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Effect of Health Information on Food Addiction Among Obese and Overweight Women

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This is to certify that the doctoral dissertation by

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Walden University
2019

Abstract

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MA, Roosevelt University, 2004

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Research on obesity, weight loss, and food addiction (FA) suggested a strong relationship between use of food additives and the brain's addictive response to food. Previous researchers have examined (FA) and have identified certain food additives such as monosodium glutamate (MSG) and high fructose corn syrup (HFCS) as contributors to food addiction and overeating. Social cognitive theory (SCT) has also been effective in addressing addictive behaviors such as drug addiction, alcohol addiction, and smoking cessation (Bricker et al., 2010). However, researchers had not examined food addiction, social cognitive theory, and obesity in the same study. The purpose of this quantitative, quasi-experimental study was to compare the effects of SCT-based health information and non-SCT-based health information on FA among obese and overweight women. The Yale Food Addiction Scale (YFAS) was used to measure changes in FA and food addiction symptoms among 84 obese and overweight women who received SCT-based health information and non-SCT-based health information. Total scores from pretests and posttests were analyzed using analysis of covariance. Between-group differences on the symptom count posttest scores of the YFAS were analyzed using analysis of variance. Scores were used to determine the difference in FA and FA symptoms between nonrandomized groups. Although the results were not statistically significant, almost 60% (n = 50) of participants experienced a favorable decrease in FA symptoms and experienced weight loss. Findings may provide a basis for determining additional options for health professionals to address obesity and FA patterns.

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Dedication

This is dedicated to my wonderful husband, Stanley Grant; our beautiful children Savannah and Savoy Grant; and to my dearly departed mom. They motivated me to keep pushing forward during the most difficult times of my dissertation because I wanted to be able to give them the best that life has to offer. My wonderful husband made the ultimate sacrifice by financially supporting our family and allowing me to focus on completing my PhD. Finally, this is dedicated to my mom because she passed away in late 2016 due to multiple comorbidities that accompany obesity and food addiction.

Acknowledgments

I would like to acknowledge my committee chair, Dr. Jay Greiner, for his kindness and encouragement. You have shown me how much the whole process and journey can change when you have someone who is knowledgeable and caring. Dr. Amy Sickel, I could not have asked for a better committee member. You are insightful and generous, with honest caring feedback. Speaking with you when I experienced a serious bump in the road during my dissertation journey saved my life and gave me the strength to continue.

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Chapter 1: Introduction to the Study

The goal of this study was to examine the effectiveness of health information based on social cognitive theory with obese and overweight women to reduce or eliminate food addiction. Over the past 10 years, discussion of food addiction has been increasing in academic journals (Davis et al., 2011). This has been due in part to the expanding waistlines and increased body mass index (BMI) of the American public (Goode, 2016) and the increased direct and indirect costs associated with being obese and overweight (Martin, Hunter, Lauve, & O'Leary, 1995). Those who are obese and overweight suffer from health complications and afflictions ranging from mild to severe (Saltiel & Olefsky, 2017). Obese individuals suffer from diseases such as hypertension, cancer, and diabetes (Persson, 2014). These afflictions lead to an increase in indirect and direct medical health costs estimated at $147 billion (Colombi & Wood, 2011). Persson (2014) estimated that almost 40% of Americans are obese.

The term food addiction is based on the addiction model. The addiction model is defined as the need to consume certain substances even when they are known to be harmful and detrimental to health (Volkow & Wise, 2005; West, 2001). The brain's pleasure centers perceive these addictive substances as a source of reward and pleasure, and individuals experience stress or anxiety if they are unable to procure the addictive substance (Volkow & Wise, 2005; West, 2001). Research on food addiction, addiction, and obesity has resulted in a convergence and reframing of public and scientific perspectives on addiction (Pedram et al., 2013, Sansone & Sansone, 2013; Volkow & Wise, 2005). Instead of being confined to certain sources of reward (such as drugs),

addiction is now viewed as an intense and maladaptive desire for pleasure or stress reduction regardless of the source of reward (Davis et al., 2011).

Researchers have identified certain food additives as significant contributors to food addiction and overeating (Insawang et al., 2012; Lowndes et al., 2012). The two significant food additives that have been identified in studies as significant contributors to food addiction are monosodium glutamate (MSG) and high fructose corn syrup (HFCS) (Insawang et al., 2012; Lowndes et al., 2012). In the current study, I examined the role that these additives play in food addiction and obesity. Findings may provide an opportunity to explore and apply social cognitive theory, which researchers have used when focusing on addiction counseling and weight management, but have not applied in food addiction.

Attempts to reduce expanded waistlines and BMIs that accompany food addiction have resulted in successes and failures depending on the approach (Hebebrand et al., 2014). One of the most promising approaches to weight loss is recognizing the role of psychosocial support among people who are overweight and obese (Hogan, Linden, & Najarian, 2002). Patients' psychosocial support determines their ability to manage and change their weight (Hogan et al., 2002). This knowledge includes but is not limited to: health risks and food selection, goals, outcome expectations, and the ability to exercise control to accomplish and maintain a task perceived as difficult or challenging (Hopkinson, 2016). Social cognitive theory is designed to address these challenges because the theory's framework is related to acquiring and maintaining health behaviors (Roche et al., 2012). Social cognitive theory focuses on promoting effective self-

management of health habits (Bandura, 2004). The components of social cognitive theory have potential for encouraging self-management of health habits (Bandura, 2004).

In this study, I used key elements of social cognitive theory to create presentations that delivered health information aimed at increasing knowledge and awareness of foods and food additives that lead to food addiction and related symptoms. It was my hope that increasing knowledge of the potential risks and outcomes of hazardous health behaviors would initiated changes in health behavior. Over the course of 4 weeks, two groups of women received different types of health information to reduce or eliminate food addiction, as measured by the Yale Food Addiction Scale (see Appendix A). One group's presentations included health information that followed key elements of social cognitive theory, such as self-efficacy, outcome expectations, incentive motivation, facilitation, and self-regulation. Although there are other elements of social cognitive theory, these particular elements have been highlighted in studies that have addressed behavioral changes for those battling addiction (Fulton, Krank, & Stewart, 2012; Kelly & Greene, 2014; Kinsella, 2017; Patterson, Umstattd, Meyer, Beaujean, & Bowden, 2014; Soule, Maloney, Guy, Eissenberg, & Fagan, 2017).

The second group received presentations of health information that were not guided by social cognitive theory. For example, one week's presentation addressed reducing and eliminating symptoms of food addiction but did not mention self-efficacy or ways to improve self-efficacy. I sent the presentations electronically every week. I hypothesized that health information based on social cognitive theory would increase participants' knowledge of the effects of eating foods that contained MSG and HFCS,

and anticipated that the increased knowledge of food addiction and the food additives that contribute to food addiction would evoke a precondition for change as participants became more aware of the consequences of their health behavior (see Bandura 1997, 2004). The second group of women received a similarly worded presentation weekly, but the presentation's message was not based on social cognitive theory.

I invited participants to a weekly review of the health information delivered online. These weekly reviews served three functions: (a) reduce participant attrition, (b) increase the chances of study participants reading the health information, and (c) reduce the likelihood of study participants not understanding the health information. To test for anticipated changes in food addiction and food addiction symptoms, I administered the Yale Food Addiction Scale (see Appendix A) to both groups as a pretest and posttest. Both groups were surveyed twice (Week 1 and Week 4) using the Yale Food Addiction Scale over the course of 4 weeks.

This study has the potential to yield a positive social change in three ways. First, health professionals who treat obese and overweight individuals may better understand food addiction's role and influence on healthy behavior. Second, as health improves due to better food choices and weight loss, obese and overweight individuals may experience extended life expectancy, improved quality of life, and increased physical mobility (Macchi, Russell, & White, 2013). Finally, cardiovascular disease risk factors, depression and comorbid mental disorders, inflammation, and harmful cytokines may be reduced (Kiernan et al., 2013; Wiltink et al., 2013).

In Chapter 1, I review literature on obesity and food addiction, including how food additives such as MSG and HFCS play a role in contributing to food addiction by subjecting obese and overweight people to suffer from symptoms such as food cravings, overeating, depression, and anxiety. Also, I describe researchers' use of health information to change behavior. Chapter 1 also includes a discussion of social cognitive theory and ways in which it has been used to modify food behavior. I also discuss gaps in these studies, followed by an in-depth discussion of the research problem, which include details on the study variables.

Background

Literature Related to Scope of Study

Based on my review of the literature, researchers had not examined obesity, food addiction, and social cognitive theory in the same study. Many researchers published studies that explored elements of social cognitive theory in weight management, modifying food choices, and drug addiction (Dennis et al., 2001; Roche et al., 2012; Walters et al., 2014). Perhaps one of the reasons researchers continue to examine the potential of social cognitive theory is that social cognitive theory comprises tools that a person needs to lose weight and fight addiction. Social cognitive theory provides resources to increase knowledge to help individuals achieve certain behavioral goals in the form of peer modeling or resources (Glanz, Rimer, & Viswanath, 2008, p. 173). Social cognitive theory also helps individuals to address the psychosocial component in the form of self-efficacy or outcome expectations. If used effectively, social cognitive

theory can be applied to a multitude of challenges for health professionals (Bandura, 2004; Glanz, Rimer, & Viswanath, 2008).

Researchers who have examined food addiction have also discovered that food addiction is not a matter of simply exercising willpower when faced with certain food choices. Many researchers have discovered people battling addiction (food or drug) experience similar physiological changes (Barry, Clarke, & Petry 2009; Wilson, 2010). For example, Barry et al. (2009) and Blaylock (1999) found that the addicted brain undergoes a toxic chemical cascade that triggers cravings for and overeating of certain foods. This chemical reaction does not take place in the unaddicted brain. Pivarunas and Conner (2015) and Parylak, Koob, and Zorrilla (2011) discussed emotional changes that have ranged from impulsivity, stress, anxiety, and depression stemming from food addiction. Despite the physiological changes the body is subjected to, researchers have found that using health information, coaching, and psychosocial theory to manage symptoms of addiction (cravings, outcome expectations, motivation, and self-efficacy) promotes behavioral change.

Gap in Knowledge in the Discipline

There are three gaps in knowledge in the discipline that I will address in this study. First, I hope to address and increase the inclusion of participants into studies that may be likely to benefit from the behavior change techniques (social cognitive theory-based health information) used in this study. For example, Roach et al. (2003) found that utilizing even one component of social cognitive theory (self-efficacy) in sharing health information resulted in improvements in the eating behavior of study participants, even

though participants did not experience increased weight loss. The second gap in knowledge in the discipline is how theory can be used to determine the selection of behavior change strategies. I selected social cognitive theory for this study because many components of the theory are conducive to individuals contemplating or engaging in behavioral change. The final gap in knowledge is using theory to tailor behavioral change techniques to quasi-experiments. Prestwich et al. (2014) stated that the theory could be used to accentuate constructs or types of individuals who should be targeted in studies.

Need for This Study

This study is needed because there is limited research that examines changes in food addiction and symptoms by comparing the differences between groups of obese and overweight women in which one group has been exposed to health information that is based on the constructs of social cognitive theory and the other group has been exposed to non- social cognitive theory-based health information. Specifically, few researchers have examined managing the symptoms of food addiction (such as cravings, anxiety, overeating, and guilt) with behavior-promoting theories such as social cognitive theory to improve food choice behavior.

Additional reasons this study is needed are the potential benefits to medical professionals and counselors that treat the obese because it will allow these professionals to understand behavioral change. For medical professionals who conduct research by searching online databases, once this study has been completed and uploaded to the online databases, the medical community will become aware of a new way to apply the constructs of social cognitive theory towards treating the symptoms of food addiction.

Also, professionals will become aware of the constructs of social cognitive theory's potential role in autonomous self-regulation and sustained behavioral change over time– useful tools in weight loss (Gorin, Powers, Koestner, Wing, & Raynor, 2014). Over time, as overweight and obese individuals lose weight, they will benefit by experiencing extended life expectancy, improved quality of life, and increased physical mobility (Macchi et al., 2013). Finally, another potential health benefit to individuals includes clinically significant improvements in cardiovascular disease risk factors, and reduction of depression, comorbid mental disorders, inflammation, and harmful cytokines (Kiernan et al., 2013; Wiltink et al., 2013).

Problem Statement

Individuals who are overweight and obese may struggle with food addiction and the accompanying symptoms, such as food cravings, feelings of guilt, and overeating (Yeh et al., 2016). These symptoms drive those who are overweight and obese to exhibit poor food choice behavior (Leahey et al., 2012). Despite abundant sources of information made available by public health agencies, and posting nutrition information on food labels, almost 70% of Americans are overweight and obese (Fortuna, 2012). In efforts to study food addiction and nutrition, previous researchers have found similarities between the body's response to illicit drugs and certain foods (Zhang et al., 2011). These findings indicated that certain foods (such as those that contain the addictive substance MSG and HFCS) trigger an addictive and negative chemical cascade in the body (Blaylock, 1999). This chemical cascade usually results in overeating and cravings (Barry et al., 2009; Rolls, 2007). Social cognitive theory comprises key constructs that have the potential to

manage the symptoms of food addiction and help weight loss efforts. I anticipated that providing health information based on social cognitive theory would lead to changes in food addiction.

There are three pieces of evidence that the problem is current, relevant, and significant to the discipline. The first is that both Davis et al. (2011) and Meule and Kübler (2012) found that food addiction is a significant contributor to the obesity epidemic and accompanying comorbidities. The second piece of evidence is that those who are food addicted suffer from higher bouts of depression and anxiety (Davis et al., 2011). These higher bouts of depression and anxiety are partially due to the inability of the food-addicted person to secure the food reward (Chao et al., 2017). The final piece of evidence is that food addicts report that they experience stronger cravings as well as feelings of guilt or anxiety than their non-food-addicted counterparts (Davis et al., 2011; Parylak et al., 2011). One component of social cognitive theory, called facilitation potentially, addresses this issue by recommending tools and resources that would enable a person to cope with these feelings and symptoms.

Investigators have shown that food addiction has taken more of a priority in research due to increased national BMI and obesity levels (Davis et al., 2011). Davis et al. (2011) and Pivarunas and Conner (2015) stated that food addiction should be listed as a classifiable condition that exhibits clinical symptom and psychobehavioral aspects that are similar to drug abusers. Finally, overeating, a key symptom of food addiction, is triggered by the inability to regulate emotions (Pivarunas & Conner, 2015).

Although researchers have linked food addiction to highly palatable foods such as pasta and processed confections, researchers have not examined a link to the chemicals that are often added to these types of foods, such as MSG and HFCS. Parylak et al. (2011) stated that those who ether label themselves as food addicted or rank as food addicted according to the YFAS often consume pasta and processed confections. In addition, researchers have not attempted to use a psychological theory as a catalyst for behavior change to address food addiction.

Purpose of the Study

Obese and overweight individuals who suffer from food addiction face physical challenges and suffer psychological anguish before, during, and after adopting healthier food behavior (Eyres, Turner, Nowson, & Torres, 2014). The purpose of this quasi-experimental study was to test the theory that food addiction can be changed, reduced, or eliminated by using several components of social cognitive theory with health information provided via electronic presentations. One component of social cognitive theory states that knowledge of health threats and health benefits create a precondition for change (Bandura, 2004). I created a precondition for change for study participants when they read the health information contained in the presentations. The presentations increased study participants' awareness of food addiction and factors that contribute to food addiction, such as MSG and HFCS, and associated symptoms (health threat). The presentations also communicated the health benefits of avoiding foods that promote food addiction. Taking this approach modeled the outcome expectations component of social cognitive theory. Outcome expectations potentially impacted study participants' health

behavior (see Bandura, 2004). Defining outcome expectations is also important because individual motivation is influenced when individuals see how adopting recommended health behaviors serves their self-interest (Bandura, 2004).

The participants were overweight and obese women from a private school in Chicago, IL and Walden University's online participant pool. I created two groups and gave participants in both groups pretests and posttests. I exposed one group to health information materials not based on social cognitive theory, while the other group received health information materials based on social cognitive theory. This occurred over the course of 4 weeks. The health information based on social cognitive theory included nutrition information and tips on healthy eating. I had a significant focus on avoiding foods containing HFCS and MSG as well as recommendations for the most commonly consumed foods that do not contain HFCS or MSG, with messages worded to reflect concepts in social cognitive theory such as self-efficacy, outcome expectations, and peer modeling.

The dependent variables were food addiction and food addiction symptom count. The dependent variable of food addiction was defined by scores from the Yale Food Addiction Scale (see Appendix A) that indicated food addiction when participants selected three or more criteria in addition to one of two clinical significance items indicating that the participant had experienced impairment or distress. I noted a potential for food addiction if participants indicated (by circling the specific food item) that they have a problem with processed foods (ice cream, doughnuts, cookies, cake, candy, white bread, rolls, and soda). I also noted a potential for food addiction if participants listed

certain foods or food brands with labels that list MSG or HFCS in their list of ingredients. The presence of MSG or HFCS in these cases was confirmed by identifying the product online via the manufacturer's website and identifying MSG or HFCS in the list of ingredients. The sum of the seven diagnostic criteria indicated food addiction symptom count.

Research Questions and Hypotheses

The research questions (RQs) and hypotheses were the following:

RQ1: What is the extent of the difference in food addiction posttest scores (while controlling for any differences at pretest) as measured by the Yale Food Addiction Scale, among overweight and obese women who receive health information based on social cognitive theory compared to overweight and obese women who receive health information not based on social cognitive theory?

$H_0$1: When comparing the impact of social cognitive theory-based health information with non-social cognitive theory-based health information presented to overweight or obese women, there is no significant difference in food addiction posttest scores (while controlling for differences in pretest scores) as measured by the Yale Food Addiction Scale.

H_A1: When comparing the impact of social cognitive theory-based health information with non- social cognitive theory-based health information presented to overweight or obese women, there is a significant difference in food addiction posttest scores (while controlling for differences in pretest scores) as measured by the Yale Food Addiction Scale.

RQ2: What effect does health information based on social cognitive theory have on symptom count posttest scores, as measured by the Yale Food Addiction Scale, among obese and overweight women compared to obese and overweight women who receive health information not based on social cognitive theory?

$H_0$2: When comparing the impact of social cognitive theory-based health information with non-social cognitive theory-based health information presented to overweight or obese women, there is no significant difference in symptom count posttest scores as measured by the Yale Food Addiction Scale.

H_A2: When comparing the impact of social cognitive theory -based health information with non-social cognitive theory-based health information presented to overweight or obese women, there is a significant difference in symptom count posttest scores as measured by the Yale Food Addiction Scale.

The independent variable was health information delivered electronically that was either based on social cognitive theory or not based on social cognitive theory. The independent variable, according to Creswell (2009), is a variable that "causes, influences, or affects outcomes" (p. 50). The two types of health information I used in this study fit Creswell's definition because they would potentially cause the dependent variable, food addiction as measured by the Yale Food Addiction Scale, to change.

According to Bandura (2004), social cognitive theory comprises a core set of determinants, the mechanism through which they work, and the optimal ways of translating this knowledge into effective health practices. These determinants include possessing knowledge of certain health risks and seeing the advantage and benefit of

adopting certain beneficial health behaviors (Bandura, 2004). If individuals are unaware of how their health behavior is affecting their health, they will have very little reason or motivation to change their health behavior (Bandura, 2004). In the current study, the electronic presentation for the treatment group was designed to increase awareness of health behaviors that contribute to food addiction. The presentation provided information about exercising control over the environment and health behavior, which was the self-efficacy component of social cognitive theory. Health information pertaining to setting goals, expected challenges adopting new behavior, and benefits of adopting healthy behaviors to overcome food addiction addressed the outcome expectations component of social cognitive theory. I presented this information electronically to treatment group participants over the course of 4 weeks. To ensure comprehension of the information presented in the presentations, I reviewed health information presented in the presentation for that week in a prerecorded weekly webinar.

Theoretical Framework

Two theories provided the framework for this study. The first theory was food addiction theory. The second theory was social cognitive theory. These theories addressed the physical and psychological perspectives of what transpires when food is ingested, and why implementing and maintaining healthy food behaviors is challenging.

Food addiction theory was the cornerstone of this study. Humans are predisposed to desire and seek foods that are fatty and sweet (Davis et al., 2011). In prehistoric times, this benefited humans by ensuring their survival when food was scarce. However, a

predisposition toward these foods in times when food is no longer scarce leaves humans vulnerable to overeating and obesity.

Food addiction has been gaining ground in both the media and in scientific research circles due to increased weight gain in the United States (Davis et al., 2011). Indirectly related to the addiction model, food addiction describes an individual's inability to modify behavior and food intake while exhibiting addictive behaviors (Joranby, Pineda, & Gold, 2005; Val-Laillet, Layec, Guerin, Maurice, & Malbert, 2011; Zhang et al., 2011). Although food addiction and general drug addiction are similar, food addiction is different from other addictions. Illegal drugs are not essential to live, but the consumption of food is critical. Associated with the brain's reward system and striatal dopamine receptors, the addiction model plays a role in obesity and how the brain reacts to drug addiction (Wilson, 2010). The loss of control resulting in overeating is reminiscent of drug intake patterns seen in those addicted to drugs and has led researchers to describe these actions when combined with obesity as food addiction (Volkow, Wang, Tomasi, & Baler, 2013).

It is essential to append the Food Addiction Theory with information about MSG and HFCS. Highly processed and palatable foods such as cakes, ice cream, and fast foods often contain these food additives, and contribute significantly to the food addiction and obesity epidemic (Blaylock, 1999). For instance, foods that contain MSG act upon the brain's reward system receptors, thus mimicking the addiction model as the person overeats to achieve the same "high/food high"–like a drug addict. This overeating, in turn, leads to feelings of guilt, shame, anxiousness, and depression (Davis et al., 2011).

An approach that could serve as a catalyst and act as a pre-condition for change by informing someone that suffers from food addiction about the foods that trigger overeating and how to manage the symptoms of food addiction would be helpful.

Finally, the theoretical foundation for the proposed study is founded upon key components of Bandura's Social Cognitive Theory. According to Bandura (2004), social cognitive theory focuses on promoting effective self-management of health habits to ensure success with the newly learned behavior. Social cognitive theory has many constructs that empower a person to implement behavioral change because it focuses on psychosocial components of a person's personality that drive motivation, such as self-efficacy, reciprocal determinism, incentive motivation, self-regulation, and outcome expectations (Bandura, 1969; Glanz, et al., 2008).

Nature of the Study

Researchers have indicated that the components of social cognitive theory show promising results in weight loss studies (Ince, 2008; Netz & Raviv, 2004; Petosa, Suminski, & Hortz, 2003). Social cognitive theory also has shown promising results in studies designed to increase physical activity over the course of several weeks (Ince, 2008; Netz & Raviv, 2004; Petosa et al., 2003). To measure progress, researchers have chosen repeated-measures designs such as ANCOVA to compare the participant responses over the duration of a study. Researchers have also used a pretest and a posttest to compare differences and changes between groups. For example, Gorin et al. (2013) used a behavioral weight loss program to examine the long-term impact of a comprehensive, home-focused weight loss study. Gorin et al. (2013) compared the

differences in weight changes of participants exposed to their behavioral weight loss programs. Only participants received treatment in one group, and in the second group participants and their living partners received treatment. This study was conducted over the course of 18 months with 201 participants. Gorin et al. (2013) selected an ANCOVA as their measurement approach and used weight and age as the covariates. Like Gorin et al. (2013), I chose to compare differences between two groups. I followed the same approach by selecting a repeated-measures ANCOVA. The pretest was used as the covariate to gauge whether the posttest scores changed because of the health information presentation. Doing so allowed comparison of food addiction scores between one group of participants exposed to health information based on social cognitive theory and another group exposed to health information not based on social cognitive theory.

The second element of the rationale for the selected design is based on this study being quasi-experimental in nature, because study participants were purposively assigned to groups. I alternately assigned participants to groups based on the order in which they signed up for the study. I used groups from a private school in Chicago, IL and Walden University's online participant pool. According to Creswell (2009), researchers select a quasi-experiment and nonrandom approach because only a convenience sample is available. For this study, the convenience sample comprised the participant pool from a private school in Chicago, IL and Walden University's online participant pool.

The third element of this study's design was selecting survey methodology to gather the desired data. I used a demographic questionnaire (see Appendix B) and a survey instrument (Yale Food Addiction Scale; see Appendix A) to collect data from

participants. Demographic data included factors such as age, weight, height, socioeconomic status, and ethnicity to describe the sample and to calculate BMI. I used BMI to identify obese and overweight participants. The demographic questionnaire also inquired about dieting habits, mental health, and anxiety. SurveyMonkey (2015) deployed the survey instrument, which was an electronic version of the Yale Food Addiction Scale. There were two reasons I selected the electronic survey format. First, administering the instrument and demographic questionnaire electronically was more cost-effective (see Groves et al., 2009); compared to administering the survey via mail, the cost for a survey administered via the Internet is lower. Second, surveys allow a researcher to collect large amounts of data privately in a short period (Creswell, 2009). Survey participants had an increased sense of privacy in this study because the surveys were administered electronically, which gave study participants an opportunity to select a comfortable and secure location to answer survey questions (see Groves et al., 2009). When study participants are allowed the opportunity to share their responses anonymously, the responses tend to more accurately reflect the survey taker's true perspective or state of health (Storey et al., 2009). In addition, I obtained ethics approval from Walden University's institutional review board (IRB) before contacting prospective study participants (Approval Number 05-03-18-0326424).

The methodology for this study was quasi-experimental. The inclusion criteria were women who (a) were at least 18 years of age, (b) had a BMI over 25, and (c) were not pregnant or had not given birth in the last 6 months. I invited people of all ethnic and

cultural backgrounds to participate and excluded participants who did not fit the sampling frame for the study.

I collected data by recruiting a convenience sample of overweight and obese women from a private school in Chicago, IL and Walden University's online participant pool. I calculated participants' BMI when they provided information about their height and weight, and compared this information to a BMI chart from the Centers for Disease Control and Prevention (CDC, 2014). If the information provided by the participants fit the overweight and obese category, I extended an invitation to potential participants to participate in the study. Potential study participants completed a screening questionnaire and provide informed consent via e-mail.

Using the online survey software SurveyMonkey, I collected data from 84 overweight and obese female participants over the age of 18. A minimum of 68 study participants was required to detect a difference in food addiction between groups, as measured by the Yale Food Addiction Scale. I informed participants that the study would be 4 weeks in duration, would take place online, would address the influence of health information on food addiction and consumption, and would include demographic information. I analyzed data using IBM SPSS 25 statistical software.

Definitions

Craving: A state of mind in which the person is continually occupied with intense thoughts and desires of a certain substance or food that compels and motivates the person to seek and consume a particular substance (usually drugs) that is difficult to resist. For

the purpose of this study, craving referred to food craving (Kemps et al., 2008; Martin, O'Neil & Pawlow, 2006).

Food addiction: The condition in which certain foods, whether seen or eaten, activate the same brain circuitry that is activated by addictive drugs, and thereby regulate dietary behavior (Rogers, 2011).

High fructose corn syrup (HFCS): Meyers, Mourra, & Beeler (2017) defined high fructose corn syrup as a liquid that is metabolized differently than other sugars. Unlike fructose, which is absorbed easily by the body and responsive to insulin, high fructose corn syrup passes through the body and is not responsive to insulin. High fructose corn syrup contains 55% fructose, 42% glucose, and 3% other saccharides (Meyers et al., 2017). The food industry began by adding HFCS to improve food palatability (Rolls, 2007). Although food palatability was improved, researchers subsequently revealed that consumption of HFCS reduces the brain's ability to detect leptin/satiety signals, resulting in metabolic syndrome, overeating, and obesity (Gucciardi, 2011).

Ghrelin: A hormone and neuropeptide (Stoyanova & le Feber, 2014) responsible for appetite stimulation, weight gain, reward, mood, learning, and memory by secreting an activating growth hormone in the stomach and parts of the brain such as the pituitary gland, hypothalamus, cortex, brain stem, and hippocampus (Costantini et al., 2011; Stoyanova & le Feber, 2014). Absence or reduced level of ghrelin in the human body results in decreased appetite (Fiszer et al., 2010).

Obese: Individuals are classified as obese when they reach a BMI of over 30, (CDC, 2014). A female is classified as obese when her body fat percentage is over 32%

(WebMD, 2003). Finally, a female is classified as obese once her waist measurement reaches or exceeds 35 inches (CDC, 2014).

Overweight: Individuals are classified as overweight when they reach a BMI of over 25 (CDC, 2014). There is no classification for overweight in the body fat category, only obesity.

Leptin: A 167-amino-acid peptide hormone that is released from white adipocytes and reflects a person's total body fat mass (Darbandi et al., 2012). Leptin is produced by brown fat tissue, the placenta, ovaries, skeletal muscles, the stomach, mammary epithelial cells, bone marrow, the pituitary gland, and the liver (Darbandi et al., 2012). This hormone is directly responsible for appetite stimulation; without it, unbridled food consumption would take place (Darbandi et al., 2012).

Monosodium glutamate (MSG): An excitotoxin that functions by improving food flavor (Blaylock, 1999). MSG is present in prepared foods such as soups, chips, fast foods, frozen foods, and canned goods. MSG is often disguised in food labels under alternative names such as hydrolyzed vegetable protein, vegetable protein, natural flavorings, and spices.

Self-efficacy: A person's expectations and belief in his or her ability to execute certain behaviors successfully (Bandura, 1997).

Assumptions

There were four assumptions in the study. First, I assumed that participants would answer survey questions honestly. Second, I assumed that those who are obese and overweight also experience food addiction. My third assumption was that all study

participants consume foods that contain certain amounts of MSG and HFCS. Last, I assumed that study participants participated in this study because they were motivated to improve their health by managing the symptoms of food addiction, and were interested in finding a way to lose weight.

These assumptions were necessary to acknowledge the role of human nature and how it may affect survey participants. Survey participants are usually aware of societal expectations and social desirability when answering survey questions, and are prone to bias and inaccurate memory (Johns & Miraglia, 2015; Rhoads & Rhoads, 2012). Second, it was important to be aware of factors that could impact the effectiveness of health information based on social cognitive theory, such as motivation and self-efficacy (see Kelly & Greene, 2014; Senécal, Nouwen, & White, 2000). Even if participants have the right information, those lacking the ability to believe in their abilities to accomplish certain tasks (self-efficacy) will not be as successful as participants with higher levels of self-efficacy (Berndt et al., 2013).

Scope and Delimitations

Those who suffer from food addiction are battling two unconventional physiological battles in the effort to control their weight and eating habits. First, individuals experiencing food addiction report a range of symptoms from food cravings to anxiety until the desired food item has been obtained (Parylak et al., 2011). Second, once the consumption of the food has commenced, dopamine emitted by the brain's pleasure centers overcome all reasoning, and individuals find themselves in a hedonistic fueled need to overeat (Nasser, 2001). The research problem and challenge for this study

is reducing or eliminating food addiction by applying the social cognitive theory. Therefore, there are two specific aspects of the research problem that I addressed in the study. First, this study helped overweight or obese study participants gain knowledge about new behavioral approaches to making better food choices. This in turn resulted in a change in weight control skills. I accomplished this by exposing overweight and obese study participants to the study's social cognitive theory-based health information presentations which were delivered weekly electronically over the course of four weeks. Second, this study improved study participant level of food addiction.

An important facet of the research problem that I addressed in the study is comparing current levels of food addiction versus anticipated changes to food addiction in the future by conducting a pre-test and a post-test. I used repeated-measures ANCOVA for several reasons. First, there were two groups in the study receiving health information, but over the course of four weeks, only one group was exposed to social cognitive theory-based health information. The second group received generalized health information that was not been customized with social cognitive theory (this group will receive the social cognitive theory-based health information after the study). Because I surveyed study participants repeatedly and compared differences between the scores, I used a repeated-measures ANCOVA for this study.

This study included a convenience sample of female participants from Walden University's online participant pool. Therefore, the study results may not be generalizable to men. Moreover, there was the potential for self-selection bias, as those that are truly food addicted may not identify themselves as food addicted. Finally, another limitation

was time and the inability to investigate the effects of social cognitive theory-based health information on food addiction for a more substantial amount of time.

The area of potential generalizability to others is possible to the extent they reflect the population given that this is a convenience sample. For example, using SurveyMonkey required a certain level of computer literacy by study participants. This placed a limit on my ability to generalize my findings and apply these study results to those that may not be computer literate. The area of potential generalizability would come from the ability to apply the study findings to study participants. I succeeded in using social cognitive theory-based health information to address food addiction challenges, there is a possibility that these findings could be duplicated in other studies with success. Another area of potential generalizability is applying the results to morbidly obese women. Due to the components of social cognitive theory, such as providing participants with the tools needed to overcome external stimuli, there could be potential to apply these principles to morbidly obese female study participants to examine how they respond. For example, this study provided definitive information that included healthier food choices that can be used as a substitute for the foods that promote obesity and overeating. This is a valuable approach because those who are obese cite various reasons for being obese. These reasons include lack of accessibility to healthier food options, food cooked in excess fat, claims that oil tastes better, and eating to the point of satiation was a higher priority than the nutritional value of food consumed (Caamaño et al., 2016; Witkos, Uttaburanont, Lang, & Arora, 2008).

Limitations

In conducting this study, I took the following limitations into account. The study population will likely include people with some level of college education to ensure that participants understand survey questions and health information materials presented. The sample consisted of overweight and obese participants, and may not be generalizable to people who have a body fat percentage or BMI within normal range. For example, Meule and Kübler (2012) conducted a study on food addiction using individuals who were healthy size and found that food addiction was positively correlated with a higher BMI. However, Meule and Kübler (2012) admitted that a limitation of their study was that it lacked overweight and obese individuals. Similar to Meule and Kübler's (2012) study, I conducted this study only on a certain segment of the population (women); as a result, findings will not be generalizable to men.

This study focused on those with some level of college education; therefore, the results may not be generalizable to individuals with a high school diploma or lower. The sampling frame for the target population was female, overweight or obese, are not currently pregnant, or pregnant in the last six months. I used convenience sampling in this research study because of the availability of the sampling units (Frankfort-Nachmias & Nachmias, 2008). Participation in this study was be voluntary, therefore, for the purpose of this research, I selected the sample because obese and overweight women are needed for the study, and the private school in Chicago, IL and Walden University online participant pool is convenient.

The Yale Food Addiction Scale measures food addiction by asking about eating habits over the past year. Examples include ice cream, chocolate, white bread, pizza, and french fries. The overconsumption of foods of this nature often causes feelings of guilt (Joranby et al., 2005; Kemps et al., 2008). This has the potential to introduce response bias if study participants underreport information. An additional possibility for study bias is non-response bias, which entails nonresponses on surveys (Creswell, 2009).

I addressed these biases by increasing the sample size to offset any nonresponse bias (Davern, 2013). Also, was no option available to skip or not answer survey questions (SurveyMonkey, 2015). Because the survey asked about what some consider a sensitive topic (food consumption), there was a concern about whether survey participants will answer questions honestly. One way this was overcome to encourage honest answers from participants was by reassuring them that I will hold their answers in the strictest confidence. I included a message in the survey that reassured study participants of the confidentiality of their responses. Another way honest answers were encouraged from study participants was by having them answer survey instrument questions via a computer from the comfort of a location of their choosing (i.e. home/mobile phone). According to Stevens-Watkins and Lloyd (2010), there was an increase in the number of survey questions that study participants answered honestly when they were not required to answer sensitive questions in front of an interviewer. A second way that I addressed biases was to implement Lanyon and Wershba's (2013) suggestion based on their study of underreporting response bias.

Significance

Previous researchers have used components of social cognitive theory to drive positive health behaviors, such as treating drug addiction, alcohol addiction, and smoking cessation programs (Bricker et al., 2010). Researchers have also applied the components of social cognitive theory to weight management programs and increasing fruit and vegetable intake (Basen-Engquist et al., 2013; McCabe, Plotnikoff, Dewar, Collins, & Lubans, 2015; Roche et al., 2012). There are two potential contributions of this study that will advance knowledge in this discipline. First, modeling health information featured in this study upon key facets of the components social cognitive theory created a precondition for change that initiated changes in health behavior. Second, participants learned how to apply components of social cognitive theory as preventative health measures and initiatives. Having knowledge of potential health risks and the benefits of implementing or following certain healthy practices can create the conditions that are the precondition for changing one's behavior (Bandura, 2004). Preconditions for change were applied to this study as well, because I made study participants aware of the potential health risks of consuming foods containing HFCS and MSG, food addiction, and how to cope with the symptoms of food addiction.

Potential Contributions of the Study

This study will advance practice or policy by helping professionals learn the role physiology and psychology play for overweight and obese people in their attempts to modify their food intake behavior. Researchers have stated that poor diet contributes to obesity and early death, which can be prevented by adopting healthier eating habits and

behaviors (Meule & Kübler, 2012). Those who review this study will learn a different approach to applying a psychological theory to health information.

Potential Implications for Positive Social Change

Potential implications for positive social change include helping the scientific community gain a deeper understanding of the significance of food addiction and how it affects food consumption choices. Parlesak and Krömker (2008) stated that even an increased awareness of the impact of the nutrition and effects of certain foods would improve eating habits. Finally, there is the potential for applying components of social cognitive theory to improve behavior outcomes for health promoting programs.

Summary

In conclusion, in this study, I presented evidence that food addiction and the overeating that accompanies food addiction have remarkable similarities to drug addiction. I have cited multiple clinical trials as evidence of the biological underpinnings that drive food and drug addiction. I have also shared commonalities between food addiction and drug addiction. However, food addiction and the overeating that results because of this affliction makes food addiction unique, as the body requires food to live, whereas it does not require other addictive substances, such as drugs, making food addiction straddle the line between substance addiction and behavioral addiction, as it encompasses characteristics of both. On one hand, foods rich in fat, sugar, and salt unleash a dopamine-charged response that acts on the brain and other pleasure centers of the body in the same way as an addictive drug. On the other hand, consuming food is a pleasurable activity with its own hedonistic-like rewards. Therefore, it was important to

examine the behavioral component of food addiction for individuals that are obese and overweight, which is why it was important to introduce components of social cognitive theory to address the symptoms of food addiction. It was also important to evaluate changes in food addiction using the Yale Food Addiction Scale.

In chapter 2, I will provide a literature review on various causes of obesity. This will include food addiction, genetics, and the environment, and will also discuss food addiction and social cognitive theory−the theoretical constructs of this study. I will conclude the chapter with potential implications and societal benefits of research on food addiction, weight management, obesity, and behavioral-based theories like the model used for this study–social cognitive theory.

Chapter 2: Literature Review

In this literature review, I restate the problem and purpose by discussing social cognitive theory as it relates to weight management, food addiction, and using health information to encourage a change in behavior. The obesity epidemic has been increasing and has led to efforts by public health authorities to increase prevention programs (Frederick, Saguy, & Gruys, 2016; George et al., 2017). Social, physiological, and environmental factors contribute to obesity, thereby making it a complex issue to resolve. Meanwhile, food addiction has gained increased attention in the scientific community.

Food addiction can be explained in part by attribution theory, which pertains to an individual's locus of control over behavior (Korn, Rosenblau, Rodriguez Buritica, & Heekeren, 2016). People who suffer from food addiction experience neurological activity that is similar to the neurological activity of a person addicted to illicit drugs (Hardy, Fani, Jovanovic, & Michopoulos, 2018; Zhang et al., 2011). Although the various properties of food (flavor, fat content, and texture) sometimes make it challenging to measure the behavioral responses and neurological responses in obese and overweight individuals, research has emerged that indicates certain food ingredients promote addictive behavior (Blaylock, 1999). These ingredients, MSG and HFCS, favorably effect food by enhancing taste, texture, and palatability, which causes a loss of locus of control, leading to overeating. When this loss of control occurs, overweight and obese people and those who suffer from food addiction experience feelings of shame, depression, guilt, and anxiety (Meseri, Bilge, Kücküerdönmez, & Altintoprak, 2016; Rasmussen, 2015).

Therefore, it is important to examine not only social cognitive theory and food addiction, but the food ingredients that contribute to food addiction: MSG and HFCS.

Synopsis of the Current Literature

This study was based on two theoretical frameworks. The first, food addiction theory, is related to addiction theory. Food addiction refers to an individual's inability to modify behavior and food intake. The behavior exhibited is similar to other addictive behaviors because dopamine levels of the brain are affected (Joranby et al., 2005; Val-Laillet et al., 2011; Zhang et al., 2011). Those who suffer from food addiction often consume highly palatable foods, which leads to overeating. The second theoretical framework was social cognitive theory, which comprises (a) awareness of the desired health outcome; (b) knowledge, which is the precondition for change, and (c) self-efficacy. Bandura (1997, 2004) stated that acquiring knowledge of a dangerous issue, health challenge, or situation, creates a precondition for change. In this study, I presented participants with health information that provided knowledge of food addiction, its influence on the body, how it impacts weight management, and how certain foods containing MSG and HFCS play a role in obesity. I anticipated that alerting food-addicted individuals of harmful ingredients such as MSG and HFCS that their precondition for change would be activated (see Bandura, 1997, 2004; Connor-Greene, 1993). In turn, they would more receptive to health information that would teach them how to avoid foods containing harmful ingredients (see Bandura, 1997, 2004; Connor-Greene, 1993). The cornerstone of these two theories is awareness. I anticipated that once study participants became aware of how the foods they eat contribute to overeating and

weight gain (increased dopamine levels in the brain and reduced detection of satiety signals from the stomach), it would set up a precondition for change. Providing health information featuring components of social cognitive theory may increase motivation to change behavior patterns and decrease food addiction.

In the following literature review, I describe obesity, causes of obesity, risk factors, and influencers of obesity. I also review studies about the effect of obesity on health, society, and comorbidity. I describe food addiction and define it in greater detail, as well as its biological effects and psychological impact on behavior. Because of its impact on the ability to adhere to positive food consumption behaviors, I also discuss cravings and key branches of social cognitive theory such as self-efficacy, outcome expectations, and incentive motivation. In addition, I discuss the relationship between foods containing HFCS and MSG and obesity. I explain how past research related to this study and describe the objectives and variables.

Literature Search Strategy

Library databases and search engines were used to access digital resources and physical books. Databases included PsycINFO, MEDLINE, CINAHL & MEDLINE Simultaneous Search, Nursing & Allied Health Source, ScienceDirect, PsychARTICLES, PsycTESTS, and ProQuest. Additional resources included references from the World Health Organization (WHO), Centers for Disease Control and Prevention (CDC), and other governmental websites.

The search terms used to conduct the literature search included *food addiction*, *Yale Food Addiction Scale*, *social cognitive theory*, *observational learning*, *peer*

modeling, *facilitation*, *drug addiction*, *high fructose corn syrup*, *monosodium glutamate*, *overeating*, *craving/food cravings*, *addiction*, *leptin resistance*, *self-efficacy*, *weight loss/weight management*, *diet*, and *behavior change.* I saved copies of digital journals and governmental websites in both electronic and hard copy formats.

Most of this literature review was conducted using a 7-year scope. There were two exceptions. The first exception was literature about social cognitive theory. The second exception was in the Yale Food Addiction Scale, the instrument used for this study.

I handled cases for which there was too little current research, and few (if any) dissertations or conference proceedings, in three ways. First, I expanded the search beyond the 7-year scope. In some cases, the search yielded additional studies both directly and indirectly related to the topic. Second, I procured books related to the topic and extracted additional information that pertained to the search term (or terms) in question. Finally, I used offshoot terms. For example, if a cited article listed a certain search term that was not used in previous searches, then the new search incorporated the new search term.

Theoretical Foundation

This study was based on two theories: social cognitive theory and food addiction theory. I chose these theories because they provided a unique perspective to not only the obesity epidemic, but also the approach and tools needed to develop a solution. This study was important because researchers often create effective solutions involving instruments, programs, and information that promote changes in health behavior that are

crafted using theoretical premises and frameworks that contain the elements needed to facilitate a solution.

Social cognitive theory is based on the complexity and capacity of the human mind to process information, and the biases that play a role in behaviors that are gained through observations, experiences, and communication (Bandura, 1986; Glanz et al., 2008). Social cognitive theory is based on reciprocity in the form of interactions guided by a person between his or her environment (Anderson et al., 2006; Bandura, 1986; Glanz et al., 2008). The theory shows that people have the ability to determine their environment for their purposes (Glanz et al., 2008). According to Bandura (1986), advanced cognitive capability coupled with flexibility enables an individual to create ideas transcending his or her sensory experiences. Bandura also argued that forethought plays a pivotal role in motivation.

Social cognitive theory is based on nine key concepts. The first is reciprocal determination, which pertains to environmental influences on a person's behavior (Bandura, 1986; Glanz et al., 2008). Reciprocal determination entails individuals' behavior precipitated by their beliefs and the environment. An ideal example of wayward reciprocal determination occurred in the 16th century. Before Galileo discovered the world is round, those who wished to explore and sail would avoid sailing past a certain point in the ocean for fear of falling off the face of the earth. In this case, false belief, (the world is flat) in addition to the avoidant behavior, (don't sail too far away in the sea) kept blind to corrective reality (sail beyond what is perceived to be the edge of the ocean and discover that the ship will not fall off the edge of the earth). Meanwhile, this false belief,

coupled with avoidant behavior created a “reciprocating triadic loop” between individuals’ false beliefs, their avoidant of reality behavior, and corrective reality.

The second concept of social cognitive theory is outcome expectations. Outcome expectations pertain to individuals’ beliefs about the consequences of their choices and actions (Bandura, 1986; Glanz et al., 2008). An example of outcome expectations would entail changing expectations about the taste associated with eating nutritious food.

A third and often highly studied concept of social cognitive theory is self-efficacy. Self-efficacy pertains to possessing the belief in one’s ability to execute necessary behavior for a desired goal (Bandura, 1986; Glanz et al., 2008). An example of self-efficacy entails individuals’ beliefs in their ability to control pain. People handles pain much better when they believe that they have the ability to control pain versus someone who is subjected to pain without the ability to control it (Bandura, 1997).

The fourth concept of social cognitive theory is collective efficacy, which entails one believing in one’s group’s ability to execute necessary behaviors for desired goal (Glanz et al., 2008). An example of collective efficacy could entail the effect of a cogent public health message. An effective public health message that evokes positive emotions about tackling health maladies is fortuitous because it makes people (the collective) feel efficacious about their beliefs of being able to embrace healthy practices that will address health aliments (Bandura, 1997).

The fifth important concept of social cognitive theory is observational learning. An example of observational learning may entail a musician observing a peer playing a new piece of music. The musician then visualizes rehearsing and reviewing the musical

piece (Bandura, 1986). While visualizing, the musician's fingers imitate the keystrokes necessary to execute the musical piece. Finally, the musician plays the musical piece. Thus, one learns a new behavior via direct experience through peer modeling and cognitive rehearsal (Bandura, 1986; Glanz et al., 2008).

The sixth concept of social cognitive theory is incentive motivation, which entails modifying behavior using punishment or praise to achieve desired behavioral outcomes (Glanz et al., 2008). An example of incentive motivation for children and adults might entail toilet training a preschooler. Bandura (1997) stated that physical impact of many activities determines how the activity will be executed because people will go to great lengths to reduce or eliminate aversive conditions and gain physical comfort. In the case of a toilet training preschooler, to avoid the aversive condition and discomfort of soiled clothing, the preschooler will train faster if he/she wears toddler underwear versus training pants or diapers (Vereckey, 2009).

The seventh component of social cognitive theory is *facilitation*, which describes one possessing the necessary tools to easily accomplish certain goals (Glanz et al., 2008). Giving several recipes (tools) featuring important foods to assist a dieter in making better food choices would be an example of facilitation.

The eighth component of social cognitive theory addresses the ability to control oneself and monitor one's actions. This component–self-regulation–entails enabling one to enact control by utilizing various means (Bandura, 1986; Glanz et al., 2008). Examples may include goal setting and rewarding oneself when desired behaviors are demonstrated (Bandura, 1986; Glanz et al., 2008).

The final component of social cognitive theory is moral disengagement, which entails dehumanizing people by disengaging self-regulating moral standards Glanz et al. (2008). The 79% rise of the presence in cyberbullying is an example of moral disengagement (Underwood & Ehrenreich, 2017). Victims of cyberbullying are associated with and experience behavior such as low self-esteem, loneliness, and low academic achievement (Underwood & Ehrenreich, 2017).

Source, Origin, and Theoretical Foundations of Food Addiction Theory

The consensus among researchers is that food addiction is similar to drug addiction from the perspective of the neurological changes to the brain. The commonly-observed addictive agents are foods containing high fat and high sugar, which is prevalent in processed foods, according to researchers conducting studies on rodents (Liebman, 2012; Ziauddeen & Fletcher, 2013). Emerging research on food addiction theory has surpassed labeling broad categories of highly palatable foods that are sources of high fat and sugar as being the culprits. Research now links specific food additives such as MSG and HFCS, which are added to foods to extend shelf life and increase desirability (Barry et al., 2009; Zhang et al., 2011). As research into food addiction theory began to gain more ground, researchers also discovered that although certain foods have a propensity to incite food addiction, some food additives increase the potential for food addiction in people who possess certain vulnerabilities (such as those who are overweight and obese).

Major theoretical propositions. There are three major theoretical propositions. The first is based on a component of social cognitive theory that states that knowledge

creates a pre-condition to change one's behavior (Bandura, 1997/2004). The second is that once a person is receptive to changing his or her behavior, providing the necessary tools via portions of social cognitive theory to foster and nurture the behavioral change will increase the person's self-efficacy and motivation compared to those who do not possess the necessary tools. The third major theoretical proposition is that by reducing the amount of not only highly palatable foods, but highly palatable foods containing MSG and HFCS, the symptoms of food addiction will be reduced or eliminated.

Assumptions. Despite the immense availability of studies that have examined food addiction theory, utilizing health information to change food consumption behavior, and utilizing components of social cognitive theory for weight management and addiction treatment, these studies suffer from three limitations. The first concerns the lack of a thorough analysis of distinct qualities of addictive foods when high fat and high sugar foods have been identified as a substantial contributor to food addiction theory. This deficiency is especially important in light of researchers stating that high fat and high sugar foods most likely contain the food additives MSG and HFCS (Collison et al., 2010; Martin et al., 1995; Ren, Ferreira, Yeckel, Kondoh, & de Araujo (2011). Understanding the likelihood that these foods contain these ingredients as well as foods such as ice cream, fast foods, processed foods, and condiments is essential. It could also potentially provide a set of implementation guidelines for health practitioners who are working to address overweight and obese populations.

Also, I will delineate several assumptions that are appropriate to the application of the theories that are the foundation of this study. In chapter one, I stated that one

assumption is that study participants will provide honest answers and feedback to instrument questions. This is important not only to the study, but also to the results. Another assumption that is appropriate is that study participants will participate in this study because they are motivated to improve their health by managing the symptoms of food addiction, and that they are interested in finding a way to lose weight.

The second limitation pertains to studies that utilize health information to bring about behavioral change. In these studies, there has been an inability to apply strategy and theory consistently. The lack of strategy and theory is unfortunate, because the research reports provide an incomplete or vague description of research outcomes−for example, Kinzie (2005) stated that their research outcome would be to "demonstrate observable effectiveness," (p. 3-5).

The final limitation concerns utilizing components of social cognitive theory for weight management and addiction treatment. Although studies have measured various components of social cognitive theory, most studies focus on self-efficacy, few studies work to integrate a majority of components of social cognitive theory into the health messages that are provided to study participants (Basen-Engquist et al., 2011). For example, Roach et al., (2003) conducted a weight loss study for adults, which included a health education component. Although considerable attention and many sections of the literature were dedicated to health education information, self-efficacy was allocated only one section. However, incorporating even a small amount of self-efficacy into this study yielded improvements in eating behavior compared to the control group (Roach et al., 2003). Another limitation concerning utilizing components of social cognitive theory

observed in other studies are researchers focusing on the health benefits of weight loss or preventing certain health conditions instead of directly mentioning potential improvements in body image (Poddar, Hosig, Anderson-Bill, Nickols-Richardson, & Duncan, 2012).

How the theory has been applied previously. This section explains and provides a literature- and research- based analysis of how the theories have been applied previously in ways similar to this current study. This section will discuss how components of social cognitive theory have been applied to weight loss studies. Because food addiction is a form of addiction, this section will also discuss how components of social cognitive theory have been applied to reduce and eliminate symptoms of addiction. Finally, this section will explore studies that have used behavioral theories to address and reduce the symptoms of food addiction.

Social cognitive theory and weight loss. Components of social cognitive theory have been applied previously and in with similar methodology to the current study in three ways. The first is helping to reduce the consumption of prepared and processed foods. In a study carried out by Nollen et al. (2008), study participants lost weight by applying components of social cognitive theory to change their health behavior and diet choices. The second method, (also a frequently utilized way with most studies) is to use the self-efficacy component of social cognitive theory to bring about behavioral change (Kiernan et al., 2013; Olander et al., 2013; Springfield et al. 2015). For example, Springfield et al. (2015) designed a weight loss intervention guided by social cognitive theory that focused on the self-efficacy component of social cognitive theory by

increasing participants' sense of self-efficacy to improve study outcomes. Finally, Clark, Abrams, Niaura, Eaton, and Rossi (1991), conducted a study on self-efficacy expectations among obese populations and utilized the Weight Efficacy Life-Style Questionnaire to measure obese participants' self-efficacy judgments about their eating behaviors.

Researchers have applied components of social cognitive theory in three ways. The first was during a study that examined social cognitive theory's effect on quitting and reducing addiction desires (Heydari, Dashtgard, & Moghadam, 2014). Heydari et al. (2014) sought to eradicate addiction by utilizing components of social cognitive theory such as personal efficacy, self-regulatory process, and self-efficacy. Haydari et al. provided information on addiction, its complications, and treatment, followed by health information that was designed to inspire feelings of vulnerability by changing study participants' attitude about addiction and the associated health risks. Finally, in the self-efficacy stage, study participants were taught problem solving, self-projection, and communication skills (Heydari et al., 2014). To measure the effectiveness of the social cognitive theory -based information, the researchers provided a post-test questionnaire, and measured the difference between the two groups using ANOVA. Connor, Gullo, Feeney, Kavanagh, & Young (2014) applied components of social cognitive theory in similar ways to the current study using a different method. In their study, Connor et al. utilized self-efficacy and outcome expectations to address symptoms of addiction among cannabis users. They found that when health information was provided to cannabis addicts, the patients' ability to cope with urges decreased (Connor et al., 2014). Finally,

in a study designed to increase health awareness for those who suffer from cardiovascular disease, Petrogianni et al. (2013) found participants experienced an increase in self-efficacy and improved diet and physical activity levels.

Behavioral change theory and food addiction. Although there is an abundant amount of research that discusses the entomology of food addiction, research that pertains to reducing the symptoms of food addiction is lacking. To date, there are no studies that have used social cognitive theory to address food addiction. Therefore, to identify a study similar to this study, I sought out studies using behavioral change theories to address food addiction. Although research was lacking in this area as well, a few studies did emerge. Burmeister, Hinman, Koball, Hoffmann, and Carels (2013) found that those who suffered from food addiction were undermined in their weight loss efforts because of eating-related and addiction pathologies, such as body shame and feelings of withdrawal. Many researchers studying addiction have explored weight loss through various means, such as reduced calorie consumption (Martin et al., 1995), and various high-calorie foods such as cheesecake and chocolate (Kenny, 2013) and chocolate milkshakes (Blum, Gardner, Oscar-Berman, & Gold, 2012). Very few researchers have tried to identify the extent of food addiction in human populations using scientific criteria and focusing on foods containing addictive substances such as MSG and HFCS (Collison et al., 2010; McCabe & Rolls, 2007).

Mason et al. (2015) utilized mindful eating practices, which focused on increasing study participant's awareness and ability to regulate hunger, food cravings, and eating triggers. Mason et al. provided study participants with health information materials to

review at home. The study was successful. Study participants who practiced mindfulness experienced greater reductions in food addiction symptoms and weight loss than control participants (Mason et al., 2015). Additionally, Gearhardt et al. (2012) and colleagues conducted a study on obese patients who were food addicted and found that food addicted study participants struggled to lose weight because they struggled with elevated depression, lower self-esteem, and inability to regulate their emotions. Finally, Burmeister et al. (2013) found that participants lost a significant amount of weight after seven weeks. However, those who showed higher food addiction scores (meaning that they experienced more food addiction symptoms) lost a smaller percentage of their body weight after seven weeks (Burmeister et al., 2013). This is because those who suffered from food addiction had higher levels of binge eating, emotional eating, hedonic eating, food cravings, and consumption of sugary foods compared to overweight and obese participants without food addiction (Burmeister et al. 2013). In conclusion, these studies lay a solid foundation for using social cognitive theory to address food addiction.

Rationale for the choice of this theory. Obesity and being overweight present a complex problem for millions of individuals worldwide. With 53% of people who attempt to lose weight failing to adhere to their diet plans, and one-third to one-half of people regaining the weight, it is clear that there is more to weight loss than simply dieting and exercising (Applehans, French, Pagoto, & Sherwood, 2016). Researchers have discovered that there are neurological underpinnings involved in the weight loss battle as well. In addition, researchers have found that food addiction plays a significant role in obesity due to the role of the brain's neurotransmitters and a person's ability to

derive pleasurable feelings from food. According to researchers, there is a similarity between those who suffer from obesity and those who suffer from drug addiction (Gearhardt et al., 2012; Pepino, Stein, Eagon, & Klein, 2014). However, there is hope. Healthcare professionals have used psychology and cognitive behavioral-based therapy to treat addictions. Specifically, components of social cognitive theory have emerged as a promising and successful way to treat various addictions. Healthcare professionals have also used components of social cognitive theory, such as self-efficacy, in weight loss treatment interventions with great success (McKee & Ntoumanis, 2014; Wilson et al., 2015). However, to date, no researchers have applied components of social cognitive theory to those who suffer from food addiction. This is the rationale for exploring food addiction theory and social cognitive theory in this study.

How and why food addiction theory relates to the present study is that many researchers have implicated food addiction in many studies as a significant contributing factor to overeating, which leads to obesity and being overweight (Gucciardi, 2011; Insawang et al., 2012; Lowndes et al., 2012). In addition, researchers have implicated food addiction in studies of food cravings and excessive sugar intake (Gucciardi, 2011). In addition, researchers have also linked highly palatable foods such as ice cream, cakes, cookies, and various fast foods with the food additives MSG and HFCS Napoli (2008). Those who are overweight and obese often consume these highly palatable foods, which contribute to cravings, overeating, and obesity (Van Dillen & Andrade, 2016).

Although many researchers have reported a positive correlation between food addiction, BMI, and highly palatable foods, very few have linked food addiction to foods

containing MSG and HFCS. The symptoms of food addiction, such as food cravings and overeating, may be explained partially by the presence of the substances in these foods that activate psychophysical response in the brain (Blaylock, 1999). Researchers have found convincing support for food addiction theory based on studies demonstrating neurological responses of people and animals when they are exposed to foods containing MSG.

Additionally, although there are several studies of animal and human subjects providing evidence that addictions and obesity can be treated with behavioral therapy such as social cognitive theory, studies that explore applying social cognitive theory to food addiction are lacking. Thus far, researchers have successfully demonstrated that social cognitive theory can break addictive habits such as smoking cessation (Dickerson et al., 2016), overeating (a symptom of food addiction), and poor food selection (an additional symptom of food addiction). In the proposed study, I will provide meaningful data and support as social cognitive theory -based health information is used to affect the eating habits of overweight and obese women who suffer from food addiction.

The objective of this study is to determine if there is a significant difference in food addiction among overweight and obese women who receive social cognitive theory-based health information compared to overweight and obese women who receive non-Social Cognitive based health information. The research question builds upon food addiction theory and social cognitive theory by studying the differences in food addiction between the group's pre- and post-test, and define the differences between groups that

receive non- social cognitive theory-based health information and social cognitive theory - based health information.

Conceptual Framework

The conceptual framework of the proposed study consists of two theories. The first theory is Food Addiction Theory. The second theory is Social Cognitive Theory. Combined, these theories will address and hopefully provide a potential solution to a significant contributor to the obesity epidemic: food addiction. There is increasing evidence that certain foods can stimulate the excessive release of the brain's pleasure and stimulating neurotransmitter–dopamine–which causes overeating, contributes to obesity, and makes maintaining healthy food behaviors challenging. Meanwhile, components of social cognitive theory have emerged as a viable approach for addressing various addictions. When incorporated into weight loss studies, components of social cognitive theory have increased and improved study goals and outcomes.

Key Statements and Definitions Inherent in the Framework

There are several key statements and definitions inherent in the framework. First, researchers have shown that food addiction is a form of addiction that mimics drug addiction in the brain. Therefore, in the context of the battle against obesity, managing the symptoms of food addiction is not as simple as increasing a person's willpower. The second statement is that behavioral therapies such as social cognitive theory have been shown to address symptoms of addiction and weight loss. Although to date no researchers have applied social cognitive theory to addressing the symptoms of food addiction, in this study, I will examine how food addiction will potentially be impacted when study

participants are exposed to health information that has been created based on components of social cognitive theory.

Definitions Inherent in the Framework

Food addiction. Certain foods, whether seen or eaten, activates the same brain circuitry that is activated by addictive drugs and thus regulates dietary behavior (Rogers, 2011).

Social cognitive theory. Social cognitive theory suggests that human behavior is the product of a dynamic interplay between personal, behavioral, and environmental influences that interact and are determinates of each other (Bandura, 1986; Glanz et al., 2008).

How the Concept Has Been Applied and Articulated in Previous Research

The notion of previous research applying components of social cognitive theory to food addiction is a new and fascinating concept. Although no researchers to date have used components of social cognitive theory to treat food addiction, some have utilized components of social cognitive theory to treat addiction, behavioral challenges, and to promote positive weight loss. Heydari et al. (2014) applied components of social cognitive theory to a group of individuals suffering from opium addiction. Heydari et al. applied the self-efficacy component of social cognitive theory towards the design of an intervention that focused on first creating a pre-condition of awareness that concentrated on increasing awareness of the addiction process and health complications. They followed this by educating study participants of the risks of their past behavior to their health, as well as suggesting preventative approaches that they could utilize to overcome

urges to regress (Heydari et al., 2014). Finally, they used a component of social cognitive theory by teaching problem-solving skills and how to positively engage another component of social cognitive theory–external environment. Although Heydari et al. (2014) articulated the components of social cognitive theory via regularly scheduled meetings with former addicts, the approach and sequence taken are similar to the approach that I took in the proposed study with the independent variable of social cognitive theory -based health information. In addition, Heydari et al. indicated that utilizing components of social cognitive theory in this manner and structure yields successful results. Heydari et al. found that 90% of social cognitive theory -based study participants quit their addition in comparison to the 73% of study participants in the control group who quit their addiction.

In a food addiction study, Kenny (2013) found that obese rats would withstand the pain of electric foot shocks to satisfy their food addiction, even when the experimenter would provide a warning signal before applying the electric foot shock. Humans who suffer from obesity-induced food addiction also experience similar warnings from the body as their food addiction worsens. These warnings can range from shocks of cardiovascular disease, diabetes, and reduced physical mobility as certain parts of the body emit pain signals (Stienstra et al., 2014). Burmeister et al. (2013) stated that although food addiction has been associated with binge eating disorder, bulimia nervosa, and compulsive overeating, food addiction is a different construct and is distinct from binge eating. Burmeister et al. (2013) also found that those who are food addicted did not have greater beliefs that weight could be regulated through willpower alone. This is

important to this study because this reinforces and reiterates that more than willpower is needed to fight obesity. This is also a significant reason for this study, as the food addicted need more than willpower to reduce and eliminate the symptoms of food addiction; applying a behavioral such as social cognitive theory might be ideal.

Finally, most researchers have used health information and education as a minor component of weight loss and addiction studies. To date, researchers from only one study appear to place a greater emphasis on the role of health information. Pierce et al. (2004) utilized monthly newsletters to increase study participants' self-efficacy to encourage them to adopt healthier eating habits, which entailed increasing intake of fruits and vegetables rich in micronutrients and phytochemicals. These newsletters focused on providing study participants nutrition information, research updates, teaching self-policing and monitoring to prevent undesirable food behavior, and provided motivation to study participants to prevent relapse into old behavior patterns (Pierce et al., 2004; Willard-Grace et al., 2015).

Literature Review

There are a multitude of studies related to the constructs of interest, which are food addiction and components of social cognitive theory. However, to fully understand the breadth and significance of food addiction, one must delve into obesity's causes and influences.

Obesity

As a result of the overconsumption of foods and insufficient energy expenditure, some scientists have theorized that decreasing overall food intake to moderate levels

would prevent obesity and promote weight loss (Chaput, Klingenberg, Astrup, & Sjödin, 2011). In the effort to identify a potential solution to the obesity epidemic, it is important to address obesity's etiology. Obesity is defined as having a BMI over 30 kg/m, and overweight is defined as having a BMI over 25 kg/m or a waist circumference over 35 inches or a body fat percentage over 32% (CDC, 2014; King, 2013; WebMD Inc., 2003). BMI is commonly used in studies and I will take this approach in the proposed study as well. Body fat percentage is infrequently used in studies, but still bears mentioning due to its ability to calculate body fat accurately. Body fat percentage is commonly measured by assessing the overall body composition using bioelectric impedance analysis, which involves use of an electrical current to assess the total amount of water in the body compared to muscle and fat (Oeffinger et al., 2014). An accurate body fat measurement is contingent upon a precise height measurement (Oeffinger et al., 2014). For women, obesity is defined as having a body fat percentage of 32% or higher (WebMD, 2003).

There are various scientific theories as to obesity's causes. Some researchers theorize that obesity can be influenced by genetics and family environment (King, 2013; Lochrie et al., 2013). For example, one study conducted on twins that is used as the cornerstone of obesity research found body weight to have a 70% chance of being inherited along with waist circumference having a 65% chance of being inherited (Clark, 1956). The researchers found that body weight and waist circumference is one of the top genetic factors that could be inherited (Barsh, Farooqi, O'Rahilly, 2000). Other researchers studying Finnish twins found similar results; however, they also found that obesity can be overcome with exercise (Silventoinen et al., 2009; Waalen, 2014).

Other scientists have speculated that obesity is due to the brain's set point malfunctioning (Greenway, 2015). Under normal circumstances, the body has certain physiological mechanisms and systems in place to ensure the body maintains homeostasis. For example, after food consumption, the mechanoreceptors in the stomach and the hypothalamic paraventricular nucleus, ventromedial hypothalamus, and the posterodorsal amygdala in the brain are activated (King, 2013). As the person continues to consume food, the brain receives signals from receptors in the stomach, alerting the brain that the stomach has reached or is reaching capacity, which in turn causes a reduction in gastric emptying (King, 2013). Insulin levels are released in proportion to the fat and sugar content of food consumed (King, 2013). The hormones ghrelin and leptin are responsible for the appetite being stimulated or inhibited. The body then indicates that it is full by emitting leptin. The process begins again when the person experiences the sensation of hunger, which is caused by the stomach emitting the appetite-stimulating hormone ghrelin (Miyazaki et al., 2013). This process is a significant component of food addiction, because foods that contain HFCS change the body's process of feeling satiated by changing the body's satiety signals. This is also important because those who are obese or overweight, and people who identify as being addicted to food, consume excessive levels of foods that contain HFCS, such as carbohydrates and ice cream (Martin et al., 1995; Parylak et al., 2011).

In theory, this process should operate consistently, which is what proponents of set point theory state. Scientists who are advocates of set point theory argue that the body maintains a level of homeostasis by maintaining a certain weight, and will naturally

adjust if body weight increases or decreases outside of the normal range (King, 2013; Swencionis & Rendell, 2012). However, this does not explain why obese people maintain abnormally lower levels of ghrelin in their bloodstreams than their thinner counterparts (Miyazaki et al., 2013). Also, obese people who have undergone bariatric surgery and had part of their stomach removed have decreased levels of ghrelin production, yet in clinical studies they still report experiencing feelings of significant hunger (Miyazaki et al., 2013).

Externality theory states that the obese and overweight are unable to detect the body's internal cues indicating hunger and satiation (Stroebe, van Koningsbruggen, Papies, & Aarts, 2013). Other researchers have found that the brain's satiety centers in obese people experience activation delays following consumption of certain foods and highly palatable substances (Gibson, Carnell, Ochner, & Geliebter, 2010). Bragulat et al. (2010) presented another reason for obesity and being overweight. They found that the bilateral hippocampus/parahippocampal area of the brain experienced greater activation in obese participants than in normal weight participants when exposed to food stimuli (Bragulat et al. 2010). This means that obese and overweight people are particularly vulnerable to high palatability foods because it makes eating very rewarding compared to the experience of a person of normal weight (Barry et al., 2009; Bragulat et al., 2010).

Each theory has merit in discussions about obesity's origins and reasons why obesity persists. However, one fact remains absolute: being overweight or obese causes significant health problems. These health problems can include hypertension, cancer, and diabetes (Colombi & Wood, 2011; Persson, 2014). These health problems cause

individuals to suffer the financial burden of direct and indirect costs that have been estimated to reach $147 billion (Center for Disease Control and Prevention, 2013). These direct and indirect costs are attributed to the financial cost of obesity-related pharmaceuticals, health care expenditures for diseases, and disabilities attributed to obesity, such as coronary heart disease, hypertension, type 2 diabetes mellitus, and certain types of cancer (Rappange, Brouwer, Hoogenveen, & Van Baal, 2009). Obese and overweight individuals may also suffer from decreased workplace productivity due to acute and chronic illness and absenteeism (Ulrich, 2005). For this reason, it is important to discuss key contributors to the obesity epidemic, such as the food additives MSG and HFCS.

Food Addiction

Recently, the theory of food addiction has been drawing national attention in the news and scientific research. What makes food addiction so fascinating yet complex is the body's physiological response as well as the individual's psychological motivation (or lack thereof) behind food selection. The scenario is similar to what a person faces when ingesting an illicit drug. A person is aware of the potential ill effects of consuming an illicit drug, yet the person fails to possess motivation to not consume the illicit drug (Barry et al., 2009). Food, however, is essential for life (Barry et al., 2009). How could something so essential to life cause such a cascade effect in the body and lead to a loss of control of behavior?

Several researchers have yielded evidence pertaining to the theory of food addiction and how the brain's neurological response to certain food is similar to the

brain's neurological response when abusing drugs (Barry et al., 2009). For example, Martin et al. (1995) indicated that obese women prefer carbohydrates such as cake and doughnuts. In another study, Burmeister et al. (2013) discovered evidence of food addiction undermining efforts to lose weight because the person is battling eating-related and addiction pathologies, such as body shame and feelings of withdrawal.

Rolls (2011) contributed to food addiction research when he discovered that parts of the brain, such as the primary taste cortex in the anterior insula and the adjoining frontal operculum, contain neurons that detect the subtleties of viscosity, fat, texture, temperature, and capsaicin in food. These areas of the brain are vulnerable to the stimulating and addictive effects of processed foods such as cakes, cookies, and ice cream. These foods often contain the addictive substances MSG and HFCS (Bellisle, 2008; Forshee, Storey, Allison, & Glinsmann et al., 2007). Continuous and repeated exposure to foods containing harmful food additives such as MSG and HFCS can predispose vulnerable individuals to eat compulsively (Barry et al., 2009; Zhang, von Deneen, Tian, Gold, & Liu, 2011). This compulsive eating expresses itself as the person makes poor food choices and exhibits poor ability to self-regulate behavior (Avena, Bocarsly, Rada, Kim, & Hoebel, 2008).

Researchers have used the Yale Food Addiction Scale (YFAS) in food addiction studies to monitor and evaluate excessive food consumption as well as other symptoms of addiction. These symptoms of addiction include but are not limited to food cravings and attending or avoiding certain events (Gearhardt, Corbin, and Brownell, 2009). This scale also evaluates psychological distress, disordered eating, weight bias, and weight-focused

attitudes (Davis et al., 2011). For example, Meule and Kübler (2012) used this scale to measure changes in the strength of cravings, and their results were used to support the argument for food addiction as well as other symptoms of addiction, such as food cravings and problem foods. Meule and Kübler (2012) found that the Yale Food Addiction Scale allowed them to explore food cravings and excessive food consumption. Their findings agreed with others' that noted that individuals with addictive eating patterns experienced more food cravings, yet simultaneously had no expectation of positive reinforcement due to eating certain foods (Meule & Kübler, 2012).

There is evidence that points to similar neurological response between humans and rats to foods and drugs (Zhang et al., 2011). For example, foods containing the addictive substance MSG showed the primary taste cortex and ventral striatum to show increased activity in MRI scans versus consuming those same foods that did not contain MSG (McCabe & Rolls, 2007). In addition, McCabe and Rolls (2007) found correlations for fullness and flavor in the parietal somatosensory operculum. Collison et al. (2010) also found that study participants who were exposed to MSG consumed these foods in an addicted-like fashion.

Biology of Food Addiction

Leptin and ghrelin levels. To understand food addiction, it is necessary to delve into the physiological components that are the catalysts for the body's physiological and psychological responses. Undertaking this task also will allow one to gain further insight into what is at stake when applying social cognitive theory to improve eating habits. There are two regulators of appetite, cravings, and weight management: leptin and

ghrelin. These hormones are directly responsible for appetite stimulation; without it, unbridled food consumption would take place (Darbandi et al., 2012).

Ghrelin is a hormone and neuropeptide (Stoyanova & le Feber, 2014) responsible for appetite stimulation, weight gain, reward, mood, learning, and memory, by secreting an activating growth hormone in the stomach and parts of the brain such as the pituitary gland, hypothalamus, cortex, brain stem, and hippocampus (Costantini et al., 2011; Stoyanova & le Feber, 2014). Absence or reduced level of ghrelin in the human body results in decreased appetite (Fiszer et al., 2010). These reduced levels contribute to obesity and being overweight by potentially over-stimulating appetite for those who are vulnerable to the chemicals in HFCS and MSG.

There are two regulators of appetite, cravings, and weight management: leptin and ghrelin. Leptin is a 167-amino-acid peptide hormone that is released from white adipocytes, and reflect a person's total body fat mass (Darbandi et al., 2012). It is generated by brown fat tissue, the placenta, ovaries, skeletal muscle, the stomach, mammary epithelial cells, bone marrow, the pituitary gland, and the liver (Darbandi, et al., 2012).

Leptin and ghrelin also play significant roles in a person being overweight or obese, and in food addiction (Barry et al., 2009). The greater the amount of body fat, the higher the serum concentration of leptin (Darbandi et al., 2012). Increased levels of leptin in the body result in the ability to suppress appetite and decrease fat stores (Darbandi et al., 2012). To examine the association between obesity and leptin, Gibson et al. (2010) conducted a clinical study and found that when exposed to a highly palatable food after a

24 hour fast, leptin-deficient obese rats experienced greater stimulation in areas of the brain that engaged goal-directed behavior. In these cases, rats would be more motivated to seek out a food reward after being exposed to a highly palatable food stimulus (Gibson et al., 2010). For obese humans, some possess a genetic mutation that reduces the production of the hormone leptin, thus preventing them from regulating their food intake in response to increased body fat (Barry et al., 2009). This mutation also results in a stronger-than-normal appetite, and feelings of a constant and gnawing hunger (Barry et al., 2009). In this case, a person's obesity is due to inaccurate hunger cues as the person overeats not for pleasure, but because the ability to sense satiety is "broken" (Barry et al., 2009)

High fructose corn syrup. One of the most significant factors that effects weight gain and is a catalyst for obesity is excess food consumption, specifically foods consumed that contain added sugars. The use of HFCS peaked in the American food supply between 1970 and 2000 (Lowndes et al., 2012). The food industry began adding HFCS to improve food palatability (Rolls, 2007). This is also because HFCS improves the texture, flavor, and shelf-life of food, and prevents freezer burn (Tweed, 2008). It is found in ketchup, pasta sauce, bread, cereal, salad dressing, yogurt, and frozen foods (Johnson, Gower, & Gollub, 2009; Tweed, 2008). Although food palatability improved since the adding HFCS in the 1970s, subsequent researchers revealed that consumption of HFCS reduces the brain's ability to detect leptin/satiety signals, resulting in metabolic syndrome, overeating, and obesity (Gucciardi, 2011). The consumption of HFCS also

contributes to cravings, overeating, weight gain, and is addictive (Challem, 2014; Collison et al., 2010; Gucciardi, 2011).

Since 1970, Gaby (2005) reported that HFCS consumption had exceeded the consumption of any other food or food group. From 1970 to 1997, HFCS consumption increased by 26% from 64 g/day to 81 g/day in 1997 (Gabby, 2005). In addition to increased sugar consumption, the type of sugar used to sweeten food products such as beverages, cakes, candy, cookies, bread, and salad dressings has changed (Gabby, 2005). Due to greater cost savings for food manufacturers and increased food shelf life, the food industry began to replace the sugar normally used in food products with HFCS in the 1970s (Gabby, 2005). By 1985, the use of HFCS had escalated to 26% use in total caloric sweeteners consumed in the US (Gabby, 2005). Interestingly, studies indicate obesity rates and HFCS consumption rise in lockstep with one another.

Two forms of HFCS are currently used in the nation's food supply. HFCS-55 is used to sweeten carbonated soft drinks and is 55% fructose and 45% glucose (Lowndes et al., 2012). The second form of HFCS – HFCS 42, is used in baked goods and other products and contains 42% fructose and 58% glucose (Lowndes et al., 2012). Studies have shown that when the body ingests foods containing fructose versus glucose, the body's insulin, leptin, and ghrelin response are different (Lowndes et al., 2012). People consume more calories when fructose is involved as opposed to glucose (Lowndes et al., 2012).

There is accumulating evidence to indicate that HFCS is also a crucial causative factor in obesity. In particular, researchers have linked HFCS to a myriad of metabolic

changes conducive to promoting obesity. Collison et al. (2010) suggested that diets containing HFCS induce the expression of genes involved in carbohydrate and lipid metabolism. The individuals also experienced negative effects on the expression of many genes, which also includes several oxidoreductases such as arachidonate lipoxygenases, and Cyp2b and Cyp2c members (Collison et al., 2010). In another study, Gaby (2005) stated that HFCS has deleterious effects on one's metabolism by reacting with protein molecules to form toxic Advanced Glycation End-products (AGEs) which play a devastating role in accelerating aging. In addition, HFCS consumption plays a role in the pathogenesis of diabetes complications, cardiovascular disease, hypertriglyceridemia and hyperuricemia, and for individuals who consume a hypercaloric diet, insulin resistance (Gaby, 2005). Consuming other forms of sugar evokes the damaging cascade reaction of releasing AGEs, but the reaction and volume of damaging AGEs are not at the same amount as the level of HFCS (Gaby, 2006). Additionally, Collison et al. (2010) discovered that HFCS's damaging effects also cross the placenta to negatively affect a developing fetus by inducing steatosis and mitochondrial disruption.

Although HFCS does little to benefit the human body and animals in clinical studies, it benefits the food industry greatly (Forshee, Storey, Allison, Glinsmann, & et al., 2007). To increase food sales, it is important to attract consumers by presenting foods that present a certain color, aroma, freshness, and once ingested, a certain sweetness, chewiness, texture, and humecancy (Barrett, Beaulieu, & Shewfelt, 2010). HFCS accomplishes this. Moreover, this additive substance works on the same area of the brain as morphine, nicotine, and alcohol (Napoli, 2008).

Monosodium glutamate. Several studies have linked similarities between food intake patterns and food addiction as it pertains to the similarity between the body's physiological response to addictive illicit drugs (Napoli, 2008). The theory of food addiction was formed based on several results from several researchers who have uncovered that certain foods that contain MSG and HFCS affect the body's neurologic pathway in the same way as the brain of someone that abuses drugs (Napoli, 2008). Studies by Insawang et al. (2012) and Ren et al. (2011) indicated that MSG consumption has been linked to high blood pressure, obesity, type II diabetes, metabolic syndrome, and an increase in body mass, regardless of food intake. In addition, Ren et al. further examined the topic and found that previous researchers claimed that MSG induces obesity by elevating plasma glutamate levels in the brain to toxic levels, which in turn affects the body's energy homeostasis levels. In animal tests, exposure to MSG resulted in elevated triglycerides, and increased fasting glucose and insulin levels, which are all indicators of metabolic disorder markers (Insawang et al., 2012). Interestingly, Ren et al. studied the effects of MSG in food preferences with animals, and found that animals had strong preferences for MSG, especially if a low-fat food contained MSG. Insawang et al. (2012) confirmed previous research by finding a correlation between consuming MSG, metabolic syndrome, and being overweight in rural Thai populations. He et al. (2008) confirmed this finding examining the relationship between MSG intake and obesity among obese participants; however, a limitation of this study was that the obese comprised only 3% of the study. Nevertheless, there was a partial correlation between

MSG intake and obesity (He et al., 2008). The lack of a large sample of He et al. (2008) study presents a gap in existing research.

Monosodium glutamate's contribution to obesity. Researchers frequently discuss food addiction and its role towards the obesity epidemic (Davis et al., 2011; Hardman et al., 2015). According to those that either self-identified as a food addict or were identified by scores from the Yale Food Addiction Scale (see Appendix A), the foods that were often listed as contributors to food addiction include processed food such as cakes, candies, and fast food (Martin et al., 1995). Various researchers have noted these foods as being infused with the addictive food additives MSG and HFCS (Barry et al., 2009; Lowndes et al., 2012; Lenz, 2007). However, no researchers have yet to examine this more closely. In this section, I will expound upon MSG and its contribution to the obesity epidemic and food addiction.

Monosodium glutamate is an excitotoxin that functions by improving food flavor (Blaylock, 1999). It is present in prepared foods such as soups, chips, fast foods, frozen foods, and canned goods (often disguised in food labels under alternative names such as hydrolyzed vegetable protein, vegetable protein, natural flavorings, and spices). MSG impacts the brain by damaging neurons and exciting these cells to death (Barry et al., 2009; Blaylock, 1999). As more cells perish, the ability to derive pleasure from consumed food diminishes, resulting in the need to consume more food, which in turn results in overeating. The biological effect is similar to what is experienced by drug addicts when they attempt to get high. Drug addicts not only need to consume more of the drug to achieve the same high, but also crave the drug (Martinotti et al., 2017). This

craving is one of the reasons why both drug addicts as well as the obese relapse and consume the addictive substance (Barry et al., 2009).

Neurological impact. As previously mentioned, considerable evidence has been mounting that demonstrates that food addiction and drug addiction share comparable neurobiological pathways, such as the opiate and dopamine reward circuitries (Barry et al., 2009; Val-Laillet et al., 2011). Dopamine is the brain's reward system; steadily increasing its rate of release and thus and the body's perception of increasing rewards can also be associated with food addiction as one consumes foods that contain MSG and HFCS (Zhang et al., 2011). Brain scans of people with food addiction have shown low levels of striatal dopamine (DA) D2 receptors and a high prevalence of A1 allele (Zhang et al., 2011). Because of this condition, overeating serves to raise low DA levels and serves as a form of positive reinforcement (Zhang et al., 2011).

Driscoll (1994) wrote an article that concurs with this current study and discussed the struggles of those that suffer from food addiction. Driscoll discussed that avoiding certain "trigger foods" is not a matter of willpower. People suffering from food addiction are unable to discern portion sizes. For example, a cow looks like a four-ounce steak to someone that suffers from food addiction. Driscoll also discussed that food addicts experience cravings, a form of body dysmorphic disorder in which food addicts see themselves as smaller than they are (Driscoll, 1994). The author suggested that the solution to food addiction is to measure and control one's portion sizes (Driscoll, 1994). However, the author may have inadvertently mentioned the limitation to this solution. Driscoll stated that a person with food addiction is obsessed with food, and that once the

person begins consuming certain foods, that a “feeding frenzy” is initiated and that the person cannot stop eating. This “feeding frenzy” is what leads to overeating. Driscoll also stated that food addicts constantly and obsessively think about food. This discovery would support and possibly explain the role of ghrelin in appetite homeostasis. In addition to regulating appetite by prompting the body to consume more food when it feels it is hungry, ghrelin also plays a role in cognitive functions such as memory (Costantini et al., 2011). This biological process could explain why a food addict craves not only certain foods, but also becomes obsessed with certain foods. Foods that contain MSG and HFCS modify the brain’s circuitry by changing how these foods are perceived when eaten (mouth feel, texture, and freshness) as well as the pleasure that is perceived when eaten (Barrett et al., 2010)

Joranby et al. (2005) conducted a review that elaborated on the psychobiological processes that trigger hunger, and also assessed the link between addiction, overeating, and obesity, and how it impacts the brain. They found evidence from previous studies that utilized functional brain imaging. These researchers yielded results indicating that the brain experiences changes similar to reactions produced by consumption of illicit drugs when a person overeats and becomes obese (Joranby et al., 2005). They also found evidence that drug abusers and those who suffer from eating disorders and are obese are biologically vulnerable. This vulnerability could make them more susceptible to loss of control, impulsiveness, and emotional and environmental cues (Joranby et al., 2005).

Psychological evidence of food addiction. Martin et al. (1995) and Fortuna (2012) reported that obese people consume more foods such as sweets, fats, and

chocolates than their normal-weight counterparts. Withdrawal symptoms abound in the form of headaches, nausea, fatigue, and irritability (Bocarsly, 2016) when the obese attempt to curb consumption of fattening foods, making dieting difficult. To relieve these temporary discomforts, the obese return to their old eating habits (Bocarsly, 2016). Perhaps if the obese and overweight knew that the discomfort that they experienced is temporary, they would continue to positively modify their food intake instead of returning to their original eating regimen ("Can you conquer,"2014).

Ludman et al. (2010) indicated that personality changes are correlated with obesity. Some have also found depression and changes in brain matter such as reduction of inhibitions (Goossens, Braet, Van Vlierberghe, & Mels, 2009; Val-Laillet et al., 2011). In another study, (McCann, 2011) found weight to be associated degrees of extroversion, neuroticism, higher agreeableness, and lower openness to experience. Meanwhile, obese individuals exercised less than non-obese individuals and consumed less healthy foods (Brook, Lee, Finch, Balka, & Brook, 2013). Moreover, obese people experience decreased levels of satisfaction with life when compared to their non-obese counterparts. This decreased level of satisfaction can impact many facets of life, including mate selection and social relationships (Brook et al., 2013).

Food addiction and social cognitive theory relate to this study's approach and research questions in several ways. Food addiction theory addresses the reason why over half of Americans are both overweight and obese (CDC, 2013). As previously stated, those who suffer from food addiction overeat despite the brain registering little or no external reward (Wright, 2011), leading to excess calories consumed, which in turn leads

to being overweight or obese. Parylak et al. (2011) observed that carbohydrates and fast food tend to be some of the most heavily abused food groups among those who suffer from food addiction. Numerous researchers have confirmed that these foods are sources of MSG and HFCS (Collison et al., 2010). MSG and HFCS have also been implicated in studies as a catalyst to food addiction (Barry et al., 2009; Collison, et al., 2010).

Food addiction theory also relates to instrument development and data analysis. The theory is applicable because I measured the differences in food addiction levels and symptoms when components of social cognitive theory were applied to health information that was shared with one group of overweight and obese women while non-social cognitive theory-based health information was shared with the second group. I measured food addiction using the Yale Food Addiction Scale. This instrument was created because professionals working in addiction and nutrition fields observed symptoms of food addiction (Gearhardt et al., 2009). Gearhardt et al. (2009) found that although there was evidence of the physiological components of food addiction (in the form of stimulation of the pleasure centers of the brain), the psychological sides of food addiction had not been explored. The Yale Food Addiction Scale examines the psychological element by examining the behavioral indicators and symptoms of dependence (Gearhardt et al., 2009).

Social Cognitive Theory and Weight Loss

Additional researchers have also noted the role of the cognitive process associated with food choices and health outcomes (Burns & Rothman, 2015; Wethington, 2005). Some have explored social cognitive theory along with various health and eating

behaviors (Nollen et al., 2008). Founded by Bandura, social cognitive theory was derived from previous theories designed by Miller, Dollard, and Rottler (Glanz et al., 2008). Originally known as Social Learning Theory, social cognitive theory was based on and acknowledged the complexity and capacity of the human mind to process information (Bandura, 1986; Glanz et al., 2008). Social cognitive theory is also based on the influential biases that play a pivotal role in behaviors that are gained through observations, experiences, and communication (Bandura, 1986; Glanz et al., 2008). Social cognitive theory is based on reciprocity, in the form of interactions that are guided by a person and his or her environment (Anderson, Wojcik, Winett, & Williams, 2006; Bandura, 1986; Glanz et al., 2008). Bandura (1986) stated that each factor - a person's behavior, cognitive capability, personal factors, and environment - work together to influence interact, determine, and therefore reciprocate between one another. Thus, many people have the ability to create and construct their environment for their own purposes and desires (Glanz et al., 2008). According to Bandura (1986), advanced cognitive capability coupled with flexibility enables one to create ideas transcending one's sensory experiences and belief in one's ability to achieve or reach goals. Bandura (1986) also believed that forethought plays a pivotal role in motivation. Social cognitive theory is based on nine key concepts:

1. Reciprocal determination−Environmental influences on a person's behavior;
2. Outcome expectations−A person's beliefs about the consequences of their choices and actions;

3. Self-efficacy−Belief in one's ability to execute necessary behavior for desired goal;
4. Collective efficacy−Beliefs about the ability of the group to execute necessary behaviors for desired goal;
5. Observational learning−Learning new behavior via direct experience through peer modeling;
6. Incentive motivation−Using punishment or praise to modify behavior;
7. Facilitation–Possessing the tools to accomplish certain goals easier;
8. Self-regulation–Controlling oneself by monitoring one's actions and utilizing various means to do so such as goal setting, rewarding oneself, and social;
9. Moral disengagement – Disengaging self-regulating moral standards by dehumanizing people (Bandura 1986; Glanz et al., 2008).

Social Cognitive Theory is based on and acknowledges the complexity and capacity of the human mind to process information, and the influential biases that play a pivotal role in behaviors that are gained through observations, experiences, and communication (Bandura, 1986; Glanz et al., 2008). Social cognitive theory is based on reciprocity, in the form of interactions guided by individuals between their environments (Anderson et al., 2006; Bandura, 1986; Glanz et al., 2008). The theory explains that people have the ability to determine their environment for their purposes (Glanz et al., 2008). According to Bandura (1986), advanced cognitive capability coupled with flexibility enables one to create ideas transcending one's sensory experiences. Bandura

also believed that forethought and self-efficacy play a pivotal role in motivation. Because I explored the construct of self-efficacy in this study, I will expound more on this topic.

According to Ozer and Bandura (1990), individual self-efficacy refers to a person's perceptions of their ability and capability to garner enough motivation, cognitive resources, and action steps to exert control over certain events. Self-efficacy pertains to what a person perceives they can do with the resources they have to impact and control events in their life and environment (Bandura, 2007). An individual's self-efficacy and his/her ability to act upon self-efficacy in certain situations determines the level of interaction and engagement a person may have with his or her environment (Ozer & Bandura, 1990). Self-efficacy is developed by individual past life experiences, and those experiences shape and form people's beliefs about their ability to produce the desired outcomes (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001). It is a vital element to social cognitive theory because it affects

> adaptation and change not only in their right but through their impact on other determinants. Such beliefs influence aspirations and strength of commitments to them, the quality of analytic and strategic thinking, level of motivation and perseverance in the face of difficulties and setbacks, resilience to adversity, causal attributions for successes and failures, and vulnerability to stress and depression (Bandura et al., 2001, p. 187).

The amount of self-efficacy that one has regulates many things. It regulates one's perceived capacity to exercise control of not only one's actions in a stressful situation, but one's thoughts as well (Ozer & Bandura, 1990). This ability can be particularly vital

in behavioral and lifestyle changes, such as adopting healthier eating habits by avoiding certain foods or choosing a healthier alternative. Ozer and Bandura (1009) have also attributed self-efficacy to the anxiety and stress that one experiences when faced with challenging situations that threaten to derail previously successful attempts at adopting new behaviors. Finally, Bandura and Locke (2003) have attributed self-efficacy to the motivation and levels of performance that dictates behavior.

In clinical studies, self-efficacy has been identified as both directly and indirectly playing a critical role in addiction and adopting healthier behaviors. Lower levels and doubts about one's self-efficacy resulted in decreased or discontinued adherence to the new behavior (subsequently ignoring the problem), and higher levels of self-efficacy led to increased adherence to the behavior (Bandura, 2005). In a separate clinical study, Bandura (2007) found low self-efficacy to result in an inability to manage negative emotions such as stress, depression, loneliness, and social pressures to engage in abuse of addictive substances such as alcohol. In another study, Nollen et al. (2008) noted self-efficacy as a factor in exercise, dietary interventions and fruit and vegetable consumption among low-income populations.

Social cognitive theory also suggests that human behavior is the product of a dynamic interplay between personal, behavioral, and environmental influences that interact and are determinates of each other (Bandura, 1986; Glanz et al., 2008). Past researchers have demonstrated that social cognitive theory has been effective in impacting weight loss. Nollen et al. (2008) found that applying social cognitive theory helped study participants lose weight by reducing their consumption of prepared and

processed foods. They also reviewed important facets of social cognitive theory, such as self-efficacy and psychosocial influencers on body composition (Nollen et al., 2008). The gap in the research as it pertains to this study is that Nollen et al. (2008) focused on reducing the consumption of prepared and packaged foods. However, they did not monitor nor acknowledge the role of high fructose corn syrup and monosodium glutamate in prepared and prepackaged foods (Blaylock, 1999).

Additional researchers have demonstrated that social cognitive theory can be used to aid in weight loss. For instance, Nollen et al. (2008) found study participants who utilized facets of social cognitive theory, such as self-efficacy, for weight loss successfully lost weight. Basen-Engquist et al. (2013) found that cancer survivors lost weight by focusing on their self-efficacy (a construct of social cognitive theory) by remaining positive and focusing on the beneficial outcome of exercise. They further revealed that participants increased the amount of time spent exercising due to experiencing an increase in their levels of self-efficacy (Basen-Engquist et al., 2013). Researchers have also suggested that social cognitive theory weight loss-based therapies are successful because they focus on crucial areas such as self-efficacy, but could be improved if self-efficacy was focused on in "real time" instead via weekly meetings (Basen-Engquist et al., 2013).

Other researchers have shown that self-efficacy plays a significant role in food choices and decision-making. The amount of self-efficacy a person has is important to dietary success. Researchers have suggested that those who are trying to lose weight who have a low sense of self-efficacy do not successfully lose weight or make beneficial

lifestyle choices that would improve health, such as changing food choices or starting and maintaining an exercise program (Bandura, 2007). When obese individuals with high self-efficacy endeavor to improve their health behavior, they are more successful than individuals with low self-efficacy.

Social Cognitive Theory applies to this study's approach and research questions in the following ways: First, social cognitive theory is a psychological theory with constructs designed to facilitate behavioral change. One element of social cognitive theory entails modifying of a person's attitude towards certain goals or challenges in order to facilitate behavioral change. Bandura (1969) stated that exposure to persuasive communications that challenge people's attitudes about certain beliefs causes cognitive disequilibrium. He also stated that people can be persuaded to "change their evaluations of an attitude object by presenting them with new information about its characteristics" (Bandura, 1969, p. 599). It is my hope that the social cognitive theory-based health information (new information) will help study participants change their attitudes about food addiction symptoms and consuming certain foods. If this successful, then there should be a change in the Yale Food Addiction Scores once I resurvey participants, which would impact the data.

Second, social cognitive theory applies to this study and research questions by helping those who suffer from food addiction to manage their symptoms. When applied to customize the message and wording of health information presentations, I anticipated that participants will not only have the tools to manage the symptoms of food addiction, but be more successful in managing these symptoms than a group receiving a non- social

cognitive theory-based health information. One of the reasons this has such enormous potential is its components. Social cognitive theory addresses both internal and external factors involved in behavioral change. For example, social cognitive theory has an observational learning component that states that a new or desired behavior can be learned by observation (in person or via media) of the desired behavior and its consequences (Bandura, 1969; Glanz et al., 2008). This has the potential to affect internal motivation for example via self-efficacy–the capacity to believe that one has the ability to complete a challenging task (Bandura, 1969; Glanz et al., 2008) as well as external motivation.

Previous researchers have explored the impact of modifying human behavior, food consumption, and exercise patterns by providing health information that taps into facets of human nature that are influenced by components of social cognitive theory, such as self-efficacy and outcome expectations. However, no researchers have explored reducing food addiction symptoms by providing health information via an electronic presentation with wording based on the constructs of social cognitive theory. For example, Basen-Engquist et al. (2013) explored self-efficacy along with exercise, but did not explore the differences between exercise and consumption of foods that contain MSG and HFCS. Kemps, Tiggemann, and Griggs (2008) found that food cravings−a symptomology of food addiction−are responsible for failed diets and feelings of depression and shame, but did not specifically measure foods consumed.

Ways Researchers Have Approached the Problem

Over the years, food addiction has been a hotly-debated and explored topic among researchers. Researchers have investigated various facets of food addiction, ranging from the validity of food addiction to its usefulness. Because food addiction is still a young area of research, there are a limited amount of studies that explore addressing the problem of food addiction. To date, only a handful of researchers have approached and attributed the problem of food addiction and being overweight or obese to food addiction directly.

Pepino et al. (2014) approached reducing and eliminating food addiction by conducting a longitudinal study of bariatric patients. This method yielded great success because 93% of food-addicted study participants who underwent bariatric surgery experienced a remission of food addiction (Pepino et al., 2014). However, Pepino et al.'s (2014) weakness was that there was a chance of the results of the study being influenced by dietary counseling that was provided after study participants underwent bariatric surgery.

In another study on food addiction, Burmeister et al. (2013) researchers attempted to address food addiction by implementing a behaviorally-based weight loss intervention for overweight and obese adults. Their study was successful in the fact that food-addicted study participants did lose weight, although Burmeister et al. stated that one weakness was those with food addictions lost less weight than study participants who were not diagnosed with food addiction, as measured by the Yale Food Addiction Scale. The weakness in Burmeister et al.'s study was the inability to apply the study results to a

more diverse population because the sample consisted of predominately Caucasian females.

Lent, Eichen, Goldbacher, Wadden, and Foster (2014) examined food addiction in a large sample of obese individuals with type two diabetes who were willing to participate in a behavioral weight loss intervention for six months. Lent et al. (2014) found similar results to Burnmeister et al. (2012) in that although food-addicted participants lost weight, they lost less weight than their non-food-addicted study counterparts. In addition, one of the strengths of Lent et al.'s study in comparison to Burnmeister et al.'s was the diversity of the study participants of Lent et al.'s. Lent et al. included more African Americans (59%), versus Burnmeister et al. who included mostly Caucasian participants (84.2%). Lent et al. stated that one of the potential weaknesses of their study was the short duration, and that study participants were selected because of their medical condition (diabetes), or that they were emotional eaters. Therefore, these afflictions may not be generalizable to the broader obese population.

Researchers have approached utilizing components of social cognitive theory for weight loss and handling addictions in various ways. Heydari et al. (2014) approached utilizing components of social cognitive theory in an educational program to eliminate study participant's addiction to opium. This approach yielded great success because it was based on each part of the social cognitive theory model in sequence. Ninety percent of study participants experienced elimination of their addiction (Heydari et al., 2014). Heydari et al. (2014) did experience a minor weakness in their study. Study participants with low self-efficacy at the start of the study did not attempt to quit their addiction

(Heydari et al., 2014). Zheng et al. (2007) addressed smoking addiction in their study while utilizing components of social cognitive theory in five health education training sessions over the course of three weeks on a population of 118 smokers. The study was successful. Forty percent of study participants in the social cognitive theory-based health education group quit smoking compared to 5% of the control group. Zheng et al. (2007) stated that one potential weakness of their study was the social and cultural climate of the country regarding to smoking compared to other countries. In China, smoking is socially perceived as a personal decision. In addition, tobacco control policies and public health messages in China are not as visible and widespread compared to other countries. Therefore, a health education study with an anti-smoking message would be a novelty and unique to study participants as opposed to being easier to ignore because of repeated exposure to anti-smoking messages if study participants were in another country (Zheng et al., 2007).

Rationale for Selection of the Variables

For quite some time, weight loss experts, as well as the general public, upheld that the key to weight loss was a simple equation of "calories in and calories out" (Schwenk, 2014). This school of thought eluded to the notion that if individuals wanted to lose weight, all they had to do was make sure to eat fewer calories than they burned. Although this outlook still pervades certain scientific journals and publications, in more recent studies, researchers are illuminating a different reason as to why millions of Americans are not losing weight. By taking a more sophisticated approach to examining how the body metabolizes food and how the brain responds to certain food groups, additional

research has emerged that demonstrates that there are outside influences that affect food choices. Researchers are beginning to come to the realization that managing one's weight is not merely a matter of willpower and self-control.

The rationale for selection of food addiction and social cognitive theory entails the following reasons: The first is that although numerous studies have been conducted to examine ways to manage and eliminate obesity, it is the opinion of this researcher that it is important to acknowledge the role of biology and how certain foods can influence eating behavior. Food addiction only addresses the biological and behavioral factors of eating behavior. The second rationale for the selection of food addiction and social cognitive theory is that researchers have successfully used social cognitive theory to reduce and eliminate addictive behavior. One of the reasons for social cognitive theory's success in studies is because it addresses all facets of addiction, behavioral change, and reciprocation. This reciprocation takes place between individuals, their external environment, and their outcome expectations for their set goals. The final reason and rationale for the selection of food addiction and social cognitive theory is that although researchers have conducted promising research on these variables separately, no studies have been performed on these variables together.

What Is Known, What Is Controversial, and What Remains to Be Studied

Two issues are controversial to researchers and appear to evoke mixed reactions. The first and most pertinent issue to this researcher is that one of the premises of food addiction is that it rests on the idea that it is fostered by high fat and high sugar foods. However, this researcher feels that these categories are too broad. Ziauddeen and Fletcher

(2013), concurred and made the same observation. According to Ziauddeen and Fletcher, the current food addiction model has not explored beyond the idea of foods that contain a high amount of fat and sugar. Ziauddeen and Fletcher recommended that researchers narrow the category by exploring components of these foods, such as concentration of nutrients in these food items that may perhaps stand as a catalyst to the addictive process. Ziauddeen and Fletcher further expounded upon this line of thinking by likening this situation to something that food addiction has often been compared to–drug addiction. They stated that just as drugs vary in their potency and addicting potential, foods could vary as well. Ziauddeen and Fletcher argued that addicting foods should be narrowed down and delineated to identify what drives the addition. Is there a common substance? Is this an addictive substance? This outlook remains to be studied.

Fortunately, researchers outside of the specialty of food addiction are already pursuing this path. Blaylock (1996), Meule and Kübler (2012), and Napoli (2008) have all found that highly processed food such as those containing high fat and sugar contents show signs of containing MSG and HFCS, and that these chemical additives have been linked to food addiction. Perhaps in time, researchers from these two specialty areas will collaborate and take the next step in food addiction research.

Ziauddeen and Fletcher (2013) mention a second issue of interest and controversy regarding food addiction. They questioned the validity of the food addiction model in the context of those who are obese and suffer from binge eating disorder. Their justification is that binge eating disorder is an entirely different psychological profile that compels a person to participate in disordered and compulsive eating (Ziauddeen & Fletcher, 2013).

The person continues this behavior despite negative consequences, and makes a significant effort in acquiring the addictive substance (Ziauddeen & Fletcher, 2013). However, food is needed to live. Furthermore, most do not need to exert significant effort to acquire food.

One key point that remains to be studied is the concept of shared genetic susceptibilities (Ziauddeen & Fletcher, 2013). Researchers have identified that obese people, just as with drug addiction, are physically vulnerable due to a lower reward threshold (Comings & Blum, 2000). Researchers conducting studies on families have linked drug addiction to alcoholism, and this, in turn, is associated with an increased risk of obesity (Dinwiddie & Cloninger, 1991). In both of these scenarios, these people are vulnerable to the food that activates hedonistic sides of the brain (high fat and high sugar foods) and therefore more prone to food addiction.

Summary and Conclusions

The major themes in the literature entail the following: First, food addiction and the overeating that takes place with people who suffer from this affliction share a commonality and similarity to drug addiction. Based on this evidence, food addiction could be one of the leading reasons why people who attempt diets subsequently fail. As soon as food-addicted individuals use their willpower and diet to improve their health, they are battling dopamine–the brain's neurological signal of pleasure that urges the person to overindulge regardless of the consequences–a similar battle that drug addicts experience when they try to resist the urge to consume drugs.

To combat addiction and obesity, health industry professionals continue to utilize behavior therapies. Researchers have identified components of social cognitive theory as potential leaders and effective tools in addressing symptoms of addiction and treating weight loss. In this chapter, I discussed various studies in which components of social cognitive theory have been utilized successfully.

There are several key items that are known in the discipline related to this topic. First, researchers now know that food addiction is real addiction–a unique addiction–but a real addiction nevertheless. Second, researchers now understand how food addiction affects the brain and how it contributes to overeating, leading to addiction. Third, although researchers have indicated that food addiction has been linked to highly palatable foods, there are a few things that are not known in the discipline that are related to this topic. For example, although researchers indicate that food addiction has been linked to highly palatable foods, there is a limited number of studies linking food additives such as MSG) and HFCS to food addiction. Also, although there are compelling studies linking food addiction symptoms to MSG and HFCS, these are few. Furthermore, although researchers have demonstrated the effectiveness of social cognitive theory in reducing/eliminating addiction symptoms, improving weight loss outcomes, increasing healthy eating outcomes, and reducing/eliminating symptoms commonly associated with food addiction, no study to date has directly applied components of social cognitive theory to food addiction.

However, this lack provides an opportunity for the proposed study. This study will fill at least one of the gaps in the literature, and will extend knowledge in the

discipline by measuring changes in food addiction levels and symptoms between groups of overweight and obese women as measured by the Yale Food Addiction Scale. I will expose one group of participants to health information based on components of social cognitive theory while the other group will receive basic health information. In chapter 3, I discuss the methodology, setting, sampling, instrumentation, and analysis used in the study.

Chapter 3: Research Method

The purpose of this study was to examine the influence of health information based on social cognitive theory on food addiction among obese and overweight women. In Chapter 3 I discuss research methods used in this study, including the research design, sampling, instrumentation, data analysis procedures, and ethical considerations. I also discuss the rationale for the research design; sample selection, characteristics, and size; and the instruments used (surveys and questionnaires). I conclude the chapter by describing the data collection and analysis processes.

Research Design and Rationale

Researchers have shown that food addiction is correlated to higher BMI (Meule, Papies, & Kübler, 2012); therefore, I selected overweight and obese women for this study. I chose women for this study because researchers indicated that women have a higher interest in their body image and are more motivated to lose weight than men (Meule et al., 2012). Because women have a higher interest in their body image and are more motivated to lose weight than men, study participants may have been more motivated to adhere to health information based on social cognitive theory. Increased motivation may have reduced the incidence of participant attrition over the course of the study's 4-week period (see Niazi, Adil, & Malik, 2013).

For this study, I identified participants as candidates according to their BMI calculated by using the CDC equation, which involved dividing a subject's weight in kilograms over the subject's height squared in centimeters (CDC, 2015). I classified potential study participants as overweight (25-29.99 kg/m) or obese (>30 kg/m2) using

the cut-off points listed by CDC (2015). The justification for including potential participants was that they were old enough to provide informed consent. I assumed that potential participants would possess the necessary reading comprehension level to complete the questionnaires and instruments, and that they would be a diverse population consisting of various ethnic backgrounds and ages.

I used a quantitative, quasi-experimental approach. This method is used when researchers develop a hypothesis or theory that states that a difference in a dependent variable is affected or changed due to a manipulated independent variable when compared between two or more groups (Green & Salkind, 2011). The purpose of this study was to examine how components of Bandura's social cognitive theory, when applied to health information, may affect food addiction level. The quantitative approach was appropriate because it enabled me to test the numerical changes in the dependent variable between two groups (see Pallant, 2016). I sought to examine the differences in food addiction between two groups of overweight and obese women in which one group received health information based on social cognitive theory and the other group received health information not based on social cognitive theory.

The research design for this study was between subjects over the course of 4 weeks. Using a pretest, I measured differences between the two groups of female overweight and obese study participants. I e-mailed the first group of study participants a PowerPoint presentation containing health information based on social cognitive theory. Both groups of participants received the Unites States Department of Agriculture Food Pyramid to ensure that participants in both groups would receive standardized nutrition

information. The Food Pyramid supported the health information featured in the presentations. I conducted a repeated-measures ANCOVA to examine participant scores from the Yale Food Addiction Scale. Using the ANCOVA, I compared pretest and posttest differences between the groups (see Mara et al., 2012). This approach allowed me to use the pretest as a covariate, which increased the power of this quasi-experimental study in determining whether the health information played a role in anticipated changes in food addiction scores. I used SPSS 25.0 to analyze the data.

The study variables included the following: The independent variable was group status: either receiving health information based on social cognitive theory (Group 1) or not based on social cognitive theory (Group 2). Group 1 received weekly presentations that included health information modeled using key elements of social cognitive theory, such as self-efficacy, outcome expectations, observational learning, incentive motivation, facilitation, and self-regulation. Group 2 received weekly presentations that disseminated health information that was not modeled using social cognitive theory.

The health information based on social cognitive theory (Appendix C) was designed to increase participant knowledge of healthy eating and food addiction, which included the effects of eating foods that studies have shown foster food addiction (i.e., foods that contain the food additives MSG and HFCS). Group 2 received a similar presentation weekly, but the presentation's message was not based on social cognitive theory. The health information was devoid of social cognitive theory elements such as self-efficacy, outcome expectations, observational learning, incentive motivation, facilitation, and self-regulation (Appendix D).

Two research design elements pertained to the design choice. The first constraint was time. I scheduled the study to be conducted over 4 weeks to reduce the chances of participant attrition. The second constraint was financial. Because this study was not funded by any organization, there were financial limitations that prevented me from offering additional cash incentives to study participants.

This design choice was consistent with research designs needed to advance knowledge in the discipline in two ways: First, previous researchers who examined the differences and changes between groups at two points of time chose an ANCOVA. For example, Hintz, Frazier, and Meredith (2015) selected this approach when they explored the effectiveness of an online intervention based on self-efficacy, a component of social cognitive theory, to help college students deal with stress more effectively. To determine whether the posttest scores increased because of the online intervention, Hintz et al. (2015) used a pretest as a covariant during the ANCOVA analysis. In another study, Dijkstra and Bos (2015) compared changes between groups of smokers exposed to new graphic cigarette warning labels. Gulliver et al. (2016) used a repeated-measures ANCOVA to test their hypothesis that one group of firefighters participating in a behavioral change intervention delivered face-to-face would show significantly more successful results compared to the second group of firefighters participating in a behavioral change intervention delivered via video.

Methodology

For this study, I recruited participants from a private school in Chicago, IL, the Walden University online participation pool, Findparticipants.com, and

Researchandme.com. Selection criteria included the following: (a) female, (b) at least 18 years of age, (c) BMI over 25, (d) overweight or obese, and (e) not currently pregnant or not have given birth in the last 6 months. I calculated the participants' BMI based on self-reported height and weight that participants submitted when they completed the e-mailed survey that accompanied the pretest and posttest. All ethnic and cultural backgrounds were eligible to participate; participants who did not fit the inclusion criteria were excluded from the study. However, they were provided the health information. As a contingency plan to ensure that I secured the minimum number of participants (68) for my study, snowball sampling and chain-referral sampling were also used. Snowball sampling and chain-referral sampling has been viewed as an effective sampling technique by researchers because it allows researchers to reach populations that may be hidden or difficult to reach (Norris, Harrington, Grossman, Hemed, & Hindin, 2016; Waters, 2015). When potential study participants contacted me, I sent an e-mail thanking them for their interest and asked them to refer anyone that they think would benefit from my study (see Addendum).

Sampling and Sampling Procedures

I used a convenience sample for this study and recruited participants from both a private school in Chicago, IL., Walden University's online participant pool, Findparticipants.com, and Researchandme.com. As previously stated, snowball sampling and chain-referral sampling were used as a contingency plan in order to secure the minimum number of study participants. The Walden University online participant pool consists of members of the Walden community, which includes Walden University

students, faculty, and employees and utilizes SurveyMonkey to gather information from its participants. The private school in Chicago, IL consisted of 55 employees and 200 parents of the currently enrolled students. An associate degree is the minimum education level of employees that are among the teaching staff of the private school in Chicago, IL. The private school in Chicago, IL also allowed me the opportunity to recruit obese and overweight women, which was the target of this study. Findparticipants.com and Researchandme.com are research panel databases that consist of study participants located worldwide that have voluntarily enrolled because they are interested in participating in research studies. Findparticipants.com panel of participants reside in 129 countries, are 16 years of age and older, various ethnicities and educational levels (Findparticipants.com, 2019). Researchandme.com consists of thousands of panel participants that are located nationwide (Researchandme.com, 2019). I utilized SurveyMonkey because it is an internet survey tool that can be customized by any researcher.

The goal of the research was to compare the potential changes in food addiction scores between groups. To achieve statistically significant results, the sample size for this study was at least 68 completed participants to potentially detect a significant difference in food addiction, as measured by the Yale Food Addiction Scale between groups. I used G*Power software to calculate the sample size for this study. G*Power allows researchers to conduct a statistical test to conduct a power analysis (Faul Erdfelder, Lang, & Buchner, 2007). I utilized an ANCOVA to allow for control of the differences in pre-test scores between the groups during this quasi-experiment (Hintz et al., 2015). Taking

this approach allowed me to make an unbiased comparison on the Yale Food Addiction Scale post-test. When using G*Power, I inputted the following parameters: a power of .80, a two-tailed alpha level of .05, and Cohen's d of .5 for a medium effect size, and a pretest-posttest correlation of .70. These parameters yielded the necessary sample size for the research question, which was 34 for each group, with N = 68.

Procedures for Recruitment, Participation, and Data Collection

I recruited female study participants who are overweight and obese and who met the additional study criteria from a private school in Chicago, IL., Walden University online participant pool, Findparticipants.com, and Researchandme.com. The Advertisement for Study was featured in the private school's bi-weekly newsletter with an invitation to contact me if interested in participating in the study (See Appendix E). The Center for Research Quality sent out an email to alert Walden University online participant pool users that my Advertisement for Study has been posted to the Center for Research Quality virtual bulletin board. The Advertisement for Study also featured an invitation to contact me if interested in participating in the study. Findparticipants.com and Researchandme.com featured my Advertisement for Study in their regularly scheduled e-mails that are sent out to members of their participant pool. For tracking purposes, both Findparticpants.com and Researchandme.com removed my contact information and directed potential study participants to click on a link that alerted me of potential study participant's interest. Both Findparticipants.com and Researchandme.com compiles the information of all interested study participants on a dashboard section of their websites for the researcher to view and track recruiting progress.

If someone contacted me via phone, I discussed the information featured on the Advertisement for Study page and the Consent Form. If the potential participant was interested in participating in the study, I confirmed that the potential study participant meets the eligibility criteria and collected their contact information which included their first and last name, and their e-mail address. I shared with the potential study participant that in 24 hours they will receive an e-mailed invitation to click a SurveyMonkey link that will contain a consent form and a survey. I also shared with the potential study participant that once they complete the survey and it is confirmed that they meet the study criteria that for four weeks I sent various health information for them to read. Also, at the end of four weeks, I asked potential study participants to complete a knowledge quiz based on the health information that they read and to re-take the survey they completed in week one. Finally, I encouraged potential study participants to contact me if they had any questions and confirmed that they had my contact information.

Potential study participants that contacted me via e-mail, were provided the Advertisement for Study page with an invitation to participate in the study if the potential study participant meets the eligibility criteria. I also included the SurveyMonkey link and asked potential study participants to reply to my email to inform me if they are not interested in participating in the study. Potential study participants were also encouraged to contact me directly if they had additional questions. My contact information was provided at the end of the e-mail. Potential study participants that contacted me but hadn’t completed a SurveyMonkey survey nor indicated they are not interested in

participating in my study were contacted in 48 hours and extended an invitation to participate in my study once a week for three months.

The SurveyMonkey link contained the consent form, demographic questionnaire, and Yale Food Addiction Scale (Appendix E). Potential study participants had the opportunity to review the consent form which described my study. The consent form provided more details about the study and stated that this study will give participants two types of health information and study the effect. Specifically, increasing awareness of foods that have been linked to increasing food addiction (see Appendix F). Study participants were also given the opportunity to indicate that they are giving informed consent by selecting "Yes" or "No" on the "Informed Consent to Participate in a Research Study" section of the online survey. Participants were asked to provide their e-mail addresses so that they may receive pre-test, weekly health information, and a post-test and knowledge quiz at the end of the study.

The next section of the online survey featured the demographic questionnaire. The demographic questionnaire served as a screening questionnaire and was used to determine which study participants meet study criteria and to collect data for this study. The demographic questionnaire collected the following information: mental health diagnosis, treatment for anxiety or depression, in the past six months, have you been pregnant, are you currently pregnant, highest level of education completed, gender, age, weight, height, and ethnicity. Height and weight information were used to describe study participants and calculate BMI. BMI was one of the selection criteria for this study. I then calculated the BMI and used this information to describe my study participants.

Participants that selected answers that did not meet study criteria were redirected to a disqualification page. The disqualification page displayed the message “Thank you for your interest in this study, I am sorry, but you do not meet one of the following study criteria. Female, at least 18 years of age, not currently pregnant or pregnant in the last six months, and overweight or obese. However, as a thank you for expressing interest in the study, all participants that have expressed interest in the study will be emailed the health information once the study concludes.” Participants were invited to contact me if they have any questions. My contact information was displayed at the end of the message.

Participants were directed to the next part of the SurveyMonkey online survey system which contained the survey instrument (Yale Food Addiction Scale) which was used to collect data for this study. I converted the Yale Food Addiction Scale into an electronic format and deployed it using the online survey system SurveyMonkey (SurveyMonkey, 2015). No modifications were made to the scale. Burrows et al. (2017) administered the Yale Food Addiction Scale online to investigate food addiction in children.

I ensured that participants were presented with information stating that they can leave the study at any time, and that they were provided with information detailing exit procedures for the study. I featured this information beneath the first instructions contained in the online survey, followed by the Yale Food Addiction Scale. Once participants answered the Yale Food Addiction Scale questions, the last page (closing page of the survey) displayed the message - “Thank you for completing our survey! This study is confidential, and the researcher will hold all responses in the strictest

confidentiality. You are invited to contact the researcher if you have any questions." on the study participant's computer screen. My contact information was provided at the end of the above message.

The study took place over the course of four weeks. The health information distributed was different for the social cognitive theory -based health information group than the non- social cognitive theory-based health information group. Once a week, both groups received health information presentations distributed via e-mail designed to increase health awareness of food addiction and overeating. Furthermore, study participants received a weekly pre-recorded webinar that reviewed the information covered in the health information presentations. Study participants viewed these pre-recorded webinars once they clicked a link in their e-mail. The eLearning software Adobe Presenter 11.1 was used to play the pre-recorded webinars (Adobe Presenter 11.1). This software was selected because it gave me the ability to confirm that the webinar has been viewed. These weekly pre-recorded webinars increased the likelihood of reviewing the information. To confirm the viewing of the pre-recorded webinar, I examined the "counter" on the webinar software weekly. If the counter indicated that a low number of people are listening to the webinar, I contacted study participants within three days via e-mail to remind each participant that this information is available in pre-recorded webinar format.

The weekly schedule over the course of four weeks included the following: The beginning of the week entailed e-mailing the health information. Towards the end of the week: distributing the weekly pre-recorded webinar. The beginning of the first week and

towards the end of the fourth week: Participants completed the Yale Food Addiction Scale (see Appendix A) via the SurveyMonkey link that to be provided via e-mail. The health information specifically discussed components of social cognitive theory, such as discovering and maximizing one's self-efficacy for food addiction symptoms. This health information also expounded upon how to fulfill outcome expectations in order to overcome food addiction symptoms and learn about facilitation tools, and how to apply these tools to symptoms of food addiction. Finally, this health information discussed how to self-regulate oneself in the face of food addiction. The social cognitive theory -based health information group's presentations addressed the following over the course of four weeks:

- Week 1: Is Your Food Helping You or Hurting You? Principles of Food addiction and Perceptions of Food (Increasing awareness about food addiction and self-efficacy). Finding Your "Happy Place" (Setting up a Food Plan). Changing Expectations about Healthier Foods (Addressing outcome expectations)
- Week 2: Just Say Yes!!!! (Self-regulation, increasing self-efficacy, and facilitation by providing tools and suggesting alternatives to commonly consumed foods that contain HFCS and MSG to reduce and eliminate food addiction).
- Week 3: Sexy and Energetic You – And You Can Eat Dessert!!! – Sexy desserts and sweets (Facilitation – providing tools, self-instruction, and outcome expectations);

- Week 4: Seven Tricks to Sticking to Your Goals – (Self – regulation and facilitation)

During the third week of the study, I sent study participants a "thank you" e-mail. This email thanked the participants for their participation, and alerted them that they are approaching the end of the study. The e-mail asked participants to refer anyone that they knew that they think would like to participate in this study. I also asked participants to reply to the e-mail if they were interested in receiving the results of the study, and will provide participants who were part of the non- social cognitive theory health information group the social cognitive theory -based health information one week after the study ends. During the fourth week of the study, a SurveyMonkey link was e-mailed to both groups of participants that directed participants to take a brief knowledge quiz. The knowledge quiz was based on the contents of the health information study participants have received over the course of four weeks. This was to confirm that study participants have reviewed the health information. The knowledge quizzes also provided an opportunity for study participants to apply the newly learned information. There were two knowledge quizzes containing 12 questions. One knowledge quiz – the social cognitive theory knowledge quiz – was based on the social cognitive theory-based health information participants had been receiving over the course of four weeks (see Appendix H). The second knowledge quiz – the non- social cognitive theory knowledge quiz – was based on the non- social cognitive theory-based health information participants had been receiving over the course of four weeks (see Appendix I). Once a participant completed the quiz, a score indicating the percentage of questions answered correctly was displayed.

Table 1 depicts the study's four-week schedule for both the non- social cognitive theory and social cognitive theory group.

Table 1

Study Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 1	Yale Food Addiction Scale Demographic Survey	Health information		Weekly Pre-Recorded Webinar		
Week 2	Health information			Weekly Pre-Recorded Webinar		
Week 3	Health information			Weekly Pre-Recorded Webinar & Thank You - Email		
Week 4	Health information			Weekly Pre-Recorded Webinar & Knowledge Quiz		Yale Food Addiction Scale

The non- social cognitive theory health information study participants received weekly health information as well, but it differed from what the social cognitive theory health information study participants received. The non- social cognitive theory health information was educational only–none of the social cognitive theory components were provided–only general information about healthy food. The titles of the study participant's health information were as follows:

- Week 1: Is Your Food Helping You or Hurting You? *(*Increasing awareness about food addiction)
- Week 2: Just Say Yes!!!! (Providing tools and suggesting alternatives to commonly consumed foods that contain HFCS and MSG to reduce and eliminate food addiction)
- Week 3: Sexy and Energetic You – And You Can Eat Dessert!!! (Facilitation – providing tools, self-instruction, and outcome expectations)
- Week 4: Seven Tricks to Sticking to Your Goals (Seven recommendations to help study participants adhere to goals. Providing tips and tricks provide study participants the opportunity to increase their ability to develop self-regulatory functions in order to sustain newly established behavior [Bandura, 1969]).

Instrumentation and Operationalization of Constructs

I administered all components of this study, including the Yale Food Addiction Scale. This scale measured food addiction, the dependent variable. The Yale Food Addiction Scale was appropriate to this study because this scale measures potential changes in food addiction between two groups of overweight and obese women (Gearhardt et al., 2009). The first group received social cognitive theory-based health information, and I compared it to the second group, which did not receive social cognitive theory-based health information.

Yale Food Addiction Scale

The Yale Food Addiction Scale, which measured the dependent variable in this proposed study, was published in 2009 and was developed by Gearhardt, Corbin, and

Brownell (Gearhardt et al., 2009). I did not need permission for the use of the scale in this study because it is publicly available. The Yale Food Addiction Scale was utilized in this study because it is the only instrument of its kind that measures levels of food addiction. Taking this approach was important because food addiction shares similar neurological pathology with addiction among people who are overweight and obese. The scale also identifies patterns in eating behavior that are common to those that share addictions in other areas, such as binge eating and alcoholism (Gearhardt et al., 2009). It measures eating behavior and has been used with the following populations: those experiencing behavioral addiction such as eating disorders, emotional eating behaviors, people who are overweight (Gearhardt et al., 2009), and self-identified food addicts (Ruddock, Dickson, Field, & Hardman, 2015). It consists of 27 questions (e.g., "I have found that I have elevated desire for or urges to consume certain foods when I cut down or stop eating them"). Fifteen questions are scored using a Likert scale scoring system from 0 to 4, with 0 (never), (once a month), 2 (2-4 times a month), 3 (2-3 times a week), and 4 (4 or more times a day). Eight questions are scored using a dichotomous scoring system of "Yes" or "No".

To calculate scores, I used a combination of dichotomous scoring and frequency scoring. For questions that are potentially probing in nature (i.e. – continuing to consume foods even though the study participant has experienced emotional or physical problems), I used dichotomous scoring (Gearhardt et al., 2009). Eight questions were scored dichotomously. For these questions, participants selected 0 if they have never experienced a food addiction symptom and selected 1 if they have experienced a

symptom. For behaviors that could potentially occur occasionally for non-problem eaters (i.e. emotional eating, dieting) frequency scoring was used. Gearhardt et al. (2009) used the following approach to score the Yale Food Addiction scale: "For the dichotomous items, two different scores were created based on diagnostic criteria: a dichotomous diagnosis (yes/no) and a symptom count (0-7)" (p. 434). I will consider the diagnostic version met, which resembles a diagnosis of substance dependence, criteria if participants endorse three or more criteria as well as at least one of the two clinical significance items (Gearhardt et al., 2009). The endorsement of at least one of the two clinical significance items implies that the participant has experienced impairment or distress (Gearhardt et al., 2009). Participants that indicated they have experienced impairment or distress were referred to support services that are affordable, free, and based on a sliding fee scale at the end of the study. The consent form also featured support services information that is affordable, free, and based on a sliding fee scale. All participants will receive a one-page summary of completed research results following participation. The symptom count score is the sum of the seven diagnostic criteria. "The median number of criteria met for this sample was 1, and 11.4% of participants in the sample met criteria for *food addiction* (Gearhardt et al., 2009)" (p. 434).

First, I calculated food addiction symptoms with a continuous "symptom count" (Burmeister et al., 2013; Gearhardt et al., 2009). Second, another section of the scale featured a "diagnostic" scoring symptom option. Completion of this section provided information about whether a person meets food addiction criteria. An individual met the criteria of food addiction if they indicated that they exhibited three or more symptoms,

and also experienced significant impairment or distress (Burmeister et al., 2013; Gearhardt et al., 2009).

This scale has been tested on clinical patients (64% women, and 18% of participants were overweight) and assessed and found to be reliable and valid based on several factors (Gearhardt et al., 2009). The content validity of the scale is founded in questions that are based on substance dependence and behavioral addictions criteria in the DSM-IV-TR (American Psychiatric Association [DSM-IV-TR], 2000). The Yale Food Addiction Scale is comprised of the following scales: The Binge Eating Scale, BIS/BAS Reactivity Scale, Eating Troubles Module, Emotional Eating Scale, Rutgers Alcohol Problem Index, and the Daily Drinking Questionnaire. Gearhardt et al. (2009), examined correlations between the Yale Food Addiction Scale and other established eating pathology predictors to assess convergent validity. The correlations were found to be statistically significant ranging from .46 to .61 (Gearhardt et al., 2009). Gearhardt et al (2009) selected these scales because they are frequently used to assess consumption of high fat and high sugar foods. Gearhardt et al (2009) adapted questions from these scales to properly assess food addiction levels.

Once questions were selected, developed, and revised from these scales and indexes, Gearhardt et al. (2009) and a pool of experts specializing in the fields of addiction, obesity, and eating pathology reviewed item content and wording. This review was to ensure that the questions adequately assessed what they were supposed to measure. Gearhardt et al. (2009) also examined scoring options such as dichotomous,

frequency and Likert scale options. To effectively capture diagnostic criteria, Gearhardt et al. (2009) chose dichotomous and frequency scoring.

The scales and indexes used to form the foundation of the Yale Food Addiction Scale have been proven to be reliable (Gearhardt et al., 2009). For example, the internal reliability of the Binge Eating Scale is Cronbach's $\alpha = .93$ (Gearhardt et al., 2009). The internal reliability of the BIS/BAS Reactivity scales are .78 and .71 respectively. The Eating Troubles Module internal reliability scale is .91. The Emotional Eating Scale has an internal reliability of .95. The Rutgers Alcohol Problem Index had an internal reliability of .95. The Daily Drinking Questionnaire had an internal reliability of .83 (Gearhardt et al., 2009).

Gearhardt et al. (2009) explored and established reliability by utilizing the Mplus statistical package. The researchers used this statistical package to explore the number of underlying factors of the questions of the Yale Food Addiction Scale (excluding questions that pertain to clinical significance). In addition, the researchers used the Mplus statistical package to conduct an exploratory factor analysis for the dichotomous data. One item earned a low factor loading of .33 and the researchers removed it because it did not strongly correlate. Gearhardt et al. (2009), plotted four factors based on eigenvalues greater than one, but plotting of each factor suggested a single factor structure. Good internal reliability (Kuder-Richardson $\alpha = .86$) resulted from all factor loadings for the single factor of .50 or higher. Gearhardt et al. (2009) also conducted a parallel factor analysis on seven dichotomous diagnostic criteria and succeeded in identifying a single

factor structure. Factor loadings for the single factor were .69 or higher (Gearhardt et al., 2009). The single factor yielded adequate internal reliability (Kuder-Richardson $\alpha = .75$).

Gearhardt et al. (2009) established validity three ways: convergent, discriminant, and incremental. They first sought to examine convergent validity by examining the correlations between scores on the Yale Food Addiction Scale and other scales that gauged and assessed eating behavior, such as emotional eating (Gearhardt et al., 2009). What they found was that the Yale Food Addiction Scale was statistically significant with scores ranging from .46 to .61 (Gearhardt et al., 2009).

When Gearhardt et al. (2009) explored discriminant validity, they compared correlations between Yale Food Addiction Scale scores and scores on measures of related but independent constructs such as alcohol use, related problems, and impulsivity. However, they found no significant correlations between the Yale Food Addiction Scale scores and alcohol consumption. However, they did find statistically significant correlations of .16 and .17 between Yale Food Addiction Scale scores and alcohol problems (Gearhardt et al., 2009). The BIS (behavioral inhibition scores) and Yale Food Addiction count scores and the Yale Food Addiction Scale diagnostic scores experienced small but significant correlation. Furthermore, Behavioral Activation scores were not significantly correlated with Yale Food Addiction Scores.

Gearhardt et al. (2009) used hierarchical multiple regression to measure incremental validity of the Yale Food Addiction Scale. To predict binge eating pathology, they entered the Yale Food Addiction Scale scores in addition to other measures of eating pathologies, such as emotional eating and eating troubles. The problem eating attitudes, *t*

= 6.98, β = .37, $p < .01$, and emotional eating, $t = 9.77$, β = .53, $p < .001$ both registered as significant predictors of the continuous binge eating measure, which accounted for 49.9% variance. After Gearhardt et al. controlled for variance accounted for at step one of the model, the symptom count version of the Yale Food Addiction Scale was a significant predictor in step two of the model. This symptom count version of the Yale Food Addiction Scale, in turn, accounted for an additional 14.8% of unique variance in binge eating scores (Gearhardt et al., 2009).

Finally, the diagnostic version of the scale yielded similar results. Emotional pathology and emotional eating scores were significant predictors of binge eating; they were so statistically significant that it accounted for 47.4% of the variance of the regression model (Gearhardt et al., 2009). Once the researchers controlled variance in step one of the regression model, the diagnostic version of the Yale Food Addiction Scale accounted for 5.8% of the unique variance. This study has been used with a population that was primarily Caucasian and female. The study participants were on average 20.11 years old, 72.5% Caucasian, 18.5% Asian-American, and 9% African-American (Gearhardt et al., 2009). The study primary consisted of women (64.2%), although men participated in the study as well (35%) (Gearhardt et al., 2009).

Operational Definitions of Variables

Food addiction. Certain foods, whether seen or eaten, activate the same brain circuitry that is activated by addictive drugs, and thus regulates dietary behavior (Rogers, 2011). Confirmation of food addiction and levels of food addiction can be measured with the Yale Food Addiction Scale.

Social cognitive theory-based health information. Health information that will share material about healthier food choices and how consuming foods with food additives MSG and HFCS adversely impact the body and encourages overeating (Insawang et al., 2012; Lowndes et al., 2012). The health information will also include instructions on how to avoid foods that contain MSG and HFCS. This information will also list food alternatives to popular foods that contain MSG and HFCS.

Data Analysis Plan

Preliminary Analyses

I collected all data and information from SurveyMonkey and downloaded it into SPSS version 25.0. I minimized the possibility of missing data and information by programming the survey delivery instrument (SurveyMonkey) to prevent survey participants from skipping questions. However, before analyzing the data, I performed data cleaning to ensure the accuracy of the data before analyzing. Data cleaning entailed verifying that all entered information has values within the expected range of the corresponding question. Additionally, I sorted the data and reviewed it to ensure that study participants did not provide irrelevant/inappropriate answers to any survey questions. However, no study participant provided irrelevant/inappropriate answers. In addition, I performed an analysis of demographical variables, which consisted of mean, mode, median, frequency distribution, mean and standard deviation of continuous study variables and frequencies of categorical ones.

The software used to analyze the data was SPSS Statistics 25.0. Comparisons were made between study participants in the social cognitive theory -based health

information group and participants in the non- social cognitive theory-based health information group. The social cognitive theory -based health information group consisted of health information featuring components of social cognitive theory, such as self-efficacy and modeling; the non- social cognitive theory -based health information group received standardized health information without social cognitive theory components. To analyze the collected data, I first included descriptive statistics such as the mean, median, mode, standard deviation, frequency, and percentage for the dependent variable and relevant demographic variables (see Table 2, Table 3, Table 4, Table 5, and Table 6).

Table 2

Descriptive Statistics

	Total Symptom Count Scores		Total Food Addiction Scores	
	Pre-Test	Post-Test	Pre-Test	Post-Test
Mean	4.12	3.27	4.58	3.62
Median	4.00	3.00	5.00	3.00
Mode	5	2	5	2
Standard Deviation	1.609	1.752	1.915	2.094

Table 3

Descriptive Statistics

	Non-SCT Based Health Information Group Symptom Count Scores		SCT Based Health Information Group Symptom Count Scores	
	Pre-Test	Post-Test	Pre-Test	Post-Test
Mean	3.90	2.98	4.33	3.57
Median	4.00	3.00	5.00	3.50
Mode	4	2	5	2
Standard Deviation	1.411	1.569	1.776	1.889

Table 4

Descriptive Statistics

	Non-SCT Based Health Information Group Food Addiction Scores		SCT Based Health Information Group Food Addiction Scores	
Descriptive statistics	Pre-Test	Post-Test	Pre-Test	Post-Test
Mean	4.21	3.21	4.95	4.02
Median	4.00	3.00	5.00	4.00
Mode	4	3	5	2
Standard Deviation	1.539	1.868	2.186	2.247

Table 5

Descriptive Statistics

	Non-SCT Based Health Information Group Symptom Count Frequencies		SCT Based Health Information Group Symptom Count Frequencies	
Frequency	Pre-Test	Post-Test	Pre-Test	Post-Test
0	*n/a*	2.4% (n = 1)	2.4% (*n*=1)	2.4% (*n* = 1)
1	4.8% (*n* = 2)	14.3% (*n* = 6)	7.1% (*n* = 3)	11.9% (*n* = 5)
2	9.5% (*n* = 4)	26.2% (*n* = 11)	9.5% (*n* = 3)	21.4% (*n* = 9)
3	23.8 (*n* = 10)	23.8 (*n* = 10)	9.5% (*n* = 4)	14.3% (*n* = 6)
4	31% (*n* = 13)	16.7% (*n* = 7)	11.9% (*n* = 5)	14.3% (*n* = 6)
5	19% (*n* = 8)	9.5% (*n* = 4)	31% (*n* = 13)	19.0% (*n* = 8)
6	7.1% (*n* = 3)	4.8% (*n* = 2)	23.8% (*n* = 10)	9.5% (*n* = 4)
7	4.8% (*n* = 2)	2.4% (*n* = 1)	4.8% (*n* = 2)	7.1% (*n* = 3)

Table 6

Descriptive Statistics

	Non-SCT Based Health Information Group Food Addiction Frequencies		SCT Based Health Information Group Food Addiction Frequencies	
Frequency	Pre-Test	Post-Test	Pre-Test	Post-Test
0	*n/a*	2.4% (n = 1)	2.4% (*n*=1)	2.4% (*n* = 1)
1	4.8% (*n* = 2)	14.3% (*n* = 6)	7.1% (*n* = 3)	9.5% (*n* = 4)
2	4.8% (*n* = 2)	21.4% (*n* = 9)	7.1% (*n* = 3)	23.8% (*n* = 10)
3	23.8% (*n* = 10)	26.2 (*n* = 11)	11.9% (*n* = 5)	9.5% (*n* = 4)
4	26.2% (*n* = 11)	16.7% (*n* = 7)	2.4% (*n* = 1)	9.5% (*n* = 4)
5	21.4% (*n* = 9)	4.8% (*n* = 2)	21.4% (*n* = 9)	16.7% (*n* = 7)
6	11.9% (*n* = 5)	9.5% (*n* = 4)	21.4% (*n* = 9)	11.9% (*n* = 5)
7	4.8% (*n* = 2)	2.4% (*n* = 1)	19% (*n* = 8)	9.5% (*n* = 4)
8	2.4% (*n* = 1)	*n/a*	4.8% *(n=2)*	7.1% (*n* = 3)
9	*n/a*	2.4% (*n* = 1)	2.4% (*n* = 1)	*n/a*

Main Analyses

Research Question 1. The dependent variables were food addiction symptoms and food addiction scores. To examine potential changes in food addiction, I analyzed scores on the Yale Food Addiction Scale (see Appendix A) using an ANCOVA to examine changes between the pre-test and post-test with the pre-test as a covariate. The associated *F*-test with the pre-test as the covariate determined if there is a significant difference between the two comparison groups and, at least in part, the effectiveness of the social cognitive theory-based health information. I utilized a .05 alpha level for testing the null hypothesis.

The first research question as presented in chapter one, is: What is the extent of the difference in food addiction post-test scores as measured by the Yale Food Addiction Scale, among overweight and obese women who receive Social Cognitive Theory-based

health information compared to overweight and obese women who receive non-Social Cognitive based health information?

The hypotheses are as follows:

$H_0$1. When comparing the impact of social cognitive theory -based health information with non-social cognitive theory-based health information presented to overweight or obese women, there is no significant difference in food addiction posttest scores (while controlling for differences in pretest scores) as measured by the Yale Food Addiction Scale.

H_A1. When comparing the impact of social cognitive theory-based health information with non- social cognitive theory-based health information presented to overweight or obese women, there is a significant difference in food addiction posttest scores (while controlling for differences in pretest scores) as measured by the Yale Food Addiction Scale.

To examine the effect of the independent variable of social cognitive theory-based health information on the dependent variable of food addiction, I analyzed scores on the Yale Food Addiction Scale (Appendix A) using an ANCOVA analysis. In addition, I tested for univariate outliers, normality, linearity, and homogeneity of variance, homogeneity of regression slopes, and reliable measurement of the covariate. This approach was recommended by Pallant (2016).

Research Question 2. Although the primary focus of this study is to analyze differences in food addiction scores among overweight and obese women who receive social cognitive theory-based health information compared to overweight and obese

women who receive non- social cognitive theory-based health information, it is possible that food addiction symptoms could change as well. Therefore, I created a second research question. This research question examined differences between the two groups of overweight and obese women who received social cognitive theory-based health information and non- social cognitive theory-based information.

The second research question as presented in chapter one, is: What effect does Social Cognitive Theory-based health information have on symptom count post-test scores, as measured by the Yale Food Addiction Scale, among obese and overweight women compared to obese and overweight women who receive the non-Social Cognitive based health information?

The hypotheses are as follows:

$H_0$2. When comparing the impact of social cognitive theory -based health information with non- social cognitive theory -based health information presented to overweight or obese women, there is no significant difference in symptom count posttest scores as measured by the Yale Food Addiction Scale.

H_A2. When comparing the impact of social cognitive theory-based health information with non-social cognitive theory-based health information presented to overweight or obese women, there is a significant difference in symptom count posttest scores as measured by the Yale Food Addiction Scale.

To examine the effect of the independent variable of social cognitive theory-based health information on the dependent variable of food addiction symptom count, I analyzed scores on the Yale Food Addiction Scale (Appendix A) using an ANOVA and

post hoc *t*-test to examine changes between the pre-test and post-test. Taking this approach allowed me to understand the differences between the means of the independent variable.

Threats to Validity

The study is quasi-experimental in nature; therefore, I considered potential threats to external and internal validity. I minimized potential threats to external validity six ways. First, selection of study participants, second, experimental setting, third, history, fourth, changes to food addiction scores, fifth, utilizing a convenience sample, and sixth, interaction of testing and post-test (Creswell, 2009).

External Validity

I attempted to minimize potential threats to external validity by managing the selection of study participants two ways. First, I stated the desired characteristics of the participants in the study and when recruiting potential study participants (Creswell, 2009). I strived to avoid overgeneralizing study results by limiting results to the sample, but provided new information that may serve to inform future studies and, potentially, inform future clinical practices when dealing with similar populations.

Second, I also minimized the threat to external validity by minimizing changes to the experimental setting. Due to the nature of the study being quasi-experimental in nature with human test subjects, I had no control of the study participant's environment, and therefore communicated to the study participants that they should strive to maintain their normal routine. Third, I minimized the potential external threat of history by

articulating the duration of the study. In addition, I discussed what transpired during each week of the study.

Fourth, I made changes to food addiction scores that may not be an accurate representation of the cause-and-effect relationship to the health information provided. Although a true experiment would have been preferred, it would have been difficult to create a closed environment in which study participants had access to only particular types of foods. In addition, the results would have been difficult to replicate, which would create an inability to generalize the results. Essentially, placing study participants into a controlled setting and selecting their daily meals for four weeks is not realistic or feasible.

The fifth threat was utilizing a convenience sample instead of a true random sample from a target population. Although a true sample from a target population would have been preferred, it would have been difficult to procure due to time constraints. Perhaps future studies will be able to pursue this line of sampling. Finally, another external threat was the possibility of the interaction of testing and post-test. This could have occurred due to the pre-test potentially decreasing study participant sensitivity (Campbell & Stanley, 1963). I hoped to address this issue by allowing some time to pass between the pre-test and post-test. It is, for this reason, that I scheduled study participants to take the post-test during the fourth week of the study.

Internal Validity

Although researchers are still uncovering new evidence about food addiction, overall, there is still much to learn about food addiction theory, and how symptoms of

food addiction can be addressed. Despite efforts to minimize or eliminate threats to internal validity, two threats bear mentioning. The first threat to internal validity was mortality. Mortality occurs when participants drop out of a study before the study ends (Creswell, 2009). To reduce the chances of mortality, I scheduled the duration of this study to end in four weeks. Most health behavior studies usually last at least 12 weeks, and therefore experience some degree of mortality. However, it is possible to observe improvement in less than four weeks. Schneider et al. (2016) found that healthy lifestyle changes, which entailed increasing consumption of fruit and vegetables, could take place in three weeks. It was my hope that the duration of this study was long enough to be adequate, yet short enough to prevent loss of interest and participation. To offset the threat of mortality, Creswell (2009) also recommended that researchers enlarge their sample. Therefore, I worked to recruit more than the minimum required amount of total study participants.

The final threat to the internal validity was sample selection. According to Creswell (2009), selection bias occurs when the researcher selects study participants who have certain characteristics that predispose them to have certain outcomes. This study may be biased because the study participants were all be female, and overweight or obese. For example, Gearhardt et al.'s (2009) landmark food addiction study consisted of 18.7% overweight participants and 73.5% normal weight participants. Gearhardt et al. (2009) found evidence of food addiction. Finally, this study may be biased because of the use of female study participants, as the results cannot be applied to men.

Ethical Procedures

To maintain ethical integrity, I submitted the IRB application to Walden University to gain access to participants and to ensure that the rights and welfare of participants are protected. In addition, the IRB application described how my study complied with ethical research policies and protocols. This study was created with ethical considerations always being at the forefront of each step of the process, from the design of the study to analysis to distribution of results. I obtained approval from Walden University's IRB before collecting data. Upon securing IRB approval, I included a confirmation number in the final dissertation (Approval number 05-03-18-0326424).

I addressed ethical concerns related to recruitment materials and processes by making sure that participants are aware of the study's procedure, the risks and benefits of the study, and the fact that participation in this study was voluntary. I communicated this in the initial message of the SurveyMonkey survey. In addition, study participants were alerted to their rights, that the study is confidential, and that I will hold all responses in the strictest confidentiality on the final survey page of the SurveyMonkey survey and the consent form (see Appendix G). Additionally, weekly correspondence provided my contact information should study participants want to communicate with me to ask additional questions.

The plan to protect confidential data entailed first recording all data and information in an excel spreadsheet. I then stored this information in three places: first on my computer; second, I uploaded the data to my external storage drive; and third, I uploaded the data to Dropbox, the cloud-based storage system. I was the only one with

access to the data and used the data solely for the purpose of research. I plan to destroy data after seven years, as per the recommendation of the American Psychology Association (Bersoff, 2008). There are no other ethical issues or conflicts of interest.

Summary

Chapter 3 began with the study's introduction and discussed the purpose of the study and examined the research design and rationale. This includes but is not limited to the approach, the study variables, and the design choice. Next, I discussed the study's methodology, sampling and sampling procedures. This includes but is not limited to sample selection, characteristics of the study's participants, and rationale for approaches taken to achieve statistically significant results. Finally, I discussed procedures for the recruitment, participation, and data collection, instrumentation and operationalization of constructs, data analysis methods, validity, reliability, and finally ethical considerations.

In chapter 4, I will describe the data and information gathered for the study, and repot study findings. Finally, in chapter 5, I will analyze the results of the study after conducting a statistical analysis.

Chapter 4: Results

This study addressed the impact of health information based on social cognitive theory on food addiction among obese and overweight women. Specifically, I looked at how health information based on social cognitive theory may reduce consumption of food additives including carbohydrates, high fructose corn syrup (HFCS), and monosodium glutamate MSG. The research questions and hypotheses were the following:

RQ1. What is the extent of the difference in food addiction post-test scores as measured by the Yale Food Addiction Scale, among overweight and obese women who receive Social Cognitive Theory-based health information compared to overweight and obese women who receive non-Social Cognitive based health information?

$H_0$1. When comparing the impact of social cognitive theory-based health information with non-social cognitive theory -based health information presented to overweight or obese women, there is no significant difference in food addiction posttest scores (while controlling for differences in pretest scores) as measured by the Yale Food Addiction Scale.

H_A1. When comparing the impact of social cognitive theory-based health information with non- social cognitive theory-based health information presented to overweight or obese women, there is a significant difference in food addiction posttest scores (while controlling for differences in pretest scores) as measured by the Yale Food Addiction Scale.

RQ2. What effect does Social Cognitive Theory-based health information have on symptom count post-test scores, as measured by the Yale Food Addiction Scale,

among obese and overweight women compared to obese and overweight women who receive the non-Social Cognitive based health information?

$H_0$2. When comparing the impact of social cognitive theory-based health information with non- social cognitive theory-based health information presented to overweight or obese women, there is no significant difference in symptom count posttest scores as measured by the Yale Food Addiction Scale.

H_A2. When comparing the impact of social cognitive theory-based health information with non- social cognitive theory-based health information presented to overweight or obese women, there is a significant difference in symptom count posttest scores as measured by the Yale Food Addiction Scale.

Chapter 4 includes a description of the data and the study findings. I present the data collection time frames, quiz results, descriptive and demographic characteristics of the sample, results of the ANCOVA and ANOVA analyses, and results of additional statistical tests that emerged from the analysis of the primary hypothesis. I also include tables and figures to demonstrate my study results.

Data Collection

The time frame for data collection was June 1, 2018 to November 27, 2018. The recruitment required collecting data from a minimum of 68 obese and overweight women from a private school in Chicago, IL and Walden University's online participants pool. After receiving approval from Walden IRB and recruiting from these two sources, I collected data from two additional sources from September 18, 2018 to November 27,

2018. Although a minimum of 68 obese and overweight women (thirty-four for each group) were required for this study, 173 women enrolled in the study and completed the pretest. Once the study concluded, 84 women had completed the posttest.

The response rates were calculated from each research recruitment site based on the number of study participants who clicked on the recruiting ad. Participants who clicked on the recruitment ad were directed to the demographic survey administered through SurveyMonkey. Participants could choose to complete the demographic survey or decline to begin the survey by closing their browser window. For participants who chose to complete the survey, SurveyMonkey e-mailed me a notification. I accessed the survey responses and confirmed eligibility for the study by calculating the study participants' BMI. Eligible participants were notified that they were eligible for the study and received the health information for the first week.

Three websites provided analytics such as the number of e-mails, electronic newsletters, and electronic announcements containing the recruiting advertisement sent to their respective participant pools. The websites Findparticipants.com and Researchandme.com provided detailed analytic information. Walden University's participant pool provided the number of participants who expressed interest in the study, which was calculated by clicking the featured study link. The private school in Chicago, IL. featured the recruiting ad in their school newsletter that was sent to 200 people consisting of parents and staff.

Websites such as Findparticipants.com, Researchandme.com, and Walden University's participant pool were required to respect the confidentiality of their

participants. Although most sites provided analytic information, they were unable to display the e-mail address of their participants to me. Therefore, there was no way for me to identify where most of the participants were recruited from. There was one exception: Researchandme.com. Study participants who volunteered for studies in the Researchandme.com website supplied their e-mail addresses and phone numbers as a condition for participating. They were informed that I would contact them if selected for the study. Researchandme.com provided me with the potential participants' e-mail addresses after I selected the participants desired for the study. One thousand seven hundred and thirteen people in the Reseachandme.com participant pool viewed the recruiting ad, and 12% (n = 205) clicked the link and contacted me expressing an interest in participating in the study. After reviewing potential study participants' responses, 101 participants were sent the SurveyMonkey link to begin the study. These participants were selected from Researchandme.com for two reasons. The first was that study participants met the selection criteria. The second reason was that more participants were needed for the study. Overall, it appeared that 50% of the study participants had completed the posttest. Therefore, although 200 Researchandme.com study participants expressed an interest in the study, 20 additional participants were needed. Researchandme.com allows researchers to purchase a certain amount of study participants for a set fee. For example, a researcher can purchase access to segments of 50 participants, 100 participants, or 250 participants. Because I needed access to 100 participants to complete the study, 100 participants were selected. This accounted for an estimated 50% response rate of participants who actually enrolled in the study, and 50% of study participants choosing to

not complete the posttest. This way if participants did not complete the posttest, there would be enough participants to complete the study.

Overall, 173 people completed the pretest. One hundred sixty-one of them were eligible for the study and met the BMI requirements. Two participants opted out of the study before the study ended. Eight participants who indicated that they were overweight did not meet the BMI criteria and had normal BMIs. Therefore, they were not included in the study. A summary is provided in Table 7).

Table 7

Pre to Post Test Completion

Completed Pre-Test	Met Study Criteria	Did Not Meet Study Criteria	Completed Four Week Study	Completed Post Test	Percent Post Test Completion
173	161	10	161	84	52%

Note: 52% post-test completion calculated 24/161 = .52. Converted decimal to percent – 0.5217 * 100 = 52.17

Knowledge Quizzes

As noted in chapter three, study participants from both groups that completed the four-week study were sent two brief 12 question knowledge quizzes via a SurveyMonkey link. The knowledge quiz for the social cognitive theory-based health information group was based on the social cognitive theory-based health information that study participants had received for four weeks (see Appendix H). The knowledge quiz for the non- social cognitive theory-based health information group was based on the non- social cognitive theory-based health information that study participants had also received for four weeks (see Appendix I). Upon completing the quiz, a score displayed the percentage of

questions answered correctly at the top of the study participants' computer screen. The knowledge quizzes served two purposes: First, to confirm that study participants reviewed the health information. Second, to provide an interactive way for study participants to apply their newly learned health information.

Once a week for four weeks, study participants that completed the study received a reminder which included the SurveyMonkey link to complete the knowledge quiz. The reminder stated the following: "Also, once you finish reviewing your information, please take this fun quiz to see how much you remember!! The quiz takes less than five minutes to complete." No study participants completed the knowledge quizzes. Due to the lack of response from study participants, the reminder message was revised and sent during the fifth week and stated the following: "Check What You Have Learned**.** Ever wonder if you REALLY remember how to change your eating habits? Here's your chance to check out what you have learned to see how much you remember!! This is not graded and you cannot pass or fail." This reminder was sent to study participants that completed the study once a week for four additional weeks. However, no study participants completed the knowledge quizzes.

By the ninth week, due to continued lack of knowledge quiz completion, the same reminder message, "Check What You Have Learned**.** Ever wonder if you REALLY remember how to change your eating habits? Here's your chance to check out what you have learned to see how much you remember!! This is not graded and you cannot pass or fail" was sent three times a week (every other day) until the end of the study. Study participants began to complete the knowledge quiz. Ten study participants from the social

cognitive theory health information group and eight study participants from the non-social cognitive theory health information group completed the knowledge quizzes. The overall score for study participants from the social cognitive theory health information group was 88% and the overall score for the non- social cognitive theory health information group was 98%. The minimum score for the social cognitive theory-based health information group (n = 10) was 69%, and the highest score was 100%. The minimum score for the non- social cognitive theory-based health information group (n = 8) was 79% and the highest score was 100%.

Prerecorded Webinars

Weekly, study participants received pre-recorded narrated webinars. These webinars reviewed the week's health information. The pre-recorded webinars were sent to increase the likelihood and convenience of reviewing the health information. I confirmed that the pre-recorded webinars were viewed by examining the webinar software "counter" in Adobe Presenter 11.1 (Adobe Presenter 11.1). The number of study participants that viewed the webinars started slowly for the first week, however, the number of study participants that viewed the webinars began to increase. The first week, study participants from the social cognitive theory-based health information group viewed the webinars from the first week six times. The non- social cognitive theory-based health information group viewed the webinars from the first week three times. The second week, participants from the social cognitive theory-based health information group viewed the webinars from the second week ten times. The non-social cognitive theory-based health information group viewed the webinars from the second week 54

times. The third week, study participants from the social cognitive theory-based health information group viewed the webinars from the third week 38 times. The non-social cognitive theory-based health information group viewed the webinars from the third week 37 times. The fourth week, study participants from the social cognitive theory-based health information group viewed the webinars from the fourth week 47 times. The non- social cognitive theory-based health information group viewed the webinars from the third week 54 times (see Table 8).

Table 8

Pre-Recorded Narrated Webinar Views

Study Week	SCT Group Number of Views	Non-SCT Group Number of Views
Week 1	6	3
Week 2	10	54
Week 3	38	37
Week 4	47	54

There were four discrepancies in data collection from the plan presented in chapter three. First, although study participants were enrolling in my study at a steady pace from the Walden University online participation pool and the private school in Chicago, IL., a few months into the study, enrollment in the study began to ebb. As of September 2018, momentum in study enrollment began to reduce from five to ten participants a day to one or two study participants a day. Although study enrollment was steady, it would take a significant amount of time to achieve a minimum of sixty-eight participants. Therefore, after discussing this challenge with the committee chair additional internet sites were reviewed that could offer access to research participants. The following terms were utilized while conducting an internet search “research pool,”

"research panel," "research participation pools," "human subjects pool," "buy research subjects," recruit participants," "online panels," "online research panels," find survey participants," and "find survey participants online." Numerous websites were contacted and analyzed, and Findparticipants.com and Researchandme.com were identified as ideal websites. These websites were selected for three reasons. First, these websites offered access to research participants for a reasonable fee. Second, there was no requirement to compensate study participants. Third, metrics were offered that allowed me to track the marketing outreach or recruitment of the recruiting ad for my study. I demonstrated the websites to my committee chair and secured approval to submit a request to the IRB. September 6th 2018, I contacted Walden University's IRB and submitted a "request for change in procedures" form. The Walden University IRB approved the request September 18, 2018.

The second discrepancy in data collection was the lack of post-test completion. As study participants approached the end of the four-week study, a reminder was e-mailed during the third week of the study. The reminder thanked study participants for completing the third week of the study and reminded them that the following week would be the fourth and final week of the study. The message also urged study participants to complete the post-test after reviewing the information for the fourth week of the study.

Weekly reminder e-mails were sent to study participants that completed the four-week study for one month after study participants completed the study. However, only two or three study participants completed the post-test every week after numerous reminders. Therefore, the frequency of the reminders was increased from once per week

to three times per week. This increased the rate of post-test completion. Before, two to three study participants would complete the post-test every week. After increasing the frequency of the reminder e-mails, five to 10 people would complete the post-test.

After numerous reminders to complete the post-test were sent to study participants that had completed the four-week study, I received feedback from three participants that stated that they were unable to open the health information that had been sent over the last four weeks. These study participants stated that this was the reason they refused to complete the post-test. Therefore, I created PDF versions of both the social cognitive theory and non-social cognitive theory versions of the health information. I sent the PDF versions of the health information to the three study participants. Also, as a preventative measure and to ensure that this problem didn't prevent other study participants from viewing the health information or completing the post-test, the PDF versions of the health information was sent to all study participants that completed the study as well. In addition, any new study participants were sent the PDF version of the health information along with the originally scheduled narrated versions of the health information and PowerPoint presentations.

The third discrepancy in data collection was that although previous research had indicated that those that are overweight and obese have a higher than normal BMI and therefore have a higher chance of being food addicted only 40.5% of study participants met the criteria for being food addicted according to the Yale Food Addiction Scale. However, food addiction research is a new and burgeoning field and the Yale Food Addiction Scale is a relatively new instrument used to formally test and confirm food

addiction. New discoveries and insights into food addiction and the Yale Food Addiction scale are frequently being identified. For example, one of the founders and creators of the Yale Food Addiction Scale, Dr. Ashley Gearhardt and her team recently published a study earlier this year where she observed a smaller than anticipated percentage (38.6%) of study participants (n = 17, N = 44) that met the criteria for food addiction according to the Yale Food Addiction Scale (Schulte, Sonneville, & Gearhardt, 2019). This is quite remarkable given the resources that her research team had available to recruit a larger sample size. Another recent study conducted by Gerhardt and her research team has emerged with similar findings. Schulte, Jacques-Tiura, Gearhardt, and Naar (2018) recruited a larger sample size to study the effect of processed foods on food addiction and utilized the Yale Food Addiction Scale. Even with a larger sample size (n = 501), only 14.6% percent of their study participants met the criteria for food addiction.

The fourth discrepancy in data collection was multiple pre-test completions by the same person. This posed a challenge for two reasons. First, if unaddressed, the same study participant would receive health information for both the social cognitive theory-based health information group and the non- social cognitive theory-based health information group. This error would have inflated the final total of recruited study participants and therefore skew the study results. However, the data was consistently analyzed and cleaned to prevent duplicate entries. Also, as mentioned in chapter two, study participants were prohibited from skipping survey questions to prevent the problem of missing data in the final study. Finally, there were no adverse events related to sharing the social cognitive theory-based health information.

Descriptive and Demographic Characteristics of the Sample

Descriptive and demographic characteristics of the sample include the following. Eighty-four participants completed the four-week study, pre-test, and post-test. The ethnicity of the study participants was as follows: Asian/Pacific Islander, 2.4% (*n* = 2), Black or African American, 21.4% (*n* = 18), Hispanic, 7.1% (*n* = 6), Mixed, black/white 1.2% (*n* = 1), Native Hawaiian, Caucasian, Asian 1.2% (*n* = 1), and White/Caucasian 66,7% (*n* = 56) (See Table 9). This sample represents the population of interest in that all study participants were female, diverse in composition, literate, willing to complete a survey, and willing to participate in an eating behaviors study.

Table 9

Frequency and Percent Statistics of Study Participant Ethnicity

Demographic Characteristics	Frequency (n)	Percent (%)
Gender		
Asian/Pacific Islander	2	2.4%
Black or African American	18	21.4%
Hispanic	6	7.1
Mixed, black/white	1	1.2 %
Native Hawaiian, Caucasian, Asian	1	1.2 %
White/Caucasian	56	66.7 %
Total	84	100%

Most study participants completed graduate school. The education level of study participants are as follows: Graduated from high school, 4.8% (*n* = 4), One year of college, 2.4% (*n* = 2), Two years of college, 8.3% (n = 7), Three years of college, 10.7%(*n* = 9), Graduated from college, 27.4% (*n* = 23), Some graduate school, 14.3% (*n* = 12), Completed graduate school, 32.1% (*n* = 27). The table provides a summary below (see Table 10).

Table 10

Education Level Descriptive Statistics

Education Level	Frequency	Percent	Valid Percent	Cumulative Percent
1 year of college	2	2.4	2.4	2.4
2 years of college	7	8.3	8.3	10.7
3 years of college	9	10.7	10.7	21.4
Completed graduate school	27	32.1	32.1	53.6
Graduated from college	23	27.4	27.4	81.0
Graduated from high school	4	4.8	4.8	85.7
Some graduate school	12	14.3	14.3	100.0
Total	84	100.0	100.0	

Study participants were also asked if they had ever received a mental health diagnosis. Fifty-six percent of study participants answered “Yes,” and forty-four percent of study participants answered “No” to this question.

There were improvements to study participants’ food addiction symptoms as a whole group. Almost 60% (n = 50) of the study participants experienced a decrease in food addiction symptoms. Twenty-two percent (n = 19) of study participants experienced an increase in food addiction symptoms. Almost eighteen percent (n = 15) of study participants experienced no change in food addiction symptoms (see table 9).

Overall group food addiction scores and symptom count scores improved. Almost 60% of all study participants experienced a decrease in both food addiction scores and symptom count scores. This change includes sixty percent of study participants that experienced a decrease in symptom count (n = 50) and 56% of study participants

experienced a decrease in food addiction (*n* = 47). The table below provides a summary (see Table 11).

Table 11

Overall Food Addiction & Food Addiction Symptom Count Scores

Change to Food Addiction Symptoms	Frequency Symptom Count Score	Percent Symptom Count Score	Frequency Food Addiction Score	Percent Food Addiction Score
Decrease	50	59.5%	47	56%
Increase	19	22.6%	18	21.4%
No Change	15	17.9%	19	22.6
Total	84	100%	84	100%

Overall, study participants experienced an improvement and decrease in their BMI levels. The non- social cognitive theory-based health information group saw the greatest improvement to their BMI levels 61.9% (*n* = 26). The social cognitive theory-based health information group also saw an improvement and decrease to their BMI levels 40.5% (*n* = 17). Some members of the social cognitive theory-based health information group saw an increase and decline to their BMI levels (33.3%, *n* = 14). The same decline was observed for the non-social cognitive theory-based health information group (28.6%, *n* = 12). Almost 26% (*n* = 11) of study participants in the social cognitive theory-based health information group experienced no change compared to 9.5% (*n* = 4) of the members of the non- social cognitive theory-based health information group. A brief summary is displayed in the table below (see Table 12).

Table 12

Changes to BMI by Health Information Group

BMI Change	SCT Health Information Group	NSCT Health Information Group
BMI Increased	33.3% (*n* = 14)	28.6% (*n* = 12)
BMI Decreased	40.5% (*n* = 17)	61.9% (*n* = 26)
No Change	26.2% (*n* = 11)	9.5% (*n* = 4)
Total	100% (*n* = 42)	100% (*n* = 42)

The health information was administered as planned. There were three unanticipated challenges. However, these challenges did not prevent implementing the plans as described in chapter three. The first unanticipated challenge to delivering the health information was the e-mail containing the attached health information was rejected and listed as undeliverable to study participant's e-mail addresses. This rejection was due to the large size of the attached health information file which was in a PowerPoint format. Study participants' e-mail providers interpreted the large file size as a virus and therefore blocked the file. This was addressed by uploading the health information to Dropbox and creating a link that the study participant could select when they opened the researcher's e-mail. Once participants opened the Dropbox link, the PowerPoint file containing the health information opened.

The third and final unanticipated challenge was at the conclusion of the four-week study. A small number of participants stated that they were unable to open the health information sent and were afraid to open the link to the narrated version of the health

information and did not complete the post-test. This feedback was addressed by converting all health information into PDF files. The PDF files were sent to the study participants that stated they were unable to open the Dropbox link. All participants that had completed the post-test were contacted and informed that as a courtesy, the PDF version of the health information was being provided. Also, all participants that had completed the pre-test, but had not completed the post-test were contacted and provided the PDF version of the files as a courtesy and to encourage post-test completion.

Results

The research questions and hypothesis were as follows:

RQ1. What is the extent of the difference in food addiction post-test scores (while controlling for any differences at pre-test) as measured by the Yale Food Addiction Scale, among overweight and obese women who receive Social Cognitive Theory-based health information compared to overweight and obese women who receive non-Social Cognitive based health information?

$H_0$1. When comparing the impact of social cognitive theory-based health information with non- social cognitive theory -based health information presented to overweight or obese women, there is no significant difference in food addiction posttest scores (while controlling for differences in pretest scores) as measured by the Yale Food Addiction Scale.

H_A1. When comparing the impact of social cognitive theory -based health information with non- social cognitive theory -based health information presented to overweight or obese women, there is a significant difference in food addiction posttest

scores (while controlling for differences in pre-test scores) as measured by the Yale Food Addiction Scale.

RQ2. What effect does social cognitive theory-based health information have on symptom count post-test scores, as measured by the Yale Food Addiction Scale, among obese and overweight women compared to obese and overweight women who receive the non-Social Cognitive based health information?

$H_0$2. When comparing the impact of social cognitive theory -based health information with non- social cognitive theory-based health information presented to overweight or obese women, there is no significant difference in symptom count post-test scores as measured by the Yale Food Addiction Scale.

H_A2. When comparing the impact of social cognitive theory-based health information with non- social cognitive theory -based health information presented to overweight or obese women, there is a significant difference in symptom count post-test scores as measured by the Yale Food Addiction Scale.

I explored the first research question using ANCOVA because I wished to examine any potential changes in food addiction scores as measured by the scores on the Yale Food Addiction scale (see Appendix A). The pre-test was used as a covariate to determine if there were any significant differences (if any) between the two comparison groups and the effectiveness of the social cognitive theory-based health information. The dependent variable for this analysis was the food addiction score. The dependent variable food addiction score was calculated and was comprised of a combination of the food symptom count score and the clinical significance and impairment score. If the food

addiction symptom count was greater than or equal to three or more and the participant indicated by answering yes, that they experienced at least one of the two clinical significance and impairment symptoms, then the participant met the diagnostic criteria for food addiction (Gearhardt et al., 2012). For ease of entering data into SPSS, the two scores were combined into one number (Gearhardt et al, 2012). The scores for both the social cognitive theory -based health information group and the non- social cognitive theory -based health information group were then entered into SPSS to calculate the food addiction score. The following tables review the descriptive statistics of both groups (range, median, mode, etc..) for the food addiction and symptom count scores (see Table 2, Table 3, Table 4, Table 5, and Table 6).

The independent variable for the first research question is group status; either the group having received social cognitive theory -based health information (social cognitive theory group) or not received (non- social cognitive theory group). One group of study participants–the social cognitive theory-based health information group–received weekly presentations that disseminated health information that modeled key facets of social cognitive theory, such as self-efficacy, outcome expectations, observational learning, incentive motivation, facilitation, and self-regulation. The non- social cognitive theory -based health information group received weekly presentations that disseminated health information and did not model any facets of social cognitive theory.

Statistical Assumptions

All the data from the dependent variables, pre-test and post-test food addiction scores and pre-test and post-test food symptom count, were reviewed and analyzed for

missing data and univariate outliers before assessing assumptions. There was no missing data or cases because I designed the survey in SurveyMonkey to prevent study participants from skipping or missing questions. Raw scores were converted into z-scores and I compared scores to the value of +/- 3.29, $p < .001$ (Tabachnick & Fidell, 2007). Any z-scores that exceeded 3.29 would be considered outliers because these scores would be three standard deviations away from the mean. I reviewed the distributions and found no univariate outliers.

Normality

Basic parametric assumptions were reviewed before analyzing the research questions. This approach entailed testing assumptions of normality and homogeneity of variance of the dependent variables. Distributions were tested to confirm normal distribution by conducting an analysis using the descriptives and explore function in SPSS 25. An evaluation of the Kolmogorov-Smirnov and Shapiro-Wilk found statistical significance for all dependent variables. Therefore, the assumption of normality has been violated and the distributions can be assumed to not be normally distributed. Table 13 and Table 14 displays the skewness and kurtosis statistics of all dependent variables.

Table 13

Summary of Descriptive Statistics Symptom Count Scores

Symptom Count	N	*M*	Skew.	Kurtosis	*S D*	Kolmogorov - Smirnov	Shapiro-Wilk
Pre-Test	84	4.12	-.358	-.414	1.609	.000	.003
Post-Test	84	3.27	-.354	-.651	1.752	.000	.001

S D = Standard Deviation

Table 14

Summary of Descriptive Statistics Food Addiction Scores

Food Addiction	N	*M*	Skew.	Kurtosis	*S D*	Kolmogorov - Smirnov	Shapiro-Wilk
Pre-Test	84	4.58	-.152	-.443	1.915	.001	.042
Post-Test	84	3.62	.522	-.506	2.094	.000	.001

S D = Standard Deviation

To test further, Paired T-Test results were also tested for normality. Figure 1 displays that skewness and kurtosis statistics of the difference of the symptom count scores. Although the score indicates statistical significance, the normal Q -Q Plot of Difference indicates that assumption of normality is satisfied. See Table 15 below and Histograms and plots of the analysis are demonstrated on Figure 1 to Figure 11.

Table 15

Assumption of Normality Test

	N	*M*	Skewness	Kurtosis	*SD*	Kolmogorov - Smirnov	Shapiro-Wilk
Difference in Symptom Count Scores	84	.85	-.052	-.496	1.840	.000	.013

M = Mean

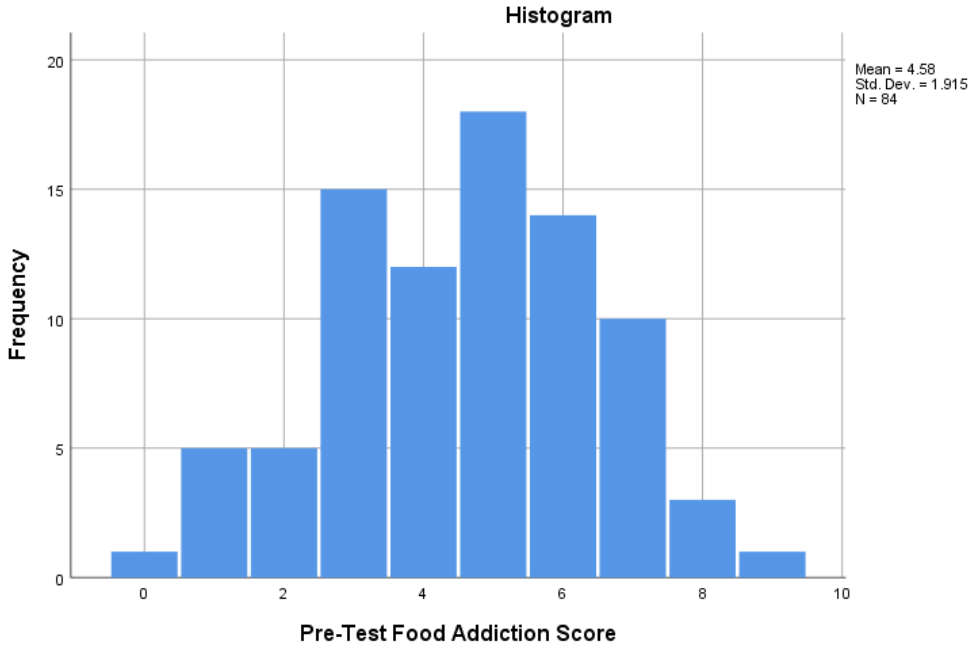

Figure 1. Histogram.

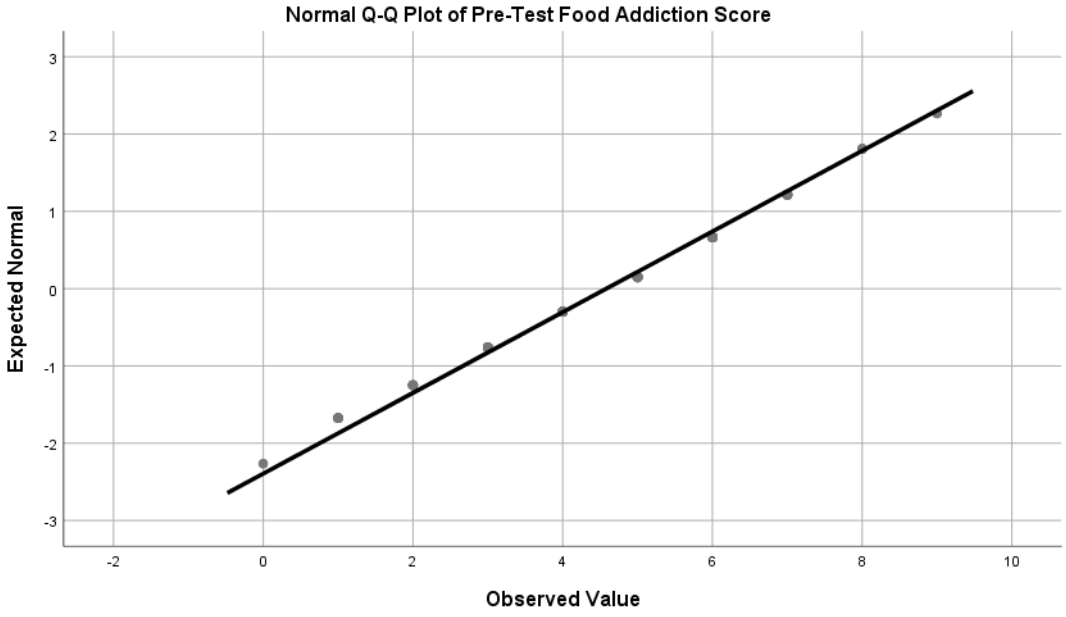

Figure 2. Normal Q-Q plot.

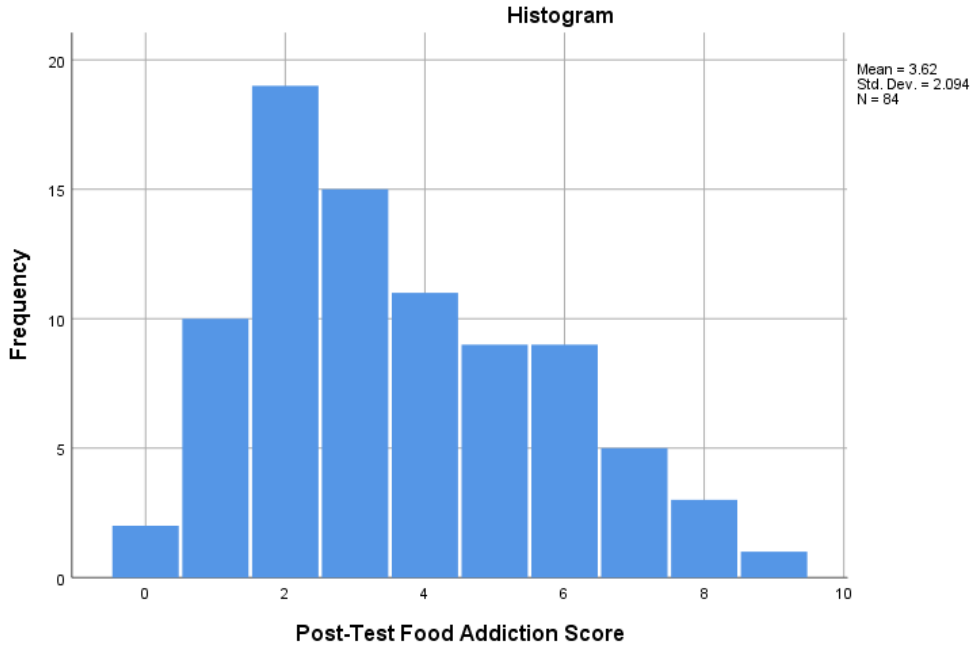

Figure 3. Histogram.

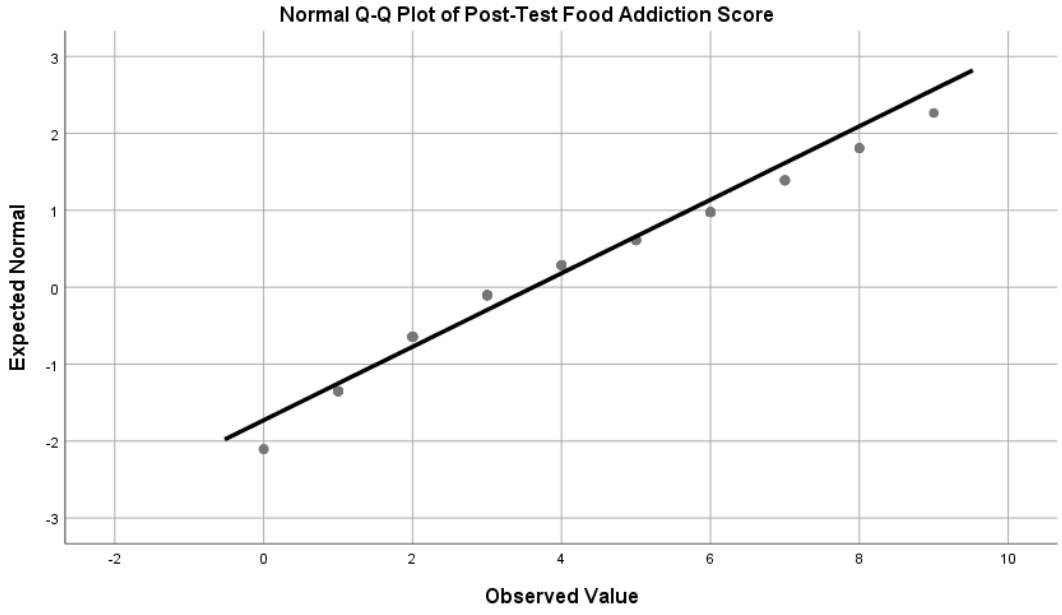

Figure 4. Normal Q-Q plot.

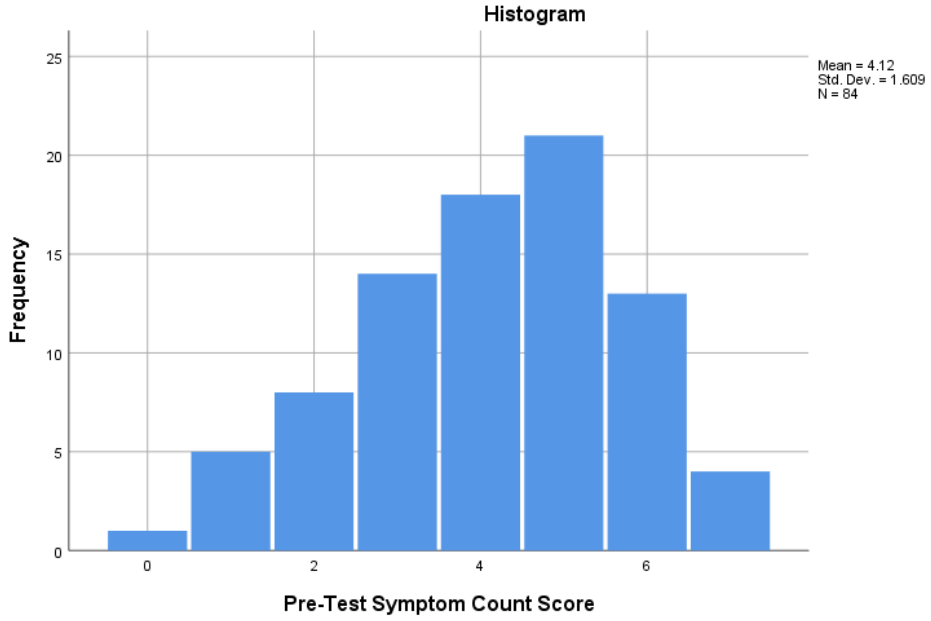

Figure 5. Histogram.

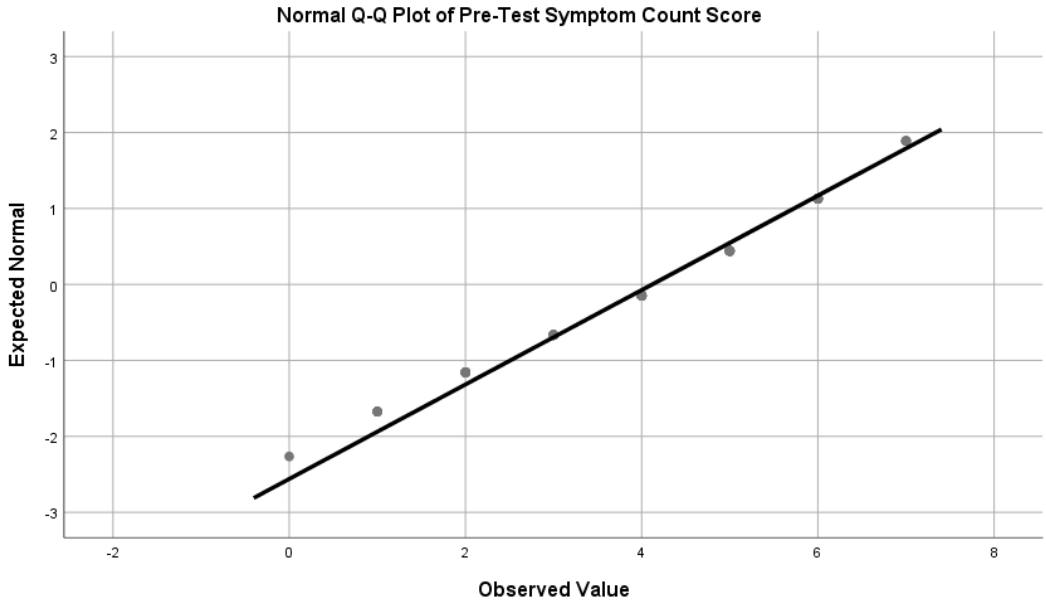

Figure 6. Normal Q-Q plot.

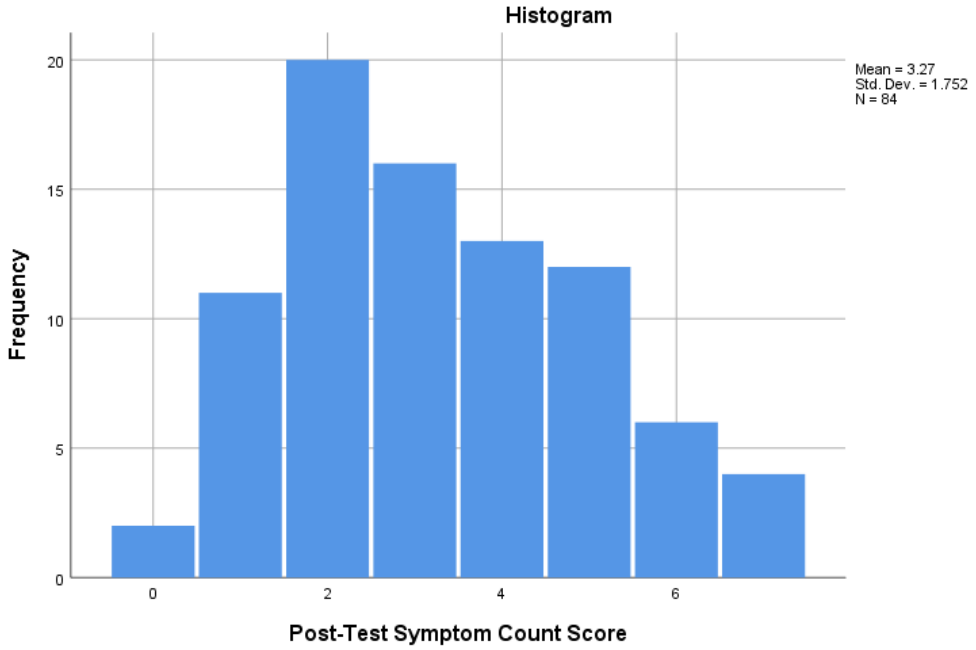

Figure 7. Histogram.

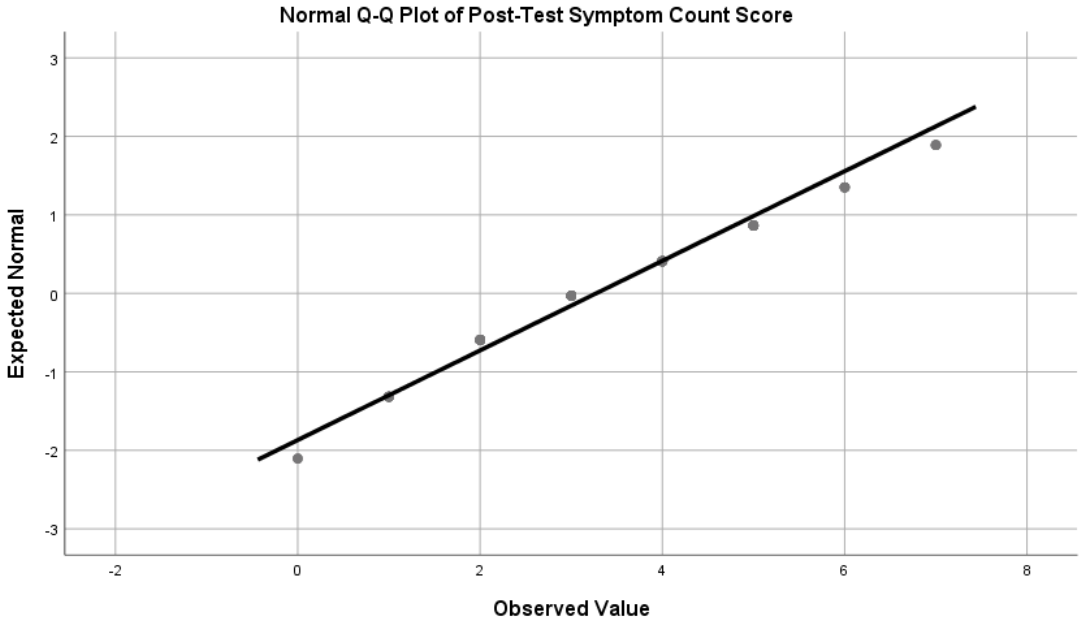

Figure 8. Normal Q-Q plot.

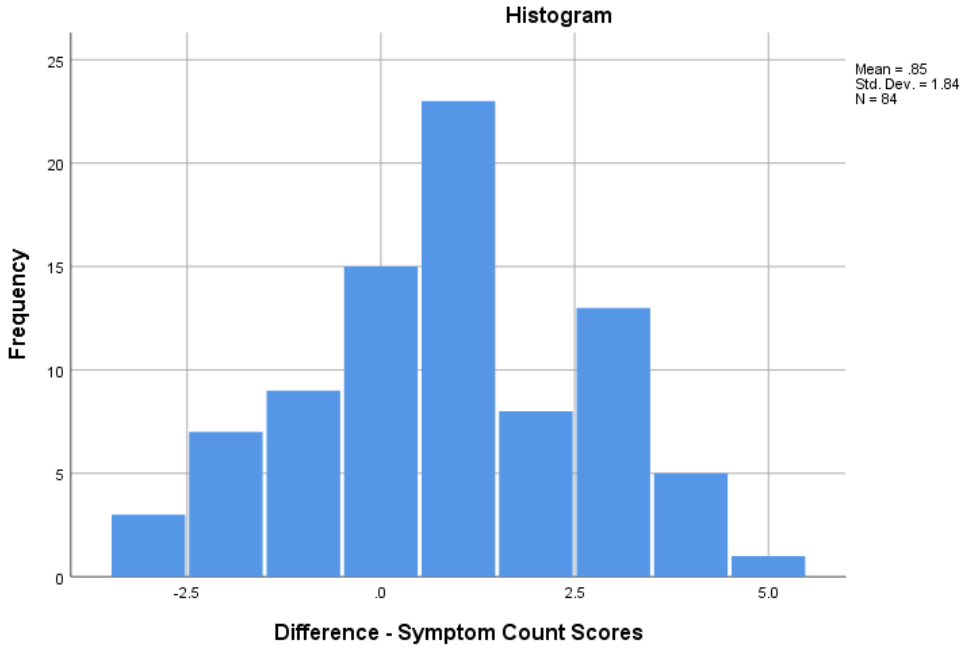

Figure 9. Histogram.

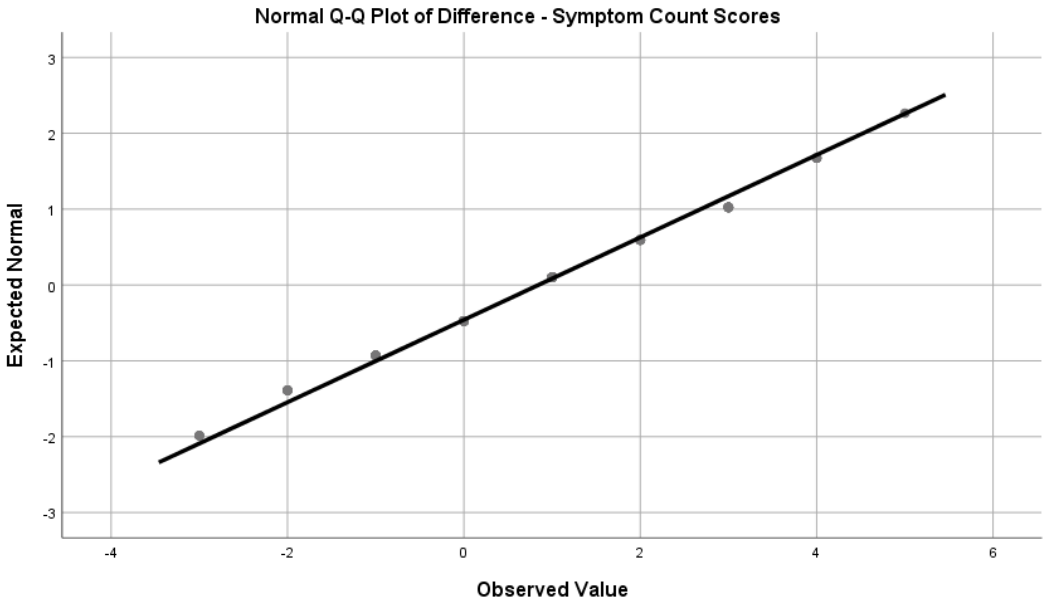

Figure 10. Normal Q-Q plot.

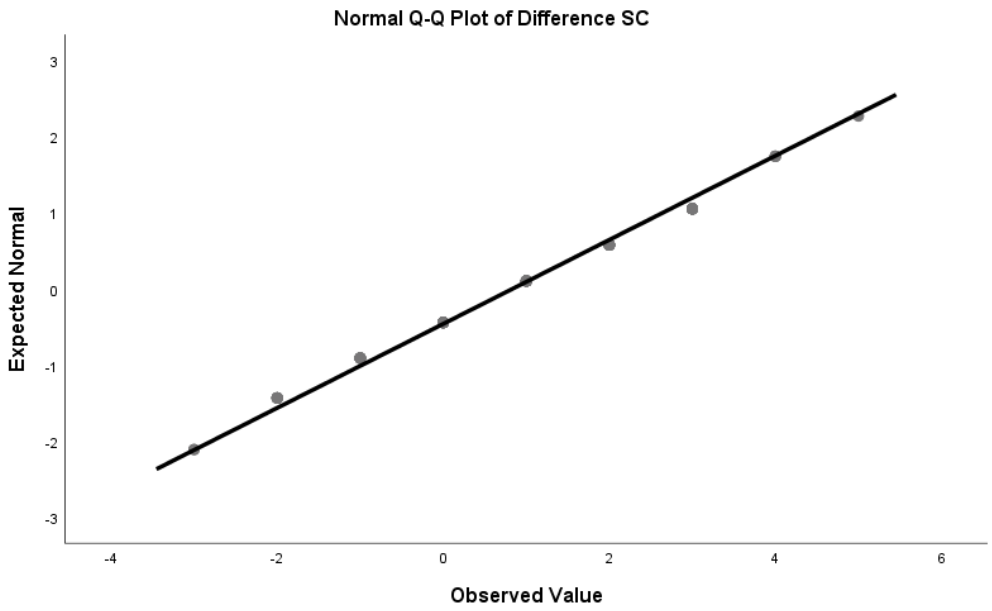

Figure 11. Normal Q-Q plot.

Homogeneity of Variance

To ensure that the error variances of the dependent variables of the pre-tests and post-tests were equal across all levels of the independent variable of the health information group a Levene's Test was conducted. The analysis for research question one yielded $p = 037$ for the food addiction pre-test and $p = .045$ for the food addiction post-test. Both p values were less than .05, therefore, the null hypothesis would be rejected and homogeneity of variance would not be assumed. The analysis for research question two yielded $p = .062$ for symptom count pre-test and $p = .058$ for the symptom count post-test. Both p values were greater than .05. Therefore, there would be no rejection of the null hypothesis in both variables. I also assume to have homogeneity of variance for both variables. See Table 16.

Table 16

Summary of Levene's Tests for Research Questions 1 & 2

Research Questions	Df1	Df2	Sig.
RQ1 – Pre-Test	1	82	.037
RQ1 – Post- Test	1	82	.045
RQ2 – Pre-Test	1	82	.062
RQ2 – Post-Test	1	82	.058

Note n = 84

Findings Research Question 1

To determine if there were any significant differences in food addiction post-test scores (while controlling for any differences at pre-test) as measured by the Yale Food Addiction Scale, among overweight and obese women who receive Social Cognitive Theory-based health information compared to women who receive non-Social Cognitive based health information, I used an analysis of covariance. After conducting the analysis, the results indicated that after controlling for the pre-test there was no significant differences in food addiction post-test scores of the Social Cognitive Theory-based health information Group and the non-Social Cognitive based health information group. $F(1, 81) = 1.252$, $p. = .266$ $n^2 = .015$. Therefore, I would fail to reject the null hypothesis for the first research question and assume that there is no difference between the groups. Table 17 provides a summary of the ANCOVA analysis below.

Table 17

Results of ANCOVA Analysis

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	M Se	F	Sig.	Partial Eta ^{2}
Corrected Model	76.078[a]	2	38.039	10.708	.000	.209
Intercept	27.100	1	27.100	7.629	.007	.086
FAS_UT_PreT	62.316	1	62.316	17.543	.000	.178
Group	4.448	1	4.448	1.252	.266	.015
Error	287.731	81	3.552			
Total	1464.000	84				
Corrected Total	363.810	83				

a. R Squared = .266 (Adjusted R Squared = .248)

The profile plot generated after conducting the ANCOVA analysis shows study participants in the social cognitive theory group had higher food addiction post-test scores (M = 4.02, SD = 2.247) when compared to food addiction post-test scores (M = 3.21, SD = 1.868) of the study participants in the non-social cognitive theory group. The profile plot below displays food addiction post-test mean scores by group (see Figure 12).

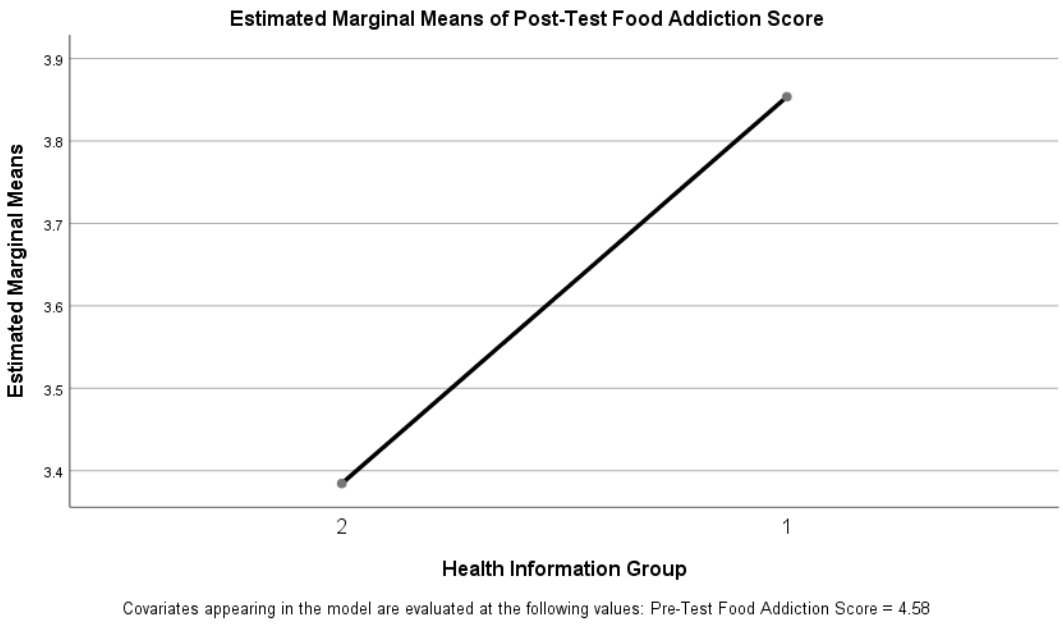

Figure 12. Profile plot.

Findings Research Question 2

ANOVA was selected to determine if the Social Cognitive Theory-based health information had any effect on symptom count post-test scores, as measured by the Yale Food Addiction Scale, among obese and overweight women when compared to obese and overweight women that received the non-Social Cognitive based health information. The independent variable was the Social Cognitive Theory-based health information, and the dependent variable was the symptom count post-test scores as measured by the Yale Food Addiction Scale. Table 18 displays the multivariate tests and the main effect of the health information was not significant, Pillai's Trace (1) =.171, p = .681 and Wilk's^{s} (1) = .171, p = .681 with a large effect-size in *Partial ETA*^{2} = 0.002. Table 19 displays the tests of within-subjects effects ANOVA and displays that the within-subjects main effect of the health information group measure across two time points for the was not

significant, Greenhouse-Geisser, $F(1, 82) = 11.859$, $p = .002$. Table 20 displays the Levene's test of equality of error variances. The analysis indicates no significant differences in the pre-test symptom count score ($p = .062$) and post-test symptom count scores ($p = .058$). Therefore, I would fail to reject the null hypothesis and assume homogeneity of variance. Finally, Table 21 features the tests of between-subjects effects which provides a summary of the ANOVA analysis. After conducting the analysis, the results indicated that there were no significant differences in symptom count post-test scores of the Social Cognitive Theory-based health information Group and the non-Social Cognitive based health information group. $F(1, 82) = 2.838$, $p. = 0.096$, $n^2 = .0033$. Therefore, I would fail to reject the null hypothesis for the second research question.

Table 18

Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta ^{2}
Health Information * HI_Group	Pillai's Trace	.002	.171[b]	1	82	.681	.002
	Wilks' Lambda	.998	.171[b]	1	82	.681	.002
	Hotelling's Trace	.002	.171[b]	1	82	.681	.002
	Roy's Largest Root	.002	.171[b]	1	82	.681	.002

Design: Intercept + HI_Group Within Subjects Design: Health Information
Exact statistic

Table 19

Tests of Within-Subjects Effects

Source		Type III Sum of Squares	df	*M S*	F	Sig.	Partial Eta ^{2}
Health Information	Sphericity Assumed	30.006	1	30.006	17.550	.000	.176
	Greenhouse-Geisser	30.006	1	30.006	17.550	.000	.176
	Huynh-Feldt	30.006	1	30.006	17.550	.000	.176
	Lower-bound	30.006	1	30.006	17.550	.000	.176
Health Information * Health Information Group	Sphericity Assumed	.292	1	.292	.171	.681	.002
	Greenhouse-Geisser	.292	1.000	.292	.171	.681	.002
	Huynh-Feldt	.292	1.000	.292	.171	.681	.002
	Lower-bound	.292	1.000	.292	.171	.681	.002

Table 20

Levene's Test of Equality of Error Variances

	Levene Statistic	Df1	Df2	Sig
Pre-Test Symptom Count Score Based on Mean	3.575	1	82	.062
Post-Test Symptom Count Score Based on Mean	3.704	1	82	.058

Table 21

Summary of ANOVA Analysis for Research Question 2

Source	Type III Sum of Squares	df	*M S*	F	Sig.	Partial Eta ^{2}
Intercept	2295.482	1	2295.482	591.895	.000	0.878
Group	11.006	1	11.006	2.838	0.096	0.033
Error	318.012	82	3.878			

MS = Mean Square
Sig. Significance

The profile plot generated after conducting the ANOVA analysis shows that study participants in the social cognitive theory group had higher food symptom pre-test scores (M = 4.313, SD = 1.776) and post-test scores (M = 3.57, SD = 1.889) when compared to food symptom pre-test scores (M = 3.90, SD = 1.411) and post-test scores (M = 2.98, SD = 1.569) of the study participants in the non-social cognitive theory group. The profile

plot below displays food symptom pre-test and post-test mean scores by group (see Figure 13).

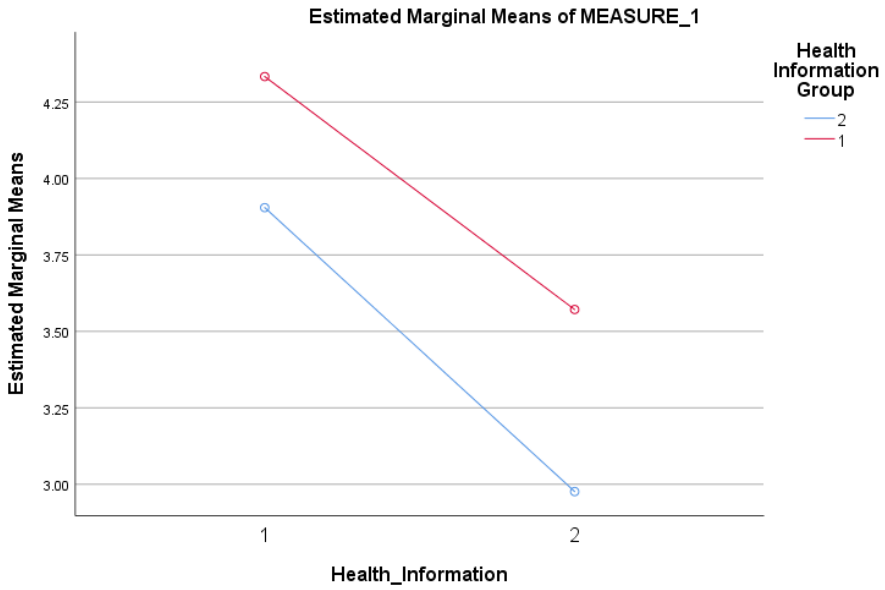

Figure 13. Profile plot.

Additional Statistical Tests: Paired-Samples T Test, Change Score Analysis, and ANCOVA

Due to the ANCOVA and ANOVA analysis yielding results that were not statistically significant, three additional statistical tests of the hypothesis were conducted. The first statistical test that was conducted was a Paired-Samples T Test Analysis. However, prior to conducting this analysis, a preliminary analysis was performed to verify no violation of the assumption of normality. Table 22 displays descriptives for the paired t-test which features the difference in the symptom count score, Skewness = -.052, Kurtosis = -4.96. Table 23 displays normality for the paired t-test of the symptom count score difference, Kolmogorov-Smirnov p = .000, Shapiro-Wilk p = .013. Both scores are

statistically significant, therefore, there is a need to reject the null hypothesis and note that the data is not normally distributed. A paired sample t-test depicts paired samples correlation and is displayed in Table 24. These results are favorable. The analysis found statistical significance (p=≤.001) and a strong correlation (r = .403, n = 84).

Table 22

Descriptives for Paired T-Test

	M	*SD*	Skewness	Kurtosis
Symptom Count Score (Differences)	.85	1.840	-.052	-.4.96

Table 23

Normality for Paired T-Test

	Kolmogorov-Smirnov		Shapiro-Wilk	
	Statistic	Sig.	Statistic	Sig.
Symptom Count Score (Differences)	.145	.000	.962	.013

Table 24

Paired Sample T-Test - Paired Samples Correlations

	N	Correlation	Sig.
Pre-Test & Post Test Symptom Count Scores	84	.403	.000

The second statistical test that was conducted was an ANOVA Change Analysis. This test was used to measure the difference in the symptom count post-test scores between groups. The results were favorable as well, the Levene's Test which found

statistical significance ($p = 0.018$). Therefore, I would reject the null hypothesis and assume that the error variance of the dependent variable is not equal across groups and homogeneity has not been achieved. An ANOVA analysis conducted on the difference between the social cognitive theory-based health information group and the non- social cognitive theory-based health information group was found to not be statistically significant F (1, 82) = .171, p. = 0.681, $n^2 = 0.171$ (Table 25). Normal Q-Q Plot displays the symptom count difference in Figure 14.

Table 25

Results of ANOVA Analysis of Symptom Count Score Difference

	Tests of Between-Subjects Effects					
Source	Type III Sum of Squares	df	*M S*	F	Sig.	Partial Eta^2
Corrected Model	.583[a]	1	.583	.171	.681	.171
Intercept	60.0124	1	60.012	17.550	.000	17.550
HI Group	.583	1	.583	.171	.681	.171
Error	280.405	82	3.420			
Total	341.000	84				
Corrected Total	280.988	83				

a. R Squared = .002 (Adjusted R Squared = .010)

a. Computed using alpha = .05

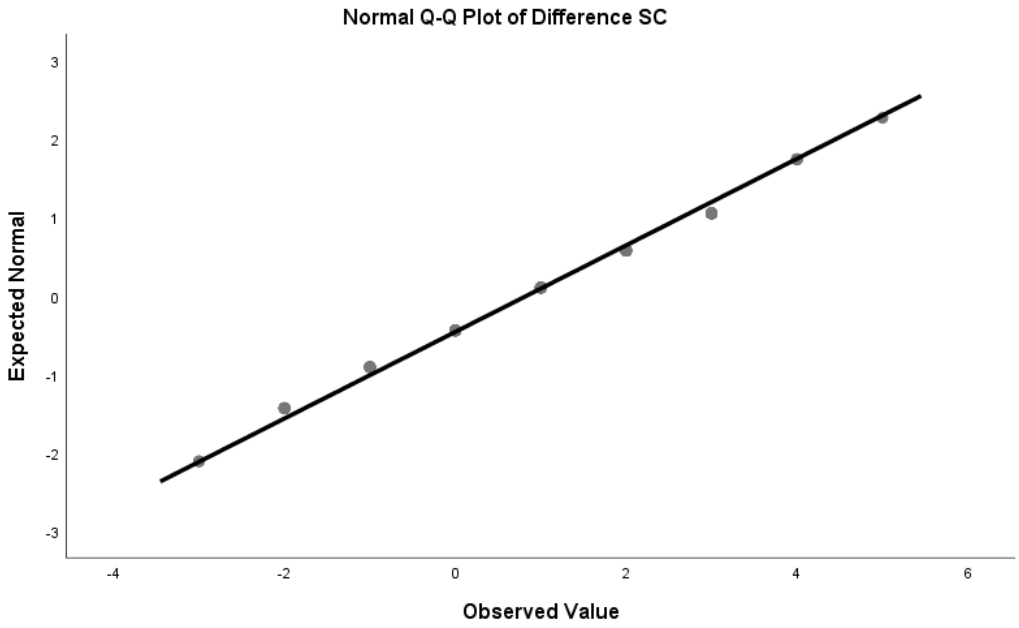

Figure 14. Normal Q-Q plot.

Even though I used a convenience sample and utilized non-random sampling to secure my participants, the data collected from my study participants was obtained from a wide range of study participants to reduce the chances of my study having lower validity and to increase the generalizability of my data. Frankfort-Nachmias & Nachmias (2008) stated that it is important to consider and compensate for nonrandom samples because they have lower validity than random samples. Increased generalizability increases a study's external validity and therefore offsets the threat to validity that a non-random sampling approach can invite. My study participants were located nationwide and from various ethnic backgrounds, so my data and findings can be generalized to the intended target of the study.

The third statistical test that was conducted was an ANCOVA analysis on the food addiction symptom count scores. The original approach to analyzing food addiction

symptom count scores was an ANOVA analysis. As previously mentioned, I chose to conduct an ANOVA analysis on the food addiction symptom count scores because I wished to examine the changes between the pre-test and post-test to understand the differences between the means of the independent variable. However, in order to ensure the data has received as thorough an analysis as possible, an ANCOVA was conducted as well. Conducting the ANCOVA on the food addiction symptom count scores would allow me to control for the pre-test score while determining if any differences existed in study participant food addiction symptom count scores. Table 26 and Figure 15 displays a brief summary below. The results of the ANCOVA analysis indicated no statistically significant difference between the group health information and the post test symptom count scores, $F(1, 82) = 1.369$, $p = .24$. Therefore, I accept the null hypothesis.

Table 26

Results of ANCOVA Analysis of Symptom Count Scores

Tests of Between-Subjects Effects						
Source	Type III Sum of Squares	df	*M S*	F	Sig.	Partial Eta^2
Corrected Model	44.909[a]	2	22.454	8.670	.000	.176
Intercept	25.614	1	25.614	9.889	.002	.109
PT Symp. Count	37.468	1	37.468	14.466	.000	.152
Group	3.545	1	3.545	1.369	.245	.017
Error	209.793	81	2.590			
Total	1155.000	84				
Corrected Total	254.702	83				

a. R Squared = .176 (Adjusted R Squared = .156)
b. M S = Mean Squared
c. PT Symp. Count = Post Test Symptom Count Score

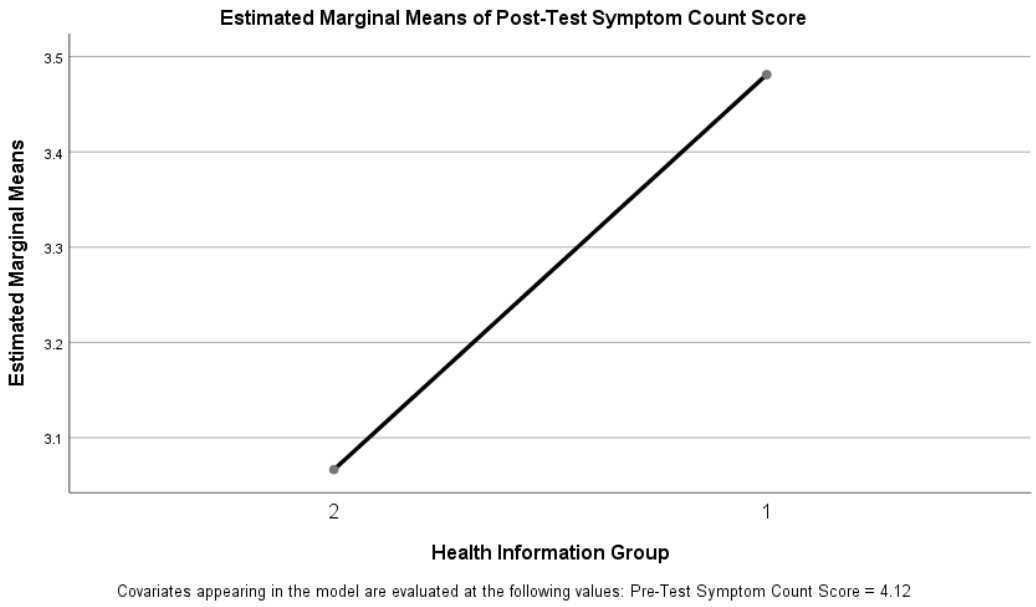

Figure 15. Estimated marginal means.

Summary

The struggle of obesity and being overweight continues to afflict almost 70% of Americans (Fortuna, 2012). Emerging research has found that potential food additives such as MSG and HFCS may be contributing to the obesity epidemic (Insawang et al., 2012; Lowndes et al., 2012). This obesity epidemic is due to the consumption of MSG and HFCS linked to food addiction, food addiction symptoms such as overeating, food cravings, and the brain's addictive response to food Blaylock (1999).

This study utilized key facets of social cognitive theory to create health information that would increase the knowledge of awareness of foods and food additives that lead to food addiction and food addiction symptoms. This new awareness would stand as a catalyst and as a precondition for change to study participant's health behaviors. There is a gap in the literature regarding the effectiveness of presenting health

information to reduce intake of food additives linked to food addiction and obesity. I hope that this study will contribute to future research in this area.

Eighty-four overweight and obese women were recruited to examine the effectiveness of using social cognitive theory -based health information with obese and overweight women to the effectiveness of using social cognitive theory-based health information to reduce or eliminate food addiction and food addiction symptoms. I examined the research questions and based on analysis findings, and I accepted or rejected the research questions.

After conducting an ANCOVA analysis which entailed comparing the food addiction scores of the social cognitive theory-based health information group and food addiction scores of the non- social cognitive theory -based health information group while controlling for the pre-test scores, I found that the results were not statistically significant ($p = 0.096$). The ANOVA analysis found that the results were not statistically significant ($p= 0.266$). Due to these results I conducted a Pre-test Post-test Analysis and found statistical significance ($p = \leq.001$) and a strong correlation ($r = .403$, $n = 84$).

In chapter 5, I will describe my interpretation of the data and information gathered for the study and report the social implications. Finally, I will discuss my study limitations and potential areas of further exploration and research. I will end the chapter with a summary of the study.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this quantitative, quasi-experimental study was to compare the effects of health information based on social cognitive theory and health information not based on social cognitive theory on food addiction among obese and overweight women. Eighty-four obese and overweight women were recruited from a private school in Chicago, IL., Walden University online participant pool, Findparticipants.com, and Researchandme.com for this study. The Yale Food Addiction Scale was used to measure changes in food addiction and food addiction symptoms after providing health information based on social cognitive theory and health information not based on social cognitive theory to both groups.

This study was conducted for four reasons. First, this study was conducted because over 60% of Americans are obese and overweight (Fortuna, 2012). People who are overweight and obese feel the pangs of expanding waistlines and the powerlessness to stop the eating behaviors that contribute to their negative feelings. The second reason this study was conducted is that few researchers have explored managing food addiction symptoms (cravings, overeating, guilt, and anxiety) with social cognitive theory to improve food choices. I have witnessed these struggles among close family members in various situations. For example, I have witnessed the look of sadness in my mother's face when she could not secure quality health care at doctor's offices. In those situations, doctors recommended that she merely exercise greater control and willpower over her food choices as the cure to any health problem. Sadly, my mother passed away due to

obesity-related complications in October 2016. Although these events were sad, they propelled me to dedicate my life to researching and understanding obesity.

The third reason this study was conducted is that researchers had uncovered significant findings related to this study. For example, obesity and being overweight are not simply matters of exercising willpower and self-control. Certain foods that are high in fat, salt, and sugar activate the brain's reward system and have an addictive effect (Göbel, Tronnier, & Münte, 2017). Those who suffer from obesity and overweight experience physiological changes similar to the changes drug addicts experience (Barry et al., 2009; Wilson, 2010). Research has shown social cognitive theory to be effective in addressing addictive behaviors such as drug addiction, alcohol addiction, and smoking cessation (Bricker et al., 2010). The final reason for this study is that there was a gap in the literature regarding the effectiveness of presenting psychologically based health information (such as the components of social cognitive theory) to reduce the intake of food additives that have been linked to food addiction and obesity.

Interpretation of the Findings

My findings confirmed and extended knowledge in the discipline. The findings were compared with what has been found in the peer-reviewed literature. The Yale Food Addiction Scale was used to measure 84 overweight and obese female participants for food addiction and food addiction symptoms in a quasi-experimental study. I divided the participants into two groups, one group who received health information based on social cognitive theory and the other group who received health information not based on social

cognitive theory, for 4 weeks. Once the data were collected, I conducted an ANCOVA and an ANOVA to answer the research questions.

Research Question 1

The results of the ANCOVA analysis indicated no significant difference in the posttest food addiction scores for Group 1 and Group 2, controlling for the pretest. Therefore, it was necessary to fail to reject the null hypothesis and accept the alternative hypothesis. In addition, the mean food addiction scores for Group 1 decreased.

Although these results were not statistically significant, the food addiction posttest scores decreased for both groups. This supports one component of Bandera's (2004) theory, which states that having knowledge of a health benefit creates a precondition for change. The precondition for change was initiated when participants were exposed to the health information. It is also possible that I unwittingly, by discussing the effects of foods that contained MSG and HFCS with both groups, initiated a precondition for change in Group 2 participants. Bandura (1997, 2004) stated that one of the aspects of a precondition for change is that a person becomes more aware of the consequences of his or her health behavior. This finding was noted in a recent food addiction study by Schulte et al. (2019). Although the participants who were classified as food addicted were expected to consume more highly processed foods than the control group, they consumed the same amount as the control group (Schulte et al., 2019). Schulte et al. speculated that the reason for this eating behavior was that food addicted participants became more aware of their eating behaviors and therefore cut down or

abstained from consuming highly processed foods that have been linked to food addiction.

There is another possible reason for the result. Schulte et al. (2019) delved deeper into food addiction by studying the amount of highly processed foods consumed and monitored (a) craving, (b) enjoyment, (c) intention to consume in the future, and (d) likelihood to consume the food if offered for free. Schulte et al. assumed that food addicted participants would consume more highly processed foods than their normal weight participants. Instead, Schulte et al. found no difference in the number of calories consumed that consisted of highly processed foods or minimally processed foods compared to their normal weight counterparts. Schulte et al. speculated that food addicted participants consumed highly processed foods in a less intentional manner and more compulsive manner compared to those without food addiction. Because of the health information provided in the current study, participants consumed highly processed food in a more intentional manner and a less compulsive manner due to receiving either theory-based health information or non-theory-based health information that identified highly processed foods as containing HFCS and MSG. This was reflected in two ways. First, the overall posttest mean food addiction scores decreased for both groups (M = 3.62, SD = 2.094) compared to the pretest scores (M = 4.58, SD = 1.915). Second, the study participants experienced a decrease in their BMIs, which demonstrated that participants experienced weight loss.

Finally, a recent study just (Ouellette et al., 2018) on food addiction may shed more light on the Yale Food Addiction Scale and food addiction. Ouellette et al. (2018)

observed that those who suffer from food addiction symptoms do not always select the questions that compose the clinical impairment section of the Yale Food Addiction Scale. Ouellette et al. found that people who suffer from food addiction symptoms can be food addicted without indicating that they experience clinical impairment. Ouellette et al. also found that a better indicator of food addiction is withdrawal symptoms and hedonic hunger. Ouellette et al. suggested removing the clinical distress and impairment criteria for food addiction and using symptom count scores instead. According to Ouellette et al., participants who scored a symptom count of 3 and above should be considered as having met the clinical criteria for food addiction. When Ouellette et al. implemented this approach, the number of participants increased from 16% to 35% of the total sample meeting the criteria for food addiction.

Research Question 2

The second research question was analyzed with an ANOVA analysis. The results of the ANOVA analysis indicated that there was no significant difference in the symptom count scores of the social cognitive theory-based health information group and the non-social cognitive theory-based health information group. Therefore, I would reject the null hypothesis and accept the alternative hypothesis. However, the mean symptom count scores decreased for both groups.

These findings extend knowledge in the discipline and Bandura's social cognitive theory even though there was a lack of statistically significant results which indicates that health information had little impact on symptom count scores. However, the decrease to study participant BMIs shows potential for the health information especially because

these changes took place over the course of the four-week study. This is because a decrease to study participant's BMIs indicates that study participants changed their eating behaviors and subsequently lost weight.

The social cognitive theory-based health information presented to the social cognitive theory group followed Bandura's recommendation for maximum effectiveness. Bandura (1986) suggested that health information should "instill in people the belief that they have the capability to alter their health habits and emphasize that success requires perseverant effort so that people's sense of personal efficacy is not undermined by a few setbacks" (p. 439). In addition to sharing with study participants how to avoid foods containing the food additives MSG and HFCS so that study participants can reduce or eliminate food addition and symptoms of food addiction, the health information for the social cognitive theory-based group emphasized the importance of seeing themselves as being capable of altering their health habits.

Although the result was not statistically significant, the decrease in mean symptom count also confirms Roach et al. (2003) finding discussed in chapter two that utilizing even one component of social cognitive theory (self-efficacy) in sharing health information resulted in improvements to study participant's eating behavior. Evidence of improvements in study participants' eating behavior was seen in the decrease in the mean symptom count and that almost 60% of the study participants experienced a decrease in symptom count scores.

Knowledge Quizzes

The first set of study participants from both groups that completed the four-week study were reminded once a week for five weeks to complete the knowledge quiz without success. At first, no study participants would take the knowledge quizzes. Once I increased the frequency of reminders from once a week to every other day (three times a week) and changed how the reminder was written, study participants from both groups began to complete the knowledge quiz. Study participants responded better to three things 1) more reminders and 2) reminders that were conversational and informal in tone 3) and emphasizing that study participants cannot pass or fail the quiz.

Changes to BMI

It was important to collect study participants height and weight information to calculate BMI scores and to determine eligibility for this study. The minimum BMI score to be eligible for the study was 25 kg/m. A BMI score of 25 kg/m – 29 kg/m indicated that a study participant was overweight and a BMI score greater than 30 kg/m indicated that the study participant was obese (King, 2013). BMI scores are calculated using a person's height and weight. A BMI score can change only if a person's weight changes. Decreases to a BMI score means that a person lost weight and increases to a BMI score means that a person gained weight. Whereas, no changes to a person's weight means that a person's weight didn't change.

I expected that study participants that received the social cognitive theory-based health information, relative to those without, would have greater decreases to their BMI scores, due to decreased food addiction symptoms. The decrease in food addiction

symptoms would in turn decrease or eliminate consumption of foods containing MSG and HFCS which would result in weight loss. Instead, 40.5% of participants that received the social cognitive theory-based health information experienced a decrease in BMI scores versus 61.9% of participants without social cognitive theory-based health information. Although an analysis of the food addiction symptom scores yielded results that were not statistically significant, the Levene's test did indicate high correlation. This is not to dispute the lack of statistical significance; statistical significance is important. Nevertheless, the fact that study participants, in four weeks, experienced a positive change to their BMI scores is noteworthy.

Limitations of the Study

Four limitations arose from the execution of this study. The first limitation - attrition impacted post-test completion. Prior to beginning this study, I anticipated and estimated a 20% post-test completion average. One hundred and seventy-three study participants completed the pre-test. However, as the study progressed and study participants completed the four-week study, a pattern began to emerge and I noticed that post-test completion averaged around 50%. Further research into attrition rates yielded two insightful findings. First, according to Lee (2003), panel studies similar to this study suffer from a high degree of attrition between surveys due to non-response. Second, Zhou and Fishbach (2016) also noted that the average attrition rate for a typical web experiment (this study meets the criteria for a web experiment due to recruiting, surveying, and distributing information online) is 34%, however depending on the

dynamics of the web experiment, attrition rates can reach 87%. A lab-based study, by comparison, experiences 0% attrition in 96% of lab studies (Zhou and Fishbach, 2016).

The attrition rate for this study was 52%. One hundred and seventy-three study participants completed the pre-test and 84 study participants completed the post-test. Lack of post-test completion was an unanticipated challenge and resulted in additional time, and financial resources spent recruiting additional study participants to increase the sample size. Two factors could have played a role in 52% attrition rate. The first factor is time. Although study participants were aware that the study was four weeks in duration, and the importance and requirement of completing the post-test, perhaps study participants were only content to receive the health information and had no interest in completing the post-test. The second factor is the nature of the study being conducted online as opposed to face-to-face. Reips (2002) findings also echo this sentiment by stating that study participants have a low commitment level to online studies due to the lack of physical interaction.

The second limitation was study participant comfort level with working with technology. When given the opportunity to provide feedback via the last question in the post-test, most participants indicated their satisfaction with the study. However, there were a small number of participants that contacted me after receiving health information for four weeks and shared with me that they were unable to open the health information. This challenge was not due to education level. After reviewing the data, and matching the study participant to their respective education level I discovered that the study participants possessed at least some level of college education. After confirming that they

could not open the link to the narrated slides nor the PowerPoint presentation a PDF version of the health information was sent.

Third limitation was lack of a control group. Although the results were not statistically significant, there was an improvement in mean food addiction scores and mean food addiction symptom count scores. A control group could have been waitlisted. Waters, George, Chey, and Bauman (2012) conducted a study where the waitlisted control group was surveyed before and after the study, but received no information during the study. The waitlisted control group study participants were informed that they would receive information after the study ended. The opportunity to compare the social cognitive theory group to the waitlisted control group could have yielded statistically significant results.

Finally, although there are very researchers that have conducted online studies, Reips (2002) recommends compensating study participants to prevent attrition. This study did not offer compensation to study participants because I would need to personally compensate the study participants. However, it is important to acknowledge that by offering financial compensation to study participants to complete the post-test it is possible that attrition rates would have been lower.

Recommendations

This study shows great potential in several areas. First, the study shows great potential in food addiction research and applying psychological theory to bringing about a positive change in eating behavior. Although no significant results were found with the ANOVA and the ANCOVA analysis, the Paired-Samples T-Test analysis yielded

favorable results and study participants experienced a decrease in food addiction symptoms. This favorable outcome demonstrates this study's second area of great potential and unveils another option and approach to applying the constructs of social cognitive theory towards treating food addiction and the symptoms of food addiction for a sustained amount of time. Third, this study broadens and expands the possibilities of the frontier of research due to this study being conducted entirely online. Fourth, there is also the potential for additional discoveries if this study were to be implemented on a broader scale by future researchers and medical professionals.

If this study were to be repeated, I would recommend the following four items. First, I would recommend future researchers understand that conducting an online study can be daunting to the uninitiated. Recruiting online for research studies has been transformed by the accessibility and convenience of the internet. However, there is a trade-off for this ease and convenience – lower conversion rates.

Initially, it would appear that neophyte researchers that are just embarking upon this journey need to only identify the number of study participants that will be needed. Next, find a website that provides access to a participant pool, conduct the study, analyze and write up the results and then the neophyte researcher is done. However, a researcher that endeavors to conduct a study online from start to finish is really initializing a "crash course" in social media marketing. This crash course will minimally include learning about online conversion rates, retention rates, digital copywriting, market research participant pool privacy laws, and automated e-mail marketing campaigns. In addition, a researcher will have to allocate adequate financial resources and time to account and

compensate for conversion rates while recruiting study participants. For example, while recruiting for this study, I needed 30 additional study participants. Researchandme.com, sent out my recruiting advertisement to 8,000 potential study participants. Initially, it appeared that I would have more than enough participants. However, these 8,000 potential study participants converted into 200 people that expressed an interest in my study and were qualified to participate. I selected 101 people out of the 200 people. Out of 101 people, only 75 completed the pre-test. Therefore, out of 8,000 potential study participants, I only had 1% (n = 75) reach "the moment of truth" to enroll in the study. This pattern was observed with all recruiting sources, even though Researchandme.com had the best overall conversion rate compared to other recruiting sources.

Second, it is important to understand the privacy rules of websites that allow researchers to pay to access their pool of research participants. One of the most challenging items for a researcher is recruiting participants for a study. For a fee, a researcher can pay to access a panel of people (called a research panel or research pool) to participate in their research study. However, some websites offering this service have privacy policies in place to protect their participants. These privacy policies often include prohibiting a researcher from collecting identifying information such as an e-mail address, phone number, or a participant's name. For this study, it was imperative to secure the name and e-mail addresses of the study participants because I needed to send a pre-test and a post-test to the same set of participants to measure the effects of the social cognitive theory-based health information on food addiction scores and symptom count scores. A majority of market research pool companies label transactions of this type as

bi-directional communication and this type of communication is a violation of their privacy policy.

Third, since conducting an ANOVA and ANCOVA requires comparing responses over the duration of a study, future researchers should be prepared to compensate for study participant retention and lack of post-test completion by recruiting a larger sample size. Although, 52% of study participants that completed the pre-test completed the post-test, I assumed that at least 80% of people that initiated the study would want to finish the study and complete the post-test and knowledge quizzes. However, I had to send numerous reminder e-mails during the week in order to urge study participants to complete the post-test. Eventually, 84 participants completed the post-test, but the completion was reached quite slowly over the course of several months.

Finally, the percentage of those that were food addicted was lower than expected Although food addiction research is a relatively new and emerging field, prior research suggests that those that are overweight and obese would have a higher rate of food addiction (Burmeister et al., 2013). However, this study discovered that 41% of overweight and obese study participants met the criteria for food addiction as identified by the Yale Food Addiction Scale. These new and surprising findings are also confirmed by a recent study conducted by Schulte et al. (2019). Schulte's et al. (2019) study delved deeper into food addiction research and found that only 14.6% of the recruited sample (n = 501) met the criteria for food addiction. Once Schulte et al. (2019) conducted the study, 38.6% (n = 17) of their study participants (n = 44) met the criteria for food addiction as identified by the Yale Food Addiction Scale.

Implications

There are three areas of potential impact for positive social change at the individual and societal level. At an individual level, this study shares valuable insight into the potentially positive role and influence components of social cognitive theory can have on food addiction and food addiction symptoms. This study also takes a unique approach to reach individuals by delivering behaviorally based health information digitally. Naslun et al. (2017) acknowledged that despite empirical evidence demonstrating that interventions based on behaviorally based theories are more successful than interventions that are not based on behaviorally based theories few interventions have delved into digital technologies to target health behaviors. At a societal level, this study sheds light on the common misconception that being overweight and obese is exclusively due to "calories in calories out." This study provides insight into the psychosocial aspect of addressing food addiction and food addiction symptoms. Finally, there is a methodological implication as it relates to potential selection bias. This potential selection bias is due to the possibility of the study participant's willingness to enroll in a study of this nature may be different from the general population.

Conclusion

Over 70% of Americans are overweight or obese and those that suffer from being overweight or obese experience direct and indirect healthcare costs as high as $147 billion (Fortuna, 2012, Center for Disease Control and Prevention, 2013). These indirect and direct costs are attributed to but not limited to healthcare expenditures for diseases

and disabilities that are related to obesity (Rappange, Brouwer, Hoogenveen, & Van Baal, 2009).

Highly palatable foods such as ice cream, cakes, and various fast foods are linked to the food additives MSG and HFCS, Napoli (2008). Although they make these foods taste more appealing, for those that are overweight or obese their brains are more vulnerable to the addictive effects of these ingredients. This vulnerability results in experiencing an inability to regulate one's eating behavior which results in food cravings and overeating (Blaylock, 1999; Joranby et al., 2005).

This study sought to help those that are overweight and obese by designing an online quasi-experiment that would utilize components of Bandura's social cognitive theory to address food addiction and food addiction symptoms. I compared the effects of social cognitive theory-based health information with non- social cognitive theory-based health information on food addiction and food addiction symptoms among obese and overweight women throughout four weeks. The results of this experiment show that after controlling for the pre-test, there were no significant differences between the groups. However, the additional analysis yielded statistically significant results and a strong correlation to the health information affecting food addiction symptoms. This positive outcome is an indication that more research should be conducted to explore potentially more significant findings.

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Appendix A: Yale Food Addiction Scale

Yale Food Addiction Scale Gearhardt, Corbin, Brownell, 2009

Contact: ashley.gearhardt@yale.edu

This survey asks about your eating habits in the past year. People sometimes have difficulty controlling their intake of certain foods such as:

- **Sweets like ice cream, chocolate, doughnuts, cookies, cake, candy, ice cream**
- **Starches like white bread, rolls, pasta, and rice**
- **Salty snacks like chips, pretzels, and crackers**
- **Fatty foods like steak, bacon, hamburgers, cheeseburgers, pizza, and French fries**
- **Sugary drinks like soda pop**

When the following questions ask about "CERTAIN FOODS" please think of ANY food similar to those listed in the food group or ANY OTHER foods you have had a problem with in the past year

IN THE PAST 12 MONTHS:	Never	Once a month	2-4 times a month	2-3 times a week	4 or more times or daily
1. I find that when I start eating certain foods, I end up eating much more than planned	0	1	2	3	4
2. I find myself continuing to consume certain foods even though I am no longer hungry	0	1	2	3	4
3. I eat to the point where I feel physically ill	0	1	2	3	4
4. Not eating certain types of food or cutting down on certain types of food is something I worry about	0	1	2	3	4
5. I spend a lot of time feeling sluggish or fatigued from overeating	0	1	2	3	4
6. I find myself constantly eating certain foods throughout the day	0	1	2	3	4
7. I find that when certain foods are not available, I will go out of my way to obtain them. For example, I will drive to the store to purchase certain foods even though I have other options available to me at home.	0	1	2	3	4

8.	There have been times when I consumed certain foods so often or in such large quantities that I started to eat food instead of working, spending time with my family or friends, or engaging in other important activities or recreational activities I enjoy.	0	1	2	3	4
9.	There have been times when I consumed certain foods so often or in such large quantities that I spent time dealing with negative feelings from overeating instead of working, spending time with my family or friends, or engaging in other important activities or recreational activities I enjoy.	0	1	2	3	4
10.	There have been times when I avoided professional or social situations where certain foods were available, because I was afraid I would overeat.	0	1	2	3	4
11.	There have been times when I avoided professional or social situations because I was not able to consume certain foods there.	0	1	2	3	4
12.	I have had withdrawal symptoms such as agitation, anxiety, or other physical symptoms when I cut down or stopped eating certain foods. (Please do NOT include withdrawal symptoms caused by cutting down on caffeinated beverages such as soda pop, coffee, tea, energy drinks, etc.)	0	1	2	3	4
13.	I have consumed certain foods to prevent feelings of anxiety, agitation, or other physical symptoms that were developing. (Please do NOT include consumption of caffeinated beverages such as soda pop, coffee, tea, energy drinks, etc.)	0	1	2	3	4
14.	I have found that I have elevated desire for or urges to consume certain foods when I cut down or stop eating them.	0	1	2	3	4
15.	My behavior with respect to food and eating causes significant distress.	0	1	2	3	4
16.	I experience significant problems in my ability to function effectively (daily routine, job/school, social activities, family activities, health difficulties) because of food and eating.	0	1	2	3	4

IN THE PAST 12 MONTHS:	NO	YES

17. My food consumption has caused significant psychological problems such as depression, anxiety, self-loathing, or guilt.	0	1
18. My food consumption has caused significant physical problems or made a physical problem worse.	0	1
19. I kept consuming the same types of food or the same amount of food even though I was having emotional or physical problems.	0	1
20. Over time, I have found that I need to eat more and more to get the feeling I want, such as reduced negative emotions or increased pleasure.	0	1
21. I have found that eating the same amount of food does not reduce my negative emotions or increase pleasurable feelings the way it used to.	0	1
22. I want to cut down or stop eating certain kinds of food.	0	1
23. I have tried to cut down or stop eating certain kinds of food.	0	1
24. I have been successful at cutting down or not eating these kinds of food	0	1

25. How many times in the past year did you try to cut down or stop eating certain foods altogether?	1 time	2 times	3 times	4 times	5 or more times

26. Please circle ALL of the following foods you have problems with:

Ice cream	Chocolate	Apples	Doughnuts	Broccoli	Cookies	Cake	Candy
White Bread	Rolls	Lettuce	Pasta	Strawberries	Rice	Crackers	Chips
Pretzels	French Fries	Carrots	Steak	Bananas	Bacon	Hamburgers	Cheese burgers
Pizza	Soda Pop	None of the above					

27. Please list any other foods that you have problems with that were not previously listed:

Instruction Sheet for the Yale Food Addiction Scale

(Gearhardt, Corbin, & Brownell, 2008)

Contact Information: ashley.gearhardt@yale.edu

The Yale Food Addiction Scale is a measure that has been developed to identify those who are most likely to be exhibiting markers of substance dependence with the consumption of high fat/high sugar foods.

Development

The scale questions fall under specific criteria that resemble the symptoms for substance dependence as stated in the Diagnostic and Statistical Manual of Mental Disorders IV-R and operationalized in the Structured Clinical Interview for DSM Disorders.

1) Substance taken in larger amount and for longer period than intended
Questions #1, #2, #3

2) Persistent desire or repeated unsuccessful attempt to quit
Questions #4, #22, # 24, #25

3) Much time/activity to obtain, use, recover
Questions #5, #6, #7

4) Important social, occupational, or recreational activities given up or reduced
Questions #8, #9, #10, #11

5) Use continues despite knowledge of adverse consequences (e.g., failure to fulfill role obligation, use when physically hazardous
Question #19

6) Tolerance (marked increase in amount; marked decrease in effect
Questions #20, #21

7) Characteristic withdrawal symptoms; substance taken to relieve withdrawal
Questions #12, #13, #14

8) Use causes clinically significant impairment
Questions #15, #16

Cut-offs

Cut-offs were developed for the continuous questions by examining scatterplots of the answers compared to Binge Eating scores, EAT-26 scores, and BMI.

0 = question not significantly met, 1 = question criteria is met

The following questions are scored 0 = (0), 1 = (1): #19, #20, #21, #22
The following question is scored 0 = (1), 1 = (0): #24
The following questions are scored 0 = (0 thru 1), 1 = (2 thru 4): #8, #10, #11
The following questions are scored 0 = (0 thru 2), 1 = (3 & 4): #3, #5, #7, #9, #12, #13, #14, #15, #16
The following questions are scored 0 = (0 thru 3), 1 = (4): #1, #2, #4, #6, #25

The following questions are NOT scored, but are primers for other questions: #17, #18, #23
Questions #26 & #27 provide information on foods that participants have trouble controlling

SCORING

After computing cut-offs, sum up the questions under each substance dependence criterion (e.g. Tolerance, Withdrawal, Clinical Significance, etc.). If the score for the criterion is ≥ 1, then the criterion has been met and is scored as 1. If the score = 0, then the criteria has not been met.

Example:
Tolerance: (#20 =1) + (#21 = 0) = 1, Criterion Met
Withdrawal (#12 =0) + (#13 = 0) + (#14 = 0) = 0, Criterion Not Met
Given up (#8 =1) + (#9 = 0) + (#10 =1) + (#11 = 1) = 3, Criterion Met and scored as 1

To score the continuous version of the scale, which resembles a symptom count without diagnosis, add up all of the scores for each of the criterion (e.g. Tolerance, Withdrawal, Use Despite Negative Consequence). Do NOT add clinical significance to the score. This should range from 0 to 7 (0 symptoms to 7 symptoms.)

To score the dichotomous version, which resembles a diagnosis of substance dependence, compute a variable in which clinical significance must = 1, and the symptom count must be ≥ 3. This should be either a 0 or 1 score (no diagnosis or diagnosis criteria met.)

Norms

Diagnosis of Food Dependence – 11.6%
Median Symptom Count Score – 1.0
Withdrawal – 16.3%
Tolerance – 13.5%
Continued Use Despite Problems – 28.3%
Important Activities Given Up – 10.3%
Large Amounts of Time Spent – 24.0%
Loss of Control – 21.7%
Have Tried Unsuccessfully to Cut Down or Worried About Cutting Down – 71.3%
Clinically Significant Impairment - 14%

Appendix B: Demographic Questionnaire

Demographic Questionnaire

Link to questionnaire: https://www.surveymonkey.com/r/Week1DQCFYFAS

Effect of Psychology Based Health Information on Food Addiction

Informed Consent to Participate in a Research Study
Walden University

Title of Research: Effect of Psychology based Health Information on Food Addiction

Name of Principal Investigator/Primary Researcher: Kirsten Grant, Health Psychology Doctoral Candidate at Walden University.

Phone Number of Principal Investigator/Primary Researcher: (xxx-xxx-xxx)

Name and Phone Number of Committee Members: Dr. Jay Greiner (xxx-xxx-xxx), Chair; Dr. Amy Sickel, Committee Member.

A. PURPOSE AND BACKGROUND

Under the supervision of Dr. Jay Greiner, Kirsten Grant a Health Psychology graduate student will be conducting research on food addiction and eating habits. The researcher is inviting women who are at least 18 years of age, not currently pregnant or pregnant in the last six months and are overweight or obese to be in the study. The purpose of this survey is to give two types of health information and study the effect. Specifically, increasing awareness of foods that have been linked in increasing food addiction symptoms and providing information to increase a person's belief in their ability to embrace new eating behaviors. The two surveys will take less than five minutes to complete.

B. PROCEDURES If you agree to participate in this research study, you will be asked to:

- Complete an initial survey online
- For four weeks the researcher will be sending you various health information to read online
- At the end of four weeks, the researcher will be asking you to complete the online survey again and an online quiz based on the health information that you read.

Here are some sample questions:

- I find that when I start eating certain foods, I end up eating much more than planned
- I want to cut down or stop eating certain kinds of food.
- Not eating certain types of food or cutting down on certain types of food is something I worry about

C. RISKS You will be asked questions about your emotions and your behavior around food both now and over the past 12 months. You might feel uncomfortable exploring some of these issues but you are free at any time to stop your participation in the survey at any time without penalty. If emotional issues surface that become overwhelming, you should seek therapeutic support. Affordable, free, and sliding scale resources are available by calling 1-800-780-2294 or logging on to www.freerehabcenters.org.

D. CONFIDENTIALITY: All efforts will be made to keep the data and information that will be derived from this study as confidential as possible. No information that could identify and individual that participated in this study will be used in any reports or publications. Spreadsheets, data, and summaries will be given codes and will be stored separately from any names or other information that could be used to identify study participants. Research information will be kept in locked files at all times. The researcher, and only those with an essential need to see names will have access to a specific file, data, information, and spreadsheets will be kept on file for at least two years after the study has concluded.

E. VOLUNTARY NATURE OF THE STUDY: This study is voluntary. You are free to accept or turn down the invitation. No one will treat you differently if you decide not to be in the study. If you decide to be in the study now, you can still change your mind later. You may stop at any time. The researcher will follow up with all volunteers to let them know whether or not they were selected for the study.

F. BENEFITS Benefits of this research include assisting this researcher, therapeutic and medical profess

OK

I. QUESTIONS The researcher conducting this study is Kirsten Grant. The advisor for this researcher is Dr. Jay Greiner. You may feel free to ask any questions that you may have at this time. Or if you later discover that you have any additional questions, please contact Kirsten Grant at (312) 804-9602, or Dr. Jay Greiner (717) 566-3838. If you have questions about your rights as a study participant a Walden University Research Participant Advocate can be reached at (612) 312-1210.

J. CONSENT You will be e-mailed an electronic copy of this consent form to keep. PARTICIPATION IN RESEARCH STUDY IS VOLUNTARY. You are free to decline to

participate in this research study, or you may withdraw your participation at any point without penalty.

1. If you agree to participate, you may indicate your consent by clicking "Yes" below.

- ○ Yes
- ○ No

*2. I understand that I can leave this study at any time.

- ☐ Yes
- ☐ No

You are invited to provide your contact information (name and e-mail address) so that you may:

-Receive various health information for four weeks
-At the end of the four weeks complete a knowledge quiz & complete the same survey again

*3. What is your first and last name? (Example: John Doe)

*4. At what email address would you like to be contacted?

*5. What is your gender?

- ○ Female
- ○ Male

*6. What is your age?

- ○ 18 to 24
- ○ 25 to 34
- ○ 35 to 44
- ○ 45 to 54

- 55 to 64
- 65 to 74
- 75 or older

*7. Which race/ethnicity best describes you? (Please choose only one.)

- American Indian or Alaskan Native
- Asian / Pacific Islander
- Black or African American
- Hispanic
- White / Caucasian
- Multiple ethnicity / Other (please specify)

*8. What is your height in feet and inches? For example, if you are 5 feet and 4 inches, write 5'4".

*9. What is your current weight in pounds?

*10. What is the highest level of education you have completed?

*11. Are you currently pregnant?

- Yes
- No

*12. In the past 6 months, have you been pregnant?

- Yes

- No

*13. Are you currently dieting?

- Yes
- No

*14. What diets have you have been on in the past three months?

- Weight Watchers
- Jenny Craig
- Nutrisystem
- Atkins
- Vegetarian
- Flexitarian
- None of the above
- Other

*15. Have you ever received a mental health diagnosis?

- Yes
- No

*16. Are you currently under treatment for anxiety or depression?

- Yes
- No

*17. Do you think anxiety effects your food intake?

- Yes
- No

Appendix C: Social Cognitive Theory Based Health Information: Week 1 to Week 4

Appendix D: Non-Social Cognitive Theory Based Health Information: Week 1 to Week 4

Appendix E: SurveyMonkey Link to Week One Study Questions

SurveyMonkey Link to Week One Study Questions:

https://www.surveymonkey.com/r/Week1DQCFYFAS

This survey asks about your eating habits in the past year. People sometimes have difficulty controlling their intake of certain foods such as:

- Sweets like ice cream, chocolate, doughnuts, cookies, cake, candy, ice cream
- Starches like white bread, rolls, pasta, and rice
- Salty snacks like chips, pretzels, and crackers
- Fatty foods like steak, bacon, hamburgers, cheeseburgers, pizza, and French fries
- Sugary drinks like soda pop

When the following questions ask about "CERTAIN FOODS" please think of ANY food similar to those listed in the food group or ANY OTHER foods you have had a problem with in the past year

IN THE PAST 12 MONTHS:

*18. I find that when I start eating certain foods, I end up eating much more than planned

*19. I find myself continuing to consume certain foods even though I am no longer hungry

*20. I eat to the point where I feel physically ill

*21. Not eating certain types of food or cutting down on certain types of food is something I worry about

*22. I spend a lot of time feeling sluggish or fatigued from overeating

*23. I find myself constantly eating certain foods throughout the day

*24. I find that when certain foods are not available, I will go out of my way to obtain them. For example, I will drive to the store to purchase certain foods even though I have other options available to me at home.

*25. There have been times when I consumed certain foods so often or in such large quantities that I started to eat food instead of working, spending time with my family or friends, or engaging in other important activities or recreational activities I enjoy.

*26. There have been times when I consumed certain foods so often or in such large quantities that I spent time dealing with negative feelings from overeating instead of working, spending time with my family or friends, or engaging in other important activities or recreational activities I enjoy.

*27. There have been times when I avoided professional or social situations where certain foods were available, because I was afraid I would overeat.

*28. There have been times when I avoided professional or social situations because I was not able to consume certain foods there.

*29. I have had withdrawal symptoms such as agitation, anxiety, or other physical symptoms when I cut down or stopped eating certain foods. (Please do NOT include withdrawal symptoms caused by cutting down on caffeinated beverages such as soda pop, coffee, tea, energy drinks, etc.)

*30. I have consumed certain foods to prevent feelings of anxiety, agitation, or other physical symptoms that were developing. (Please do NOT include consumption of caffeinated beverages such as soda pop, coffee, tea, energy drinks, etc.)

*31. I have found that I have elevated desire for or urges to consume certain foods when I cut down or stop eating them.

*32. My behavior with respect to food and eating causes significant distress.

*33. I experience significant problems in my ability to function effectively (daily routine, job/school, social activities, family activities, health difficulties) because of food and eating.

IN THE PAST 12 MONTHS:

*34. My food consumption has caused significant psychological problems such as depression, anxiety, self-loathing, or guilt.

*35. My food consumption has caused significant physical problems or made a physical problem worse.

*36. I kept consuming the same types of food or the same amount of food even though I was having emotional or physical problems

*37. Over time, I have found that I need to eat more and more to get the feeling I want, such as reduced negative emotions or increased pleasure.

*38. I have found that eating the same amount of food does not reduce my negative emotions or increase pleasurable feelings the way it used to.

*39. I want to cut down or stop eating certain kinds of food.

*40. I have tried to cut down or stop eating certain kinds of food.

*41. I have been successful at cutting down or not eating these kinds of food

*42. How many times in the past year did you try to cut down or stop eating certain foods altogether?

*43. Please select ALL of the following foods you have problems with:

- [ ] Ice cream
- [ ] White Bread
- [ ] Pretzels
- [ ] Pizza
- [ ] Chocolate
- [ ] Rolls
- [ ] French Fries
- [ ] Soda Pop
- [ ] Apples
- [ ] Lettuce
- [ ] Carrots
- [ ] Doughnuts
- [ ] Pasta
- [ ] Steak
- [ ] Broccoli
- [ ] Strawberries

- [ ] Bananas
- [ ] Cookies
- [ ] Rice
- [ ] Bacon
- [ ] Cake
- [ ] Crackers
- [ ] Hamburgers
- [ ] Candy
- [ ] Chips
- [ ] Cheese burgers
- [ ] None of the above

*44. Please list any other foods that you have problems with that were not previously listed:

DONE

Appendix F: Advertisement for Study

SEEKING FEMALE RESEARCH PARTICIPANTS

Do you eat large amounts of food and feel out of control sometimes?

Have you tried to cut down on the amount of food that you eat?

Have you experienced cravings for certain foods?

OR

You may be eligible to participate in a research study about food addiction and eating behaviors!

Eligibility requirements:

- Female
- At least 18 years of age
- Not currently pregnant or pregnant in the last six months
- Overweight or obese

What does this study involve?

- Answering two surveys about you, your eating habits, height, and weight
- For four weeks you will receive information about foods that have been linked to food addiction and food addiction symptoms.
- The two surveys will take less than five minutes to complete.

All queries will be confidential

For more information, please contact the researcher:

Phone: 312-804-9602 Email: Kirsten.Grant@WaldenU.edu

Appendix G: Informed Consent to Participate in a Research Study

Walden University

Title of Research: Effect of Psychology based Health Information on Food Addiction

Name of Principal Investigator/Primary Researcher: Kirsten Grant, Health Psychology Doctoral Candidate at Walden University.

Appendix H: Knowledge Quiz – Social Cognitive Theory Group

Link to quiz: https://www.surveymonkey.com/r/QuizSCT

Quiz - SCT Group

1. Food addiction is

- When one has the need to eat certain foods (usually fattening and sugary foods) even when one knows that overeating these foods could be harmful to one's health.
- Liking all food.
- Eating one particular food all the time.

2. Which food ingredients have been added to foods to increase food addiction?

- Monosodium glutamate and high fructose corn syrup
- Salt and sugar
- Sodium bicarbonate and butter

3. Select two foods that may contain monosodium glutamate or high fructose corn syrup

- [ ] Salad dressing
- [ ] Ice burg lettuce
- [ ] Soup
- [ ] Apples

4. Select two benefits of consuming foods that are free of monosodium glutamate and high fructose corn syrup

- [ ] Less cravings
- [ ] Potential weight loss
- [ ] Less urges to go the bathroom
- [ ] Less dry skin

5. Select two foods that are free of monosodium glutamate and high fructose corn syrup

- [ ] Cheese
- [ ] Fresh fruit
- [ ] Diet ice cream
- [ ] Prepackaged fruit topped flavored cottage cheese

6. Flexing your "self-efficacy muscle" can help reduce and manage symptoms of food addiction

- ( ) Yes
- ( ) No

7. In order from one to three, rank in order the steps to take to identify healthier dessert food choices

Write down your top three favorite desserts

Use social media (Pinterest & Allrecipies.com) to recreate your favorite desserts

Purchase missing ingredients

8. You are shopping for ice cream in the grocery store, and are looking for ice cream flavors without high fructose corn syrup. Which two ice cream flavors will you choose?

- [ ] Haagen Dazs Chocolate Ice Cream

- [ ] Breyers Fat Free Creamy Vanilla Ice Cream
- [ ] Breyers Natural Vanilla Ice Cream
- [ ] Breyers Fat Free Chocolate Ice Cream

9. You are shopping for cookies in the grocery store, and are looking for cookie flavors without high fructose corn syrup. Which two cookie flavors will you choose?

- [ ] Keebler Sandies Classic
- [ ] Nabisco Oreo Cookies
- [ ] Newman's Own Chocolate Chip Cookies
- [ ] Nabisco Chips Ahoy Chocolate Chip Cookies

10. True or false, was this this quote featured in the health information that you received in week four? "Don't think about what can happen in a month. Don't think about what can happen in a year. Just focus on the 24 hours in front of you and do what you can to get closer to where you want to be."

- ○ True
- ○ False

11. How much water should you drink daily

- ○ One liter
- ○ Half your body weight
- ○ Two cups

12. To save time and increase convenience

- ○ Buy frequently used items in bulk
- ○ Buy frequently used items one at a time
- ○ Buy frequently used items only when you need them

13. The researcher conducting this study is Kirsten Grant. You may feel free to ask any questions that you may have at this time by typing in the box below. Or if you later discover that you have any additional questions, you are invited to please contact Kirsten Grant (xxx) xxx-xxxx or E-Mail: Kirsten.Grant@Waldenu.edu

DONE

Appendix I: Knowledge Quiz – Non- Social Cognitive Theory Group

Link to quiz: https://www.surveymonkey.com/r/QuizNon-SCTGroup

Quiz - Non SCT Group

1. Food addiction is

- When one has the need to eat certain foods (usually fattening and sugary foods) even when one knows that overeating these foods could be harmful to one's health
- Liking all food
- Eating one particular food all the time.

2. Which food ingredients have been added to foods to increase food addiction?

- Monosodium glutamate and high fructose corn syrup
- Salt and sugar
- Sodium bicarbonate and butter

3. Select two foods that may contain monosodium glutamate or high fructose corn syrup

- [ ] Salad dressing
- [ ] Ice burg lettuce
- [ ] Soup
- [ ] Apples

4. Select two benefits of consuming foods that are free of monosodium glutamate and high fructose corn syrup

- [ ] Less cravings
- [ ] Potential weight loss
- [ ] Less urges to go the bathroom
- [ ] Less dry skin

5. Select two foods that are free of monosodium glutamate and high fructose corn syrup

- [ ] Cheese
- [ ] Fresh fruit
- [ ] Diet ice cream
- [ ] Prepackaged fruit topped flavored cottage cheese

6. You are shopping for ketchup, barbecue sauce, mayonnaise, and mustard. You turnover each bottle to read the ingredients and put any bottle back on the store shelf that lists ___ in the ingredients.

- ○ High fructose corn syrup
- ○ Olive oil
- ○ Sugar

7. In order from one to three, rank in order the steps to take to identify healthier dessert food choices

Write down your top three favorite desserts

Use social media (Pinterest & Allrecipies.com) to recreate your favorite desserts

Purchase missing ingredients

Question Title

8. You are craving a single serving of something fast, sweet, and chocolate flavored. Which dessert do you decide to prepare?

- Chocolate mug cake
- Chocolate soufflé
- Five-layer cake

9. How can you find desserts without high fructose corn syrup and monosodium glutamate?

- Buy foods based on taste alone
- Read food labels and check ingredients before purchasing
- Buy only fat free foods

10. Which of the below are tricks to sticking to your goals

- Surround yourself with a positive support network
- Don't allow a negative "soundtrack" to play in your head
- Remind yourself that you are choosing to eat certain foods and not denying yourself
- All of the above

11. How much water should you drink daily

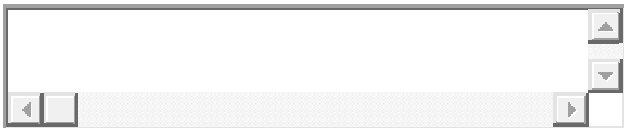
- One liter
- Half your body weight
- Two cups

12. Besides water, what is another way to stay hydrated?

- Fruit infused water
- Tea made with loose leaf tea leaves unsweetened or sweetened with agave, turbinado sugar, raw honey, or stevia
- Carbonated water
- All of the above

13.

The researcher conducting this study is Kirsten Grant. You may feel free to ask any questions that you may have at this time by typing in the box below. Or if you later discover that you have any additional questions, you are invited to please contact Kirsten Grant (xxx) xxx-xxxx or E-Mail: Kirsten.Grant@Waldenu.edu



DONE