vitamins**, **minerals**, or **other herbal supplements** other than your multivitamin?

☐ NO

Thank you *very much* for completing this questionnaire! Because we want to be able to use all the information you have provided, we would greatly appreciate it if you would please take a moment to review each page making sure that you:

- **Did not skip any pages and**
- **Crossed out the incorrect answer and circled the correct answer if you made any changes.**

☐ YES (GO TO INTRODUCTION TO QUESTION 147)

These last questions are about the vitamins, minerals, or herbal supplements you took that are NOT part of a One-a-day-, Theragran-, or Centrum-type of multivitamin.

Please include vitamins taken as part of an antioxidant supplement.

Over the past month…

147. How often did you take **Antacids such as Tums or Rolaids**?

☐ NEVER (GO TO QUESTION 148)

☐ 1–3 days in past month
☐ 1–3 days per week
☐ 4–6 days per week
☐ Every day

147a. Was your antacid usually "extra strength"?

☐ NO
☐ YES
☐ Don't know

148. How often did you take **Calcium** (with or without Vitamin D) (**NOT** as part of a multivitamin in Question 146 or antacid in Question 147)?

☐ NEVER (GO TO QUESTION 149)

☐ 1–3 days in past month
☐ 1–3 days per week
☐ 4–6 days per week
☐ Every day

148a. Did your **Calcium** usually contain **Vitamin D**?

☐ NO
☐ YES
☐ Don't know

148b. Did your **Calcium** usually contain **Magnesium**?

☐ NO
☐ YES
☐ Don't know

148c. Did your **Calcium** usually contain **Zinc**?

☐ NO
☐ YES
☐ Don't know

Over the <u>past month</u>…

149. How often did you take **Iron** (**NOT** as part of a multivitamin in Question 146)?

☐ NEVER

☐ 1–3 days in past month
☐ 1–3 days per week
☐ 4–6 days per week
☐ Every day

150. How often did you take **Vitamin C** (**NOT** as part of a multivitamin in Question 146)?

☐ NEVER

☐ 1–3 days in past month
☐ 1–3 days per week
☐ 4–6 days per week
☐ Every day

151. How often did you take **Vitamin E** (**NOT** as part of a multivitamin in Question 146)?

☐ NEVER

☐ 1–3 days in past month
☐ 1–3 days per week
☐ 4–6 days per week
☐ Every day

The last two questions ask you about other supplements you took more than once per week.

152. Please mark any of the following **single supplements** you took more than once per week (**NOT** as part of a multivitamin in Question 147):

- ☐ B-6
- ☐ B-complex
- ☐ B-12
- ☐ Beta-carotene
- ☐ Folic acid/folate
- ☐ Magnesium
- ☐ Occu-vite/Eye health
- ☐ Potassium
- ☐ Selenium
- ☐ Vitamin A
- ☐ Vitamin D
- ☐ Zinc

153. Please mark any of the following **herbal, botanical, or other supplements** you took more than once per week.

- ☐ Chondroitin
- ☐ Coenzyme Q-10
- ☐ Echinacea
- ☐ Energy supplements
- ☐ Fish oil/omega 3's
- ☐ Flaxseed/oil
- ☐ Garlic
- ☐ Ginger
- ☐ Ginkgo biloba
- ☐ Ginseng
- ☐ Glucosamine/ chondroitin
- ☐ Peppermint
- ☐ Probiotics
- ☐ Saw palmetto
- ☐ Soy supplement
- ☐ Sports supplements
- ☐ St. John's wort
- ☐ Other

Appendix D

International Physical Activity Questionnaire (IPAQ)

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

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** and **moderate** 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. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal.

PART 1: JOB-RELATED PHYSICAL ACTIVITY

The first section is about your work. This includes paid jobs, farming, volunteer work, course work, and any other unpaid work that you did outside your home. Do not include unpaid work you might do around your home, like housework, yard work, general maintenance, and caring for your family. These are asked in Part 3.

1. Do you currently have a job or do any unpaid work outside your home?

   ☐ Yes

   ☐ No → ***Skip to PART 2: TRANSPORTATION***

The next questions are about all the physical activity you did in the **last 7 days** as part of your paid or unpaid work. This does not include traveling to and from work.

2. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, heavy construction, or climbing up stairs **as part of your work**? Think about only those physical activities that you did for at least 10 minutes at a time.

   _____ **days per week**

   ☐ No vigorous job-related physical activity → ***Skip to question 4***

3. How much time did you usually spend on one of those days doing **vigorous** physical activities as part of your work?

   _____ **hours per day**
   _____ **minutes per day**

4. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads **as part of your work**? Please do not include walking.

_____ **days per week**

☐ No moderate job-related physical activity → ***Skip to question 6***

5. How much time did you usually spend on one of those days doing **moderate** physical activities as part of your work?

_____ **hours per day**
_____ **minutes per day**

6. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time **as part of your work**? Please do not count any walking you did to travel to or from work.

_____ **days per week**

☐ No job-related walking → ***Skip to PART 2: TRANSPORTATION***

7. How much time did you usually spend on one of those days **walking** as part of your work?

_____ **hours per day**
_____ **minutes per day**

PART 2: TRANSPORTATION PHYSICAL ACTIVITY

These questions are about how you traveled from place to place, including to places like work, stores, movies, and so on.

8. During the **last 7 days**, on how many days did you **travel in a motor vehicle** like a train, bus, car, or tram?

_____ **days per week**

☐ No traveling in a motor vehicle → ***Skip to question 10***

9. How much time did you usually spend on one of those days **traveling** in a train, bus, car, tram, or other kind of motor vehicle?

_____ **hours per day**
_____ **minutes per day**

Now think only about the **bicycling** and **walking** you might have done to travel to and from work, to do errands, or to go from place to place.

10. During the **last 7 days**, on how many days did you **bicycle** for at least 10 minutes at a time to go **from place to place**?

_____ **days per week**

☐ No bicycling from place to place → ***Skip to question 12***

11. How much time did you usually spend on one of those days to **bicycle** from place to place?

_____ **hours per day**
_____ **minutes per day**

12. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time to go **from place to place**?

_____ **days per week**

☐ No walking from place to place → ***Skip to PART 3: HOUSEWORK, HOUSE MAINTENANCE, AND CARING FOR FAMILY***

13. How much time did you usually spend on one of those days **walking** from place to place?

_____ **hours per day**
_____ **minutes per day**

PART 3: HOUSEWORK, HOUSE MAINTENANCE, AND CARING FOR FAMILY

This section is about some of the physical activities you might have done in the **last 7 days** in and around your home, like housework, gardening, yard work, general maintenance work, and caring for your family.

14. Think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **vigorous** physical

activities like heavy lifting, chopping wood, shoveling snow, or digging **in the garden or yard**?

_____ **days per week**

☐ No vigorous activity in garden or yard → ***Skip to question 16***

15. How much time did you usually spend on one of those days doing **vigorous** physical activities in the garden or yard?

_____ **hours per day**
_____ **minutes per day**

16. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** activities like carrying light loads, sweeping, washing windows, and raking **in the garden or yard**?

_____ **days per week**

☐ No moderate activity in garden or yard → ***Skip to question 18***

17. How much time did you usually spend on one of those days doing **moderate** physical activities in the garden or yard?

_____ **hours per day**
_____ **minutes per day**

18. Once again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** activities like carrying light loads, washing windows, scrubbing floors and sweeping **inside your home**?

_____ **days per week**

☐ No moderate activity inside home → ***Skip to PART 4: RECREATION, SPORT AND LEISURE-TIME PHYSICAL ACTIVITY***

19. How much time did you usually spend on one of those days doing **moderate** physical activities inside your home?

_____ **hours per day**

_____ **minutes per day**

PART 4: RECREATION, SPORT, AND LEISURE-TIME PHYSICAL ACTIVITY

This section is about all the physical activities that you did in the **last 7 days** solely for recreation, sport, exercise or leisure. Please do not include any activities you have already mentioned.

20. Not counting any walking you have already mentioned, during the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time **in your leisure time**?

_____ **days per week**

☐ No walking in leisure time → ***Skip to question 22***

21. How much time did you usually spend on one of those days **walking** in your leisure time?

_____ **hours per day**
_____ **minutes per day**

22. Think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **vigorous** physical activities like aerobics, running, fast bicycling, or fast swimming **in your leisure time**?

_____ **days per week**

☐ No vigorous activity in leisure time → ***Skip to question 24***

23. How much time did you usually spend on one of those days doing **vigorous** physical activities in your leisure time?

_____ **hours per day**
_____ **minutes per day**

24. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** physical activities like bicycling at a regular pace, swimming at a regular pace, and doubles tennis **in your leisure time**?

_____ **days per week**

☐ No moderate activity in leisure time → ***Skip to PART 5: TIME SPENT SITTING***

25. How much time did you usually spend on one of those days doing **moderate** physical activities in your leisure time?
_____ **hours per day**
_____ **minutes per day**

PART 5: TIME SPENT SITTING

The last questions are about the time you spend sitting while 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. Do not include any time spent sitting in a motor vehicle that you have already told me about.

26. During the **last 7 days**, how much time did you usually spend **sitting** on a **weekday**?

_____ **hours per day**
_____ **minutes per day**

27. During the **last 7 days**, how much time did you usually spend **sitting** on a **weekend day**?

_____ **hours per day**
_____ **minutes per day**

Appendix E

Description of the Research and Electronic Consent Form

UNIVERSITY OF HOUSTON
CONSENT TO PARTICIPATE IN RESEARCH

PROJECT TITLE: Effectiveness of an Undergraduate Core Curricula Physical Activity and Obesity Course on Students' Health Behaviors

You are being invited to participate in a research project conducted by Randi Weintraub Betts form the Educational Leadership – Higher Education and Cultural Studies Program at the University of Houston. This work is part of a dissertation under the supervision of Dr. Catherine Horn, Association Professor at the Educational Psychology Department, College of Education.

Your participation is voluntary and you may refuse to participate or withdraw at any time without penalty or loss of benefits to which you are otherwise entitled. You may also refuse to answer any question. You will be given the opportunity to skip items pertaining to illegal behavior on the survey. Additionally, there are no foreseeable risks of this particular study.

The purpose of this study is to determine if there is a change in personal health behaviors on students who complete an introductory lower level undergraduate physical activity and obesity course. Therefore this study is exclusively designed for students who are enrolled in Kin 1304: Public Health Issues in Physical Activity and Obesity at the University of Houston. Similarly, all student participants must be enrolled in this KIN 1304 course. If you are not enrolled in this KIN 1304 course, you are not eligible to participate in this particular study.

You will be one of approximately 1000 subjects to be asked to participate in this project. You will be given three surveys that should take approximately 90 minutes in total to complete each time. Therefore, total participation time would equal 180 minutes. The surveys will be distributed and accessible electronically at the beginning of the semester and again at the end of the semester. An example of a statement that you will be asked to respond to is "How often do you eat macaroni and cheese"?

Your participation in this project will be kept confidential within legal limits, and your responses will be anonymous. Your name will not be recorded on the survey. Your final grades will be abstracted and linked to the survey responses as part of the study. While you will not directly benefit from participation, your participation may help investigators evaluate whether this academic course could be used for development and implementation of new university wide programs to promote healthy behaviors. Participation in this project is voluntary and the only alternative to this project is non-participation.

The results of this study may be published in professional and /or scientific journals. It may also be used for educational purposes or for professional presentations. However, no individual subject will be identified.

If you have any questions regarding the study contact Randi Weintraub Betts at rweintraub@uh.edu or 713-743-5879. You may also contact Dr. Catherine Horn, faculty sponsor, at clhorn2@uh.edu or 713-743-5032.

ANY QUESTIONS REGARDING YOUR RIGHTS AS A RESEARCH SUBJECT MAY BE ADDRESSED TO THE UNIVERSITY OF HOUSTON COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS (713-743-9204).

Principal Investigator: Randi Weintraub Betts

Signature of Principal Investigator:

SUBJECT RIGHTS

1. I understand that informed consent is required of all persons participating in this project.

2. All procedures have been explained to me and all my questions have been answered to my satisfaction.

3. Any risks and/or discomforts have been explained to me.

4. Any benefits have been explained to me.

5. I understand that, if I have any questions, I may contact Ms. Randi Weintraub Betts at 713-743-5879. I may also contact Dr. Catherine Horn, faculty sponsor, 713-743-5032.

6. I have been told that I may refuse to participate or to stop my participation in this project at any time before or during the project. I may also refuse to answer any question.

7. ANY QUESTIONS REGARDING MY RIGHTS AS A RESEARCH SUBJECT MAY BE ADDRESSED TO THE UNIVERSITY OF HOUSTON COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS (713-743-9204). ALL RESEARCH PROJECTS THAT ARE CARRIED OUT BY INVESTIGATORS AT THE UNIVERSITY OF HOUSTON ARE GOVERNED BY REQUIREMENTS OF THE UNIVERSITY AND THE FEDERAL GOVERNMENT.

8. All information that is obtained in connection with this project and that can be identified with me will remain confidential as far as possible within legal limits. Information gained from this study that can be identified with me may be released to no one other than the principal investigator and his faculty sponsor. The results may be published in scientific journals, professional publications, or educational presentations without identifying me by name.

I HAVE READ (OR HAVE HAD READ TO ME) THE CONTENTS OF THIS CONSENT FORM AND HAVE BEEN ENCOURAGED TO ASK QUESTIONS. I HAVE RECEIVED ANSWERS TO MY QUESTIONS. I GIVE MY CONSENT TO PARTICIPATE IN THIS STUDY. I HAVE RECEIVED (OR WILL RECEIVE) A COPY OF THIS FORM FOR MY RECORDS AND FUTURE REFERENCE.

Peoplesoft ID #: _____

Do you consent?

- ☐ Yes
- ☐ No