Florida State University Libraries

2023

Improve Health through Understanding Nutrition Labels

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Abstract

Purpose: The purpose of this project is to assess college students' baseline understanding of nutrition labels and nutrition information, then use an educational intervention to expand their knowledge on nutrition labels and nutrition information and hopefully improve healthy food choices.

Methods: The project used a pre-test/post-test design and descriptive statistics for data analysis. A non-random convenience sample was utilized to obtain participants for this project and recruitment was by flyer.

Results: A total of 21 participants were included in the final sample of the DNP project. The overall results in correct responses when compared to pre intervention and post intervention responses remained consistent for knowledge of nutrition labels. There was an overall increase in correct responses when compared to pre intervention and post intervention responses for knowledge of nutrition information. The results showed that majority of the participants either strongly agreed or somewhat agreed that the educational intervention was an acceptable tool and that they felt more confident in using nutrition labels to make healthier food choices in the future.

Discussion: This project was effective in increasing knowledge of nutrition information in the college student population. The educational intervention was found to be an acceptable tool to deliver the information on nutrition labels and nutrition information and participants felt more confident in using nutrition labels to make healthier food choices in the future after participating in this project.

Conclusion: Considering the findings of this project, the nursing profession should incorporate education on nutrition labels and nutrition information into their practice to enhance their

patients' knowledge on this subject which can assist them in making healthier food choices leading to a decrease in obesity and the development of chronic diseases.

Improve Health through Understanding Nutrition Labels

Since 1975, the worldwide rate of obesity has tripled causing an epidemic (Swanson et al., 2016; World Health Organization [WHO], 2021). Obesity does not discriminate but instead affects all genders, age groups, and ethnicities across the world. Overweight and obesity can be described as a buildup of too much fat which can result in harm to a person's overall health (WHO, 2021). The World Health Organization (2021) reported that 39% of adults aged 18 years of age or over were categorized as overweight and 13% were obese. In 2016, the number of children and adolescents aged 5-19 years of age that were found to be either overweight or obese was over 340 million (WHO, 2021). Being overweight or obese puts one at an increased risk for developing chronic diseases. Unfortunately, the exact cause is unknown with many factors playing a significant part in the development of obesity (Apovian, 2016). The processing of foods has changed significantly in the last one hundred years due to technological advancements resulting in higher consumption of fats, simple sugars, salts, and calories (Apovian, 2016). The introduction of nutrition labels on all foods is dated back to the 1850's due to food born illnesses (The University of Texas at Austin: Department of Nutritional Sciences, 2018). In 1966, the United States Department of Agriculture (USDA) mandated that the ingredients be placed on nutrition labels (The University of Texas at Austin: Department of Nutritional Sciences, 2018). In 2022, nutrition labels will see Genetically Modified Foods (GMO) or bioengineered foods (Upham, 2022). Due to the long history of nutrition labels, it is imperative for the safety of consumers to understand nutrition labels and reduce any barriers to nutrition endeavors so that the labels can be a beneficial tool in the selection of healthy foods (Moore et al., 2018).

Background and Significance

Individuals experience many transitions throughout their lifetime. Entering college right out of high school is a major transition for young adults. This period of life is exciting, but critical due to the significant lifestyle changes they experience. These lifestyle changes include an increase in personal autonomy (which includes making their food and dietary decisions), an increase in responsibility, an increased need for time management skills, a change in surroundings, and a change in relationships (Abraham et al., 2018; Christoph et al., 2015). Due to these momentous lifestyle changes, these adolescents are at an increased risk for weight gain, which could potentially affect their health in adulthood and lead to chronic diseases. (Baum, 2016; Pope et al., 2017; Yahia et al., 2016). These chronic diseases include cardiovascular disease (hypertension, dyslipidemia, heart disease, and stroke), Type II Diabetes Mellitus, a variety of cancers, osteoarthritis, sleep apnea, mental illness (depression and anxiety), and having a low quality of life (Centers for Disease Control and Prevention [CDC], 2021). Causes of weight gain in college students include higher consumption of ultra-processed foods, alcohol, and sugared beverages, a sedentary lifestyle, physical inactivity, stress, depression, anxiety, and lack of sleep (Baum, 2016; Beudry et al., 2019; Chao, 2018; Chaput & Dutil, 2016; Cooper et al., 2018; Deforche et al., 2015; Janeway & Mistry, 2009; Luger et al., 2018). The American College Health Association (ACHA) found in the 2019 National College Health Assessment (NCHA) survey that over 37% of college students reported being overweight and 16% reported being obese (Manchester, 2021). The myth that college freshmen only gain weight in their first year of college has been discredited; undergraduate college students continue to experience weight gain throughout their four years of college (Pope et al., 2017).

Nutrition labels have been around since the late 1960s and have been a requirement on processed foods since the Food and Drug Administration (FDA) passed the Nutrition Labeling

and Education Act (NLEA) in 1990 (Dumoitier et al., 2019). Processed foods can be credited for the rise in overweight and obesity due to the addition of salt, sugar, and fat to extend their shelf life or to make them more appealing to the consumer (Cecchini & Warin, 2015; National Health Service, 2020). Interestingly, with the increased consumption of processed foods, an individual consumes 205 more calories in their daily caloric intake than they did in the 1960s (Apovian, 2016). Nutrition labels have been considered a strategy to help people select healthier foods and reduce unhealthy diets, which can lead to a decrease in chronic diseases (Cecchini & Warin, 2015). However, nutrition label knowledge and usage are lacking. Christoph and colleagues (2015) reviewed sixteen studies from college surveys in four different countries and found that only 36.5% of college students and young adults reported using food labels either always or often. Using nutrition labels as a preventive tool to educate college students about the foods they are consuming could help them form behaviors that can impact their food choices and diet quality later in life, resulting in a halt to the trend of obesity (Christoph et al., 2015; Moore et al., 2018).

Problem Statement

Obesity is on the rise in all age groups across the world, but the age group that sees this trend escalate the quickest is the college student population due to the major lifestyle changes they encounter (Yan & Harrington, 2020). Many factors contribute to college students' weight gain with research suggesting that nutrition labels could be instrumental in combating this growing trend. There have been many research studies that evaluate whether college students use nutrition labels when selecting foods, but little is known about how well this population understands nutrition labels.

Purpose of the Project and Aims

The purpose of this project is to assess college students' baseline understanding of nutrition labels and nutrition information, then use an educational intervention to expand their knowledge on nutrition labels and nutrition information and hopefully improve healthy food choices. The primary aims of the DNP project include:

1. Determine if there is an increase in the knowledge of nutrition labels in participants after viewing an educational intervention.

2. Determine if there is an increase in the knowledge of nutrition information in participants after viewing an educational intervention.

3. Examine if the educational intervention is an acceptable tool to deliver the information on nutrition labels and nutrition information.

Clinical Question

Among college students at a major university, does an educational intervention increase their knowledge and understanding of nutrition labels and nutrition information thus promoting healthy food choices?

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Review of Literature

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A search of the literature was completed by using the following electronic databases: PubMed, CINAHL, EBSCOhost, and Google Scholar. The terms food label and nutrition label were used interchangeably within the literature search. The terms that were used in the literature search included: nutrition label(s), food label(s), college students, undergraduate college students, graduate college students, understanding nutrition label(s), knowledge of nutrition label(s), understanding food label(s), knowledge of food label(s), college students understanding of nutrition label(s), college students knowledge of nutrition label(s), college students understanding of food label(s), college students understanding of food label(s), reason for college

students weight gain, "freshman 15", college students dietary patterns, and primary care provider's (PCP) knowledge about nutrition label(s). The inclusion criteria were the studies carried out between 2016 and 2022 for them to be considered appropriate. An exemption was made by using one article published in 2004, one article published in 2005, one article published in 2007, one article published in 2009, one article published in 2011, one article published in 2013 two articles published in 2014, and four articles published in 2015 due to their relevance of the topic.

The "Freshman 15" Myth

Since the 1980s, research has found that college students gain a significant amount of weight in their first year of college (Pope et al., 2017; Vadeboncoeur et al., 2015; Vadeboncoeur et al., 2016). The term where college freshmen gain fifteen pounds in their first year of college has become known as the "freshman 15". However, the "freshman 15" myth has been discredited by many (Baum, 2016; Pope et al., 2016; Vadeboncoeur et al., 2016). Instead, many researchers have found that college freshmen gain anywhere from one to ten pounds, not the fifteen that everyone once accepted as true (Baum, 2016; Pope et al., 2017; Vadeboncoeur et al., 2016). Baum (2016) found that college freshmen only gain one pound a year and will gain more weight in that year if they are from a lower socioeconomic background. Whereas in one study (Vadeboncoeur et al., 2016) that followed 215 first-year college students in England over a thirty-four-week timeframe, it was found that a mean weight gain of 7.6 pounds was gained by 51% of the participants by the end of the academic year. However, it was also found in the same study that 25% of the participants lost a mean weight of 7 pounds (Vadeboncoeur et al., 2016). Deforche and colleagues (2015) found that from the final year of high school to the second year of college, female students gained 4.2 pounds and male students gained 9.2 pounds. Intriguingly

though, Pope et al. (2017) went on to indicate that weight gain does not only occur in the freshman year of college but is found to occur throughout the four years of college. Eighty-six college students were studied from their freshmen to senior year of college and the mean weight gain was 9.64 pounds at the end of their senior year (Pope et al., 2017). Even though weight loss can occur during college, evidence shows that weight gain is more common in this population.

Factors Affecting Weight Gain in Undergraduate College Students

College is a very exciting time for every individual to experience. There are many new experiences one gets to partake in. The first year of college is such a critical transition period for many adolescents. These young adults are going from living at home with their parents or caregivers, who ultimately make the decisions for them, to making decisions autonomously while living in dorms or apartments. During this time, most young adults are living independently for the first time in their life. Significant lifestyle changes occur during this first year resulting in these young adults being put at an increased risk for becoming overweight or obese (Abraham et al., 2018; Baum, 2017; Pope et al., 2017; Yan & Harrington, 2020). Many young adults have an increase in personal autonomy (including making their dietary decisions), an increase in responsibility, and an increased need for time management skills (Abraham et al., 2018; Christoph et al., 2015). This transitional period forces adolescents to start forming their routines and preferences, which can continue into adulthood (Christoph et al., 2015; Pope et al., 2017; Swanson, 2016).

Ultra-Processed Foods, Alcohol, and Sugared Beverages

Based on a 2,000 calorie per day diet for adults aged 19-59, the 2020-2025 Dietary Guidelines for Americans recommend that adults consume two and a half cups of vegetables, two cups of fruits, six ounces of grains, three cups of dairy, five and a half ounces of protein

foods, twenty-seven grams of oils, and two hundred and forty kilocalories for other uses (Neuhouser, 2019; U.S. Department of Agriculture & U.S. Department of Health and Human Services, 2020). Establishing healthy eating habits during college is critical (Abraham et al., 2018). However, if a decrease in healthy eating habits and an increase in weight gain is achieved during this period, it is predicted that these habits will follow adolescents into adulthood which can be challenging to change once established (Abraham et al., 2018; Pope et al., 2017; Swanson, 2016). Unfortunately, college students do not consume these daily recommendations. Since this is the first time that most college students are living away from home, many develop poor eating habits due to university dining halls, access to unhealthy foods, the consumption of a limited variety of foods, an increase in sugar-sweetened beverages, and an increase in alcohol consumption (Baum, 2016; Luger et al., 2018; Swanson, 2016; Vadeboncoeur et al., 2016). Beaudry and colleagues (2019) found that during the first year of college, male and female students experience negative changes in their nutritional intake and body weight indicating that increased adiposity is associated with poor diet choices. The same study also found a reduced intake of healthy foods and increased consumption of unhealthy foods by the participants (Beudry et al., 2019). Deforche and colleagues (2015) found that a contribution of weight gain in females was due to a decrease in fruit and vegetable intake. One study (Brown et al., 2014) found that college students would select foods out of a vending machine that was not centered on the nutritional value but instead based on cost, convenience, flavor, and time. However, Yahia (2016) found that the college students who had more knowledge in nutrition were more likely to ingest less unhealthy fats and cholesterol. Many college students that live on campus could be more likely to eat in the dining halls that the university provides. Unfortunately, these dining halls are more likely to have a limited variety of foods and could include foods that are either

fried or high in fat (Baum, 2016). In college, alcohol is more easily available to college students. Alcohol can cause weight gain due to it being a macronutrient that supports the storage of fat and increases an individual's appetite (Baum, 2016). Beudry and colleagues (2019) also discovered that an increase in beer and liquor was found to increase adiposity due to poor diet choices. Weight gain in young college men is contributed to the increase in the consumption of alcohol (Deforche et al., 2015). Any liquid that is sweetened with added sugars can be a sugared sweetened beverage. Sugared sweetened beverages can also include sodas, fruit-flavored drinks, and sports drinks (Vilaro et al., 2018). In 2013-2014, 65.4% of 12–19-year-olds (which college students fall into this category) were found to consume sugared sweetened beverages (Bleich et al., 2017). Luger and colleagues (2018) discovered a positive association between sugar-sweetened beverages and obesity in children and adults, leading to the conclusion that the consumption of these beverages should be reduced ultimately encouraging a healthier drinking option, such as water. College students need to be more aware of their diet, as these unhealthy habits could persist into adulthood.

Sedentary Lifestyle & Physical Inactivity

Becoming overweight or obese is related to an imbalance between too many calories being consumed and not enough calories being depleted due to increased consumption of foods that are high in sugars and fats and a decrease in physical activity (WHO, 2021). A combination of a sedentary lifestyle, physical inactivity, and an unhealthy diet can result in being overweight or obese (Hruby & Hu, 2016; WHO, 2021). These three elements are synergistic and unfortunately can be found in the undergraduate college student population. First-year college students, including the years that follow, experience a drastic decrease in physical activity due to an increase in a massive sedentary activity, which is studying (Baum, 2016). Deforche and

colleagues (2015) found a decrease in certain sedentary behaviors, like watching TV and playing computer games, but found an increase in other sedentary behaviors, like using the internet and studying. However, the study also found that a greater increase in BMI was related to a high decrease in sport participation, a high increase in using the internet, and a low increase in studying (Deforche et al., 2015).

Stress, Depression, and Anxiety

College is a stressful time in a young adult's life in which they can also experience depression and anxiety, resulting in contributions to weight gain (Bhujade, 2017; Janeway & Mistry, 2009; Swanson, 2016; Vadeboncoceur, 2015). Reports have shown that there will be anywhere from 10% to 20% of college students suffering from either stress, depression, or anxiety (Bhujade, 2017). Stress is a disruption of homeostasis that affects dietary intake and food selection (Chao, 2018). Undergraduate college students experience stress due to the sudden change of high school, being away from home, fear of academic failure, time management, fear of not making friends, and the struggle to find themselves (Bhujade, 2017). Choi (2020) found that if students who perceived their stress as high were more likely to engage in unhealthy dietary behaviors when compared to those with low perceived stress. However, there is mixed evidence for a relationship between stress and weight gain in college students, but a positive relationship has been found that connects stress to abnormal weight-related behaviors (binge eating and emotional eating) and an unhealthy dietary intake (Lyzwinski et al., 2018). Anxiety and depression are emotions that one feels. Anxiety is characterized by feelings of tension and nervousness whereas depression is when one feels unmotivated or discouraged. Many students experience these emotions at one point in their college life. Janeway and Mistry (2009) pointed out that college weight gain can spiral out of control in such a short amount of time due to the

hard to manage, vicious cycle of eating and depression. As weight gain increases and self-confidence drops, college students become more aware of the weight they have gained and their energy for studying is decreased due to having depression or anxiety about the weight gain which leads to them feeling like they have lost control (Janeway & Mistry, 2009). Unfortunately, this outlook can lead to further eating to relieve these feelings of depression or anxiety (Janeway & Mistry, 2009). In a study by Wenjuan and colleagues (2020), it was found that anxiety turned out to be the most predominant and serious psychological issue for college students, particularly the female population, whereas depression was found to be higher among male college students.

Lack of Sleep

Sleep is important in maintaining an individual's physical and mental health. One's sleep needs vary between one individual to another, but the basic requirements to healthy sleep include sufficient duration, regularity, good quality, and the lack of sleep disruptions and disorders (Chaput & Dutil, 2016). Unfortunately, the college student population is deprived of a healthy sleep pattern due to studying late at night (Chaput & Dutil, 2016; Janeway & Mistry, 2009). Cooper and colleagues (2018) found that sleeping less than seven hours per night made individuals more susceptible to having a greater BMI and developing obesity than the individuals who slept beyond seven hours per night. Weight gain and an unhealthy diet have been linked to a lack of sleep in undergraduate college students' (Chaput & Dutil, 2016; Rauber et al., 2020). An increase in food intake, a poor-quality diet, and obesity have been linked to a short duration of sleep, a poor quality of sleep, and late bedtimes (Chaput & Dutil, 2016). Rauber and colleagues (2020) also made the connection in those who engaged in physical activity and had higher levels of sleep duration were found to have a decrease in obesity.

Graduate Students: Stress, Sleep, & Nutrition

Graduate school can be defined as an academic institution provided by universities that offer advanced programs beyond the routine four-year bachelor's degree. In the Fall of 2020, there were 3.1 million students enrolled in graduate degree programs in the United States with 61% (1.9 million) of the students being female and 39% (1.2 million) of the students being male (National Center for Education Statistics [NCES], 2022). Graduate students experience a multitude of stressors when starting their graduate program journey. These include professional, personal, and academic stressors (Offstein et al., 2004). When graduate students are forced to balance professional and academic stressors with their family responsibilities, they can start to neglect their physical and mental health (Grube et al., 2005; Mazzola et al., 2011).

Studies have shown that when compared to undergraduate students, graduate students report higher levels of stress (Wyatt & Oswalt, 2013). According to the American College Health Association's National College Health Assessment in the Spring of 2019, 12% of males and 17% of females reported feeling a tremendous amount of stress in the last twelve months (2019). Another study found that out of 223 graduate students, 48.9% felt stressed and 24.7% felt very stressed (Oswalt & Riddock, 2007). Sleep is an important quality in life. Allen and colleagues (2021) found that graduate student participants slept on average of 6.4 hours per night and only 62% reports their quality of sleep was good. Proper nutrition is imperative for the body to function at its best. It is a reasonable assumption that with the amount of stress graduate students experience, their nutritional intake is not up to par. Rummell (2015) discovered that 50% of graduate students reported an increased appetite and 38.4% reported change in weight. According to the American College Health Association's National College Health Assessment in the Spring of 2019, 7% of males and 8% of females reported consuming five or more servings of fruits and vegetables per day whereas 6% of males and 4% of females report no servings of fruits

or vegetables at all (2019). Oswalt & Riddock (2007) explored coping strategies in relation to stress in 223 graduate student participants. Interestingly, their results showed that 68.5% reported to eating comfort foods and 24.7% reported to overeating in coping with their stress (Oswalt & Riddock, 2007).

Nutrition Education by Primary Care Providers

The current college student population should have been educated on nutrition whenever they were in elementary school or at yearly doctor's appointments with the help of the Food Pyramid (Abraham et al., 2018). Since 2011, the U.S. Department of Agriculture replaced the Food Pyramid with MyPlate which is a visual food guide to help incorporate fruits, vegetables, protein, grains, and dairy to make a nutritious and balanced meal (Abraham et al., 2018; U.S. Department of Agriculture & U.S. Department of Health and Human Services, 2020). However, recent research is suggesting that adolescents do not receive the proper education they need when it comes to nutrition, which can result in childhood or adulthood obesity (Crowley et al., 2019; Hargraves, 2019; Kaar et al., 2019). Hargraves (2019) found that two-thirds of Nurse Practitioners in Florida reported providing pediatric obesity screening, prevention, and treatment either most of the time or always in their practice. In another article, it was reported that pediatric providers were optimistic about their contribution to nutrition counseling, but also reported being easily frustrated with providing nutrition care and ultimately devoting a decreased time to nutrition counseling due to their alleged barriers (Kaar et al., 2019). The perceived barriers included lack of reimbursement of their time, a decreased success in their counseling due to a lack of motivation of the patients and families, and the provider's deficit of nutrition knowledge (Crowley et al., 2019; Kaar et al., 2019). For college students to consume healthy foods and have

a nutritious diet, they must be properly educated at an early age on the importance of healthy eating.

Nutrition Labels

Since the passing of the Nutrition Labeling and Education Act (NLEA) in 1990 by the FDA, nutrition labels can be found on all processed foods (Dumoitier et al., 2019). These processed foods include breads, cereals, canned and frozen foods, snacks, desserts, drinks, and many others (Dumoitier et al., 2019; U.S. Food & Drug Administration, 2021). The following information, which is based on a 2,000 daily calorie diet for the percentage of daily recommended value, has been mandatory on all nutrition labels since 1994 to include: serving size, calories, servings per container, calories from fat, macronutrients (carbohydrates {dietary fiber and sugar}, fat {saturated fat and trans-fat}, and protein), cholesterol, sodium, and micronutrients (calcium, iron, vitamin A, and vitamin C) (Dumoitier et al., 2019; U.S. Food & Drug Administration, 2020). Twenty-two years later in 2016, the FDA made the following changes to the nutrition label: calories from fat were removed, "added sugars" was included to distinguish the natural sugars from the added sugars, and vitamins A and C were replaced with vitamin D and potassium (Dumoitier et al., 2019; U.S. Food & Drug Administration, 2020). The FDA has made recommendations on how to read nutrition labels. Looking at the percent of daily value first is beneficial; if the percent of daily value is 5% or less of a nutrition then this is considered to be low whereas if the percent of daily value is 20% or higher then this is considered to be high (U.S. Food & Drug Administration, 2020). Choosing foods that are higher in dietary fiber, Vitamin D, calcium, iron, and potassium and lower in saturated fat, sodium, and added sugars are recommended (U.S. Food & Drug Administration, 2020). Even though nutrition labels have been used on all processed foods for over thirty years, research has found that more

education on nutrition labels is needed to increase the selection of healthy foods and in return could decrease the growing trends of obesity (Dumoitier et al., 2019; Mhurchu et al., 2017; Moore et al., 2018; Neuhouser, 2019; Odaman et al., 2019).

Research on nutrition labels is shown to be widely explored in the college student population. After analyzing many research articles, the conclusion has been made that many undergraduate college students do not use nutrition labels on a regular basis (Christophe et al., 2015; Odaman et al., 2019). Odaman and colleagues (2019) found that 50% of undergraduate college students did not read nutrition labels while Christoph and colleagues (2015) discovered that 36.5% of college students and young adults reported only using nutrition labels either always or often. However, in one study it was found that the younger generation is more likely to pay attention to nutrition labels than the older generation (Soederberg-Miller et al., 2016). Education on nutrition labels is important. The more education one receives on nutrition labels, the better they will be equipped with using nutrition labels to better their overall health. Moore and collegues (2018) analyzed seventeen studies and found that all of them reported having a significant improvement in their understanding or use of nutrition labels after a teaching session occurred. Not only is it beneficial to understand nutrition labels when selecting foods, but this information is important for one's overall health in the battle against obesity and chronic diseases (Cecchini & Warin, 2015; Cha et al., 2014; Neuhouser, 2019). Managing one's diet and changing their behavior on food choices has been the best non-invasive intervention to date (Apovian, 2016). Both Cecchini and Warin (2015) and Neuhouser (2019) indicated that nutrition labels can create healthy diet patterns while reducing unhealthy diet patterns, leading to a decrease in obesity which can reduce the risk for developing chronic diseases like heart disease, cancer, and diabetes.

Literature Gaps

The literature review presented reveals various factors related to college students' weight gain as well as several gaps that are correlated with nutrition label knowledge and understanding among college students. Barriers that primary care providers face when providing nutrition education to adolescents were also mentioned which exposed a reason as to why college students' do not utilize nutrition labels when selecting foods. There have been many studies that have examined whether college students' read or use nutrition labels. However, further exploration is warranted on the topic of assessing college students' baseline knowledge and understanding of nutrition labels and nutrition information then using an educational intervention to improve their cognizance. This Doctor of Nursing Practice (DNP) project hoped to address these gaps to determine if an educational intervention will improve college students' knowledge and understanding of nutrition labels and nutrition information.

Theoretical Framework

The Health Belief Model was used as the theoretical framework for this project to determine college students' baseline understanding of nutrition labels and nutrition information, then use an educational intervention to expand their knowledge and understanding of nutrition labels and nutrition information. The Health Belief Model was developed in the 1950s by a group of social psychologists and is a non-nursing theory in which an individual perceives a threat related to a health problem and adapts behaviors that can prevent or manage the problem (McEwen & Wills, 2019). These psychologists wanted to focus on improving public health and increasing the use of preventive services in healthcare (Kim & Kim, 2020). Even though the Health Belief Model is not a nursing theory, its' use in nursing research and practice has been significant with more than

130 articles published in nursing literature within the last decade that have based their framework on using this model (McEwen & Wills, 2019).

The Health Belief Model consists of six concepts: 1) perceived susceptibility, 2) perceived severity, 3) perceived benefits, 4) perceived barriers, 5) cues to action, and 6) self-efficacy (McEwen & Wills, 2019). Each of these concepts are vital to the Health Belief Model and play a significant role. Perceived susceptibility refers to one's own belief of developing a health problem (McEwen & Wills, 2019). Perceived severity is one's opinion of how serious the health problem can be and the consequences that follow (McEwen & Wills, 2019). Perceived benefits are described as one's opinion of the effectiveness of preventive measures and actions taken to reduce the threat (McEwen & Wills, 2019). Perceived barriers are one's view of the hurdles one must face to overcome the threat (McEwen & Wills, 2019). Cues to action is when an individual is triggered and realizes that they are conscious of a health threat (McEwen & Wills, 2019). The sixth concept, self-efficacy, was not introduced until 1988 and is one's own belief that they have the ability to change the behaviors that put them at risk for an unhealthy life (McEwen & Wills, 2019). Each concept of the Health Belief Model can be applied to the DNP project (McEwen & Wills, 2019):

1. **Perceived susceptibility** refers to the college student needing to consider the possibility of becoming overweight or obese, which can lead to the development of chronic disease(s).
2. **Perceived severity** refers to the college student's realization that if they continue an unhealthy diet, with little attention to nutrition labels and nutrition information, it can lead to one or more chronic diseases. Once the diagnosis of a chronic disease has been made and complications develop, this could potentially lead to their death.
3. **Perceived benefits** refer to increasing the college student's knowledge and understanding of nutrition labels and nutrition information so that they can choose healthier foods. The hope is that the educational intervention will result in an overall healthier lifestyle and decrease their risk of becoming overweight or obese, which can lead to the development of chronic diseases in the future.
4. **Perceived barriers** refer to the college student not wanting to make the necessary changes in the selection of healthier foods, learning to understand and improve their

knowledge of nutrition labels and nutrition information is too hard, experience self-doubt when it comes to learning new information about nutrition labels and nutrition information, the belief that learning nutrition labels and nutrition information is too overwhelming, saying that one is too busy with daily activities to improve their knowledge of nutrition labels and nutrition information, and receive negative criticism from family or friends about improving their knowledge of nutrition labels and nutrition information.

5. **Cues to action** refers to the educational intervention to educate the college student regarding the importance of nutrition labels, nutrition information, and choosing healthier foods.

6. **Self-efficacy** refers to the college student applying their nutrition label and nutrition information knowledge to selecting healthier food choices which can be beneficial to their health now and in the future.

The Health Belief Model is a strong foundation for this DNP project because it can make college students aware of their risk for becoming overweight or obese, which can lead to the development of chronic disease(s) and provide guidance in increasing their knowledge and understanding of nutrition labels and nutrition information. This model is a good basis in which it can explain the reason behind health-related behaviors, identify health behaviors that need to be improved, and create strategies to change health-related behaviors for the better (McEwen & Wills, 2019).

Methodology and Implementation

Design

This project is a quality improvement for the Health and Wellness Center at Florida State University (Appendix A). The project used a pre-test/post-test design and descriptive statistics for data analysis. Information gathered from the literature review was used to present material of nutrition labels and nutrition information through an educational intervention. Participant's knowledge of nutrition labels and nutrition information was assessed before and after the educational intervention via survey. The pre-test/post-test design compared participant's

knowledge of nutrition labels and nutrition information at baseline then again after the educational intervention.

Participants

To obtain participants for this project, a non-random convenience sample was utilized. The participants of this project were college students that attend Florida State University in Tallahassee, Florida. Inclusion criteria for each student to participate included 1) are over 18 years of age, 2) is a student at Florida State University, 3) can read and write in English, 4) have basic cell phone skills that includes knowledge of a QR code, and 5) ability to follow directions in an online survey. Exclusion criteria for each student to participate included 1) are under 18 years of age, 2) is not a student at Florida State University, 3) cannot read and write in English, 4) do not have basic cell phone skills, 5) cannot follow directions in an online survey, and 6) if they have a past eating disorder it is encouraged not to participate due to nutrition labels being a possible trigger for their illness. Demographic information was obtained on each participant. To recruit participants to partake in the project, a flyer (Appendix B) was advertised at the Health and Wellness Center, the College of Nursing, and was dispersed to each dorm hall by the resident advisors (RA). Recruitment for the project also included the flyer being advertised on the College of Nursing's social media accounts, Facebook and Instagram, and on FSU's Center for Health Advocacy & Wellness (CHAW) program's social media account, Instagram. The flyer explained the purpose of the project and a QR code, as well as a website link, was included on the flyer for access to the survey (via Qualtrics). Participation in the project was completely voluntary and consent for participation was obtained. The incentive for participation was a chance to win one of two $50 Publix gift cards via a drawing. Participants must have completed the entire survey if they wish to be considered for the drawing. At the end of the survey,

participants were instructed to email the primary investigator if they were interested in being considered for the drawing. Participants were informed that any information provided is confidential, and their email address was only used in the consideration of the drawing.

Setting and Resources

Collection of data occurred online through Qualtrics, after approval from Florida State University's Institutional Review Board (IRB) in May 2022. A flyer with a QR code and website link, which directed participants to the survey that is linked to Qualtrics, was used. Flyers were advertised at multiple locations at Florida State University (the Health and Wellness Center, the College of Nursing, and dorm halls), on two of FSU's College of Nursing social media accounts, Instagram and Facebook, and on FSU's Center for Health Advocacy & Wellness (CHAW) program's social media account, Instagram. Participation in the project was completely voluntary. Upon completion of the survey, participants were instructed to send the primary investigator an email if they were interested in a chance to win one of two $50 Publix gift cards via a drawing.

Instruments/Tools

The instruments and tools used for this project were a pre-test, an educational intervention, and a post-test. The educational intervention had information on how to understand and use nutrition labels to enhance the learner's knowledge, information on each nutrient included on the nutrition label, education on chronic health conditions, and recommendations in healthy eating. The pre-test gathered baseline knowledge and the post-test assessed the participant's knowledge after the intervention was presented. Prior to beginning the pre-test, a cover page (Appendix C) and consent form (Appendix D) was provided. The cover page explained the project and the consent form page explained the risks/benefits of the project. The

pre-test, educational intervention, and post-test were developed by the primary investigator of the

project and evaluated by the major professor and site director for content validity. The pre-test

and post-test both use a nutrition label (Appendix E). The nutrition label was created using a free

nutrition label generator from the website: https://www.onlinelabels.com/tools/nutrition-label-

generator.

The pre-test (Appendix F) consisted of two sections: 1) demographics and 2) knowledge

of nutrition labels and knowledge of nutrition information. Section one included eleven

demographic questions which included gender, age, race, year of education, area of study their

current major is in, hours per week they work, current living arrangements, if the participant

currently experiences a chronic medical condition, and if they have ever received education

about nutrition labels. Section two consisted of two parts: 1) knowledge of nutrition labels and 2)

knowledge of nutrition information. Part 1 consisted of eight questions and gathered information

regarding participant's baseline knowledge of nutrition labels using either one correct answer or

true/false. A nutrition label was available in this section for the participants to answer the

questions. Part 2 consisted of six questions and gathered information regarding participants

baseline knowledge of nutrition information using either one correct answer or true/false. The

pre-test took approximately 7 minutes to complete.

The post-test (Appendix G) consisted of two sections: 1) evaluate knowledge of nutrition

labels and 2) evaluate knowledge of nutrition information. Section one evaluated knowledge of

nutrition labels after the educational intervention was presented. Eight questions were asked in

the first section using either one correct answer or true/false. Section two evaluated knowledge

of nutrition information after the educational intervention was presented. Six questions were

asked in the second section using either one correct answer or true/false. The post-test was

concluded with three questions asking if the educational intervention was an acceptable tool to deliver the information on nutrition labels and nutrition information, if the participant feels more confident in using nutrition labels to make healthier food choices in the future, and a comment box regarding recommendations for the educational intervention. The post-test took approximately 5 minutes to complete.

Intervention and Data Collection

The educational intervention was a PowerPoint presentation created by the primary investigator (PI) and reviewed by her faculty advisor and the Director of the CHAW. The goal of the educational intervention (Appendix H) was to provide an efficient way to deliver the information to the participant to encourage recollection and understanding of the information that is being delivered. The educational intervention included examples of a nutrition label, explaining what is on the nutrition label, explaining how to use and understand the nutrition label, an explanation of each nutrient on the nutrition label, review chronic health conditions, give recommendations in healthy eating, and provided resources if more information was sought. The educational intervention included a voiceover that was recording by the primary investigator and was approximately 12 minutes in duration.

The project intended to determine if there is an increase in the knowledge of nutrition labels in participants after viewing an educational intervention, determine if there is an increase in the knowledge of nutrition information in participants after viewing an educational intervention, and examine if the educational intervention is an acceptable tool to deliver the information on nutrition labels and nutrition information. Data was collected from July 2022 until October 2022. The project was advertised via a flyer with a QR code and website link. The flyer was advertised at multiple locations at Florida State University (the Health and Wellness

Center, the College of Nursing, and dorm halls), on two of FSU's College of Nursing social media accounts (Instagram and Facebook) and on FSU's CHAW program's social media account (Instagram). If participants were interested, they could scan the QR code or use the website link that is included on the flyer. The QR code and website link is linked to Qualtrics, which allowed participants to complete the pre-test, educational intervention, and post-test. Results of the surveys were collected by the primary investigator using Qualtrics.

Implementation Plan

The project started with a flyer being advertised at multiple locations at Florida State University (the Health and Wellness Center, the College of Nursing, and dorm halls), on two of FSU's College of Nursing social media accounts (Instagram and Facebook), and on FSU's CHAW program's social media account (Instagram). College students were the main participants targeted for this project. Those interested in participation could scan the QR code or use the website link that was included on the flyer. The participants were directed to Qualtrics. The first page viewed by participants were two paragraphs explaining the project. Participants would then click the next arrow which directed them to the second page. The second page included informed consent as well as a notification of participants' risks and benefits associated with participation in the project. If participants agreed to participation, they would click the next arrow to begin the pre-test. If they decided not to participate, then they were instructed to close the webpage. The full survey (pre-test, educational intervention, and post-test) could be completed in approximately 25 minutes. The flyers were advertised from July 2022 until October 2022. In October 2022, the QR code and website link on the flyers were disabled. Upon completion of data collection and disablement of the QR code and website link, the primary investigator collected all survey results using Qualtrics.

Human Subject and Informed Consent

Prior to the collection of data, this project was deemed as non-human research therefore an IRB exemption was approved by Florida State University's Institutional Review Board (IRB). Participants were recruited to partake in this project by the advertisement of a flyer. If participants agreed to participation in the project, then they autonomously scanned the QR code or used the website link on the flyer to complete the survey. Consent for participation in the project was obtained if the participant started the survey. If the participant wished not to participate, then they would not start the survey. Risks associated with this project was minimal. The participants could have experienced anxiety while participating in the project regarding their own mindset of nutrition labels and nutrition information or could have been triggered by the nutrition labels and nutrition information if they have experienced an eating disorder in the past but had the option to stop participating at any time in the project if they wished. The main benefit of the project is that the participant would gain knowledge of nutrition labels and nutrition information that will better assist them with food choices that could lead to a better diet quality throughout their life. Participants were explained that this project is completely anonymous, and that they would not be asked to provide their name or any identifiable information that can be traced back to them. Upon full completion of this project, participants would be eligible to win one of two gift cards by sending the primary investigator an email saying that they wanted to be included in the drawing. This project was completely confidential, and the participants email address was only used for the purpose of the drawing. The responses obtained from this project were stored on a password protected computer, as well as protected within the Qualtrics survey software, that was kept in a locked office.

Data Analysis

Data was analyzed using Microsoft Office Excel Software 2021. Certain demographic variables were analyzed using the number and percentage of participants included in the study. The demographic variables included gender, age, race, education year, area of study, hours per week worked, current living arrangements, chronic medical conditions, and past education on nutrition labels.

Aim #1 explored whether there was an increase in the knowledge of nutrition labels in participants after viewing an educational intervention. Descriptive statistics was used to compare pre-test/post-test participant responses of nutrition labels after an educational intervention. There was a total of eight questions based on nutrition labels that were included on the pre-test and post-test. The eight pre-test questions were analyzed separately to incorporate the number and percent of participants that chose the correct and incorrect answer. After the educational intervention, the eight post-test questions were analyzed separately to incorporate the number and percent of participants that chose the correct and incorrect answer.

Aim #2 explored whether there was an increase in the knowledge of nutrition information in participants after viewing an educational intervention. Descriptive statistics was used to compare pre-test/post-test participant responses of nutrition labels after an educational intervention. There was a total of six questions based on nutrition labels that were included on the pre-test and post-test. The six pre-test questions were analyzed separately to incorporate the number and percent of participants that chose the correct and incorrect answer. After the educational intervention, the six post-test questions were analyzed separately to incorporate the number and percent of participants that chose the correct and incorrect answer.

Aim #3 explored whether the educational intervention was an acceptable tool to deliver the information on nutrition labels and nutrition information. There was a total of three questions in

the post-test evaluating if the educational intervention was an acceptable tool to deliver the information on nutrition labels and nutrition information. Two of the questions were Likert style and one of the questions was a comment box regarding recommendations for the educational intervention. The Likert style questions utilized summary statistics for data analysis using minimum, maximum, and median as well as the number and percent of participants who answered each question. The recommendations for the educational intervention were reviewed in the discussion section.

Results/Findings

Demographics

A total of 93 individuals accessed the survey through either a QR code or website link displayed on the flyer. A total number of 51 participants completed the pre-test and a total number of 23 individuals completed the post-test. After data review was performed, individuals who were a student at Florida State University, 18 years of age or older, and completed the informed consent, pre-test, educational intervention, and post-test were included in the final sample. There was a total of 21 participants who were included in the final sample of the DNP project. There was a 41.18% completion rate for the DNP project.

The demographic data included gender, age, race, year of education, area of study of current major, hours worked per week, current living arrangements, living with a chronic medical condition, and previous education about nutrition labels. The demographic data is illustrated in Table 1. Regarding gender, there were 6 participants (28.6%) who reported being male and 15 participants (71.4%) who reported being female. There were multiple responses for age. Majority of the participants identified as White/Caucasian (n= 17, 81%), one person identifying as Black/African American (n=1, 4.8%), one person identifying as Hispanic/Latino

(n=1, 4.8%), and two people identifying as Asian (n=2, 9.5%). Year of education among

participants varied with freshman (n=5, 23.8%), sophomore (n=0, 0%), junior (n=1, 4.8%),

senior (n=6, 28.6%), and graduate student (n=9, 42.9%). The participants were from various

majors. Regarding hours worked per week, responses included I do not work (n=8, 38.1%), 1-

10hrs (n=4, 19%), 11-20hrs (n=4, 19%), 21-30hrs (n=0, 0%), 31-40hrs (n=4, 19%), and more

than 40hrs (n=1, 4.8%). Current living arrangement responses included live in a dorm (n=4,

19%), live at home with parents (n=4, 19%), live off campus alone (n=0, 0%), live off campus

with roommates or significant other (n=10, 47.6%), and other (n=3, 14.3%). The responses for

other included home with husband (n=1), live off campus with my family (n=1), and on-campus

apartment hall (n=1). There were 3 participants (14.3%) who reported that they were currently

living with a chronic medical condition (Type II Diabetes Mellitus (n=1, 25%), Hypertension

(High Blood Pressure) (n=1, 25%), Overweight/Obesity (n=1, 25%), and other (n=1, 25%)). The

other 18 participants (85.7%) reported that they were currently not living with a chronic medical

condition. In the category of previous education about nutrition labels, the responses included

yes, from my doctor (n=2, 9.5%), yes, from a nutritionist (n=0, 0%), yes, from an online source

(n=6, 28.6%), no (n=7, 33.3%), and other (n=6, 28.6%). The responses for other included college

nutrition courses.

Table 1. *Participant Demographic Information, History of Chronic Medical Conditions, &*

History of Education on Nutrition Labels

Table 1: Participant Demographic Information, History of Chronic Medical Conditions, & History of Education on Nutrition Labels		
Question	Number (n)	Percent (%)
Are you currently a student at Florida State University?		
Yes	21	100
No	0	0

Total	21	100
Which gender do you identify yourself as?		
Male	6	28.6
Female	15	71.4
Other	0	0
Total	21	100
What is your age?		
18	4	19
20	2	9.5
21	3	14.3
22	1	4.8
23	1	4.8
24	2	9.5
26	1	4.8
29	1	4.8
30	2	9.5
31	1	4.8
32	1	4.8
34	2	9.5
Total	21	100
Which race do you identify yourself as?		
White/Caucasian	17	81
Black/African American	1	4.8
Hispanic/Latino	1	4.8
Asian	2	9.5
Native American	0	0
Other	0	0
Total	21	100
In what year of education are you in?		
Freshman	5	23.8
Sophomore	0	0
Junior	1	4.8
Senior	6	28.6
Graduate Student	9	42.9
Total	21	100
In what area of study is your current major?		
Arts, Architecture, & Applied Arts	0	0
Business & Economics	0	0
Earth & Environmental Sciences	1	4.8
Engineering & Applied Sciences	1	4.8
Health & Biological Sciences	8	38.1
History & Archaeology	1	4.8
Journalism & Communications	1	4.8

Languages & Literatures	1	4.8
Law, Politics, & Government	0	0
Music, Dance, Drama, & Film	0	0
Philosophy & Religion	0	0
Physical Sciences & Mathematics	0	0
Social Sciences	1	4.8
Other	7	33.3
Total	21	100
Do you work in addition to going to school? If so, how many hours per week do you work?		
I do not work	8	38.1
1-10hrs	4	19
11-20hrs	4	19
21-30hrs	0	0
31-40hrs	4	19
More than 41hrs	1	4.8
Total	21	100
What are your current living arrangements?		
Live in a dorm	4	19
Live at home with parents	4	19
Live off campus alone	0	0
Live off campus with roommates or significant other	10	47.6
Other	3	14.3
Total	21	100
Do you currently live with a chronic medical condition?		
Yes	3	14.3
No	18	85.7
Total	21	100
If yes to the question above, check all that apply.		
Type I Diabetes Mellitus	0	0
Type II Diabetes Mellitus	1	25
Hypertension (High Blood Pressure)	1	25
Hypercholesterolemia (High cholesterol)	0	0
Cardiovascular Disease	0	0
Overweight/Obesity	1	25
Other	1	25
Total	4	100
Have you ever received education about nutrition labels?		
Yes, from my doctor	2	9.5
Yes, from a nutritionist	0	0
Yes, from an online resource	6	28.6
No	7	33.3
Other	6	28.6
Total	21	100

Results

Clinical Aim #1

Clinical Aim #1 explored to determine if there was an increase in the knowledge

of nutrition labels in participants after viewing an educational intervention. Table 2

displays the number and percentage of correct and incorrect responses pre and post

educational intervention on knowledge of nutrition labels. The results of the pre-test

asking individuals to correctly answer questions about a nutrition label are as follows:

How many servings are in this container? (n=20, 95.2%), How many calories are in one

serving? (n=21, 100%), What percent of your recommended daily value of total

carbohydrates will you get from one serving of this product? (n=20, 95.2%), How many

grams of dietary fiber are in one serving of this product? (n=20, 95.2%), How many

calories is the % Daily Value based on? (n=20, 95.2%), How many grams of naturally

occurring sugars are in this product? (n=15, 71.4%), Based on the daily consumption goal

for potassium, this food has enough potassium included. (n=4, 19%), and Based on the

daily consumption goal for sodium, this food does not have enough sodium included.

(n=12, 57.1%). The results of the post-test asking individuals to correctly answer

questions about a nutrition label are as follows: How many servings are in this container?

(n=20, 95.2%), How many calories are in one serving? (n=19, 90.5%), What percent of

your recommended daily value of total carbohydrates will you get from one serving of

this product? (n=20, 95.2%), How many grams of dietary fiber are in one serving of this

product? (n=20, 95.2%), How many calories is the % Daily Value based on? (n=20,

95.2%), How many grams of naturally occurring sugars are in this product? (n=18,

85.7%), Based on the daily consumption goal for potassium, this food has enough

potassium included. (n=4, 19%), and Based on the daily consumption goal for sodium,

this food does not have enough sodium included. (n=12, 57.1%).

Table 2. *Correct and Incorrect Responses of Knowledge of Nutrition Labels*

Table 2: Correct & Incorrect Responses of Knowledge of Nutrition Labels				
	Pre Intervention		Post Intervention	
Question	Number (n)	Percent (%)	Number (n)	Percent (%)
How many servings are in this container?				
Correct	20	95.2	20	95.2
Incorrect	1	4.8	1	4.8
Total	21	100	21	100
How many calories are in one serving?				
Correct	21	100	19	90.5
Incorrect	0	0	2	9.5
Total	21	100	21	100
What percent of your recommended daily value of total carbohydrates will you get from one serving of this product?				
Correct	20	95.2	20	95.2
Incorrect	1	4.8	1	4.8
Total	21	100	21	100
How many grams of dietary fiber are in one serving of this product?				
Correct	20	95.2	20	95.2
Incorrect	1	4.8	1	4.8
Total	21	100	21	100
How many calories is the % Daily Value based on?				
Correct	20	95.2	20	95.2
Incorrect	1	4.8	1	4.8
Total	21	100	21	100
How many grams of naturally occurring sugars are in this product?				
Correct	15 (9*; 6**)	71.4	18 (11*; 7**)	85.7
Incorrect	6 (3*; 6**)	28.6	3 (1*; 2**)	14.3
Total	21	100	21	100
Based on the daily consumption goal for potassium, this food has enough potassium included.				
Correct	4 (4*; 0**)	19	4 (2*; 2**)	19

Incorrect	17 (8*; 9**)	81	17 (10*; 7**)	81
Total	21	100	21	100
Based on the daily consumption goal for sodium, this food does not have enough sodium included.				
Correct	12 (7 *; 5**)	57.1	12 (7*; 5**)	57.1
Incorrect	9 (5*; 4**)	42.9	9 (5*; 4**)	42.9
Total	21	100	21	100

Note. Undergraduate student answers are marked with a * and graduate student answers are marked with a **.

Clinical Aim #2

Clinical Aim #2 explored to determine if there was an increase in the knowledge of nutrition information in participants after viewing an educational intervention. Table 3 displays the number and percentage of correct and incorrect responses pre and post educational intervention on knowledge of nutrition information. The results of the pre-test asking individuals to correctly answer questions about nutrition information are as follows: Based on Dietary Guidelines for Americans, what is the maximum daily consumption goal for sodium? (n=6, 28.6%), Based on Dietary Guidelines for Americans, what is the maximum daily consumption goal for added sugars? (n=5, 23.8%), Ignoring nutrition labels and consuming foods at one's pleasure will put an individual at a higher risk for developing which of the following? (n=20, 95.2%), Which nutrient has been associated with an increased risk of developing cardiovascular disease? (n=17, 81%), To decrease the amount of cholesterol consumed, one should cook and bake with liquid oils (like canola or olive oil) instead of solid fats (like butter, lard, or shortening). (n=20, 95.2%), and Protein cannot be consumed by eating plant-based foods. (n=19, 90.5%). The results of the post-test asking individuals to correctly answer questions about nutrition information are as follows: Based on Dietary Guidelines for Americans, what is the maximum daily consumption goal for sodium? (n=14, 66.7%),

Based on Dietary Guidelines for Americans, what is the maximum daily consumption

goal for added sugars? (n=12, 57.1%), Ignoring nutrition labels and consuming foods at

one's pleasure will put an individual at a higher risk for developing which of the

following? (n=20, 95.2%), Which nutrient has been associated with an increased risk of

developing cardiovascular disease? (n=19, 90.5%), To decrease the amount of cholesterol

consumed, one should cook and bake with liquid oils (like canola or olive oil) instead of

solid fats (like butter, lard, or shortening). (n=20, 95.2%), and Protein cannot be

consumed by eating plant-based foods. (n=20, 95.2%).

Table 3. *Correct and Incorrect Responses of Knowledge of Nutrition Information*

Table 3: Correct & Incorrect Responses of Knowledge of Nutrition Information				
	Pre Intervention		Post Intervention	
Question	**Number (n)**	**Percent (%)**	**Number (n)**	**Percent (%)**
Based on Dietary Guidelines for Americans, what is the maximum daily consumption goal for sodium?				
Correct	6 (4*; 2**)	28.6	14 (7*; 7**)	66.7
Incorrect	15 (8*; 7**)	71.4	7 (5*; 2**)	33.3
Total	21	100	21	100
Based on Dietary Guidelines for Americans, what is the maximum daily consumption goal for added sugars?				
Correct	5 (4*; 1**)	23.8	12 (5*; 7**)	57.1
Incorrect	16 (8*; 8**)	76.2	9 (7*; 2**)	42.9
Total	21	100	21	100
Ignoring nutrition labels and consuming foods at one's pleasure will put an individual at a higher risk for developing which of the following:				
Correct	20	95.2	20	95.2
Incorrect	1	4.8	1	4.8
Total	21	100	21	100

Which nutrient has been associated with an increased risk of developing cardiovascular disease?				
Correct	17 (10*; 7**)	81	19 (11*; 8**)	90.5
Incorrect	4 (2*; 2**)	19	2 (1*; 1**)	9.5
Total	21	100	21	100
To decrease the amount of cholesterol consumed, one should cook and bake with liquid oils (like canola or olive oil) instead of solid fats (like butter, lard, or shortening).				
Correct	20	95.2	20	95.2
Incorrect	1	4.8	1	4.8
Total	21	100	21	100
Protein cannot be consumed by eating plant-based foods.				
Correct	19	90.5	20	95.2
Incorrect	2	9.5	1	4.8
Total	21	100	21	100

Note. Undergraduate student answers are marked with a * and graduate student answers are marked with a **.

Clinical Aim #3

Clinical Aim #3 explored to examine if the educational intervention was an acceptable tool to deliver the information on nutrition labels and nutrition information. Summary statistics were utilized to calculate the minimum, maximum, and median data regarding the two Likert style questions. Table 4 displays the number and percentage of the responses for the Likert style questions as well as if participants responded with comments or thoughts regarding recommendations for the educational intervention. The minimum number of participants (1) reported that they somewhat disagree that the educational intervention on nutrition labels and nutrition information is an acceptable tool to deliver the material. The maximum number of participants (16) reported that they strongly agree that the educational intervention on nutrition labels and nutrition information is an acceptable tool to deliver the material. The median value was 1, with

most participants strongly agreeing that the educational intervention on nutrition labels

and nutrition information is an acceptable tool to deliver the material. Overall, 16

participants (76.2%) strongly agree, 4 participants (19%) somewhat agree, 0 participants

(0%) neither agree nor disagree, 1 participant (4.8%) somewhat disagree, and 0

participants (0%) strongly disagree. The minimum number of participants (1) reported

that they somewhat disagree that they feel more confident in using nutrition labels to

make healthier food choices in the future. The maximum number of participants (14)

reported that they strongly agree that they feel more confident in using nutrition labels to

make healthier food choices in the future. The median value was 1, with most participants

strongly agreeing that they feel more confident in using nutrition labels to make healthier

food choices in the future. Overall, 14 participants (66.7%) strongly agree, 5 participants

(23.8%) somewhat agree, 1 participant (4.8%) neither agree nor disagree, 1 participant

(4.8%) somewhat disagree, and 0 participants (0%) strongly disagree. There were 7

participants (33.3%) who responded with comments or thoughts regarding

recommendations for the educational intervention and 14 participants (66.7%) who did

not.

Table 4. *Acceptability of Intervention*

Table 4: Acceptability of Intervention		
Question	**Number (n)**	**Percent (%)**
The educational intervention on nutrition labels and nutrition information is an acceptable tool to deliver the material.		
Strongly Agree		
Somewhat Agree	16	76.2
Neither Agree nor Disagree	4	19
Somewhat Disagree	0	0
Strongly Disagree	1	4.8
Total	0	0
	21	100

I feel more confident in using nutrition labels to make healthier food choices in the future?		
Strongly Agree	14	66.7
Somewhat Agree	5	23.8
Neither Agree nor Disagree	1	4.8
Somewhat Disagree	1	4.8
Strongly Disagree	0	0
Total	21	100
Please add any comments or thoughts regarding recommendations for the educational intervention that should be addressed.		
Response	7	33.3
No Response	14	66.7
Total	21	100

Discussion

The worldwide rate of obesity has tripled since 1975 causing a rise in obesity rates in all age groups across the world. However, the college student population has been found to be the age group who sees this trend escalate the quickest due to the major lifestyle changes they encounter (Yan & Harrington, 2020). Further education on nutrition labels to the college student population has the potential to create healthy diet patterns and behaviors to decrease the risk of obesity which can ultimately reduce the risk for developing chronic diseases (Cecchini & Warin, 2015; Christoph et al., 2015; Dumoitier et al., 2019; Mhurchu et al., 2017; Moore et al., 2018; Neuhouser 2019; Odaman et al., 2019). This DNP project was created to increase college students' knowledge of nutrition labels and nutrition information to hopefully improve their choices of healthy foods. Findings of this project will be discussed in relation to the clinical aims.

Demographics

The demographics of this project varied with majority of the participants being female, of White/Caucasian descent, and an undergraduate student. Based on Florida State University's

Office of Institutional Research for the year of 2021, these findings were expected results. Females accounted for 58.1% of total enrollment for Florida State University in the fall semester of 2021 (Florida State University, 2021b). It was reported that 56.3% were White, 20.7% were Hispanic, 9.2% were Black, and 3.2% were Asian (Florida State University, 2021a). In Fall 2021, there were 45,493 students enrolled with 73.6% being undergraduates and 24.5% being graduates (Florida State University, 2021b). Interestingly, it was also found that the average age for undergraduate and graduate participants in this study aligned with Florida State University's 2021 findings. The average age for undergraduate students at Florida State University in the Fall of 2021 and the average age for undergraduate participants in this project was 20 (Florida State University, 2021b). The average age for graduate students at Florida State University in the Fall of 2021 and the average age for graduate participants in this project was 30 (Florida State University, 2021b). However, the average age of all students at Florida State University in the Fall of 2021 was 23 and the average age of all participants in this project was 24 (Florida State University, 2021b). In the category of participants receiving education on nutrition labels in the past, the results were intriguing. Results showed that 38.1% of participants chose "yes" to receiving past education on nutrition labels. Results showed that 33.3% of participants chose "no" to receiving past education on nutrition labels. Results showed that 28.6% chose "other" when referring to receiving past education on nutrition labels. It should be noted that all participants who chose "other" regarding receiving past education on nutrition labels clarified that they were educated on nutrition labels in a nutrition course in college.

Nutrition Labels

Regarding the findings of knowledge of nutrition labels, the overall results in correct responses when compared to pre intervention and post intervention responses remained

consistent. There were six questions that exhibited no change when compared to pre intervention and post intervention. Interestingly, there was one question (#2: How many calories are in one serving?) which revealed a decrease in correct responses when compared to pre intervention (100%) and post intervention (90.5%). However, one question (#6: How many grams of naturally occurring sugars are in this product?) did present an increase in correct responses when compared to pre intervention (71.4%) and post intervention (85.7%). The findings in this project do not align with the findings of Moore et al. (2018) who analyzed seventeen studies and found all of them to have a significant improvement in their understanding or use of nutrition labels after a teaching session. The findings were expected to increase after the educational intervention instead of staying consistent.

Nutrition Information

Regarding the findings of knowledge of nutrition information, there was an overall increase in correct responses when compared to pre-test and post-test responses after an educational intervention was administered. Out of the six questions regarding knowledge of nutrition information, there were two questions which showed a significant change in correct response before and after the educational intervention. Question 1 (Based on Dietary Guidelines for Americans, what is the maximum daily consumption goal for sodium?) showed a correct response of 28.6% pre intervention and 66.7% post intervention. Question 2 (Based on Dietary Guidelines for Americans, what is the maximum daily consumption goal for added sugars?) showed a correct response of 23.8% pre intervention and 57.1% post intervention. The increase in correct responses was expected since the educational intervention taught the participants about nutrients that can be found on the nutrition label.

Acceptability

The educational intervention was evaluated to determine if it was an acceptable tool to deliver the information on nutrition labels and nutrition information. The results showed that majority of the participants either strongly agreed or somewhat agreed that that the educational intervention was an acceptable tool. It should also be mentioned that one participant somewhat disagreed. Along with determining the acceptability of the educational intervention, another question asked if participants felt more confident in using nutrition labels to make healthier food choices in the future. Majority of the participants either strongly agreed or somewhat agreed that they felt more confident in using nutrition labels to make healthier food choices in the future. This finding is congruent with articles that mention nutrition labels can be used as a preventative tool to educate college students about foods and provide support in selecting healthier foods (Cecchini & Warin, 2015; Christoph et al., 2015; Moore et al., 2018). It should be noted that one participant chose neither agree nor disagree and another chose somewhat disagree. There was a comment section for participants to leave their thoughts regarding recommendations for the educational intervention. There were a total of seven responses which recommended more visuals and a less monotone voice during the presentation. The educational intervention was found to be an acceptable tool to deliver the information on nutrition labels and nutrition information.

Limitations

There were multiple limitations recognized during the implementation of this project. A reason as to why there was not a higher number of participants who were included in the final sample of the DNP project is because this was an online survey. It has been found that online surveys do not get a high number of participants like face-to-face surveys do. Wu and colleagues (2022) found that the average online survey response rate is 44.1%. The analysis also found that

a higher response rate was not generated by sending an online survey to more participants and incentives to participate in the online survey did not show a significant impact on the rate of responses (Wu et al., 2022). Once data analysis had been performed, it was found that majority of the sample identified as Caucasian. This could disrupt the generalization of results. The project was implemented in July, towards the end of the summer semester. Between the summer and fall semester the university campus does not see an influx of students like it would normally see while the semester is in session. During the break between semesters, there was minimal responses seen in Qualtrics. The flyer was only advertised in certain locations at the Florida State University campus and social media sites. To increase participation rates, it would have been valuable to advertise the flyer in all the buildings located at Florida State University. Another limitation that should be considered is the validity of the survey used during this project. The survey used during this project was created by the primary investigator. Even though the survey was peer-reviewed by the faculty advisor and the Director of the CHAW, it was not a validated survey and should be considered a limitation.

Implications for Nursing Practice

To decrease the rise in worldwide obesity, education on nutrition labels and nutrition information should be a priority in the nursing profession so that patients can use this as a beneficial tool while selecting healthier foods. If college students are educated about nutrition labels and nutrition information at an early age, they can form healthy food behaviors early on in their life which can ultimately reduce the rise in obesity while also preventing the development of chronic diseases. This project found that 66.7% of participants strongly agreed and 23.8% of participants somewhat agreed that after participating in this project that they felt more confident in using nutrition labels to make healthier food choices in the future. Interestingly, this project

found that 9.5% of participants reported being educated on nutrition labels by their doctor. Using an educational intervention to educate patients on nutrition labels and nutrition information can be a positive tool in the nursing profession. These results show that the nursing profession should incorporate nutrition labels and nutrition information education in their practice so that patients can have better knowledge and confidence in choosing healthier foods.

Conclusion

The purpose of this project was to assess college students' baseline understanding of nutrition labels and nutrition information, then use an educational intervention to expand their knowledge on nutrition labels and nutrition information and hopefully improve healthy food choices. Multiple studies have examined whether college students' read or use nutrition labels. This project adds to the limited literature on the topic of assessing college students' baseline knowledge and understanding of nutrition labels and nutrition information then using an educational intervention to improve their cognizance. This project found that after using an educational intervention, results stayed consistent when evaluating nutrition labels whereas results improved when evaluating nutrition information. It was also found that the educational intervention was found to be an acceptable tool to deliver the information on nutrition labels and nutrition information. Another finding was that participants felt more confident in using nutrition labels to make healthier food choices in the future after participating in this project. Considering the findings of this project, the nursing profession should incorporate education on nutrition labels and nutrition information into their practice to enhance their patients' knowledge on this subject which can assist them in making healthier food choices leading to a decrease in obesity and the development of chronic diseases.

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Appendix A

UNIVERSITY HEALTH SERVICES
MARY B. COBURN HEALTH & WELLNESS CENTER *at* FSU

March 29, 2022

Megan Price, BSN, RN
Florida State University
Doctor of Nursing Practice (DNP) Student
905 Merganser Way
Crestview, FL
32539

Dear Megan,

It is my pleasure to write a letter of support for your Doctor of Nursing Practice (DNP) project entitled "Improve Health through Understanding Nutrition Labels." I understand that the purpose of the project is to assess college students' baseline understanding of nutrition labels and nutrition information, then use an educational intervention to expand their knowledge on nutrition labels and nutrition information.

The Health & Wellness Center at Florida State University will be utilized as a setting for this project. Flyers will be advertised throughout the Health & Wellness Center as a way to recruit participants to partake in the project. The Center for Health Advocacy and Wellness (CHAW) at University Health Services will also be essential in implementing this project as a resource in advertisement. Those who agree to participate in this project will do so independently by scanning the QR code located on the flyer. Participants will complete a pre-test, review the educational intervention, and then complete a post-test. Data will be collected by using an online survey, Qualtrics.

At this time, University Health Services at the Florida State University is pleased to partner with Megan Price, Dr. Susan Porterfield, and the FSU College of Nursing and is in full support of this project being a quality improvement to increase college students' knowledge and understanding of nutrition labels and nutrition information.

Sincerely,

Amy B. Magnuson, PhD, RD, LD/N

Amy B. Magnuson, PhD, RD, LD/N
University Health Services Director | Florida State University
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amagnuson@fsu.edu 850.644.8868 (main) 850-644-3011 (direct)

960 Learning Way, P.O. Box 3064178, Tallahassee, FL 32306-4178
850.644.6230 • Fax 850.644.1491 • www.uhs.fsu.edu

Appendix B

Do you struggle with understanding nutrition labels?

Would you like to improve your knowledge with understanding nutrition labels?

The purpose of this project is to assess college students' baseline understanding of

nutrition labels and nutrition information, then use an educational intervention to expand

their knowledge on nutrition labels and nutrition information and hopefully improve healthy

food choices.

- ✓ Quality Improvement Project Initiative
- ✓ Conducted by FSU DNP Student: Megan Price
- ✓ Contact Megan Price, BSN, RN for more information at mms14e@fsu.edu
- ✓ Affiliated with FSU Health & Wellness Center
- ✓ This project includes a pre-test (approximately 7 minutes), an educational intervention (approximately 12 minutes), and a post-test (approximately 5 minutes) which can be completed at your convenience with the use of a QR code or link located below.
- ✓ Upon completion of all three parts (pre-test, educational intervention, and post-test), participants will be entered for a chance to win 1 of 2 $50 Publix gift cards.

If you would like to participate, please scan on the QR code or visit the link below.

https://fsu.qualtrics.com/jfe/for
m/SV_0TKG9crc4VU1ryC

Appendix C

Hello,

Obesity is on the rise in all age groups across the world, but the age group that sees this trend escalate the quickest is the college student population due to the major lifestyle changes they encounter. Many factors contribute to college students' weight gain with research suggesting that nutrition labels could be instrumental in combating this growing trend. There have been many research studies that evaluate whether college students use nutrition labels when selecting foods, but little is known about how well this population understands nutrition labels.

The purpose of this project is to assess college students' baseline understanding of nutrition labels and nutrition information. After the baseline assessment is collected, participants will be educated using an educational intervention to expand their knowledge and understanding of nutrition labels, as well as nutrition information. This project includes a pre-test, educational intervention, and post-test. Participants must be at least 18 years or older to participate. By clicking the next button, your rights associated with participation will be outlined. After you read and understand your rights, you will be directed to complete the survey (it includes the pre-test, educational intervention, and post-test) if you wish to participate.

Thank you.

Appendix D

Informed Consent Statement

Improve Health through Understanding Nutrition Labels

You are being invited to participate in a research project that assesses college students' knowledge and understanding of nutrition labels and nutrition information. The following statement explains your rights if you decide to participate in the project as well as your right to decline to participate or stop participating in the project at any time. Please read the following form very carefully.

The following project is being conducting by Megan Price, BSN, RN, a third year Doctor of Nursing Practice student at Florida State University College of Nursing. Obesity is on the rise in all age groups across the world, but the age group that sees this trend escalate the quickest is the college student population due to the major lifestyle changes they encounter. Many factors contribute to college students' weight gain with research suggesting that nutrition labels could be instrumental in combating this growing trend. This project assesses participants knowledge and understanding of nutrition labels and nutrition information. Participants will be educated using an educational intervention to expand their knowledge and understanding on nutrition labels, as well as nutrition information.

If you do agree to participate in the project, you will be asked to complete the pre-test, educational intervention, and post-test that directly follows this form. The total time it will take for you to complete the project is approximately 25-30 minutes. The pre-test should take approximately 7 minutes. The educational intervention should take approximately 12 minutes. The post-test should take approximately 5 minutes. The pre-test will include demographic information, baseline assessment of knowledge of nutrition labels, and baseline assessment of knowledge of nutrition information. The educational intervention will explain nutrition labels and nutrition information. The post-test will evaluate your knowledge and understanding of nutrition labels and nutrition information after viewing the educational intervention.

Risks associated with participating in the project are minimal. You could experience anxiety while participating in the study regarding your own mindset of nutrition labels and nutrition information. You could also be triggered by the nutrition labels and nutrition information if you have experienced an eating disorder in the past. Once again, you can stop participating at any time in the project if you wish.

Benefits for participating in this project are also present. One benefit of the project is that you will gain knowledge of nutrition labels and nutrition information that will better assist you with food choices that could lead to a better diet quality throughout your life.

If you decide to participate in this project, you will not be asked to provide your name or any information that can be identifiable to you. The information that you provide will 1) be recorded securely, 2) be processed and reported as group data only, and 3) not be available for someone to easily identify you. The information provided by you will be confidential and will not be used in any other means.

Participation in this project includes the chance to win one of two $50 Publix gift cards. To be considered for the drawing, you must complete all parts of the project which includes the pre-test, educational intervention, and post-test. Upon completion of the post-test, if you want to be considered for the drawing for one of two $50 Publix gift cards, you must email the primary

investigator at mms14e@fsu.edu. As stated before, this project is confidential and the information that you have provided will not be used for any other means besides this project. Emailing the primary investigator will only be used for the purpose of the drawing.

Participating in this project is completely voluntary and you can stop at any time for any reason. Withdrawing your participation in this project can be done at any time prior to submitting your responses. However, once your responses are submitted, they will not be able to be identified in relation to other participants. Your relationship with Florida State University will not be affected by any means upon your decision to or to not participate in this project. If at any point you decide that you do not want to participate anymore, you can exit the survey prior to completion.

The primary investigator in this project is Megan Price, BSN, RN. You can contact the primary investigator if you have any questions or concerns regarding the project or your rights as a participant in the project. A contact email is mms14e@fsu.edu. The major professor is a second contact, Susan Porterfield, PhD, FNP-C, and can be reached at sporterfield@fsu.edu.

If questions or concerns arise about this project and you would like to discuss them with someone other than the primary investigator or the major professor, you are encouraged to contact the FSU Institutional Review Board (IRB) at their physical location of 2010 Levy Avenue, Building B, Suite 276, Tallahassee, Florida 32310, or their telephone number of 850-644-7900, or their email address of humansubjects@fsu.edu.

Please click the next button if you wish to participate. If you choose not to participate, please close this webpage now.

Thank you for your time.

Appendix E

Nutrition Facts

5 servings per container

Serving size   **1 Cup (228g)**

Amount Per Serving

Calories   290

% Daily Value*

Total Fat 10g	**13%**
Saturated Fat 5g	**25%**
Trans Fat 0g	
Cholesterol 35mg	**12%**
Sodium 880mg	**38%**
Total Carbohydrate 37g	**13%**
Dietary Fiber 5g	**18%**
Total Sugars 7g	
Includes 1g Added Sugars	**2%**
Protein 13g	**26%**
Vitamin D 1mcg	4%
Calcium 340mg	25%
Iron 1.8mg	10%
Potassium 520mg	10%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Appendix F

Pre-Intervention: Improve Health through Understanding Nutrition Labels

Pre-Test Section 1: Demographics
1. Are you currently a student at Florida State University?
    A. Yes
    B. No
        1. If no was selected, you are welcome to continue the survey and complete the educational intervention.
2. Which gender do you identify yourself as?
    A. Male
    B. Female
    C. Other, please specify _____
1. What is your age?
    A. _____
2. Which race do you identify yourself as?
    A. White/Caucasian
    B. Black/African American
    C. Hispanic/Latino
    D. Asian
    E. Native American
    F. Other, please specify _____
3. In what year of education are you in?
    A. College Freshman
    B. College Sophomore
    C. College Junior
    D. College Senior
    E. Graduate Student
4. In what area of study is your current major?
    A. Arts, Architecture, & Applied Arts
    B. Business & Economics
    C. Earth & Environmental Sciences
    D. Engineering & Applied Sciences
    E. Health & Biological Sciences
    F. History & Archaeology
    G. Journalism & Communications
    H. Languages & Literatures
    I. Law, Politics, & Government
    J. Music, Dance, Drama, & Film
    K. Philosophy & Religion
    L. Physical Sciences & Mathematics
    M. Social Sciences
    N. Other, please specify
5. Do you work in addition to going to school? If so how many hours per week do you work?

A. I do not work
B. 1-10hrs
C. 11-20hrs
D. 21-30hrs
E. 31-40hrs
F. More than 41hrs

6. What are your current living arrangements?
   A. Live in a dorm
   B. Live at home with parents
   C. Live off campus alone
   D. Live off campus with roommates or significant other
   E. Other, please specify _____

7. Do you currently live with a chronic medical condition?
   A. Yes
   B. No

8. If yes to the question above, check all that apply.
   A. Type I Diabetes Mellitus
   B. Type II Diabetes Mellitus
   C. Hypertension (High Blood Pressure)
   D. Hypercholesterolemia (High cholesterol)
   E. Cardiovascular Disease
   F. Overweight/Obesity
   G. Other, please specify _____

9. Have you ever received education about nutrition labels?
   A. Yes, from my doctor
   B. Yes, from a nutritionist
   C. Yes, from an online source
   D. No
   E. Other, please specify

Pre-Test Section 2: Knowledge of Nutrition Labels & Knowledge of Nutrition Information

Pre-Test Section 2a: Knowledge of Nutrition Labels
Please use the following nutrition facts label to answer questions 1-8.

Nutrition Facts

5 servings per container

Serving size	1 Cup (228g)

Amount Per Serving

Calories 290

	% Daily Value*
Total Fat 10g	13%
Saturated Fat 5g	25%
Trans Fat 0g	
Cholesterol 35mg	12%
Sodium 880mg	38%
Total Carbohydrate 37g	13%
Dietary Fiber 5g	18%
Total Sugars 7g	
Includes 1g Added Sugars	2%
Protein 13g	26%
Vitamin D 1mcg	4%
Calcium 340mg	25%
Iron 1.8mg	10%
Potassium 520mg	10%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

1. How many servings are in this container?
    A. 3
    B. 5
    C. 7
    D. 9
2. How many calories are in one serving?
    A. 145
    B. 228
    C. 290
    D. 580
3. What percent of your recommended daily value of total carbohydrates will you get from one serving of this product?
    A. 2%
    B. 13%
    C. 18%
    D. 25%
4. How many grams of dietary fiber are in one serving this product?
    A. 3g
    B. 5g
    C. 7g
    D. 37g
5. How many calories is the % Daily Value based on?
    A. 1,000 calories
    B. 1,500 calories

       C. 2,000 calories

       D. 2,500 calories

6. How many grams of naturally occurring sugars are in this product?
   - A. 1
   - B. 6
   - C. 7

7. Based on the daily consumption goal for potassium, this food has enough potassium included.
   - A. True
   - B. False

8. Based on the daily consumption goal for sodium, this food does not have enough sodium included.
   - A. True
   - B. False

Pre-Test Section 2b: Knowledge of Nutrition Information

1. Based on Dietary Guidelines for Americans, what is the maximum daily consumption goal for sodium?
   - A. 2,000mg
   - B. 2,300mg
   - C. 3,000mg
   - D. 3,300mg

2. Based on Dietary Guidelines for Americans, what is the maximum daily consumption goal for added sugars?
   - A. 45g
   - B. 50g
   - C. 55g
   - D. 60g

3. Ignoring nutrition labels and consuming foods at one's pleasure will put an individual at a higher risk for developing which of the following:
   - A. Type II Diabetes Mellitus
   - B. Hypertension (High Blood Pressure)
   - C. Hypercholesterolemia (High Cholesterol)
   - D. Cardiovascular Disease
   - E. Overweight/Obesity
   - F. All of the above

4. Which nutrient has been associated with an increased risk of developing cardiovascular disease?
   - A. Saturated Fat
   - B. Cholesterol
   - C. Trans Fat
   - D. All of the above

5. To decrease the amount of cholesterol consumed, one should cook and bake with liquid oils (like canola or olive oil) instead of solid fats (like butter, lard, or shortening).
   - A. True

B. False
6. Protein cannot be consumed by eating plant-based foods.
   A. True
   B. False

Appendix G

Post-Intervention: Improve Health through Understanding Nutrition Labels

Post-Test Section 1: Evaluating Knowledge of Nutrition Labels
Please use the following nutrition facts label to answer questions 1-8.

Nutrition Facts

5 servings per container

Serving size	1 Cup (228g)

Amount Per Serving

Calories	290

% Daily Value*

Total Fat 10g	13%
Saturated Fat 5g	25%
Trans Fat 0g	
Cholesterol 35mg	12%
Sodium 880mg	38%
Total Carbohydrate 37g	13%
Dietary Fiber 5g	18%
Total Sugars 7g	
Includes 1g Added Sugars	2%
Protein 13g	26%
Vitamin D 1mcg	4%
Calcium 340mg	25%
Iron 1.8mg	10%
Potassium 520mg	10%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

1. How many servings are in this container?
    - E. 3
    - F. 5
    - G. 7
    - H. 9
2. How many calories are in one serving?
    - E. 145
    - F. 228
    - G. 290
    - H. 580
3. What percent of your recommended daily value of total carbohydrates will you get from one serving of this product?
    - E. 2%
    - F. 13%
    - G. 18%
    - H. 25%
4. How many grams of dietary fiber are in one serving this product?

E. 3g
F. 5g
G. 7g
H. 37g

5. How many calories is the % Daily Value based on?
    E. 1,000 calories
    F. 1,500 calories
    G. 2,000 calories
    H. 2,500 calories

6. How many grams of naturally occurring sugars are in this product?
    D. 1
    E. 6
    F. 7

7. Based on the daily consumption goal for potassium, this food has enough potassium included.
    C. True
    D. False

8. Based on the daily consumption goal for sodium, this food does not have enough sodium included.
    C. True
    D. False

Post-Test Section 2: Evaluating Knowledge of Nutrition Information

1. Based on Dietary Guidelines for Americans, what is the maximum daily consumption goal for sodium?
    A. 2,000mg
    B. 2,300mg
    C. 3,000mg
    D. 3,300mg

2. Based on Dietary Guidelines for Americans, what is the maximum daily consumption goal for added sugars?
    A. 45g
    B. 50g
    C. 55g
    D. 60g

3. Ignoring nutrition labels and consuming foods at one's pleasure will put an individual at a higher risk for developing which of the following:
    A. Type II Diabetes Mellitus
    B. Hypertension (High Blood Pressure)
    C. Hypercholesterolemia (High Cholesterol)
    D. Cardiovascular disease
    E. Overweight/Obesity
    F. All of the above

4. Which nutrient has been associated with an increased risk of developing cardiovascular disease?
    A. Saturated Fat

    B. Cholesterol
    C. Trans Fat
    D. All of the above

5. To decrease the amount of cholesterol consumed, one should cook and bake with liquid oils (like canola or olive oil) instead of solid fats (like butter, lard, or shortening).
    A. True
    B. False

6. Protein cannot be consumed by eating plant-based foods.
    A. True
    B. False

Conclusion Questions
Please rate your level of agreement with the following statements:

1. The educational intervention on nutrition labels and nutrition information is an acceptable tool to deliver the material.
    A. Strongly Agree
    B. Somewhat Agree
    C. Neither Agree Nor Disagree
    D. Somewhat Disagree
    E. Strongly Disagree

2. I feel more confident in using nutrition labels to make healthier food choices in the future?
    A. Strongly Agree
    B. Somewhat Agree
    C. Neither Agree nor Disagree
    D. Somewhat Disagree
    E. Strongly disagree

3. Please add any comments or thoughts regarding recommendations for the educational intervention that should be addressed.
    A. _____

Appendix H

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6

Trans Fat

- Is an unsaturated fat but is different structurally than unsaturated fat that naturally occurs in plant foods.
- Has damaging health effects and is not an essential nutrient in the diet.
- Two forms of *trans* fat:
  - Naturally forming *trans* fat: found in small amounts of animal products, like beef, lamb, and dairy products
  - Artificially forming *trans* fat: formed during the processing of foods found in partially hydrogenated oils, like baked goods, coffee creamer, ready to use frostings, snack foods, and stick margarines
    - Partially hydrogenated oils were used to improve texture, shelf life, and flavor of foods. Most uses of partially hydrogenated oils have been phased out as of 2018. Refined vegetable oils might contain a small amount of *trans* fat unintentionally due to their manufacturing process.
- Use the number of grams (g) to compare and choose foods because *trans* fat has no Daily Value.

(U.S. FDA, 2020d)

7

Cholesterol

- Found in all cells of the body as a waxy, fat-like substance.
- Produced by the liver primarily and also consumed from food (referred to as dietary cholesterol).
- IT IS NOT NECESSARY TO GET CHOLESTEROL FROM FOOD BECAUSE THE BODY PRODUCES ALL THE CHOLESTEROL IT NEEDS.
- Cholesterol importance
  - Is a structural component of cell membranes
  - Necessary for the production of bile (produced by the liver to aid in the digestion of fat in the intestine)
  - Used to make vitamin D and hormones (estrogen & testosterone)
- Dietary cholesterol is only found in animal products including:
  - Beef fat, chicken fat, and pork fat
  - Dairy products: milk, cheese, & yogurt
  - Egg yolks
  - Meats & poultry
  - Processed meat & poultry products: bacon, hot dogs, jerky, some lunch meats, & sausages
  - Shellfish: lobster & shrimp
  - Spreads: butter, cream cheese, & sour cream
- Blood cholesterol:
  - Low-density lipoprotein (LDL) cholesterol: BAD
  - High-density lipoprotein (HDL) cholesterol: GOOD
- The Daily Value for cholesterol is less than 300mg/day.

(U.S. FDA, 2020e)

8

Sodium

- Even though salt & sodium are used interchangeably, they actually are not the same thing.
  - Salt: crystal-like compound which is plentiful in nature
  - Sodium: is a mineral and is one of the chemical elements which is found in salt
- Approximately 4% of dietary sodium comes from adding salt to food when one is cooking or eating.
- Over 70% of dietary sodium comes from eating packaged and prepared foods.
  - Americans consume about 3,400mg of sodium per day on average.
- Most of the sodium consumed by Americans comes from:
  - Breads & rolls
  - Pizza
  - Sandwiches: hamburgers & hot dogs
  - Cold cuts & cured meats: deli meat, packaged ham, and turkey
  - Soups
  - Burritos & tacos
  - Snack foods: chips, crackers, microwave popcorn, & pretzels
  - Processed chicken
  - Processed cheese
  - Egg dishes & omelets
- Importance of sodium:
  - An essential nutrient needed by the human body in small amounts
  - Many body processes: fluid balance, muscle contraction, & nervous system function
  - Food ingredient: curing meat, baking, thickening, retaining moisture, enhancing flavor, and as a preservative
- The Daily Value for sodium is less than 2,300mg/day.
  - Equals 1 teaspoon of salt

Nutrient should be consumed less.

(U.S. FDA, 2020f)

9

Total Carbohydrate

- Are found primarily in plant foods, except for dairy products, and includes:
  - Dietary Fiber
  - Total & Added Sugars
  - Sugar Alcohols
- Importance of carbohydrates:
  - Provide calories, or energy, for the body
    - 1g of carbohydrate = 4 calories
  - Carbohydrates are broken down into glucose by the human body allowing the glucose to provide energy to the body's cells, tissues, and organs (like the brain and muscles). Glucose is the prime energy source and can be used immediately or stored in the liver and muscle to be used at a later time.
- The Daily Value for total carbohydrate is 275g/day.

(U.S. FDA, 2020h)

10

Dietary Fiber

- Is made up of many sugar molecules that are linked together and is a carbohydrate that is bound together not easily digested by the small intestine.
  - Soluble dietary fiber: dissolves in water and forms a thick gel-like substance in the stomach that is broken down in the large intestine by bacteria and can provide calories
    - Interferes with the absorption of dietary fat and cholesterol (which can help lower LDL) and slows digestion
  - Insoluble dietary fiber: cannot be dissolved in water, can pass through the GI tract intact, and is not a source of calories
    - Food and waste can be sped up through the digestive system
  - Both can make you feel full which could lower your calorie intake and stay content longer
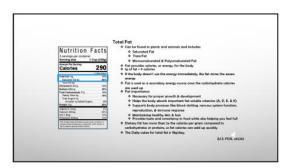- Can be found in foods like:
  - Beans & peas
  - Fruits
  - Nuts
  - Seeds
  - Vegetables
  - Wheat bran
  - Whole grains
- The Dietary Guidelines for Americans recommends limiting the intake of refined grains, along with products made with refined grains, and consuming at least half of grains as whole grains.
- The Daily Value for dietary fiber is 28g/day.

(U.S. FDA, 2020c)

Nutrient should be consumed more.

11

Total & Added Sugars

- Are the simplest & smallest type of carbohydrate that is very easily digested and absorbed by the body.
  - Natural sugar: sugar is present in the food naturally
    - Dairy products: milk or yogurt
    - Fruit: includes fresh, frozen, dried, and canned in 100% fruit juice
    - 100% fruit & vegetable juice
    - Vegetables
    - For example: the natural sugar in this product are 6g.
  - Added sugars: sugars that are added to the food (like during food processing)
    - Baked goods: cakes, cookies, pastries & pies
    - Desserts: ice cream or puddings
    - Salad dressings, sauces, spreads, condiments, & gravies
    - Sugar-sweetened beverages: energy drinks, fruit drinks, soft drinks, sports drinks, & sweetened coffee and tea
    - Sweets: candies, jams, icings, & syrups
    - Single-ingredient sugars: table sugar, maple syrup, & honey
    - For example: the added sugars in this product are 6g.
  - Sugar importance
    - Used to sweeten, preserve, & improve the functional attributes of foods & beverages
- The Daily Value for added sugars is less than 50g/day.

Added sugar should be consumed less.

(U.S. FDA, 2020g)

12

Nutrition Facts

Protein:

Nutrition Facts

Vitamins & Minerals

Vitamin D, Calcium, Iron, &
Potassium should be
consumed more.

(U.S. FDA, 2020)

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CHRONIC HEALTH CONDITIONS

Cardiovascular Disease	Hypertension (High Blood Pressure)	Type II Diabetes Mellitus	Hypercholesterolemia (High Cholesterol)
		Overweight/Obesity	Osteoporosis	Anemia

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HEALTHY EATING TIPS

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EXTRA EDUCATIONAL FDA RESOURCES CAN BE FOUND AT THE FOLLOWING WEBSITES:

➢ HTTPS://WWW.FDA.GOV/FOOD/HEALTH-EDUCATORS/NUTRITION-EDUCATION-RESOURCES-MATERIALS/NUTRITION-FACTS-LABEL

➢ HTTPS://WWW.FDA.GOV/FOOD/NEW-NUTRITION-FACTS-LABEL/HOW-UNDERSTAND-AND-USE-NUTRITION-FACTS-LABEL

➢ HTTPS://WWW.ACCESSDATA.FDA.GOV/SCRIPTS/INTERACTIVENUTRITIONFACTSLABEL/FACTSHEETS.CFM

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