Obesity, a Disease of Adaptation to Environmental & Physiological Stressors

by
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Approval Page

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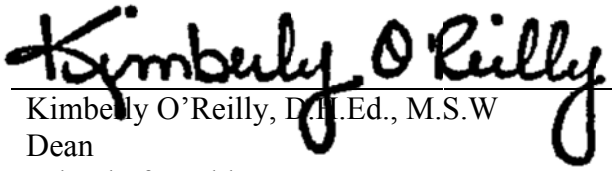

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Abstract

The educational intervention of this Applied Dissertation consisted of a presentation during which self-selected volunteers were introduced to relevant literature focusing on less known factors causing the disease of obesity and contrasting from behavior. The workshop was structured to address the problem statement: "The researcher will develop and implement an educational intervention for professional adults and students of a higher-education community in California and assess a change in attitudes toward obesity."

Environmental factors, physiological factors, and negative attitudes associated with obesity were proposed as stressors. Those stressors were identified as harming the obese population. Attitudes toward obesity, plus personal behavior and thoughts as predictors of attitudes, were respectively measured with the Fat Phobia Scale and a Structured Interview.

Pre and post-tests of the Fat Phobia Scale showed a decrease of $SE = .83$ between the means (quantitative data). Pre and posts-tests semi-quantitation and calculation of the Structured Interview showed an increase of 71.43% in the frequencies of causal themes introduced during the intervention (qualitative results). A triangulation scheme was used to evaluate the value and complementary method of each tool. The outcomes implied a positive change in awareness of introduced causal agents and the intervention affirmative impact. In spite of few participants ($N = 7$), best practices were applied to protect participants' confidentiality; and with the intent to design an intervention suitable for replication with a broader range of participants.

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Chapter One: Introduction

Several centuries ago, being overweight or obese was considered a social grace and a desirable condition, as seen in poetry and paintings (Baudelaire, 1861; Rubens, 1628). This is a stark contrast from today's perception. Now, the popular belief views obesity as the result of a negative behavior (Berryman, Dubale, Manchester, & Mittelstaedt, 2006; Hilbert, Rief, & Braehler, 2008; Puhl & Brownell, 2006). Obesity is determined using the Body Mass Index (BMI), a formula connecting weight to health (Centers for Disease Control [CDC], 2010). For the adult population, CDC (2010) established a normal BMI between 18 and 24.9, overweight as BMI between 25 and 29.9, and obese as BMI of 30 and above.

Overeating is commonly believed to cause obesity (Ludwig et al., 2010; Prentice, 2001; Swinburn, 2009). This collective belief triggers the general negative attitude toward obesity (Berryman et al., 2006; Hilbert et al., 2008; Puhl & Brownell, 2006). Hilbert et al. (2008) reported that correlating obesity to illness or heredity carried less stigmatization. Thenceforth, if the belief of a negative behavior was challenged by introducing evidence that obesity is caused by essential factors other than behavior, it was anticipated that the general negative attitude toward obesity would be affected. Those essential factors did not include behavior, but specific environmental and cerebral stressors involved in obesity.

The proposed environmental stressors food additives (FA) and damaging attempts (DA) were correlated to the stages of the General Adaptation Syndrome (GAS; Selye, 1946). Physiological stressors are agents causing activities in the brain, which provoke dynamics affecting the body homeostasis, and expressed in the stress they stimulate

(Bernard, 1856; Bijaoui, 2004; Conti, 2001; Chrousos & Gold, 2002; Kontopoulou & Marketos, 2002; Selye, 1946). Those dynamics are the results of cerebral chemical dislodgements, or processes during which neurons' chemical organizations are displaced, causing cerebral stress, challenging the body homeostasis, and resulting in diseases (Bernard, 1856; Bijaoui, 2004; Conti, 2001; Chrousos & Gold, 2002; Kontopoulou & Marketos, 2002; Selye, 1946). For the purpose of this paper, physiological stressors and cerebral stressors will be conveying the same concept. The psychological stressors were correlated to social pressure expressed in negative attitudes toward obesity.

Correlating obesity to illness or heredity was associated with less stigmatization (Puhl & Brownell, 2006). Similarly, correlating obesity to different causes than behavior, such as environmental and physiological/cerebral stressors, could positively impact stigmatization. If those proposed stressors were accepted as causing obesity, negative attitudes toward obesity would be confronted with a new rational challenging behavior as the only or first cause of obesity.

The researcher proposed FA, DA, (or FADA, for Food Additives and Damaging Attempts combined), and lack of homeostasis in cerebral activities as essential stressors affecting obesity; rather than behavior, as generally believed, and which results in negative attitudes toward the obese population. This argument was substantiated in Chapter Two, Literature Review.

Chapter Two described the differences between processed and non-processed food as they relate to health and weight (Ravussin, Valencia, Esparza, Bennett, & Schulz, 1994), and the relation between food additives and obesity (Brownell & Warner, 2009). Additionally, obesity had been associated with specific cerebral (brain) activities

(Pinkney, 2004; Pritchard, Turnbull, & White, 2002). Cerebral components, such as the hypothalamus and certain hormones had been linked to obesity (Pinkney, 2004; Pritchard et al., 2002). However, in spite of evidence of other essential factors than behavior in obesity, only negative attitudes toward the obese population seemed to have been reported (Berryman et al., 2006; Hilbert et al., 2008; Puhl & Brownell, 2006). This could perhaps be attributed to the lack of reviewed scientific evidence amalgamating and evaluating facts with the purpose to influence attitudes, the way this research was conducted.

Negativity toward obesity had caused the obese population much stress and frustration (Berryman et al., 2006; Hilbert et al., 2008; National Association to Advance Fat Acceptance [NAAFA], 2009; Puhl & Brownell, 2006). Particular environmental and physiological factors were identified in the Applied Dissertation as generating stress. The mechanism of the stress-system explained how stressors cause diseases of adaptation (Chrousos & Gold, 2002; Selye, 1946). The relation between the environmental stressors (referred to as FADA, for the purposes of this research project), the stress involved, and the bodily adaptation to stressors were examined and correlated to the GAS (Selye, 1946). The literature review supported the proposed argument, the human body adapts to cerebral and to environmental stressors caused by available food supplies with a specific disease, obesity.

Obesity is proposed as a disease of adaptation to essential stressors, such as FADA, and to a lack of homeostasis in cerebral activities. Yet, the common belief that obesity is only the result of the behavior of overeating affects the obese population, and aggravates their condition. Puhl and Brownell (2006) reported the majority of

interviewed participants reacted to the stigma by eating more (80% of overweight and obese adults).

Eight theories postulated about obesity were reviewed (Chapter Two) and identified as cerebral stressors, including the genetic theory and the psychological causation theory. While the genetic theory plays a certain role in the epidemic of obesity, one may also argue that parents' lifestyles and food shopping behavior are likely to influence children, making the argument an environmental issue as well. The psychological causation theory proposed that obese people were more sensitive to external cues than to internal ones, causing them to be more responsive to food additives.

Even if the psychological causation theory postulated that food additives provoked a response, thus resulting from environmental stress, this theory was reviewed as a cerebral stressor. For the purpose of this argument, when reviewing the psychological causation theory, external cues were considered stimuli that are perceived and experienced as stressors by the brain.

The dangers of a wide exposure to food additives (FA), damaging attempts (DA), cerebral stressors (including genetic predisposition and sensitivity to external cues), and negative attitudes were evaluated in conjunction with the prevalence of obesity. Negative attitudes affecting the obese population's mental state, also reported as prompting that population to eat more, were considered are contributing further to the prevalence of obesity (NAAFA, 2009; Puhl & Brownell, 2006).

Problem Statement

The researcher will develop and implement an educational intervention for professional adults and students of a higher-education community in California and assess a change in attitudes toward obesity.

Sub Problems

- **Sub-problem 1:**

  Does awareness about food additives change attitudes towards obesity after participation in an educational intervention?

- **Sub-problem 2:**

  Does awareness about cerebral activities affect attitudes towards obesity after participation in an educational intervention?

Impact of the Problem

The use of FA (food additives) has become an extensive commercial practice, and a major contributor to the epidemic of obesity (BusinessDirectory.com, 2009; Lagerquist, 2003). Nevertheless, society as a whole holds the belief that obesity originates from a negative behavioral condition (Hilbert et al., 2008; Puhl & Brownell, 2006). In addition to its social and psychological effects, the impact of obesity has broadened the scope of pathologies. Obesity is an open gate to deadly secondary diseases such as type 2 diabetes, cardiovascular disorders, and some types of cancer (Gray, 2008; McCance & Huether, 1998). Gade and Gade (2010) extended the list of morbidities associated with obesity to atherosclerosis, hypertension, pulmonary disease, renal disease, liver and gall bladder diseases, polycystic ovarian syndrome, coagulation disorders, sleep apnea, osteoarthritis, gynecological problems, and ocular diseases.

Sufferers from these medical complications and from the social stigma of this disorder are often admonished for causing their own condition through their behaviors. The NAAFA (2009) is an expression of the obese population's frustration as the result of being abused and targeted as being responsible for being obese. The mission of the organization pleads for acceptance of its members' overweight condition. Even healthcare professionals had reported a negative attitude towards their obese patients, contributing further to the stress experienced by the obese population in response to general negative attitudes toward their disease (Berryman et al., 2006; Hilbert et al., 2008; Puhl & Brownell, 2006).

Changing the belief correlating obesity to a negative behavior involves a certain mental adaptation as first acknowledged in the health model belief (Becker, 1974). The theory of cognitive dissonance illustrated why beliefs and attitudes are difficult to change (Festinger & Carlsmith, 1959; Griffin, 2009). Cognitive dissonance refers to the experience of introducing a new cognition to a material already integrated to the psyche, which causes psychological tension because the new cognition is in contradiction with a previous one already assimilated. When applying the cognitive dissonance theory to attitudes toward obesity, the following scenario may happen: If a person has integrated to his/her cognition the belief that obesity is the result of the behavior of overeating, when exposed to compelling evidences that obesity is the result of other primary factors than overeating, this person could experience a state of tension between the two concepts; and reject adamantly the newer one. The impact of this argumentative reaction was rationalized by the theory of cognitive dissonance (Festinger & Carlsmith, 1959; Griffin, 2009).

The continual, and now global, growth of obesity has called for many relevant research and studies published on the topic (Gade & Gade, 2010). The epidemic of obesity was recently linked to the quality of the food being injected, confronting the problem at its source (Brownell & Warner, 2009; Lagerquist, 2003; Weil, 1990). Food additives, processed sugar and commercial salt instead of natural sugar and sea salt are factors contributing to *The perils of ignoring history: Big tobacco played dirty and millions died. How similar is big food? (*Brownell & Warner, 2009).

Evidence of the Problem

CDC (2007, 2010) identified obesity as a primary health concern. The rise of the condition was observed for both U.S. adult and pediatric populations (CDC, 2010). This steady increase in adult obesity has more than doubled with 15% of adults considered obese in 1994 and 32% in 2007 (Gade & Gade, 2010).

The relationship between stressors and disturbing physiological processes was first established by Selye (1946) and explained with the General Adaptation Syndrome. The scientist theorized an association between stress and disease as a cause and effect phenomena, with stress causing diseases of adaptation (Selye, 1946). The notion of stress in obesity had been contemplated (Drapeau, Therrien, Richard, & Tremblay 2003). However, when Drapeau et al. (2003) stated obesity was the result of stress, the authors did not seem to have identified the source of the stress; or how the process produced a stressor as acknowledged below in the stages of the GAS.

Selye (1946) postulated diseases of adaptation were a response to stressors. When exposed to stressors, the body responds in three successive stages that characterize the GAS: (a) the alarm stage, (b) the stage of resistance, and (c) the stage of exhaustion. A

review of literature found no indication that obesity has been directly labeled a disease of adaptation to environmental and cerebral stressors. Environmental, biological, and psychological events are now evaluated, and then applied to the GAS.

Environmental Stressors and Their Applications to Obesity (ATO)

The two environmental stressors considered were FADA. FA refers to added artificial ingredients (food additives) discussed in Chapter Two; and DA consists of two harmful practices recommended to lose weight, removing natural sugar and removing sea salt from a given diet, as discussed further on in this chapter. The correlation between FADA and stressors is elaborated further and incorporated to the stages of the GAS below. Social pressure, although an environmental stressor, also includes emotional damages and discriminatory pain inflicted upon the obese population (NAAFA, 2009; Puhl & Brownell, 2006). It is addressed under Psychological Stressors and ATO. The educational intervention addressed environmental stressors by exposing FADA. Environmental issues concerning food availability and health issues were also reviewed in Chapter Two (Brownell & Warner, 2009; Nutbeam, 2004; Spence, Cutumisu, Edwards, Raine, & Smoyer-Tomic, 2009).

Biological Stressors and ATO

Hanson (personal communication, June 18, 1977) warned of the dangers of food additives that encumber the digestive system and stagnate in the intestinal tract, as their metabolic absorption is not suitable for human consumption. Lagerquist (2003) confirmed those dangers are diseases associated with processed food and weight increase. Weil's (1990) margarine experiment demonstrated (reported in Chapter 2) how FA remained motionless in intestinal linings. Obesity and related secondary diseases had

often been associated with complications in food absorption, suggesting a direct link between secondary diseases, the quality of the product being metabolized, and intestinal absorption (McCance & Huether, 1998; Työppönen**,** Petäjä, & Mattila-Sandholm**,** 2003).

Psychological Stressors and ATO

Obese individuals often feel powerless facing common negative attitudes toward their condition. Since 1969, NAAFA (2009) had addressed the psychological stressors involved in being, as they call themselves, fat. The psychological aspect of obesity, although an essential consequence of the illness, is not included in the biological perspectives described here. The factors applied to the GAS by Selye (1946) are primarily physiological attempts caused by environmental stressors and biological adaptation, as first identified by Darwin (1871). However, psychological stressors are discussed in the Literature Review in the section "Attitudes Towards Obesity," as the stressors involved in obesity are multifaceted. Selye's (1946) three stages of adaptation (GAS) could be applied to the complexity of obesity, pairing stressor to stage of adaptation.

Alarm Stage and Application to Obesity (ATO)

In presence of a stressor, the central nervous system (CNS) is aroused, resulting in two responses: fight or flight. McCance and Huether (1998) specified, "In stress a demand exceeds a person's coping ability, resulting in reactions such as disturbances of cognition, emotion, and behavior that can adversely affect a person's well-being" (p. 286). When the body is internally exposed to FADA, the initial opportunity to flee has passed. The lack of flight may be attributed to ignorance about the damages that available food causes.

The body then metabolizes FADA, fighting them, but eventually cannot fight anymore, as one's defense weakens. FADA are likely to provoke absorption troubles, irritation, or inflammation, until metabolic habituation occurs (Työppönen et al., 2003; Vasquez, 2006). Obesity had been linked to food availability (Spence et al., 2004). Food additives and fast food had been correlated to obesity (Binkley, Eales, & Jekanowski, 2000; Brownell & Warner, 2009).

When food availability and price allow people to eat FA-and only FA-on a daily basis, metabolic habituation develops (Nutbeam, 2004; Työppönen et al., 2003; Vasquez, 2006). Consequently, the alarm stage is constantly operating, causing the stress-system to malfunction; and the body to react with a disease of adaptation (Chrousos & Gold, 2002; Selye, 1946).

Stage of Resistance and ATO

During the stage of resistance, the body reacts by mobilizing its defenses. In obesity, the fight is already lost with the absorption and metabolic habituation of FA. The fat-cell theory, reviewed in Chapter Two of the Applied Dissertation, explained how body cells continue to grow larger in number and in size (You, 2006). In an attempt to resist, the body then adapts to consuming harmful stressors.

This contributes to the difficulties an obese person experiences when trying to lose weight. Enlarged cells do not shrink back easily to the sizes they once were (You, 2006), before the exposure to stressors (FA). You (2006) reported reducing the size of abdominal fat cells required more than cutting calories.

Stage of Exhaustion and ATO

Stressors' continuous attacks prompt a "compensatory mechanism" by "acquired adaptation" (McCance & Huether, 1998, p. 287). Chouros and Gold (2002) explained how malfunction of the stress-system could lead to serious, life threatening diseases, such as type 2 diabetes, cardiovascular disorders, some types of cancer, atherosclerosis, hypertension, pulmonary disease, renal disease, liver and gall bladder diseases, polycystic ovarian syndrome, coagulation disorders, sleep apnea, osteoarthritis, gynecological problems, and ocular diseases (Gade & Gade, 2010; Gray, 2008; McCance & Huether, 1998). In presence of harmful additives, the body adapts to the stress triggered by food additives, causing the body stress-system to malfunction. The human body adapts to stressors (FA) and responds with obesity, a life-threatening condition.

To fight obesity, the common behavioral techniques reinforce reduction or elimination of sea salt and natural sugar (considered damaging attempts) from a given diet. Regimes including DA have not been effective in long-term control of obesity. Furthermore, studies have demonstrated that eliminating salt and eliminating glucose from one's diet trigger serious health problems (McCance & Huether, 1998; Swanson & Suh, 2005). These practices do not help the obese population with stable results. Instead, they seriously jeopardize the human body's homeostasis. Sodium-potassium pump imbalances and incidences of dementia in type 2 diabetic patients were reviewed as a consequence of the Stage of Exhaustion and ATO (McCance & Huether, 1998; Whitmer, 2006).

Sodium-potassium pump. The sodium-potassium pump is a cellular transport mechanism between sodium and potassium that takes place at the cell membrane. It ensures intracellular activities with the involvement of ions. Removing salt from an obese

person's diet seriously jeopardizes the sodium-potassium pump by altering its balance. "Changes in the ratio of…available sodium and potassium … are responsible for many of the symptoms associated with potassium imbalance" (McCance & Huether, 1998, p. 92).

Dementia in type 2 diabetic patients. Removing sugar from an obese and/or diabetic person is also serious and potentially harmful; affecting insulin production and increasing neurological damages (Swanson & Suh, 2005). Type 2 diabetes is a major secondary disease triggered by obesity. The alarming occurrence of dementia in older type 2 diabetic patients as published by Whitmer (2006) led to the American Diabetes Association (ADA) advocating major behavioral changes to the population. In contrast to previous years, when ADA was excluding sugar from a type 2 diabetic's diet, ADA later recommended sugar (ADA, 2000, 2010). Regrettably, damages such as dementia, Alzheimer's disease, vascular damage, and diabetic coma have already been reported (Busko, 2009; Swanson & Suh, 2005; Whitmer et al., 2009).

Whitmer et al. (2009) hypothesized a correlation between obesity and dementia in a 30-year longitudinal study. The authors concluded, "…mechanisms linking central obesity to dementia need to be unveiled" (p. 1046). The results indicated 50% of the 1,049 obese participants suffered dementia. In her Swedish Twin study, Busko (2009) examined obesity, type 2 diabetes, dementia, and Alzheimer's disease from a twin registry. Diabetes type 2 twins (n = 13,693) with a mean age of 76.8 at the onset of dementia were diagnosed with vascular dementia. The Swedish twin registry study reported midlife diabetes increased dementia and Alzheimer's disease risk by 125%. Whereas other studies have hypothesized a relation between diabetes and dementia, this longitudinal study overwhelmingly confirmed it. Busko (2009) concluded, "These

findings add to the growing evidence of a link between diabetes, vascular damage, and neurodegenerative changes in the brain" (p. 77). Removal of natural sugar deprives the brain from glucose, glucose being the brain's favorite nourishment (Honour, personal communication, November 7, 1997). Swanson and Suh (2005) demonstrated the effectiveness of natural sugar/glucose for therapy of comatose diabetics to prevent neurological damages.

In conclusion, several years ago, type 2 diabetics (type 2 diabetes being a common secondary disease of obesity) were recommended to remove all sugars from their diet, but more recently were urged to include some sugar in their diet (ADA, 2000, 2010). However, type 2 diabetics have been reported to suffer from an overwhelming incidence of dementia, as much as 125%, as reported by Busko (2009). Type 2 diabetics have also suffered from neurological damages caused by diabetic comas, and repaired with natural sugar (Swanson & Suh, 2005). Thus, removing natural sugar from an obese and/or diabetic person's diet does not guarantee weight loss. Yet, it precedes and predicts dementia, and diabetic coma, which may create neurological damage, unless recovered with natural sugar therapy (Busko, 2009; Swanson & Suh, 2005).

Glucose (natural sugar) had been acknowledged as the brain's favorite and main source of energy. Its removal then becomes questionable and prompts for an inference. Is there a direct correlation between removal of sugar and conditions such as memory loss, dementia, and other neurological conditions? Sadly, the answer appears to be positive, and classifies removal of natural sugar as a seriously damaging attempt.

Food Additives as Environmental Stressors

The cost of obesity in medical care and in lives exceeds the money saved by food commercialization. Increased food shelf life and cheaper retail prices brought about food industrialization (BusinessDirectory.com, 2009). Some of the food industries, already aware of the consequences of encumbering food with artificial additives, have shown signs of progress by advertising food with no preservatives, and chicken or beef without hormones, or antibiotics, as observed in recent years on complying food labels. It could have been a spontaneous withdrawal, but it seems to follow some federal recalls. Industrialization is evident in fast food restaurants' composition and preparation of food. Spence et al. (2009) stated that the practice of chemical food additives had spread to other developed countries adapting the American lifestyle; and where subsequently, obesity had become a growing problem.

Gade and Gade (2010) reported half of the German population was overweight. The authors also noted that less developed countries were catching the epidemic. Furthermore, Gade and Gade (2010) specified, "The obesity epidemic includes less developed countries, such as Mexico, where 70% are overweight, and Egypt, where 60% are overweight" (p. 40). While responding to the demands of a fast-paced lifestyle, food additives provide an apparently less expensive cost in food preparation, but not in health care.

The situation then changes, as the society is faced with diseased conditions. Initially less expensive food becomes very expensive in medical costs, in life circumstances, and in deaths, triggering bodily reactions that cause obesity and secondary diseases. Obesity had also been associated to homeostatic imbalance.

Homeostatic Imbalance as a Cerebral Stressor

Cerebral stress and environmental pressure confirmed why behavioral techniques alone have little lasting success in resolving the problem of obesity. Uncontrollable bingeing episodes had been documented as the result of a disturbance in cerebral homeostasis caused by a chemical dislodgement in the brain, a consequence of internal stressors and/or external stressors (Bijaoui, 2002; Chrousos & Gold, 2002; McCance & Huether, 1998; Selye 1946). The addictive quality of some additives in food or beverages had contributed to the loss of homeostasis. Obesity had been commonly attributed to a caloric intake larger than the body's expenditure (McCance & Huether, 1998). Yet, other relevant attributions are figuring:

> …weight and well-being are subjected to a personal equation between food intake, taste, and energy expenditure; while other factors, such as the source, the condition of the food (especially if natural or encumbered with preservatives not designed for the human body), the individual's lifestyle and psychological framework are all as important (Bijaoui, 2009, p. 160).

The point-of-view expressed above implies a query. From a health perspective, why deal with the unnecessary additional weight provoked by elements (especially FA) that are not supposed to be there in the first place? If food composition were an ally instead of an enemy holding harmful ingredients, fewer hours at the gym would be necessary. Besides extending life, eliminating those unnecessary components from food would improve quality of life by allowing people to spend those hours exercising doing something more personally enjoyable than going to the gym. Indeed, while a great number of people are going there because they think they have to in order to shade pounds, what percentage really enjoys doing it?

Overview of the Research Environment

History

The workshop took place in the facilities of a higher-educational organization. This institution is a world-renowned center for education and health research. It was founded in the late 1800's in California, with only 53 students. Today, the population between students, teachers, and staff has increased to over 36,000. For over a century, its steady expansion has made it a worldwide renowned center for education and research. The diversity in its academic features and in its population gives this community a unique character that keeps it continuously growing and developing.

Organizational Chart

One of the community organizational charts was reproduced in Appendix A. The Administration Information Services (AIS) was selected because of the involvement of this department with all the other departments operating within the location. Its tremendous activity assures the community technological operations.

Community

The institution is famous for its prominence in arts, sports, business, sciences, education, and health research. Its mission focuses on the development of human beings and society through cultivation and enrichment of mind and spirit. Its dedicated and visionary faculty has led the quest for life and health sustainability through education and identification of the causes and prevention of diseases. Recently, members of this institution reported that faculty and students shared intellectual excitement, collegial aura, and diversity in interests. Premium academic scholarships diverse in all disciplines also contribute to the institution's exclusivity.

Limitations

A foreseen limitation is the number of persons available to participate in the interventions at the time and day they would be scheduled. It could be difficult to have a significant number of volunteer adults available at the same time. Individual schedules may not allow participating in external activities. Another limitation could be the willingness and truthfulness of the participants (Barbie, 1999). Biases toward the researchers can happen in any study (Barbie, 1999). The author stated:

> Routinely announcing the identity of the poll's sponsor, for example, can itself bias responses. Respondents have the right to know the sponsor's identity after the interviewing is complete, and, of course, they have the right to refuse to participate altogether(Barbie, 1999, p. 412).

In his book, *The basics of social research*, Barbie (1999) gave the example of a political pool. Expanding on Barbie's concept, this researcher may experience two kinds of biases, negative, and positive. A negative bias may come from individuals who have classified obesity as a behavioral disease. A positive bias may be coming from personal acquaintances.

Resources

Implementation of the experimental design of the proposed project necessitated certain resources. The expenses associated with this applied research were assumed by the researcher, including the cost of material and of traveling. Physical facility for the workshop was coordinated with the institution.

Context

The environment appeared to welcome initiative and support research. However, strict administrative guidelines were expected to be followed for any attempted research project, while support pertained to a very close community. The intervention of the proposed research project consisted of a workshop.

The content of the workshop was divided in two parts. Part One reviewed research findings about the effect of environmental stressors on the body as they relate to obesity and to its secondary diseases. Part Two reviewed the cerebral stressors involved in obesity. The format of the project was consistent with research designs the researcher had been exposed to when active in the environment.

Researcher's Role in the Environment

The researcher was no longer involved with the community when implementing this study. She was an alumnus of the Health Promotion Diseases Prevention Studies (HPDP) program, where she participated in several research projects. In 1998, she personally researched the effect of laughter on health; and in 1999, the connection between flexibility and wellness. She also worked at the Master of Public Health Office while a student during the time of the accreditation of this newer program within the school of medicine.

Her background includes a Bachelor of Science in Health Promotion Diseases Prevention, a minor in Neuroscience, a master's degree in Psycho-educational Counseling, and a Ph.D. in psychology with a certification as Research Psychoanalyst from the Medical Board of California. She self-published a book titled *The other side of the curtain* (2006, 2009).

Purpose of the Study

The expression and the cause of a behavior are two separate issues: the behavioral expression in obesity does not make behavior its cause. The purpose of the study was to measure a change in attitudes toward obesity, before and after an educational intervention exploring less known factors around the disease. Obesity was introduced as a disease of adaptation to stressors, instead of a behavioral disease, as it is mostly believed (Ludwig et al., 2010; Prentice, 2001; Swinburn, 2009).

Definition of Terms

Body Mass Index (BMI): BMI is a measure determining if a person is obese (BMI over 30 kg/m2) or not. "Patients with a BMI between 25 and 29.9 are considered overweight, not obese" (National Institute of Health, 2009).

Cerebral activities: Activities normally taking place in the brain between brain parts and brain functions under optimal homeostasis.

Cerebral Stress: A brain condition resulting from a disturbance in homeostasis and affecting cerebral activities in such a way that a loss of control follows, such as in bingeing. Cerebral stress is caused by a chemical dislodgment in the brain.

Chemical Dislodgment: A process taking place in the brain and during which a given neuron or several neurons' chemical organizations are displaced. This situation causes a cerebral stress.

Food Additives: "A functional substance that is normally neither consumed as a food itself nor is used as a food ingredient, but is intentionally added to food (usually in small quantities) to assist in its processing or to improve its certain characteristics such as aroma, color, consistency, taste, texture, packaging, and/or shelf life.

Additives are not considered nutritional even if they have some nutritive value" (BusinessDirectory.com, 2009, para. 1).

Homeostasis: "A relatively constant state within the body, naturally maintained. Various sensing, feedback, and control systems bring about this steady state, especially the reticular formation in the brainstem and the hormone-producing glands. Some of the functions controlled by homeostatic mechanisms are the heartbeat, blood production, blood pressure, body temperature, salt balance, breathing and glandular secretion" (Mosby's Medical Encyclopedia C.D., 1997, para. 1)

Leptin: Leptin is the hormone involved in fat metabolism.

Ob Gene: Ob is the gene responsible for the secretion of leptin in adipose tissue.

Obesity: A condition defined by BMI. "… a major nutritional problem in the United States" leading to "excessive body fat" and "the major cause of cardiovascular diseases, cancer, and diabetes mellitus" (McCance & Huether, 1998, pp. 1346-1347).

Stress: Bernard (1856) and Selye (1946) have defined stress as a chemical or physical disturbance in the cells or tissue fluid caused by a change, either in the external environment or within the body. This reaction requires a response or adaptation and is caused by a stressor.

Uncontrollable Bingeing Episode: Gorging self beyond satiety and responding only to an impulse that is too strong to be suppressed, a total loss of control.

Stressor: An internal or external stimulus causing the body to respond with symptoms of adaptation (Bernard, 1856; Selye, 1946).

Acronyms

ADA: American Diabetes Association

ATO: Application To Obesity

DA: Damaging Attempts

FA: Food Additives

FADA: Food Additives and Damaging Attempts

Summary

The concept of obesity as a disease of adaptation to environmental and cerebral stressors, instead of a behavioral disease, found support in the review of available literature. The composition of food, a major factor responsible for the epidemic of obesity, had been scientifically researched and reported. Studies also sustained the evidence that uncontrollable overeating was a reaction to cerebral activities predominantly beyond the control of an obese person, challenging the belief that obesity stems from a behavioral cause. Obesity was proposed as the result of a response to stressors, thus a disease adapting to the stress caused by FADA, which are devastating to the human body, while provoking or enticing cerebral events, such as cerebral stress resulting in chemical dislodgment.

When perceived and classified as a disease of adaptation, obesity becomes preventable if supported by the environment, the government, and by personal engagement. The ultimate goal of this Applied Dissertation was to measure attitude toward obesity, before and after providing information which may perhaps lessen occurrences of negative attitudes, by associating obesity to environmental and physiological/cerebral stressors; and not to the negative behavior of overeating.

Chapter Two: Literature Review

A review of available literature endorsed evidence for the scientific foundation of this research project. The arguments of this Applied Dissertation were first, obesity is the consequence of specific factors such as food composition (environmental stressors), especially chemical additives (Brownell & Warner, 2009); and second the consequence of cerebral activities (physiological stressors) associated with specific biological events (Pinkney, 2004), including uncontrollable overeating (Ozaki & Murphy, 2003). Overeating had been perceived as a negative behavior, affecting the obese population (Ludwig et al., 2010; NAAFA, 2009; Prentice, 2001; Puhl & Brownell, 2006; Swinburn, 2009).

This chapter also included a review of attitudes toward obesity (Hilbert & al., 2008; Puhl & Brownell, 2006) and what programs or workshops, if any, had been implemented to curb it. Reports had overwhelmingly shown negative attitudes toward obesity. However, no workshop or program designed to curb this general negative attitude seemed to exist.

Dietary intake often included additives such as high-fructose corn syrup (Bray, Nielsen, & Popkin, 2004), monosodium glutamate (MSG) (He et al., 2008), or bovine hormone (Turner, Knap, Byers, & Kopchick, 1998). The choice of processed meats (Vang, Singh, Lee, Haddad, & Brinegar, 2008), fast food (Binkley, Eales, & Jekanowski, 2000); or margarine (Weil, 1990) may be associated with a lack of awareness of health consequences. Subsequently, food accessibility and lack of knowledge have been reported to predict dietary intake (Spence, Cutumisu, Edwards, Raine, & Smoyer-Tomic, 2009).

While others have objected the practice of including MSG in food and bovine hormone in milk, introducing a different dimension into dietary choice, Nutbeam (2004) addressed the evidence that health inequalities needed to be handled by policy making and practices. Additional research validated the cerebral events involved in hormonal imbalances (Chrousos & Gold, 2002; Selye, 1946) that predict obesity (Pinkney, 2004).

Food additives (FA) (Bray et al., 2004; He et al., 2008; Turner et al., 1998) and dietary intake (Weil, 1990) especially from fast food (Vang et al., 2008; Binkley et al., 2000) had been connected to obesity. The availability of food (Spence et al., 2004; Nutbeam, 2004) became another environmental factor. The Pima Indians' experience (Ravussin et al., 1994), illustrating the relation between food availability and health status, was reported below under Environmental Issues.

Beyond behavior, environmental issues contributed to biological events, including breast cancer (Gray, 2008), another obesity secondary disease. Those dynamics supported the causal relationship between obesity, FA with excessive fast food availability, and breast cancer. Cerebral events dependent upon internal activities were not correlated to behavior. Yet, attitudes toward obesity stayed mostly negative. This negative attitude was reported even to occur in health professionals (Berryman & al., 2006; Hilbert et al., 2008), while negative stereotypes were very much associated with overweight and obese adults (NAAFA, 2009; Puhl & Brownell, 2006).

Additives

Bray, Nielsen, and Popkin (2004) suggested consumption of high-fructose corn syrup (HFCS) in beverages may play a role in the rise of obesity. The authors investigated the relationship between HFCS intake and the development of obesity by

analyzing food consumption patterns from 1979 to 1990 of all Americans aged two or older, as reported on the food consumption tables published by the U.S. Department of Agriculture (Bray et al., 2004). The results indicated the consumption of HFCS (40% of caloric sweeteners added to drinks and food) had a temporal relationship to the epidemic of obesity. During those 20 years, the consumption of HFCS increased by 1000% per person. The authors estimated the consumption of beverages sweetened by HFCS indicated an average daily intake of 132 kcal with a higher intake by 20% of the consumers, reaching 316 kcal per deciliter (dl) of HFCS. Bray et al. (2004) reported 20% of all Americans consume more than 11% of their calories from HFCS. The results showed a significant difference with $p <$ or = 0.01. Monosodium glutamate (MSG) was the next commonly used food additive researched.

In a cross-sectional study of 752 healthy Chinese adults, aged 40-59, He et al. (2008) examined the effect of MSG in food intake. The study took place in rural South and North China (He et al., 2008). Four in-depth multipass 24-hour recalls were used. Most participants prepared their food at home. The results showed the odds ratios of overweight and obese were 2.10 (95% confidence interval, 1.13–3.90, with p for trend across four MSG categories = 0.03) and 2.75 (95% confidence interval, 1.28–5.95, p = 0.04). The study indicated MSG users had a higher prevalence of obesity.

A particular food additive, bovine growth hormone (rBGH, AKA, rBST), was reported to be transmitted from cows to humans through milk and milk products. Growth hormones are found in nearly all milk products, unless specifically stating, not from cows treated with growth hormones. Hansen and Wallinga (2007), among others, had reported the dangers of this genetically engineered hormone injected into cows to increase

production. rBST and bGH are both growth hormones injected to cows to increase production of milk and meat; and subsequently are transmitted to human consuming the products.

Turner et al. (1998) observed two groups of mice, one expressing mutant bovine growth hormone (bGH), and the other a nontransgenic control (NTC). The authors observed the two groups maintaining a similar body mass from 28 to 50 days of age. But at 68 days of age, the weight from the bGH group was 4.5g greater than the control.

Studies have also reported a correlation between rBST intake and breast cancer (Gray, 2008). Breast cancer had been associated with excess body fat (McCance & Huether, 1998). Research supported the idea that chemical additives contribute greatly to the prevalence of obesity and breast cancer. Whether in the ingredients list or genetically engineered in the food, additives and pesticides significantly figure in processed and fast food meats and in milk products (Gray, 2008; Weil, 1990). Links had been established between genetically engineered food, food additives, pesticides, and specific diseases such as obesity, breast cancer, diabetes, and intestinal malfunction (Binkley et al., 2000; Ravussin et al., 1994; Spence et al., 2004; Työppönen et al., 2003; Vang et al., 2008).

Dietary Intake

Vang et al. (2008) evaluated a possible link between the intake of processed meats, obesity, and weight gain. The authors probed a relationship between the occurrence of obesity and diabetes among 8,401 adults eating processed meats on a regular basis, at least once a week. Participants were between 45 and 88 years old. This longitudinal study of 17 years demonstrated that the intake of processed meat was correlated to the incidence of obesity and diabetes. The results indicated processed meat

was a risk factor with a 74% chance of increase in obesity and diabetes (*OR* = 1.74; 95% CI 1.36-2.22).

Binkley et al. (2000) considered the relationship between dietary changes and the rising obesity in the United States. The authors used data from a secondary source, the Continuing Survey of Food Intake by Individuals (CSFII). The data was taken during two consecutive years. The participants (*N* =16,103) reported that their food away from home (FAFH) was mainly food from fast food restaurants and packaged food. A multiple regression method was used and the results indicated significance in the regression of $p<0.05$. The authors concluded the relationship between FAFH and the growth of obesity was not coincidental: The intake of fast food was concluded to be a major contributing factor to obesity.

Great numbers of people who want to lose weight had been consuming margarine instead of butter. Weil (1990) did not share this view and predicted future research would verify the clear health hazards triggered when eating margarine. Furthermore, Weil (1990) suggested an experiment with a stick of margarine left in a shady area at home or in the garage. A couple of days later, no flies, fruit flies, or microorganisms of any kind would be found on the margarine. This happened because margarine hardens like plastic. In the human body, this hardening prompts arthrosclerosis and high cholesterol. Weil (1990) explained margarine is made of saturated fat and trans-fatty acids the human body cannot metabolize. Butter, in contrast, is made of polyunsaturated fat, which are easily digested. Yet, commercial butter is likely to contain pesticides as a preservative, eliminating the health benefits found in natural butter.

Environmental Issues

Dietary intake with its incorporated additives may appear as a choice. Unfortunately, it is often a forced uneducated choice that is prompted by the environment's lack of healthy and affordable choices (Brownell & Warner, 2009; Gray, 2008; Nutbeam, 2004; Ravussin et al., 1994; Spence et al., 2004)

Spence et al. (2004) examined the relationship between local food and obesity among 3,850 adults living in the Capital Health region of Alberta, Canada. The authors established a link between the availability of fast-food, convenience stores, and the incidence of obesity. The participants answered a telephone-administered survey. The results indicated, the nearer to fast-food stores the participants were living, the more obese they were likely to be. Self-reported body-mass index (BMI) of 30 or over was classified as obese.

Nutbeam (2004) addressed health inequalities, correlating obesity to the need for policy-makers to confront these inequalities into policy and practice. In analyzing the issues around health inequalities across several countries, Nutbeam (2004) found differences in opportunity, access, and resources affected the population's health status. The author tied the conditions of inequalities in health accessibility to policy-making.

The story of the Pima Indians, a classic illustration of how the environment and lifestyle affect the weight of a population, had demonstrated the situation. The Pima Indians living in Mexico had an ancestry life, and the ones living in Arizona had an American lifestyle and diet. Both groups had the same genetic pattern (Ravussin et al., 1994). Obesity and type 2 diabetes were prevalent only in Arizona's Pima community, affecting 54% of the population (Ravussin et al., 1994).

Brownell and Warner (2009) exposed a similar situation in their remarkable work entitled *The Perils of ignoring history: Big tobacco played dirty and millions die: How similar is big food?* The authors reviewed and analyzed the practices of the tobacco industry and correlated them to the ones of the food industry. While the two industries display important differences in their product, Brownell and Warner (2009) found similarities in their responses to the concerns that the products caused harm. The authors stated: "…obesity is now a major global problem, the world cannot afford a repeat of the tobacco industry, in which industry talks about the moral issues high grounds but does not occupy it" (p. 260).

This study also reported the similar involvement of the tobacco and food industries in political and legislative arenas. Brownell and Warner (2009) suggested the need for food consumers to be aware of the dangers. Nutbeam (2004) argued food availability is a political issue that needed to be linked to policy making.

Obesity had been classified as a risk factor associated with breast cancer (McCance & Huether, 1998), which had also been found to have an environmental component (Gray, 2008). In her search for evidence about breast cancer, Gray (2008) found several factors to be *The connection between breast cancer and the environment* (p.2), as the author titled her work. One of the factors Gray (2008) discussed was weight gain. While the author examined a list of significant factors connected to breast cancer, and reported other causes than fat involved with breast cancer, only the ones relevant to this argument were discussed here. Gray's (2008) search for evidence of the environment involvement in breast cancer focused on some of the issues the Applied Dissertation addressed, especially FA and pesticides. Pesticides have been mentioned earlier as an

additive in butter (Weil, 1999). Weil would recommend butter instead of margarine, but only natural butter, not commercial butter with pesticides.

Weil (1999) also predicted future research would confirm his hypotheses; and Gray (2008) confirmed Weil's prediction (1999). In her food additives' argument, Gray (2008) exposed as well the bovine hormone, rBST, and zeranol, "compounds administrated to cattle and sheep to enhance growth" (p.7). The hormone rBST is a synthetic reproduction of somatotropin, a hormone involved in the pituitary gland's activities. The environmental problem is that foods containing rBST do not list it, and is present in the majority of milk and milk-derived products.

The quality of food consumed then becomes directly correlated to health issues, as food consumption is dependent upon availability and quality; and the most widely available food is predominantly of the lowest quality. The review of literature showed that food accessibility and lack of knowledge draw individuals to eat readily available food. The public as a whole becomes at risk.

Lack of education regarding diet and the nutritional makeup of highly accessible processed food had been considered a prime factor in the epidemic of obesity in the United States (Brownell & Warner, 2009; Spence et al., 2004). Developed and undeveloped countries have modeled the American lifestyle. For instance, Canada and others countries were reported to now face a growing incidence of obesity (Gade & Gade, 2010; Spence et al., 2004).

If food's availability and composition contribute greatly to obesity, and if obesity is a primary health concern, obesity becomes the direct result of environmental factors. The environment is conducive to eat foods that are programmed to make people

unhealthy and bigger, because FA are not designed for the human body. However, obesity is mostly believed to be linked to behavior.

Behavior as a Factor in Obesity

Although behavior is not considered a crucial factor in obesity for this project, three studies supporting this point-of-view were reviewed for comparison purpose (Ludwig et al., 2010; Prentice, 2001; Swinburn, 2009). Prentice (2001) defined overeating as the consumption of an energy intake inappropriately larger than spent energy. However, the causes Prentice (2001) identified as resulting in overeating were environmental and cultural factors, supporting this argument. Environmental factors were described as increased availability of cheap energy-dense and high-fat food. Cultural factors did not seem to be much elaborated, but sedentary lifestyles were added to the risks. Prentice (2001) recognized active and passive overeating were health risks resulting in obesity by evaluating a system of food intake. The author differentiated both styles of eating in describing passive overeating as inadvertent.

"Increased food intake alone explains rise in obesity In United States" (Swinburn, 2009, p. 1) seems to dispute this researcher's theory. However, Swinburn's (2009) argument was food intake alone, in contrast to a lack of physical activities, was responsible for the increase of obesity in the United States. Swinburn (2009) studied the factors contributing to the epidemic of obesity. The author examined reports of metabolic relationships, the laws of thermodynamics, epidemiological data, and agricultural data. Adults (n = 1,399) and children (n = 963) were observed under free-living conditions and in real-life situations. The observations consisted of accurate measuring of the calories burned in casual daily situations. Swinburn (2009) reported a fizzy drink for children and

a small portion of fries counted 350 calories, and one large hamburger for adults about 500 calories. The study demonstrated weight gain in the American population appeared to be explained by eating more calories (calories predominantly found in fast food), rather than not exercising enough.

Ludwig et al. (2010) investigated the effect of dietary intake (in relation to glycemic index, GI) on energy metabolism in volunteer obese teenagers ($N = 12$). (Glycemic index is a measure of glucose level in the blood). The teenagers were observed on three occasions. The participants ate identical meals for breakfast and lunch. The meals were comprised of low, medium, or high GI content. The source of the glucose included artificial sweeteners. After the meals, plasma, serum and hormones were measured. Afterwards, energy intake was voluntary. High GI meals were followed by a 53% greater intake than medium GI, and 81% greater than in low GI; which means when high GI food is consumed, people feel hungrier and later on eat more. The authors concluded after consumption of high GI meals, the rapid absorption of glucose induced a sequence of hormonal and metabolic changes that promoted excessive food intake in obese subjects. This study correlated obesity to a high intake of glucose and high intake of artificial sweeteners.

The three last studies discussed overeating as a health risk predicting obesity (Prentice, 2001); overeating as a cause for obesity (Swinburn, 2009); and the correlation between GI and obesity (Ludwig et al., 2010). They also indicated factors contributing to obesity, such as food availability and composition (Prentice, 2001); the caloric amount of the food being ingested (Swinburn, 2009); and the artificial glucose amount in food (Ludwig et al., 2010). Prentice's (2009) factors were similar to the ones reported by this

researcher (food availability and composition). Swinburn (2009) and Ludwig et al. (2010) studied fast food intake and high glucose from artificial sweeteners. Interestingly, these studies correlated obesity to overeating and to large caloric absorptions. However, the authors did not seem to evaluate the sources of the food involved, organic food having fewer ingredients and fewer calories than fast food and food with additives. This is an important non-specified factor which would directly support the claim of the Applied Dissertation, if the source and the quality, or lack of quality, of the food ingested were to be more discussed.

Biological/Physiological Factors

Selye's (1946) GAS theory postulated how stress creates diseases of adaptation. When stressors disturb homeostasis, the body is adapting with the stress response, which triggers diseases of adaptation. Chrousos and Gold (2002) explained how the malfunction of the stress-system could lead to serious, life-threatening diseases. The hormonal system known as the hypothalamic-pituitary-adrenal (HPA) or stress-circuit responds to external stress by releasing the corticotrophin-releasing hormone (CHR). This triggers the pituitary gland to release adrenocorticotropin (ACTH), another hormone, into the blood stream (Chrousos & Gold, 2002). Those two hormones are involved in the stress response. Melanocortin was another hormone reported to be involved in obesity (Pritchard, Turnbull, & White, 2002).

Pritchard et al. (2002) studied the processing of the peptide pro-opiomelananocortin in the hypothalamus (a major brain structure) and its impact on the melanocortin hormone. The hypothalamus is the brain structure that controls the central nervous system and regulates appetite, body temperature, sleep, sex drive, mood, thirst,

and hunger. It is also involved with the endocrine system and responsible for communicating with the pituitary gland. The melanocortin hormone is synthesized by the pro-opiomelananocortin peptide in the pituitary gland. Pritchard et al.'s (2002) results demonstrated a relationship between the hypothalamus, the melanocortin hormone, and obesity.

Similarly, Pinkney (2004) found hormonal imbalances in adjacent hormones, such as thyroid stimulating hormone (TSH), follicle stimulating hormone (FSH), or growth hormone (GH), to cause obesity. Pinkney (2004) suggested the pituitary gland may be affected by hormonal imbalances coming from adjacent hormones, TSH, FSH, or GH. After analyzing several studies, the author probed a relationship between various hormonal deficiencies, their effects on the pituitary gland, and the hypothalamus. Pinkney (2004) concluded these hormonal imbalances were also correlated to obesity.

McCance and Huether (1998) reported eight theories postulating on the physiological and developmental factors of obesity. The genetic theory, fat-cell theory, lipoprotein-lipase theory, lipostatic theory, thermogenetic theory, sodium-potassium-adenosine triphosphate pump theory, diabetes-associated theory, and psychological causation theory are summarized below.

Genetic theory

The genetic theory postulated the obese gene produces leptin, which is expressed in adipose tissue. It may control the storage of body fat by regulating energy expenditure and satiety (from food intake). Alterations in leptin may result in excessive storage of body fat (McCance & Huether, 1998).

Fat-cell theory

Fat-cell theory hypothesized overweight people's fat cells are excessive. Adipose tissues are subjected to energy balance. The number of fat cells increase when there is a positive energy balance (McCance & Huether, 1998).

Lipoprotein-lipase (LPL) theory

LPL theory promoted that obese people have high levels of LPL in their fat cells. If the weight is reduced, the levels of LPL rise. LPL stimulates fat cells and prevents the loss of weight (McCance & Huether, 1998).

Lipostatic theory

According to the lipostatic theory, blood carries leptin, a molecule affecting appetite (Kennedy, 1953). It communicates with the hypothalamus, the regulator of appetite in the brain. Further studies confirmed, in case of lesion of the leptin molecule that satiety level would increase, thus leading to overeating and triggering obesity (McCance & Huether, 1998).

Thermogenic theory

Brown fat cells are mitochondria-rich fat cells that ensure heat production. Mitochondria are responsible for energy transport within the cell. This theory explained how excess energy is stored as fat (McCance & Huether, 1998). Food additives (FA) become unnecessary encumbering molecules, disrupting the metabolism, and affecting the energy transport within the cell.

Sodium-potassium-adenosine triphosphatase pump theory

This pump transports sodium out of the cell, and potassium inside the pump. During the transport, the adrenosine thriphosphatase molecule splits and produces energy.

According to this theory, obese people are lacking this pump (McCance & Huether, 1998).

Diabetes-associated theory

Excessive food intake promotes high levels of glucose in the blood. The excess is stored in the liver and adipose cells (McCance & Huether, 1998). This excess causes the body insulin response to become irregular. Human bodies store glycogen/glucagon in the liver. Diabetes is affected by the storage and distribution of glycogen, which "is the form in which excess carbohydrate is stored in the liver and muscles; the hormones insulin and cortisol facilitate this process. When the blood glucose level decreases, the liver converts glycogen to glucose" (Taber, 2001, p. 853).

Psychological causation theory

This theory proposed obese people respond more to external cues, especially sight, smell and taste, than to internal cues. Hunger and satiety were described as internal cues (McCance & Huether, 1998).

These theories indicate the biological aspect, not the behavioral factors of obesity. Since Kennedy (1953), further research has expanded upon the lipostatic theory. Friedman (2002) and Liu (2004) broadened the concept of the lipostatic theory. Friedman (2002) discovered the DNA sequence of the leptin protein and established the leptin feedback loop, a succession of chemical events affecting the obese (ob) gene. In an experiment, Liu (2004) reported how altered ob genes in mice that did not produce leptin, causing the mice to overate, and become obese.

Ozaki and Murphy (2003) studied a possible mutant gene linked to obsessive compulsive disorder (OCD). OCD can be expressed in binging. The authors analyzed the

DNA of 170 unrelated individuals, including 30 participants with OCD affected by eating disorders. Those researchers detected a substitution of genes Val425 for genes lle425 in the gene sequence of two patients with OCD and their families. Those patients and their siblings also had a particular form of hSERT variant (a gene involved in the human serotonin transport), which is associated with an increased expression of serotonin. The authors correlated OCD to a cerebral dysfunction in the production of serotonin.

As discussed earlier, stressors activate the GAS, causing diseases of adaptation (Selye, 1946). Chrousos and Gold (2002) reported the malfunction of the stress-system may lead to life-threatening diseases. The hormonal structure known as the hypothalamic-pituitary-adrenal (HPA), or stress circuit, responds to stress by releasing the corticotrophin-releasing hormone (CRH) which trigger the pituitary to release adrenocorticotropin (ACTH), another hormone, into the blood stream (Chrousos & Gold, 2002). The ACTH then activates the adrenal gland to also release other hormones, such as epinephrine (formally known as adrenaline), norepinephrine and cortisol. Those three hormones are active in the body response to stress. In an optimal situation, cortisol is responsible for the feedback effect that shuts down the response after the threat, or stressor, has passed (Chrousos & Gold, 2002). The loop, or stress-circuit, affects the whole body: the HPA axis activates the autonomic nervous system, which controls vital functions such as heart rate, blood pressure, digestion, etc... (Chrousos & Gold, 2002; Selye, 1946). McCance and Huether (1998) correlated obesity to heart rate, blood pressure, and digestive disturbances. These conditions are due to a lack of homeostasis.

Kontopoulou and Marketos (2002) proposed a return to the source in their article, *The ancient Greek origin of a modern scientific principle*, in which they revisited the

basic, but still chief, concept of homeostasis first identified by Hippocrates (400 B.C.). Similarly, Conti (2001) revisited Bernard (1856) who he identified as the precursor of neuroscience. Later research had supported the idea that hormonal dysfunctions and stress are interconnected and the consequence of a lack of homeostasis. Hormonal dysfunctions are related to stress, causing the stress-system to adapt with diseases when homeostasis is disturbed (Chrousos & Gold, 2002; Selye, 1946).

Today, it is widely agreed that hormonal dysfunctions, either from external or internal sources, are connected to a loss of homeostasis. Obesity is the direct consequence of both external (FADA) and internal (neurons' chemical dislodgement) stressors challenging body homeostasis. Nonetheless, attitudes toward obesity are generally based on the perceived behaviors of the obese population, resulting in negative stigmas.

Attitudes Towards Obesity

Hilbert et al. (2008) analyzed stigmatizing attitudes toward obesity with a survey administrated via telephone. The authors also looked at psychological and sociodemographic determinants. The participants (N = 1,000) were assessed about their "stigmatizing attitudes toward obesity, causal attributions of obesity, the labeling of obesity as an illness, perceptions about prevalence, severity and chronicity of obesity, support of obesity prevention, and sociodemographic characteristics" (Hilbert et al., 2008, p. 1529). The results indicated 55% of the participants (n = 550) were undetermined about stigmatization, while 23.5% (n = 235) had stigmatizing attitudes and 21.5% (n = 215) had no stigmatizing attitudes toward obesity. Greater stigmatization was correlated with less education, older age, and attributing obesity to individual behavior. This group also demonstrated stronger support for prevention efforts. But, it did not offer

financial support for prevention programs. Attributing obesity to heredity and to an illness was associated with less stigmatization. This statement endorses the hypotheses of this research by stressing the fact that obesity is essentially believed to be caused by behavior; but if obesity is perceived as the result of another cause than behavior, then stigmas would be reduced. Hilbert et al., (2008) concluded a prevalence of stigmatization toward obesity and suggested information on the etiology of the disease could lead to destigmatization.

While those results support the necessity of an educational workshop such as the intervention of this project, they do not seem to correlate with the next study. The populations reported to have stigmatizing attitudes toward obesity and overweight were found in dietetic students, physicians, and health practitioners (Berryman et al., 2006; Puhl & Brownell, 2006). This group reported to have a high prevalence of stigmatization toward the obese population, as reported next. The conflicting findings between the above study (more education would prevent negativity) and the two next ones (negativity coming from educated groups) seem to confirm the complexity inherent to the problem of attitudes toward obesity.

Berryman et al. (2006) studied attitudes toward obesity, dietary intake, and body composition in dietetics and nondietetics students at Ohio University. The population included 76 women, dietetics and nondietetics students with 38 students (n=38) in each group. A Fat Phobia Scale assessed participants' attitudes. A food frequency questionnaire measured dietary intake and an air displacement plethysmography reported body fat composition. Both groups were similar regarding age, weight, and body fat and both demonstrated negative attitudes toward obesity. The authors concluded that dietetic

students had similar negative attitudes toward obesity as nondietetic students. This negative attitude, even from health professionals, is likely to affect the obese population (Puhl & Brownell, 2006).

Puhl and Brownell (2006) investigated the factors associated with weight stigma in overweight and obese adults. The researchers examined the "experiences of weight stigmatization, sources of stigma, coping strategies, psychological functioning, and eating behaviors" (p. 1802) in a population of 3,304 (N = 3,304) adults, including 2,560 women and 111 men. Sample I had 2,449 (n = 2,449) females and Sample II (n = 222) was a combination of men (n = 111) and women (n = 111) drawn from Sample I. Self-reporting questionnaires were completed online. The questionnaires were "measuring the frequency of weight stigmatization and coping responses to deal with bias, the most common sources of the bias, symptoms of depression, self-esteem, attitudes about weight and obesity, and binge eating behaviors" (Puhl & Brownell, 2006, p. 1802). Variables were analyzed with different scales. The authors reported negative stereotypes experienced by the obese population from healthcare professionals, such as dieticians, mental health professionals, doctors, nurses, and from family members, co-workers, and authority figures (police, teachers, etc.) The majority of the participants (80%) reported dealing with stigma by eating more food.

These last studies revealed the general perception of obesity. This perception explained the psychological and emotional conditions experienced by an obese individual, adding one more dimension to the illness of obesity, which is mental pain. This pain is more intricate to deal with because it is less tangible, rather expressed in powerful and no tangible symptoms. While negative attitudes toward obesity have been

widely reported, no educational intervention introducing the etiology of the disease, and with the intention to curb those attitudes seems to have been documented. This fact urges the necessity of a comprehensive study aiming to demonstrate that the cause of obesity is not mainly the result of behavior, as commonly thought, but is the outcome of a lack of quality in food composition, or of a lack of homeostasis, which becomes the trigger of deadly consequences.

Summary

The review maintained that FA, food availability, and involvement of hormonal activities are major contributors to the epidemic of obesity. In reaction to eating food not designed for humans and/or in response to hormonal stress, the body protects itself with a specific disease of adaptation, obesity.

Stressors challenge homeostasis. The GAS, a response to stressors, adjusts to the threats by adapting (Selye, 1946). Obesity, the result of environmental availability and the consequence of cerebral stress, adapts with the GAS in response to the stressors. This makes obesity, another proposed disease of adaptation, classifiable as a seriously life-threatening disease (Bijaoui, 2009; Chrousos & Gold, 2002; Selye, 1946). Obesity may be added to Chrousos and Gold's list of life-threatening diseases triggered by stressors. Indeed, the body is adapting to environmental stressors found in food, and to hormonal dysfunctions, by a specific disease of adaptation, obesity.

In conclusion, cerebral or environmental stressors provoke chain reactions, which may include overeating, and where the body protects itself with a specific disease, obesity. Obesity becomes the response to stressors as first theorized by Selye (1946), and

less of an expression of behavior. Yet, the expression of obesity stays confounded with its cause, making the obese population the target and victim of discrimination.

Chapter Three: Methodology

The Applied Dissertation proposed a research project designed to observe a potential change in attitudes toward the obese population. Studies had indicated obesity is believed to be the result of a faulty behavior, overeating (Ludwig et al., 2010; Prentice, 2001; Swinburn, 2009); which had been repeatedly reported as being negative, thus affecting the obese people emotionally and behaviorally (Berryman et al., 2006; Hilbert et al., 2008; NAAFA, 2009; Puhl & Brownell, 2006). In contrast to a pejorative or an emotional argument, the researcher's approach to attitudes toward the obese population is cognitive.

Environmental and physiological or cerebral stressors were identified as agents causing respectively weight gain and chemical dislodgment in the brain. It was anticipated that perception, beliefs, and attitudes toward obesity would be reconsidered and expressed in change (Becker, 1974). In his health belief model and personal behavior, Becker (1974) hypothesized beliefs would predict attitudes and behaviors. Later research similarly correlated beliefs and behaviors as predictors of attitudes (Sjoberg, 1982). Additionally, instructional prevention programs were reported to positively affect changes in knowledge and behavior (Miller & al., 1990). Thus, if the popular belief associating obesity to the negative behavior of overeating was to be challenged by new evidences, attitudes toward obesity were anticipated to be influenced as well.

During the intervention, the researcher presented published evidence of two essential causal factors of obesity, first food composition, especially chemical additives, (Brownell & Warner, 2009; Rudd Center for Food Policy and Obesity [2005-2011];

Spence et al., 2009); and second brain activities provoking cerebral stress and chemical dislodgement (Bijaoui, 2002, 2004; Conti, 2005; Chrousos & Gold, 2002; Drapeau et al., 2003; Kontopoulou & Marketos, 2002; Pinkney, 2004; Pritchard & al., 2002).

Participants of the experimental intervention were introduced to selected literature with the intention to observe a change in attitudes toward obesity. The intervention, titled "Essential Factors in Obesity", as seen on the Syllabus (Appendix I), consisted of a workshop structured with two distinct parts, Part One and Part Two, in order to enhance participants' understanding of proposed causal factors in obesity.

In Chapter Three, the purpose of the study, with its goals and objectives, were redefined and linked to the problem statement. The methodology consisted of pre-and-posttests observations collected from a sample population belonging to a higher education institution. The data collection involved two instruments which results were analyzed using a t-test to assess differences between means of individual scores (for the quantitative test); and a semi-quantitation evaluation of repeated themes to assess the impact of the intervention.

Proposal

Purpose of the Study

The purpose of the study was to develop an educational intervention to be presented to an adult academic community in California. The two proposed causes of obesity, environmental stressors and physiological/cerebral stressors, were titled as "essential" with the intent to contrast from the prevalent belief associating the negative behavior of overeating to obesity. The intervention consisted of an instructional

workshop including a Power-Point presentation, and designed with two pre-tests, an intervention, the same tests administrated again as posttests.

Part One consisted of the presentation of two documented essential environmental stressors involved in obesity, food additives and damaging attempts (FADA). Scientific results had correlated obesity to FA (Bray & et al., 2004; Brownell & Warner, 2009; Gray, 2008; He et al., 2008; Spence et al., 2009; Turner et al., 1998; Vang et al., 2008; Weil, 1990). Other studies had reposted the dangers involved in practicing commonly recommended behaviors to lose weight, such as elimination of sugar and salt consumptions (Busko, 2009; McCance & Huether, 1998; Swanson & Suh, 2005; Whitmer et al., 2009), which were labeled here as damaging behaviors (DA).

The first essential cause (FA) and the consequences (DA) of obesity, FADA, were identified as environmental stressors. Endorsed behaviors to fight obesity (DA) had resulted in health deterioration (Bijaoui, 2009; Busko, 2009; McCance & Huether, 1998; Swanson & Suh, 2005; Whitmer et al., 2009). DA were included as an illustration of the way obesity had been mainly approached, with an accumulation of questionable recommended behaviors, while the obesity crisis is now a global risk associated with a climbing number of secondary diseases (CDC, 2010; Gade & Gade, 2010). Consequently, DA were identified as environmental stressors, and as means to influence attitudes. Following the first sub-problem, environmental stressors, the second sub-problem, physiological/cerebral stressors, was introduced in Part Two.

Part Two of the presentation involved the second essential proposed cause of obesity, physiological stressors. Published scientific evidence correlated specific cerebral events to obesity (Drapeau et al., 2004; Pinkney, 2004; Turner et al., 1998) and to

diseases of adaptation (Chrousos & Gold, 2002). Diseases of adaptation were first acknowledged as the response of the body when adjusting to stressors by activating the GAS (Seley, 1946).

This adaptation triggers the stress-circuit (Chrousos & Gold, 2002), which provokes a significant physiological adaptation, expressed in diseases of adaptation (Chrousos & Gold, 2002; Seley, 1946). Obesity was introduced as another disease of adaptation to not only environmental but to physiological/cerebral stressors as well, with the intent to influence attitudes. Correlating obesity to a disease resulted in less negative attitudes (Hilbert et al., 2008; Puhl &Brownell, 2006).

It was anticipated attending the workshop would generate a measurable change in participants' attitudes. The material presented during the educational intervention (the workshop) had been strategically organized with specific goals and objectives intended to observe if there would be a difference between the statistical means of the Fat Phobia Scale and the frequencies of themes in the Structured Interview. Knowledge and awareness about little endorsed causes of obesity (FADA as environmental stressors, and cerebral stressors) were estimated to affect attitudes toward the disease. Yet, there was the possibility that no change may be observed.

Problem Statement

The researcher will develop and implement an educational intervention for professional adults and students of a higher-education community in California and assess a change in attitudes toward obesity.

Sub Problems

- **Sub-problem 1:**

Does awareness about food additives change attitudes towards obesity after participation in an educational intervention?

- **Sub-problem 2:**

  Does awareness about cerebral activities affect attitudes towards obesity after participation in an educational intervention?

Goals of the Study

The goals of the study were to educate workshops' participants about scientific evidence correlating obesity to chemical ingredients (FA); about the dangers of common recommended by damaging behaviors to lose weight (DA); and about specific cerebral activities involved in obesity. The purpose was to observe if a change in attitudes toward the obese population would occur. The four overarching goals of the study were:

- Educate about the dangers of FA and their contribution in causing obesity to develop into a disease of adaptation to environmental stressors (Bray & et al., 2004; Brownell & Warner, 2009; Gray, 2008; He et al., 2008; Selye, 1946; Spence et al., 2009; Turner et al., 1998; Vang et al., 2008; Weil, 1990).
- Demonstrate how two common behavioral practices meant to fight obesity (suppression of sea salt and of natural sugar) are actually health risks (DA) (Busko, 2009; McCance & Huether, 1998; Swanson & Suh, 2005; Whitmer et al., 2009).
- Educate about the cerebral stressors involved in diseases of adaptation and in obesity (Chrousos & Gold, 2002; Pinkney, 2004; Turner et al., 1998).
- Report the general negative attitude toward obesity, and it impact on the obese population (Berryman & et al., 2006; Puhl & Brownell, 2006).

The intervention was anticipated to be successful by positively reflecting on the sub-problems; by observing a difference between the two means of the Fat Phobia Scale; and by observing recurring or emerging themes in the qualitative data of the Structured Interview. It was also projected to be replicated.

Objectives of the Study

In order to reach the stated goals, six specific objectives were outlined:

- Identify selected research articles revealing chemical in food (FA) reported to cause obesity (Brownell & Warner, 2009; Spence et al., 2009) as environmental stressor.
- Acknowledge the harmful results of two specific recommended behavioral practices to lose weight, removing sea salt and of natural sugar from a given diet, as health risks (DA) (Bijaoui, 2009; Busko, 2009; McCance & Huether, 1998; Swanson & Suh, 2005; Whitmer et al., 2009).
- Classify FADA as environmental stressors.
- Identify selected research articles indicating the role of cerebral stress in selected behavior and in brain activities (Chrousos & Gold, 2002; Pinkney, 2004; Turner et al., 1998; Seley, 1946).
- Acknowledge the cerebral activities involved in obesity and classify them as cerebral stressors.
- Observe if attitudes toward obesity had been influenced after presentation of the workshop.

Goals and objectives derived from the problem statement and were planned within a definite methodology comprising of pre-and-post observations. By increasing

knowledge about proposed essential causes of obesity, attitudes were anticipated to be influenced by indicating a difference in pre and post data of the Fat Phobia Scale and of the Structured Interview. For the Fat Phobia Scale, the difference was expected to show a decrease in means; and for the Structured Interview, it was expected to show an increase of relevant themes.

Methodology

The project involved collection of quantitative and qualitative data using corresponding tools, within a pre-and-posttests design. The researcher compared findings from two measures that capture information about the attitudes of a projected subset of 55 participants. (Fifty five participants was an estimate based on a percentage of the population which would get a personal email about the educational intervention) This convenience group was to receive the pre-test, the intervention, and the post-test. The two measures for the data collection schemes were:

- The Fat Phobia Scale (Bacon, Scheltema, & Robinson, 2001) (Appendix E). The Fat Phobia reflected the underlying construct of cerebral stressors, addressing feelings and emotions. Feelings and emotions had been reported to be dependent upon physiological events (Bernard, 1856; Bijaoui, 2002; Chrousos & Gold, 2002; Conti, 2001; Kontopoulou & Marketos, 2002; Petri, 1996; Pritchard et al., 2002; Puhl & Brownell, 2006; Seligman, 1975; Selye, 1946); a correlation applicable to the premises of the Fat Phobia Scale (Bacon et al., 2001) for the purpose of the Applied Dissertation.
- A Structured Interview (Appendix F) was designed by the researcher and reflected the underlying construct of environmental stressors. The questions were

meant to evaluate personal behavior and thoughts as indicators and predictors of attitude. Personal behavior had been correlated to attitudes (Becker, 1974; Sjöberg, 1982). Personal behavior, beliefs, and thoughts about food and obesity reflected the underlying construct of environmental stressors.

The first sub-problem focused on the environmental stressors (FADA) associated to obesity, and were presented during Part One of the workshop. The second sub-problem focused on cerebral stressors associated to obesity, and were presented during Part Two. The design of the workshop was intended to test a potential difference in attitudes between the data provided by the two instruments. The content of the workshop was meant to affect attitudes by observing if a change in perception, thought, and attitude about obesity would take place; or would not take place.

The workshop was the independent variable. The anticipated change to be observed in attitudes was the dependent variable. There was also the possibility no change may be reported.

Sample

The target population was drawn from a community of professors, staff, and students belonging to a higher educational establishment in California who agreed to assist to the workshop. Recruitment was estimated at 55 adults ($N = 55$). The sample was drawn from that community at large, consisting of individuals who self-selected to participate to the research project, and agreed to do so by signing the Inform Consent (Appendix B). There were no penalties for withdrawing from the study at any time a participant would wish to do so. Participation was voluntary, producing a non-randomized draw.

Therefore, the inclusion criteria encompassed adults belonging to the same higher-education community. Faculty, staff, and students were anticipated to self-select and chose to attend the workshop. There were no exclusion criteria.

In spite of the diversity of the population's background, ethnicity, culture, gender, socio-economic status (SES), and other identifying factors, the community prides itself for its strong homogeneous characteristics, as members of the same community. The convenience sample was anticipated to be somewhat typical of the community at large and to reflect a balanced representation of the population's diversity. Recruitment included fliers posted at different locations and emails (Appendices G and L).

Instrumentation

Two Tools

The instrumentation consisted of two tools. The Fat Phobia Scale and the Structured Interview which were each administrated twice during the workshop, once at the beginning of Part One, and a second time at the end of Part Two.

Fat Phobia Scale: The Fat Phobia Scale was developed between 1984 and 1991 by Bacon, Scheltema and Robinson (1984-1991). This first version had 50 items and had been tested for reliability and validity. Later, it was revised and released as Fat Phobia Scale Revisited: The Short Form (Bacon et al., 2001). In the second edition, the authors developed a shorter version of the first Fat Phobia Scale, reducing the original 50-item scale to 14 items.

Reliability of the Fat-Phobia Scale

The reliability of the newer version was tested with both previous samples, the original sample (N=1135) (Bacon & et al., 1984-1991), and the new sample (N = 255)

(Bacon, & et al., 2001). The reliability of the scale was assessed by testing the two samples with Cronbach's alpha, once in 1984-1991, and a second time in 1999.

The reliability of the 2001 sample was also tested with both samples, and assessed with the Pearson correlation to calculate the extent to which each scale was associated with each other. The total mean scores of both samples were calculated, and a t-test analysis investigated the independence of the scores. The alpha (α) was set at 0.01.

The results indicated an excellent reliability for the shorter 14-item scale in both samples with Cronbach's = 0.87 for the 1984-1991 sample; and Cronbach's = 0.91 for the 1999 sample. For both samples, no item would have affected the reliability, if deleted.

The short form demonstrated a good correlation with the long form in both samples with r=0.82 in the 1984-1991 sample; and 0.90 in the 1999 sample. Item-total correlations showed an average of 0.54 in the 1984-1991 sample and an average of 0.62 in the 1999 sample. There was no significant difference in the mean of both scores (t(308.36)=2.33, P=0.021).

The authors (Bacon et al., 2001) concluded the short form of the scale maintained an excellent reliability and correlated highly with the longer form. The psychometric properties of the original scale were maintained even though the test length was reduced from 50 to 14 items.

Validity of the Fat Phobia Scale

Bacon et al. (2001) stated there was construct validity for both scales (1984-1991 and 1999). The authors reported they demonstrated validity by using Cronbach's alpha and calculating an average item-total correlation for both samples. The item-total

correlations ranged from 0.42-0.65 (average=0.54) in the 1984-1991sample; and from 0.28-0.77 (average=0.62) in the 1999 sample.

Bacon et al. (2001) also reported a lack of validity in the scales as there was no indication of what was a socially desirable answer. The authors further explained they were referring to psychological research, suggesting, when assessed with obvious methods, true prejudicial feeling may be hidden. Bacon et al. (2001) discussed the fact as a lack of control and a limitation. However, they did not consider this fact as greatly affecting the overall validity of the scale. Another limitation of the study was the population, which were predominantly white females.

Nonetheless, external validity seems to be effective as other researchers had used both versions of the Fat-Phobia-Scale (Berryman et al., 2006; Yuker, Allison, & Faith, 1995). Yuker et al. (1995) reported that the Fat Phobia Scale was among the three scales demonstrating the best psychometric properties, and recommended further research on attitude toward obesity should include the Fat Phobia Scale. The recommendation was endorsed by the researcher for this research project.

Structured Interview: The Structured Interview questionnaire consisted of three open-ended questions with answers to be grouped for qualitative evaluation. Similar questions were previously administered to three different persons in July 2010 for a pilot evaluation of the questions. Since, the questions had been re-evaluated. The interview was revised for bias by research experts and by volunteers accepting to review it and to provide feedback to the researcher. The questions were improved, according to the feedback received.

Behavior and attitudes were anticipated to demonstrate an association with each other, as behavior had been documented as a predictor of attitudes (Glanz, Marcus-Lewis, & Rimer, 1997; Miller, Booraem, Flowers, & Iversen, 1990; Sjöberg, 1982). The purpose of the Structured Interview was to assess respondents' behavior in food shopping as a predictor of their attitudes; and to collect their opinions in regard to environmental and cerebral stressors. Even though reliability and validity are less of a criterion for qualitative evaluations than quantitative assessments, equal attention has been given to the Structured Interview.

Data Collection

Informed Consent: The first document to be collected was the Informed Consent (Appendix B). The Informed Consent was read by the researcher at the very beginning of the workshop to let the participants know about the research project and about their rights, before any other event took place. Their right to withdraw was discussed.

Identification Questionnaire (IQ): The second document was the Identification Questionnaire (IQ) (Appendix C), which had two purposes. The IQ first purpose was to protect responders' privacy by providing an anonymous system of organization for all data to be collected with a secret Identification Number (ID) for confidentiality protection. Its second purpose was to provide the convenience sample an opportunity to identify the population characteristics, such as sex, age, ethnicity, level of education, and income level.

The system consisted of a random 4-digit number (ID) to be reported on a place indicated on each instrument the participant would fill in thereafter. Upon arrival to the

workshop, each participant randomly selected his/her own ID from a bag with papers folded with a secret number written inside.

Names or any other indications identifying participants were not appearing on any documentation. The anonymous ID was the only data connecting participants to the instrumentation for demographic purposes. After the documents were filled by participants, they were stored in corresponding folders. Documents were kept in corresponding folders labeled as such, making a total of eight folders including the syllabus. The content of the folders were distributed as follows:

Folder 1: Informed Consent Forms (Appendix B)

Folder 2: Identification Questionnaire (ID) (Appendix C)

Folder 3: Fat Phobia Survey Pre-Test (Appendix E)

Folder 4: Structured Interview Pre-Test (Appendix F)

Folder 5: Syllabus (Appendix I)

Folder 6: Fat Phobia Survey Post-Test (Appendix E)

Folder 7: Structured Interview Post-Test (Appendix F)

Folder 8: Workshop Evaluations (Appendix J)

After collection, the folders were kept by the researcher for data analysis purposes only. Once all data were entered, the folders were anticipated to be sealed in a box. Once the data had been collected, analyzed, and discussed, the content of the box was to be destroyed.

Instruments: Two instruments, the Fat Phobia Scale and the Structured Interview, provided data collection. Besides providing data, the results were to serve as a

tool of evaluation for the instruments. The collection consisted of quantitative (Fat Phobia Scale), and qualitative data (Structured Interview).

Evaluation Form: The evaluation forms were the last forms to be collected. The first purpose of the evaluation was for participants to assess the presentation. Its second purpose was to evaluate the instrumentation tools.

To recap, the data collection consisted of seven documents. The documentation included two instruments gathering information with a Likert type scale (Fat Phobia Scale) and with open-ended questions (Structured Interview).

Data Analysis

The Fat Phobia Scale assessed personal comfort within obesity and quantified individual feelings, opinions, and attitudes about obesity in others and self with a 5-point scale. The results were analyzed for effectiveness of the intervention with a simple t test for detecting difference between the two means. An Excel program was used for statistical analysis.

The Structured Interview reported participants' thoughts and personal behavior as predictors of attitude toward obesity (Glanz & et al., 1997; Miller & et al., 1990; Sjöberg, 1982). The qualitative data was categorized for recurring themes' comparisons.

The Fat Phobia Scale (1) and the Structured Interview (2) constructs respectively reported:

(1) Fat Phobia: Comfort with personal perception of obese people ranging from negative to positive.

(2) Structured Interview: Comfort with personal behavior and thoughts as a predictor of attitudes toward obese people.

The results of the two constructs were displayed in Tables similar to Table 3:1. As a preview of the upcoming data collection, Table 3:1 introduced an example of upcoming results.

Table 3:1

Example of Projected Data Analysis of Outcomes

Item	Identification Number (ID)	Fat Phobia		Structure Interview	
		Pre	Post	Pre	Post
1	1111	-	-	-	-
2	2222	-	-	-	-
3	3333	-	-	-	-
4	4444	-	-	-	-
5	5555	-	-	-	-
6	6666	-	-	-	-
7	7777	-	-	-	-
(to …)	8888	-	-	-	-

Note : Fat Phobia[1] = Range of perception of obesity from negative to positive; Structured Interview[2] = Personal behavior and opinions as a predictor of attitude.

The Fat Phobia Scale (Appendix E) offered 14 items with adjectives qualifying feelings, thoughts, and attitudes toward obese people on a scale from five to one, with five describing the most negative aspect of the qualification, and one the most positive. This survey reported how individuals perceive obesity, within a descendant scale (from five to one). For instance, the first adjective “lazy” (five on the scale) was opposed to “industrious” (one on the scale), and the second item “no will power” (five) was opposed to “has will power” (one). Unlike most other items which were similar to “lazy” and “no will power”, item ten stated, “dislike food” (five) facing “like food” (one); and item 12 stated, “undereats” (five) facing “overeats” (confounding). The two last ones expressed compassion, such as “insecure” and “low self-esteem”. This made ten negative items on

the left, two confounding ("dislike food" facing "like food"), and two emphatic items ("insecure" and "low-self-esteem").

The qualitative responses to the Structured Interview (Appendix F) were analyzed with pre and post frequencies for an in-depth analysis of participants' answers to the open-ended questions. The researcher established tables for recurring themes in the answers with observed frequencies, which could range from 1 to an undetermined numbers of recurring and emerging themes. For a similar interview in July 2010, the researcher had established a simple frequencies code system for themes comparisons (Appendix H).

The Structured Interview was meant to connect personal behavior and thoughts to a set of pre-established cognitions as predictors of attitude. It was composed of three questions specifically inquiring about the studied themes. The first probed about personal behavior when food shopping. The second inquired about opinion/thought on food additives and chemical preservatives; and the third about opinion/thought about brain activities.

When reporting the results of their research, Miller et al. (1990) stated: "Notable was a lack of correlation between information, attitudes, and a commitment to change behavior" (para. 2). This quote also suggested, if information was to be provided, attitudes could change. Providing information was the purpose of the intervention, in order to influence changes in attitudes.

A t-test, one tail, demonstrated the possible impact of the educational intervention on the participants' attitudes with the average values (mean, median, and mode) to be observed and analyzed. For the spread of the value, the variability was calculated with the

range, the interquartile range, and the standard deviation. The measures of dispersion from the central distribution were not estimated, and the estimated degree of freedom was expected to be (55-1) = 54. The standard error was reported, and the distribution was expected to be normal. Pre-and-post comparisons were evaluated with a p-value. This statistic was used to assess the strength of the evidence supporting the problem statement and sub-problems. The results were estimated to show a *p*-value less or equal to 0.05 ($p \leq 0.05$) and are reported in Chapter Four.

In conclusion, if someone were to acknowledge receiving, accepting, and integrating new information, his/her understanding of related facts would be projected to change as well (Becker, 1974). It was anticipated participants' feelings, perceptions, thoughts, and attitudes about obesity could be affected after viewing the Power-Point presentation. This change would figure in the statistical results.

While the perspective of the intervention was cognitive in nature, the Fat Phobia Scale addressed the psychological aspects involved in attitudes toward the obese population (cerebral stressors). The Structured Interview addressed the environmental stressors reported in FADA.

IRB Approval and Ethical Considerations

The University's Institutional Review Board (IRB) granted IRB exemption for this research project. However, ethical considerations were implemented and followed by the researcher. A constant effort to protect participants' privacy was sustained.

Participants were made aware of the nature, the purpose, and the format of the research when reviewing the Informed Consent (Appendix B). This was also briefly announced on the flier (Appendixes G & L), reviewed by the researcher before

participants sign the Consent Form (Appendix B); and before starting Part One. Ethical considerations included, but were not limited to, keeping the data anonymous, assuring participants' wellness and safety; and informing as well the participants of their right to participate or to withdraw, at any time they would wish to do so during the development of the research project.

To review, the secret ID number (a four-digit number very easy to remember) provided a system of identification with a questionnaire (IQ) (Appendix C) designed to describe the demographics of the population, while keeping the data anonymous. After collection, the participants' answers were anticipated to be correlated to the ID number. The purpose of the ID was to protect participants' confidentiality. It was intended to be reported on each of the instruments for organizational purpose, and for an additional evaluation of the results in relation to the population's demographics.

Role of the Researcher

The role of the researcher of the Applied Dissertation was to act as a Principal Investigator. Each task relating to the intervention was carefully planned by the researcher in view of a successful implementation. Those tasks included, but were not limited to, preparation of all documents, organization of the all events as listed in the time-table (Appendix D), implementation of the workshop, analysis and interpretation of the results, synthesis of the research within the discussion, and lastly, a vision for future research.

Budget

The cost of the project was assumed by the researcher (Appendix K). Budget included location fees; advertising for the project; printing expenses; gasoline; parking;

and possible lodging expenses. The use of technology did not incur a cost, as first estimated. The university had projection material already installed in all classrooms. A detailed account of projected and occurred expenses was figured in Appendix K.

Timeline

The community was known for its few resources as far as space availability because of the intense teaching and research activities taking place daily. The exact date and location of the workshop were first projected for the end of September 2011 (Appendix D). Correlating location, date, and time for the workshop were the greatest challenge concerning the implementation

After, finalization of the location and date of the project, the next task was to update the material with the new information. Once updated, the material announcing the workshop was distributed and emailed within the community. Then, the recruitment process began.

Summary

The Applied Dissertation involved pre and posttests study design. The data collection comprised two instruments, the Fat Phobia Scale and the Structured Interview questionnaire in the form of open-ended questions. The data analysis of the Fat Phobia Scale was assessed with a comparison of means and a t-test; the results were reported with a *p*-value estimation. The results of the qualitative data provided by the Structured Interview were evaluated and discussed with a frequency system and a semi-quantitation calculation. The final phase of the pre-implementation included finalizing the location of the workshop, before formally announcing the project to the community, and before starting recruitment.

Curriculum/Intervention

The intervention was designed to bring awareness to an educated community of published facts on the effect of chemical components in food (FA), harmful health behaviors (DA) as they related to salt and sugar; and about the influence of brain activities as they relate to obesity. While the epidemic of obesity had steadily increased in the United States and in other developed countries (CDC, 2007; CDC, 2010; Gade & Gade, 2010) making obesity a global health alarm, no intervention seemed to have addressed a cognitive approach to the stigmatization associated with being obese as it is experienced by the population.

Stigmas had been reported with observations and psychological approaches (Berryman et al., 2006; Hilbert et al., 2008; NAAFA, 2009; Puhl & Brownell, 2006). However, no correlation to cognitive factors with the purpose of influencing attitudes seemed to have been established. The proposed methodology provided scientific data supporting essential causal factors of obesity other than the behavior of overeating. Those factors consisted of eating available and damaging food supplies; and of physiological or cerebral activities involved in obesity. For the purpose of this research, individual behavior was not considered an essential factor for being obese, but food additives, damaging attempts (FADA), and chemical dislodgment in the brain were considered essential factors causing obesity. This awareness was anticipated to produce an observable change of attitudes toward obesity by addressing cognition, instead of emotions.

Teaching was informal in contrast to a conventional classroom situation. The theoretical framework of the researcher for this project was adult education oriented,

which called for a flexible approach. The workshop was designed for 90 minutes, which required a strategic organization for the information to be selected, condensed and presented. This strategic organization involved several techniques, including an application of the Health Belief Model (Becker, 1974), and humor and awareness when dealing with possible tension provoked by cognitive dissonance (Festinger & Carlsmith, 1959; Griffin, 2009). Humor had been documented as an excellent tool to reduce tension. It was anticipated that humor would alleviate any possible mental tension when dealing with cognitive dissonance.

Theoretical Framework

The researcher's theoretical framework for her teaching approach was first inspired from Erickson's (1950) and Piaget's (1952) theories; with a later inclusion of an adult education framework which is essentially based on Malcolm Knowles (Kidd, 1978), on the Constructivism Model (Ryde, 2010), and on the emotions involved in learning (Petri, 1996). Malcolm Knowles introduced the notion of Andragogy (Kidd, 1978). Ryde (2010) built on that concept. Petri (1996) reported how individual past experiences involved in learning influence present physiological and psychological events taking place while learning new material.

Andragogy proposed a method of education for adults which is different from pedagogy. An adult learns differently from a child because he/she already has a framework of references to which he/she integrates new information. This notion has been applied to the Constructivism Model (Ryde, 2010).

The Constructivism Model supported the idea that new knowledge is integrated to old knowledge (Ryde, 2010). While children may have a blank slate, as documented in

psychology, adults do not. This observation illustrated the notion that adult education is adaptable to previous knowledge (Ryde, 2010). Subsequently, in adult learning, old and new learned materials are blended together, as in creating osmosis of knowledge, for a new integration, adaptation, and application.

Therefore, the integration of the new material presented during the workshop would be dependent upon previously accepted knowledge on obesity; and upon the way the new information (identifying other factors than behavior causing obesity) would be incorporated into the listener's framework. However, in some instances, resistance in accepting new evidence may call for strategic interventions; as already mentioned above and further discussed below with the HBM (Becker, 1974) and with the cognitive dissonance theory (Festinger & Carlsmith, 1959). For prevention purposes, those two theories were incorporated into the workshop as strategies in case of unexpected potential resistance to a concept challenging behavior as causing obesity.

Adaptation recognizes the value of a new material presented, and incorporates it to previous assimilated knowledge (Piaget, 1952), in prediction of beliefs, attitudes, and behaviors (Becker, 1974; Glanz & et al., 1997; Miller & et al., 1990; Sjöberg, 1982). After the intervention, application would be to practice the new integrated material by showing understanding to the obese population, instead of negativity; and to practice a preventable behavior when shopping for food. To conclude, the researcher's theoretical framework had been influenced by Erickson (1950), Piaget (1952), Malcolm Knowles (Kidd, 1978), Ryde (2010), and Petri (1996), who studied various learning stages and situations, including emotions as key factors in a learner's ability to perceive, assimilate, and retain new material; theoretical framework predicting her teaching philosophy.

Teaching Philosophy

The researcher's teaching philosophy is usually flexible and includes a multi-modality approach. It is flexible because adaptable to the audience group's age, previous exposure or not to the material, level of education, and particular areas of interest within an audience. However, for this particular situation, the researcher was more directive than in her usual teachings, as her purpose was to measure a potential change in attitudes before and after the workshop.

The researcher specializes in psycho-educational workshops, during which she combines her educational style with students' possible previous knowledge (Kidd, 1978; Ryde, 2010) and/or understanding of the topic. Her style blends adult education to the students' reactions by addressing their emotions in learning (Petri, 1996) with a psycho-educational approach. (Here psycho-educational is not meant as the study of psychology, but as a technique she practices for maximizing learning in addressing learners' personal emotions when dealing with the subject matters to be taught.) She considers teaching as a rewarding system of interactions between teacher and students. Each teaching and learning experience is different from another one because the dynamics between the teacher/facilitator and the students, or audience, are always different, in spite of the consistency of the material to be learned. The teacher, or facilitator, holds the role to create and maintain a rewarding learning environment. In the educational environment where the research is taking place, growing from learning is assumed from the community.

The population of this learning environment is very much acquainted with research. It supports research projects and initiative. Similarly, the audience of the

intervention will be comprised of educated and open-minded adults familiarized with research, and with models of change, a theory the researcher applies as a strategy.

Teaching Strategies

The researcher's teaching strategies are different here than in her usual teaching situations. The topic of the research not being mainstream (in contrast of obesity being the result of the behavior of overeating), two theories supporting the issues involved in changing had been announced above and were incorporated within the intervention. Those theories were included as strategies and prevention for the previous mainstream belief to cause tension to the learner.

According to one of the models of change, the health belief model (HBM), when exposed to modifying factors, attitudes are expected to change when perception of a situation had been modified (Becker, 1974). Although the HBM was usually taught and practiced for people to change a health behavior, here it was incorporated as a strategic intervention by informing participants prior to the presentation of the concepts involved in changing beliefs, thoughts, attitudes, and behaviors.

Another strategy applied was the theory of cognitive dissonance (Festinger & Carlsmith, 1959; Griffin, 2009). This theory explained how mental tension may occur if an individual is presented with a new cognitive evidence which confronts a previous belief. A potential negative attitude toward obesity would be the result of material previously integrated to one's psyche. In order for the new material not to provoke mental tension in some individuals, the researcher prevented with humor. Humor, an excellent tool to reduce tension, was expected to alleviate any possible mental tension

when dealing with cognitive dissonance. Humor figures in comfortable environment, allowing, facilitating, and receiving unfamiliar grounds more openly.

Either for adults or for children, it is important to create a comfortable environment which is at the same time, student-centered and knowledge-centered. The researcher incorporates various modalities of teaching, such as learner-centered, knowledge-centered, environment-centered, and community-center. For this particular intervention, the most applied methodology was knowledge-centered with the aid of technology, an important tool to be incorporated when delivering a message. Main points of the presentation were highlighted with a system of projections. A Power Point presentation, while having the function of emphasizing specific areas of the material, also addresses the visual learners.

As in most classroom situation, addressing auditory and visual styles figure by listening to the researcher and looking at the material. The system of projections emphasizes visual learning style; and auditory style will be addressed by the voice of the researcher, as it is commonly addressed by a teacher in a non-online environment. During the intervention, tactile style will be also represented by passing to the audience empty containers of food displaying the ingredients being discussed during the workshop.

Thus, strategies and technologies represented additional means to influence attitudes. Those means were believed to aid in facilitating the integration of the proposed concept, obesity as the result of consuming FA, and of cerebral stressors leading to chemical dislodgment. Strategies and technology were adapted to an adult audience within an academic learning environment.

Delivery Format and Learning Environment

The Delivery Format of the intervention consisted of a 90-minute workshop divided into two parts. Part One reflected the scientific findings associating obesity to FA, and the danger of common damaging behaviors practiced to lose weight (DA), in order to introduce FADA as environmental stressors. Part Two reflected on other studies reporting specific physiological/cerebral stressors involved in obesity.

The learning environment supported traditional learning and claimed to be open to new concepts. The delivery was traditional within a classroom situation; while the dense content of a new concept about the causes of obesity was summarized into a one-time workshop. Those facts greatly influenced the delivery format of a possible contested message because not correlating obesity to behavior, and challenging a non-mainstream approach.

Course Description

The course, a 90-minute workshop, introduced material reporting scientific evidences correlating obesity to environmental (Part One) and cerebral stressors (Part Two). The development of the course was addressing the goals and objectives of the project research. Attitudes toward obesity were observed with pre-and-posttests, in order measure and evaluate the effectiveness of the intervention. A more detailed description of the course is described in the syllabus (Appendix I).

At the beginning of the workshop, Becker's (1974) HBM was reviewed and proposed as an illustration and a guide for integrating new perspectives about obesity. This introduction, strategy for facilitating the acceptance of essential causes of obesity,

dealt with the participants' understanding on how perception, beliefs, behaviors, and attitudes are interconnected.

Then, the content of the course was drawn from the literature reviewed in Chapters One and Two. During Part One, selected findings were discussed as they relate to FA (Binkley et al., 2000; Bray et al., 2004; Brownell & Warner, 2009; Hansen & Wallinga, 2007; He et al., 2008; Gray, 2008; Turner et al., 1998; Vang et al., 2008; Weil, 1990); and as they relate to DA (Busko, 2009; McCance & Huether, 1998; Swanson & Suh, 2005; Whitmer et al., 2009). Then, the events provoked by FADA and their consequence in disease of adaptation were correlated to the GAS (Selye, 1946) and introduced as environmental stressors.

At the beginning of Part Two, the theory of cognitive dissonance (Festinger & Carlsmith, 1959; Griffin, 2009) was reviewed and correlated to the HBM as an unconscious resistance to change. The concept of cognitive dissonance was explained with humor and proposed as an illustration of how unconscious happenings developed in the psyche. Such as for the HBM, this clarification was a strategy for facilitating the acceptance of new essential causes of obesity. As reported above, those strategies were meant to deal with possible emotions and were addressed with a lighter side (humor) in order to reduce possible emotional tension with previous beliefs.

Next, selected studies connecting cerebral activities to homeostatic imbalances were presented with their connection to cerebral stress and obesity (Chrousos & Gold, 2002; Friedman, 2002; Conti, 2001; Kennedy, 1953; Liu, 2004; Kontopoulou & Marketos; 2002; McCance & Huether, 1998; Ozaki & Murphy, 2003; Pinkney, 2004; Pritchard, Turnbull, & White, 2002; Selye, 1946). The last topic covered at the end of the

workshop was negative attitudes toward obesity (Berryman & al., 2006; Hilbert & al., 2008; Puhl & Brownell, 2006); and the effect of these negative attitudes on the obese population (NAAFA, 2009; Puhl & Brownell, 2006).

In revision, Andragogy (Kidd, 1978), the Constructivism Model (Ryde, 2010), and emotions in learning (Petri, 1996) constituted the theories supporting the researcher's teaching methodology. HBM (Becker, 1974) and the cognitive dissonance theories were included as strategies to facilitate the integration, adaptation, and application of a new perspective being the cause of obesity. The Course Description was also provided and displayed in the Syllabus (Appendix I).

To further conclude, an inference such as: if obesity is caused by factors other than behavior, which are food composition and malfunction in the brain, then the obese population does not deserve to be stigmatized. This inference, another statement for the purpose of the study, concluded the Power-Point presentation.

Course Expectations

The participants were anticipated to identify a difference between the two constructs, environmental vs. cerebral stressors. The answers were estimated to report a change in attitude toward obesity after gaining knowledge from the presentation. This acquired knowledge was expected to be observed in the difference of students' attitudes, and to feature in a significant change, expressed in less stigmatizing toward the obese population.

Learning Goals

There were four learning goals correlated to the research's final outcomes/goals. The sequence stayed the same as the research goals' sequence discussed earlier under the Goals of the Study section. They are:

- Learn about the dangers of FADA and their connection to obesity.
- Classify obesity a disease of adaptation in response to environmental and cerebral stressors, and as a consequence of the GAS Theory (Selye, 1946).
- Learn about the cerebral stress involved in obesity.
- Reconsider negative attitudes toward obesity by replacing past assumptions with new cognitive evidences.

Learning Objectives

Each learning objective, an intermediary step intended to reach the corresponding goal was correlated to a specific material presented in the intervention.

- Introduce selected research articles reporting FA to cause obesity.
- Identify specific recommended behavioral practices to lose weight as DA, such as removing sea salt and natural sugar from diet.
- Recognize FA & DA (FADA) as environmental stressors.
- Review research articles indicating the role of cerebral stress in selected behavior and brain activities.
- Discuss the documented attitudes toward obesity.

Learning Outcomes

Outcomes, consequences of the objectives, provided a system to evaluate if the objectives and the goals had successfully reached their purposes. By answering positively the sub-problems (the effect on attitudes of an educational intervention addressing the

environmental and physiological stressors causing obesity), the outcomes would demonstrate the following list:

- Workshop participants (WP) will recognize the environmental risk factors causing obesity.
- WP will correlate obesity and its secondary diseases to environmental stressors.
- WP will identify the difference between non-organic food and organic food.

WP will change any negative attitudes toward the obese population to a more tolerant one.

Audience Description

The audience consisted of volunteer adults associated with a higher-education community in California. The target population was recruited with fliers and announcements by emails. The sample comprised of self-selected participants agreeing to attend the workshop. The inclusion criteria applied to adults belonging to the same higher-education community; and who self-selected and agreed to participate to the workshop. There was no exclusion criterion.

The population was well-known for its diversity and the sample was expected to reflect that diversity. The ID (Appendix C) indicated a 4-digit number for anonymous identificatio to be reported on each document. The audience was also likely to include participants who firmly believe obesity is a behavioral disease, as it is mostly assumed, and as the researcher had once learned while a student there. As documented in the theory of the model of change (Becker, 1974), a theory widely studied in this educational institution, perceiving a different reality was expected to produce a change in beliefs,

values, attitudes, and behavior. Those concepts also made up for important societal factors.

Societal Factors

Beliefs, values, attitudes and behaviors characterize a community's culture. This community's research and beliefs had endorsed the idea that obesity is mostly related to behavior, as the researcher was exposed to when active in the community. This is an important societal factor to be addressed by reviewing Becker's (1974) HBM, one of the models of change she had learned and practiced in the same community; and by reviewing the cognitive dissonance theory (Festinger & Carlsmith, 1959).

The availability to assist to the intervention, a societal factor greatly influencing the audience's participation and the sample size, was a concern that became a problem. If someone was to drop out of the study, it would not significantly affect the results.

Syllabus

The syllabus listed the sequence of the topics covered during the workshop. It is displayed in Appendix D. It also provides a clear list of events for replication.

Summary

The purpose of the project was to observe and measure a change in attitude toward obesity after exposure to two constructs, environmental and cerebral stressors as essential causes of obesity. The perception of obesity had been correlated to negative attitudes, an issue greatly affecting the obese population. This attitude was founded on the belief that obesity is the result of a particular behavior, overeating. The intervention was anticipated to influence attitudes by presenting an educated audience scientific evidence correlating obesity to environmental and cerebral factors.

The curriculum of the project was drawn from traditional teaching situations; yet adapted to an intervention where assignments and assessment are not conventionally figuring, such as in a workshop situation. The material to be presented was selected from studies reported in Chapters One & Two. The purpose of the intervention was to observe if acknowledgment of scientific facts supporting the proposed essential causes of obesity would influence, or maybe not influence, the predominantly negative attitudes toward the disease.

Evaluation Tools

The delivery of the intervention consisted of a workshop, a format which did not allow for assessment as it is practiced and expected in traditional classrooms. The format of a 90-minute workshop, in contrast to several weeks of teaching/learning, was not suitable for assignments.

Additionally, an assumed teaching and learning contract between the teacher and the students was not figuring. The topic was different from conventional curriculum, teachings, and beliefs about obesity. Another significant contrast to traditional educational settings was in the assessment methodology. Participants' learning was not measured with a grade indicating if they had passed or failed the class. However, pre-and-posttests assumed the function to measuring learning.

To ensure the material was integrated, pre-and-posttests and open-ended questionnaires had two functions. The first function was to collect data to be statistically analyzed. The second one was to serve as well as a tool of assessment. To further evaluate the knowledge gained by participants, a form evaluating the researcher's performance was presented at the end of the workshop (Appendix J).

Method of Evaluation

Participants Assessments

Workshop participants were given the opportunity to assess the educational intervention with a survey evaluating the presentation of the workshop (Appendix J). As earlier discussed under participants' assessments, pre-and-posttests and open-ended questionnaires were used as well as a method to evaluating if learning had taken place by reporting a change in attitudes. Results provided by the instrumentation were also used as a measure of assessment to determine if learning had occurred. Those results also provided an assessment tool for the workshop's evaluation. Attitudes would not have changed without efficient exposures to scientific facts, and without the new material successfully integrated and learned.

Evaluation of Instrument One

The Fat Phobia Scale (Appendix E) was expected to measure accurately attitudes towards obesity by reporting participants' beliefs and thoughts. It consisted of 14 statements addressing cerebral constructs. The scale provided quantitative data.

Evaluation of Instrument Two

Structure Interview (Appendix F) instrument consisted of three open-ended questions. The first question about respondents' personal behavior provided for a prediction of their attitudes. The two last questions addressed participants' opinions about environmental and cerebral stressors, providing qualitative data.

Summary

The researcher's teaching philosophy was inspired from child development theories, from adult education principles, and from emotions in learning. Her multi-

modality and flexible teaching style was adapted to a learning situation consisting of a workshop. Here, it was mostly directive and knowledge-centered with an effort to address different learning styles, such as tactile learners by passing relevant food containers.

Participants' integration of material was assessed with the same method used to collect the data, pre-and-posttests, and open-ended questions. An additional assessment tool had been constructed to evaluate the design of the workshop and the researcher's presentation (Appendixes J). Likert Scale and a semi-quantitation evaluation were used to assess respectively with the Fat Phobia Scale and the Structured Interview.

Standard Operating Procedures (SOP) and Policies

The Applied Dissertation's Standard Operating Procedures (SOP) outlined the procedures to be followed for replicating the research. The content of the project as it relates to environmental and cerebral stressors is available in the researcher's work. The instruments, the Fat Phobia Scale and the Structured Interview are also available from their respective sources. The delivery of the project was designed for 90 minutes, with an opening session, two parts, and a closing session. The sequence of its content is indicated for further delivery:

- Opening: The first documents to be administrated are, Consent Form, Identification Questionnaire, Fat Phobia Scale pre-test, and the Structured Interview pre-test.
- Part One: The HBM (Becker, 1974) is reviewed. Next, Chapters One and Two selected findings about FA (Binkley et al., 2000; Bray et al., 2004; Brownell & Warner, 2009; Hansen & Wallinga, 2007; He et al., 2008; Gray, 2008; Turner et al., 1998; Vang et al., 2008; Weil, 1990); and about DA (Busko, 2009; McCance

& Huether, 1998; Swanson & Suh, 2005; Whitmer et al., 2009) are introduced. Those studies correlate FADA to obesity. Then, the events provoked by FADA are correlated to the GAS (Selye, 1946), as environmental stressors.

- Part Two: The theory of cognitive dissonance (Festinger & Carlsmith, 1959; Griffin, 2009) is reviewed and correlated to the HBM as an unconscious resistance to change. Next, selected studies connecting cerebral activities to homeostatic imbalances are introduced with their connection to cerebral stress and obesity (Chrousos & Gold, 2002; Friedman, 2002; Conti, 2001; Kennedy, 1953; Liu, 2004; Kontopoulou & Marketos; 2002; McCance & Huether, 1998; Ozaki & Murphy, 2003; Pinkney, 2004; Pritchard & al., 2002; Selye, 1946). And lastly, negative attitudes towards obesity are revised (Berryman & al., 2006; Hilbert & al., 2008; Puhl & Brownell, 2006); with the effect of these negative attitudes on the obese population (NAAFA, 2009; Puhl & Brownell, 2006).
- Closing: The three last documents to be administrated were the Fat Phobia Scale post-test, the Structured Interview post-test, and the Workshop Evaluation Form. Chapters 1 & 2 explored in details the content of the studies just listed. These studies endorsed the premises included in the research project. The organization of the delivery makes up for a possible replication.

Limitations

At least three limitations were anticipated:

The first anticipated limitation was a possible resistance to the proposed premise, obesity essentially caused by environmental and cerebral stressors, in contrast to the mainstream perspective viewing obesity to be caused by behavior. This limitation was

expected from individuals who had perceived and/or reported obesity as the result of overeating. To address this limitation, the researcher had included two specific theories as strategies, the HBM (Becker, 1974), and the cognitive dissonance concept (Festinger & Carlsmith, 1959, Griffin, 2009).

Research findings had provided ample evidences supporting the proposed stressors involved in obesity. Those evidences did not seem to have yet been connected to attitudes towards obesity in the way it is proposed here. This may predict for a lack of interest to attend the workshop, thus a limitation.

The second limitation was the researcher personal belief that behavior was not the first, nor the essential, cause of obesity (although, she used to believe so); but obesity being the results of other essential causes. Research needs to be approached with a neutral position, which may not always be easy to achieve when dealing with personal convictions, beliefs, and assumptions that drive an investigator; not easy, but not impossible. Although this new belief about obesity was the result of her perception and internalization of facts after years of observations, the researcher presented the project with an approach as neutral as possible; and to further address this limitation, she gave, among the information displayed in the power Point presentation, her own example to illustrate cognitive dissonance with humor.

The third limitation was the lack of funding for new research areas. Research being mainly associated with funding on popular themes, this project may not attract much interest, unless motivation to participate is present and/or funding secured. Motivation may be approached with including the workshop in a class requirement. Funding would provide the means to advertise for the research and to offer a

compensation for attracting participants to the project. Without a valuable incentive to be offered to participants, the data collection would be problematic.

Assumption

At least two assumptions were considered:

The first assumption was to count on the support from the community where the intervention was projected to take place. This implied finding a space available at a suitable time for participants to partake in the project. The researcher found out that space availability for an occasional event as this one was not guaranteed, as classrooms and conferences rooms were already in demand by the community.

The second assumption was to anticipate participants would be available or interested by the study. Without incentives, without personal interest, and without recommendations from persons in authority, it was very difficult to recruit a sufficient number of people agreeing to assist to the workshop, as everyone seemed to have a full schedule.

Maintaining Best Practices

From an ethical consideration, maintaining best practices should not only be applied because required by the IRB, but mainly because a researcher should practice integrity, naturally. To maintain best practices, the researcher should ensure that rules and regulations, including but not limited to, participants' rights and safety, are thoroughly respected.

Maintaining best practices should be in all areas of the research field, honesty being an essential element in maintaining best practice. As a student, as a teacher, and as a professional, maintaining best practices include focusing on the project, indicating

sources, prevailing difficulties as they rise, respecting everyone involved in the process, and being concerned about the participants' safety and wellbeing.

From a practical consideration, the many and diversified studies reported here are organized in a manner facilitating replication. Those fields of studies include biology, education, preventive and natural medicine, psychology, and neuroscience. Although this work is the accumulation of years of knowledge and observations gathered from those different fields of interests, the material had been classified and structured by the researcher within a clear Power Point presentation, facilitating the implementation. This allows for a simplified further involvement from another researcher to comfortably refer to the selected studies for replication.

Summary

The proposed methodology introduced a projection for gathering, collecting, and analyzing data relating to attitudes toward obesity. Chapter Three also reviewed several factors concerning the implementation of the intervention, which consisted of an educational workshop designed for replication. The results provided by the instrumentation were further discussed and compared in Chapter Four.

Chapter Four: Discussion

Chapter four reported the findings of an interventional study seeking to observe how new information could impact attitudes toward obesity, and concluded the Applied Dissertation. Data collection and analysis, comparison with findings of the literature review, best practices, and implication of findings were discussed. Recommendations for future research were suggested. Best practices were applied as they relate to the implementation of the project.

Overview

The relationship between obesity and negative attitudes toward the obese population was well documented (Berryman et al., 2006; Hilbert et al., 2008; NAAFA, 2009; Puhl & Brownell, 2006). This relationship was associated to the popular belief that overeating resulted in obesity (Ludwig et al., 2010; Prentice, 2001; Swinburn, 2009). Sjöberg (1982) established a correlation between personal beliefs and behaviors to attitudes toward others, with personal beliefs and behaviors predicting attitudes. Lack of information was not influencing a change in beliefs, behaviors, and attitudes (Miller et al., 1990). Consequently, those findings may suggest information correlating causes other than the behavior of overeating to obesity may result in changing a previous negative attitude toward the condition. Furthermore, Puhl and Brownell (2006) observed a correlation between attitudes and a given cause of obesity. Attributing obesity to genetics or diseased conditions reported less negativity (Hilbert et al., 2008).

The effect of an educational workshop (the intervention) on attitudes toward obesity proposed in the Applied Dissertation associated obesity to two major constructs, environmental and cerebral stressors. Those constructs were classified as essential

triggers of obesity. Environmental stressors were addressed in the qualitative analysis collected through a Structured Interview (Appendix F); and cerebral stressors were addressed in the quantitative data collected using the Fat Phobia Short Form (Bacon et al., 2001, Appendix E). It was projected that acknowledgment of environmental stressors and cerebral stressors as essential causes of obesity could impact attitudes toward the obese population.

Before detailed reports of the data gathering, the problem had been reviewed. Obesity had been a growing condition in the United States (CDC, 2007, 2010). This threat had been spreading as a global condition (Gade & Gade, 2010). Attitudes toward obesity were documented as negative and affecting the obese population (Berryman et al., 2006; Hilbert et al., 2008; NAAFA, 2009; Puhl & Brownell, 2006).

Problem Addressed

Beyond the United States, the problem of obesity had increased to global dimensions (Gade & Gade, 2010). This observation had been correlated to food industrialization and the availability of fast food throughout the world (BusinessDirectory.com, 2009; Binkley et al., 2000; Bray et al., 2004; Brownell &Warner, 2009; Lagerquist, 2003; Nutbeam, 2004; Spence et al., 2009; Työppönen et al., 2003). The incidence of obesity globally increased; however, the predominant negative attitude toward obesity did not appear to have lessened.

While the problem of obesity had outspread from the United States to the rest of the world in terms of incidences and medical complications (CDC, 2007; Gade & Gade, 2010), the problem had also caused the obese population psychological afflictions Negative attitude toward obesity may be encountered in multiple settings. The National

Association to Advance Fat Acceptance (NAAFA, 2009) was created as a reaction to the predominantly negative attitudes the obese population has undergone, at work, and outside work. Bias and stigmas were documented as affecting the obese population with depression and with eating more food (NAAFA, 2009; Puhl & Brownell, 2006). Thus, eating more food becomes a coping mechanism. A coping mechanism is an unconscious adaptation to a given stress (American Psychiatry Association, [APA] 1994; McCance & Huether, 1998). The DSM IV or Diagnostic and Statistical Manual of Mental Disorders (1994) classified depression as a mental condition affecting an individual's ability to function at work and in society. Subsequently, it appears that depression may be proposed and categorized as another secondary disease resulting from obesity. Therefore, an intervention addressing bias and stigmas with the attempt to reduce negativity toward the obese population seemed appropriate.

Purpose

The purpose of the study was to measure a change in attitudes toward obesity, before and after an educational intervention exposing less known factors around the disease within an adult academic community. The two proposed causes of obesity, environmental stressors and physiological/cerebral stressors, were titled as essential with the intent to contrast from the prevalent belief that the negative behavior of overeating caused obesity. By providing scientific information that food additives and chemical dislodgments in the brain resulted in obesity, the researcher postulated that negativity toward the obese population could be reduced. During the workshop, environmental stressors and cerebral stressors were identified as essential, and as constructs of the

design. The goal to reduce negativity toward the obese population was supported with objectives corresponding to the constructs.

Problem Statement

The researcher will develop and implement an educational intervention for professional adults and students of a higher-education community in California and assess change in attitudes toward obesity.

- **Sub-problem 1:**

  Does awareness about food additives change attitudes towards obesity after participation in an educational intervention?

- **Sub problem 2:**

  Does awareness about cerebral activities affect attitudes towards obesity after participation in an educational intervention?

Sample

Recruitment of the sample involved fliers and email announcements of an educational intervention designed to influence the general negative attitudes towards obesity. Emails announcing the workshop were sent to about 20 persons in positions to influence others and who forwarded the emails to a breadth of people. Those 20 people included the Director of the Department from which the researcher graduated. From this source, a wide distribution was anticipated; however, the announcement was forwarded to only two professors teaching and researching obesity. Those two professors declined the invitation because the time scheduled for the workshops conflicted with their teaching schedules.

The first flier announced a workshop called “Essential Factors in Obesity”. Nevertheless, low number of interested persons to participate prompted to change the marketing strategy by redesigning the flyer, scheduling additional workshops and changing the title. In an attempt to recruit more participants, and as recommended by Lewis (personal communication, October 29, 2011), a marketing expert, the last two scheduled workshops were announced with a flier that included artwork and was titled “What’s in the food we eat? Things we should know” (Appendix L). The workshops were scheduled for September 22, October 13, October 25, November 10 and December 7, 2011. On September 22, they were five participants and on October 13, two. There were no participants on the next three workshops. The number of participants stayed low, totaling seven participants during five workshops.

Unfortunately, the last three scheduled announcements were not offered at suitable dates since they were competing with the community’s scheduled activities. The third workshop coincided with important events scheduled at the location, the fourth workshop with finals, and on the last scheduled workshop the campus was closed for winter break. Those last unplanned factors affected attendance. Finding the best date to recruit participants was greatly dependent upon availability of space and of potential participants.

Seven participants ($N = 7$) were drawn from a target population at large and formed a convenience sample. All the participants voluntarily agreed to participate to the research project. The sample was non-randomized.

Demographics of the Sample

The demographics of this convenience sample were collected with the Identification Questionnaire (Appendix C). The randomized self-selected 4-digit number (ID) assigned to each participant was provided to allow correlation of demographics to the instrumentation for analysis of results per demographic characteristics. However, in order to follow as much as possible best practices associated with ethics and confidentiality purposes, the participants' results were not correlated to their original ID, as the low number would have allowed for easy identification of the person according to the answers provided. Diversity of the population at large was represented in the sample (Table 4:1).

Participants' gender was almost equally distributed with three women (n = 3) and four men (n = 4). Diversity among the participants was an adequate representation of the community at large with African American, Hispanic or Latino, and Pacific Islander ethnicity reported (one each); White and Other (two each). The ages of the participants ranged from 18-25 to 66-75. The concentration of age ranged from 36-55. Educational levels ranged from high school to master's degree. (Details of all demographic variables may be found on Table 4:1) The income levels ranged from $ 20,000-$29,000 to $90,000-$99,000. This observation appeared to confirm the researcher's impression the sample population was composed of students and staff.

Table 4:1

Demographic Variables of the Sample

Variables	N = 7
Gender	
Male	4

Female	3
Age	
18 – 25	1
26 – 35	0
36 – 45	2
46 – 55	3
56 – 65	0
66 – 75	1
Race/ethnicity	
Caucasian/White/Europe	2
African American/Black	1
Hispanic/Latino	1
Pacific Islander	1
Other	2
Education	
High school	1
Some college	3
2-Year college	1
4-Year college	1
Mater Degree	1

Data Analysis

The measurement tools consisted of the Fat Phobia Scale (Appendix E) and the Structured Interview (Appendix F). Both surveys were administrated as pre-and-posttests. The Fat Phobia provided a quantitative scale and the Structured Interview offered qualitative data, which for comparison purposes was converted to a semi-quantitation calculation by the researcher**.** The low number of participants (N =7) did not allow for comparison of the two methods as anticipated and described in Chapter 3. The quantitative results were analyzed with an Excel program in order to evaluate the effectiveness of the educational intervention by comparing the two means. The qualitative results were compared to each other with an evaluation of repeated themes. A triangulation scheme reviewed both results, quantitative and qualitative.

Quantitative Analysis

Although the diversity of the population at large was represented in the sample, the means of the pre-and-posttests may not have been indicative of the whole population means because of the limited number of participants in the study. The Fat Phobia was scaled from one to five with the following premise: the higher the score, the more negativity toward the obese population. The mean score for the Fat Phobia Scale pre-test was of 3.44 (*SD* = .91) and for post-test of 2.16 (*SD* = .52) (Table 4:2). However, the small sample size may have affected the reliability of the standard deviations. The Z-scores were 0.501657 for the pre-test and 0.491301 for the post-test. The difference between the two means was .83 (*SE*= .83) with a 95% confidence interval of 0.96547, t (7) = 2.09521, and a *p* value of .058.

Table 4:2

Pre-Post Test Scores Analysis of Fat Phobia Scale

Tests	FAT PHOBIA results *N* = 7		
	Pre-Intervention	Post-Intervention	Difference of Means
Sum of Scores	24.07	18.30	
Mean	3.44	2.61	.83
Median	3.36	2.43	
Mode	2.64-2.93	2.14-2.15	
Outliers	4.85/2.07	3.36/1.86	
Range	2.78	1.5	
Standard Deviation	0.91	0.52	
Z Scores	.501657	.491301	
Degrees of Freedom	6	6	

Note: 95% Confidence Interval of 0.96547, *t* (7) = 2.09521, *r* = .488582; *p* = .058
* $p \leq .5$, one tailed.

Qualitative Analysis

The Structured Interview questions addressed three categories corresponding to the sub-problems: participants' personal behaviors when food shopping as a predictor of attitudes (Question #1), opinions on obesity as an environmental construct (Question #2), and opinions on obesity as a cerebral construct (Question #3). Themes emerged or/and recurred in the answers, providing qualitative data to be classified using a frequency system of repeated themes (Tables 4:3 to 4:5). Pre-and-posttests of the Structured Interview showed recurring significant themes with new themes emerging in the post-tests.

In the pre-test responses, themes identified as answers to Question #1 "When you go shopping for food, what makes you decide what to buy, or not to buy?" with frequencies (in parentheses) were "fresh & healthy" (3), "need" (3), "feel like" (2), "family habits" (1), and "appearance of food" (1). Themes for Question #2 "In your opinion, what contributes to obesity?" with frequencies (in parentheses) were "fats" (3), "not exercising" (2), "quantity of food" (2), "sugars" (2), and "fast food" (1). Themes for Question #3 'In your opinion, what's going on with someone who is obese?' with frequencies (in parentheses) were "make them binging" (3), "don't know" (1), "not sure" (1), "lots of things" (1), and "slows them down" (1).

In the post-intervention responses, themes identified as answers to Question #1 "when you go shopping for food, what makes you decide what to buy, or not to buy?" with frequencies (in parentheses) were additives/composition/ingredients" (3), "freshness/healthy" (3), "family/planning" (2), "price" (2), "appearance/taste" (2), and "need" (1). Themes for Question #2 "In your opinion, what contributes to obesity?" with

frequencies (in parentheses) were “food additives” (5), “fast food (2)”, “processed food and meats” (2), “white sugar” (1), “growth hormones” (2), “pesticides” (1), “quantity of food” (1) and “environmental stressors” (1). Themes for Question #3 “In your opinion, what’s going on with someone who is obese?” with frequencies (in parentheses) were negativity” (2)”, “low self-esteem” (1), “stress” (1), “imbalance” (1), eat more (1), “shut down (1), “destroys brain” (1), and “large impact on brain**”** (1).

Pre-and-Post-Tests Structured Interview Comparison of Data

Although it would have been relevant to compare, contrast, and further correlate those answers to participants’ initial answers, individual comparisons were not performed for privacy and confidentiality reasons. As referred to earlier in the chapter, the limiting number of seven participants would have allowed for easy identification per gender, age, and/or race. In spite of a random anonymous number, this situation would have allowed for distinction among the participants. Thus, the researcher opted not to perform such comparison, as the participant’s right to remain unidentified would have been jeopardized. Subsequently, comparisons were performed instead for emerging and recurring themes.

Table 4:3

Pre-Post Comparison of Themes Reflecting Personal Behavior

Structured Interview Question #1		
Recurring Themes	Pre-Intervention	Post-Intervention
Feel like/need	5	1
Appearance/taste/fresh/healthy	4	5
Family habits/planning	1	2
Price	0	2
Food additives/composition/ingredients	0	5

Note: Related themes were grouped for comparison purposes.

The most relevant observed change in the themes reflecting personal behaviors in Question # 1 (Table 4:3) was on the personal needs group were personal attributes were decreased from five to one (feel like/need), appearing to be the direct impact of the intervention. Although price was not mentioned in the answers to the pre-test questionnaire or during the intervention, it was mentioned twice in the answers to the post-test questionnaire. Participants seemed to have connected to the collective popular belief and fact associating organic food to a higher price than non-organic food. The last item on Table 4:3 "Food additives/composition/ingredients" was not mentioned in the answers to the pre-test questionnaire but figured in the presentation, demonstrating the impact of the workshop with a frequency elevation from zero to five.

In the themes appearing in Question # 2 reflecting opinions to obesity and environmental constructs (Table 4:4) it is worth noticing the sugars. Before the intervention, two participants had associated the use of "sugar" to obesity, a popular belief. After the intervention, only one participant reported "white sugar" as a contributor to obesity. This answer reflected the difference stressed by the researcher during the workshop between white and natural sugars. The raw data of "Sugars" and "White sugar" expressed the difference between both forms of sugar, as it was perceived by the participants. The most significant changes came in the increase observed for the themes of "food additives, processed food and meats, growth hormones, pesticides and environmental stressors", all topics mentioned at the workshop.

Table 4:4

Pre-Post Comparison of Environmental Constructs

Structured Interview Question #2

Recurring Themes	Pre-Intervention	Post-Intervention
Not exercising	2	0
Quantity of food	2	1
Fats	2	0
Sugars	2	0
White sugars	0	1
Fast food/ Processed food & meats	1	4
Food additives/ Growth hormones	0	7
Pesticides	0	1
Environmental stressors	0	1

Note: Related themes were grouped for comparison purposes.

Table 4:5

Pre-Post Comparison of Cerebral Constructs

Structured Interview Question #3		
Recurring Themes	Pre-Intervention	Post-Intervention
Don't know/not sure/lots of things	3	0
Make them binge	3	0
Slows them down	1	0
Low self-esteem	0	1
Negativity	0	2
Stress/imbalance	0	2
Eat more	0	1
Shut down/destroy brain	0	2
Large impact on brain	0	1

For Question #3, the reported opinions on obesity indicated a shift from negative or indifferent attitudes to a more positive understanding of the condition. Themes emerging in the pre-test such as "don't know, not sure, make them binge" were replaced by "low self-esteem, negativity, stress, imbalance, shut down/destroy brain" in the post-test, reflecting the impact of the information provided in the workshop with a frequency elevation from zero to five with 0% in the pre-test and 71.43 % in the post-test.

Participants provided more frequencies for environmental stressors (Table 4:4) than for cerebral stressors (Table 4:5). This observation seemed to endorse further Sjöberg's (1982) correlation between attitudes and personal behaviors by correlating attitudes to personal concerns. The participants appeared to be healthy individuals and were concerned by their personal well-being, thus relating more to environmental stressors than to cerebral stressors. This concern was also expressed when participants were asking relevant questions to the researcher about their own food consumption.

Triangulation

The quantitative data and the qualitative data provided for a mixed studies evaluation. However, comparing both data was neither relevant nor significant because of a limited population ($N = 7$). Nonetheless, both methods provided results completing each other. The quantitative analysis delivered statistical information on the effectiveness of the intervention. Pre-and-posttests indicated a reduction between the means of $SE = .83$. The Fat Phobia predicted, the lower the number, the less negativity (Bacon et al., 2001). The qualitative analysis conveyed a relationship between the material presented during the workshop and the participants emerging themes in their answers to the post-test with an occurrence of themes covered during the educational intervention and represented by 71.43 %. Obesity was more attributed to environmental and cerebral stressors (post-test answers) than to behavior (pre-post answers); confirming that attributing obesity to behavior was reported to cause more negativity than attributing obesity to other causes, such as heredity or illness.

Both analyses, quantitative and qualitative, addressed different aspects of the problem of negativity toward the obese population. The Structured Interview involved

constructs associating obesity to scientific facts within a cognitive approach; whereas the Fat Phobia consisted of constructs associating obesity to feelings and emotions. Thus, an approach more cerebral than environmental because emotions and feelings, even though provoked by external or internal situations, always translate in physiological events (Bernard, 1856; Bijaoui, 2002; Chrousos & Gold, 2002; Conti, 2001; Kontopoulou & Marketos, 2002; Petri, 1996; Pritchard et al., 2002; Puhl & Brownell, 2006; Seligman, 1975; Selye, 1946).

Workshop Evaluation

A Workshop Evaluation Form (Appendix J) asked participants about their experience in attending the workshop. Participants reported a general positive review of the workshop. They verbally and in writing communicated their little knowledge about the material covered. They also shared their immediate intent to change their behavior about their future food shopping.

One participant mentioned his little knowledge about the abbreviations used by the researcher in her Power-Point presentation. Although abbreviations were spelled out during the presentation, this information revealed a lack of proper targeting, as the researcher had assumed the abbreviations would be retained when orally spelled out. In response to this constructive comment, the researcher made the appropriate changes in her Power Point presentation.

Comparison with Findings of the Literature Review

The literature described three characteristics associated with obesity: negativity toward the obese populations, beliefs as predictors of attitudes, and personal behaviors as predictors of attitudes (Berryman et al., 2006; Hilbert et al., 2008; Puhl & Brownell,

2006). Berryman et al. (2006), Hilbert et al. (2008), Puhl and Brownell (2006) observed the general negativity toward obesity and the impact on the obese population. The Fat Phobia Scale predicted, the higher mean observed, the more negativity toward obesity. Before the intervention, the mean observed for the Fat Phobia Scale was 3.44. After the intervention, the mean was 2.61. Negativity was reduced by *SE* = .83. This result may indicate the possible effectiveness of the proposed intervention at a larger scale.

Beliefs were reported as predictors of behaviors and attitudes. Becker (1974) and Sjöberg (1982) established a correlation between personal behaviors and attitudes. Similarly, the results of the study indicated a relationship between beliefs, behaviors, and attitudes. This relationship was maintained after the intervention. Beliefs were challenged when confronted to scientific reports correlating obesity to specific stressors; subsequently, behaviors and attitudes indicated the anticipated change.

Miller et al. (1990) correlated a lack of information to no change in beliefs, behaviors, and attitudes; while Hilbert et al., 2008 and Puhl and Brownell (2006) observed that attributing obesity to genetics or to diseased conditions resulting in less negativity. The intervention provided information in an attempt to influence beliefs and attitudes, attributing obesity to environmental and cerebral stressors. As reported in the literature, attributing obesity to other causes than to the behavior of overeating resulted in less negativity. These findings suggested that subsequent interventions providing similar information could lower negativity toward the obese population.

Changing beliefs and attitudes involve educational, emotional, and cognitive processes (Becker, 1974; Festinger & Carlsmith, 1959; Griffin, 1997; Petri, 1996, Miller et al, 1999). Negativity toward obesity is a deep factor expressed in opinions and

attitudes. Even when challenged, it may not be easily modifiable. As a preventative measure, the researcher integrated specific theories (HBM and cognitive dissonance) to her presentation, which seemed to have made the participants aware of personal cognitive and emotional limitations and challenges involved in change. The strategies seemed to have positively worked. No confronting episodes occurred, in contrast to the time-period when the researcher was presenting her idea without similar strategies in place. No negativity about the research's premises was observed among the participants who assisted to the intervention.

To conclude, pre-scores of the research confirmed the findings of the literature. The impact of the implementation resulted in a measurable change of attitudes. The general negative attitude toward the obese population was reported and analyzed within the pre-test scores and answers. After the intervention, the post-tests indicated a change from negative attitudes to more positive ones. No similar interventions specifically designed to measure a change in attitude toward the obese population with pre-and-post-tests, while addressing a cognitive approach, seems to have been documented in the literature.

Implications of Findings

The data provided in the post-test questionnaire showed less negativity. The participants were more responsive to environmental stressors than cerebral stressors, probably because more concerned and at risk of environmental stressors' consequences. Although, it was very difficult to gather participants to assist to the workshop, once at the workshop, all were surprised by the topics covered and especially interested by the material relating to environmental stressors.

To insure best practices, a wider audience is highly recommended. A larger number of participants would allow for additional analysis without compromising confidentiality, while providing statistical results with validity and reliability. A granted and larger audience, such as within an established classroom situation; or a contracted audience reachable with research financial backup, would suggest better practices be employed.

Limitations

- There is always the possibility of introducing bias when addressing a program influencing negative attitudes toward obesity. An unbiased approach would require addressing the topic with neutrality.
- Lack of familiarity with the community activities in the time-frame of the study and a limitation on the ability to secure a location resulted in a delayed intervention and a low number of participants.
- Use of fliers not particularly noticeable may have contributed to the low participation, as they were surrounded by other fliers with vibrant colors and pictures. A more aggressive marketing strategy including involvement of stakeholders in the community and fliers catching attention could have increased the participants' number.
- Lack of resources needed to secure a physical location in a timely manner; and access to funding for advertising.

Recommendations for Further Research

The researcher proposed to confront negativity toward obesity with evidence that environmental stressors, such as food additives, are accountable for the global spread of

obesity. Similar rational approaches may offer valuable tools to measure a decrease in negativity toward the obese population. Participants were very much interested in learning about food additives for personal choice, and as prevention of consumption of unhealthy preservatives and weight gain. Therefore, the presentation may need to focus more on food additives and less on cerebral stressors. Education would lessen the weight gained associated with food additives. At the same time it could lessen negative attitudes toward obesity, as not behavior but environmental stressors would be accepted as causing the condition. Implementing an educational program targeting volunteers and focusing on changes in lifestyle would also benefit when it comes to food consumption. Unfortunately, organic food is correlated to a "higher price," as observed in the post-test of the Structured Interview.

The Structured Interview could be developed into a quantitative format. It has potential to capture people's personal behavior as a predictor of attitudes toward obesity, and to be a predictor of personal preventative behavior. Both factors, negativity and personal preventative behavior, may be influenced by the intervention designed for this research. This conversion would provide a professional and quantitative tool for estimating environmental stressors, a tool that was scare in the literature review and prompted the researcher to propose her Structured Interview.

The next recommendation would be to officially classified obesity as a disease of adaptation to stressors, as first theorized by Selye (1946). Obesity was correlated to the stages of the GAS (Selye, 1946) in Chapter One. Proposing obesity as a disease adapted to the bodily stress provoked by environmental stressors, as food additive and

composition, (Bijaoui, 2009) would open new perspectives to the now worldwide condition of obesity.

Additional recommendation concerns the relationship between depression and obesity (APA, 2000; NAAFA, 2009; Puhl & Brownell, 2006). It appears that depression could also be categorized as another secondary disease resulting from obesity. This classification, as the one previously recommended (obesity a disease of adaptation to environmental and cerebral stressors), is anticipated to reduce the damages resulting from the negativity addressed to the obese population. Other significant factors associated with obesity are calling for further research, such as the addictive quality of specific food additives.

Summary

Chapter Four reported the findings of an intervention designed to observe if an educational workshop would affect a sample population. The data collection included two methods, quantitative and qualitative. The quantitative data indicated less negativity in the means of the pre-and- posttests (*SE* = .83). The qualitative data demonstrated a change in participants' awareness on obesity and about environmental stressors by a 71.43 % increase.

Fulfilling the purpose statement, the researcher successfully developed and implemented an educational intervention for professional adults and students of a higher-education community in California; and assessed a change in attitudes toward obesity. However, the participants' turnover was not representative of the expected population. Answering the first sub-problem inquiry, "Does awareness about food additives change attitudes towards obesity after participation in an educational intervention?," the study

found that there were indications of a change of attitude by a slight decrease between pre-and-post means of the Fat Phobia Scale, and more understanding of the condition of obesity per the new themes reported in the post Structured Interview. To the second sub-problem inquiry, "Does awareness about cerebral activities affect attitudes towards obesity after participation in an educational intervention?", it was also found to be true as proven by the participants' answers in which obesity was no longer attributed to negative elements.

Obesity and negativity toward the obese population are both current and increasing problems. The proposed intervention may offer a tool to decrease negativity and to prevent or reduce obesity by adopting a lifestyle free of environmental stressors. The first intent of this project was to reduce negativity towards the obese population.

However, the need for a second scope of operations became apparent when participants demonstrated an unexpected interest in the material presented for personal consumption. The researcher had the impression that she was more influencing participants' future behavior of food shopping than negativity toward obesity.

Maybe then, this negativity could also be further addressed with individual projection in mind. Indeed, psychological projection appeared to the researcher as a possible reason for the general negative attitude of obesity. Similar educational interventions about food additives could result in both preventing obesity, and reducing negativity.

In other words, beside the cognitive approach of the intervention, the problem of negativity could be improved with a possible intervention including clearer premises about personal behavior and food shopping as a mean to positively influence attitudes

towards others; which could be assessed by a professionally constructed version of the Structured Interview into a quantitative inquiry. This new format would also allow for quantitative data and a more extensive comparison of results to the Fat Phobia Scale, while addressing environmental issues.

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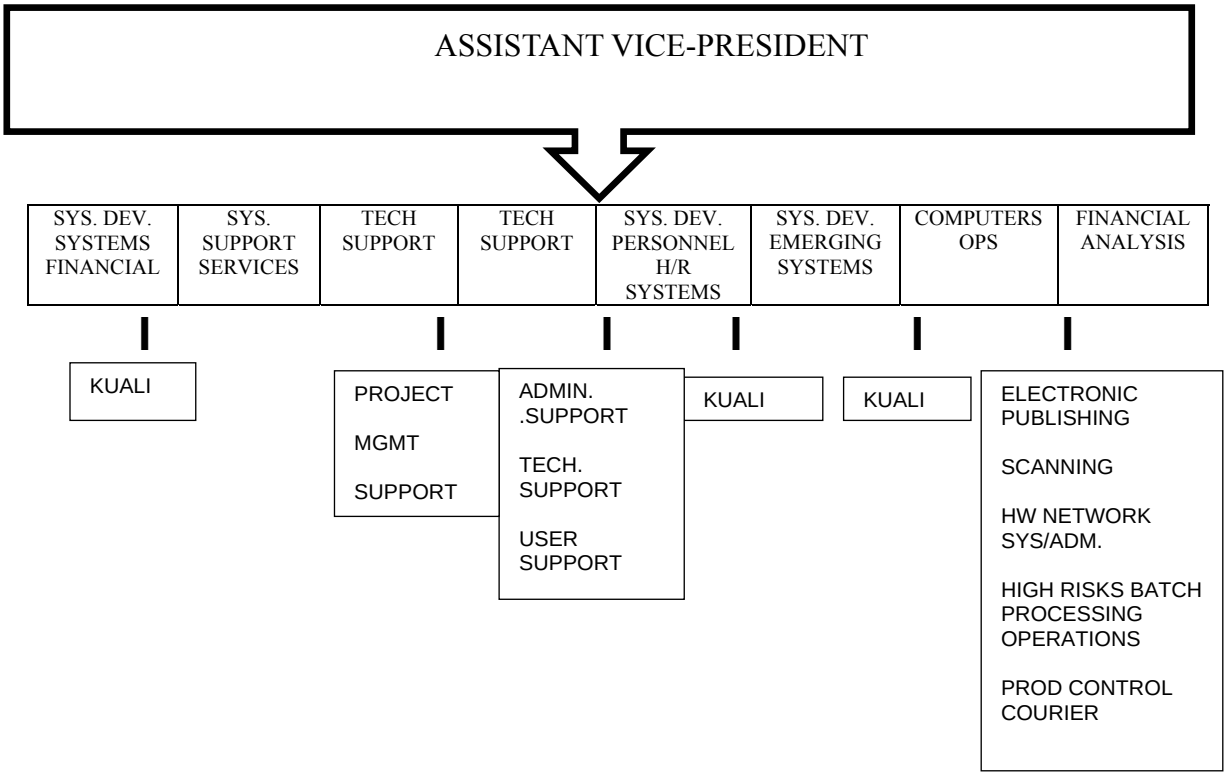
Appendix A

Organization Chart

Organization Chart

ADMINISTRATIVE INFORMATION SERVICES (AIS)



AIS Chart was selected because relevant to every function of the organization.

Appendix B

Informed Consent

Informed Consent

Obesity, a Disease of Adaptation to Environmental & Physiological Stressors
Principal Investigator: **Nadia Judith Bijaoui**
24-Hour Telephone Number: 310 – 776 -1059
KIRKSVILLE COLLEGE OF OSTEOPATHIC MEDICINE (KCOM)
UNIVERSITY OF SOUTHERN CALIFORNIA (USC)

You have been invited to participate as a subject in an experiment. The information you will be providing is confidential. Before you decide whether you want to participate in the experimental procedure, you have a right to the following information:

FDA & IRB REQUIRE THAT YOU MUST BE INFORMED ABOUT:

1. **Nature and purpose of the study**: This study is about attitudes towards obesity. You will be listening about factors other than behavior involved in obesity. About 55 subjects are expected to participate in this study.
2. **Procedures**: You will be asked to attend a workshop during which you will be learning about the environmental and biological factors involved in obesity. You will also be asked your opinion in the format of pre-and-posttests.
3. **Discomforts and risks:** No discomforts or risks are expected from the study.
4. **Benefits**: You may become aware of unhealthy composition when buying food. As a potential benefit to the society, you may attribute obesity to other factors than behavior, lessening the prejudice against the obese population.
5. **Alternative procedures:** An alternative would be not to participate.
6. **Should medical complications occur**, there are no medical treatments available. If you experience a medical emergency, we will call 911. You will be responsible for all costs and consequences there by incurred.
7. You will have the **opportunity to ask questions** about the study and the procedures before we start, or any time after. In addition, for additional information concerning your rights as a subject, you may contact, the Kirksville College of Osteopathic Medicine (KCOM) IRB Chairperson, R.J. Theobald, Jr., Ph.D. (660-626-2316). You also may follow up on your confidentiality by contacting KCOM IRB (660-626-2316).
8. **The ability to withdraw from the study**: Your participation is entirely voluntary and you have the right to withdraw at any time without penalty, prejudice, or loss to you.
9. **Written consent form:** you will be given a signed and dated copy**.**
10. You have the **opportunity to consent freely** to the study without coercion.

I have carefully read the information contained above and I understand fully my rights as a potential subject in this study.

Date: _____September 22nd, 2011_____ Time: _____

Signature: _____

Appendix C

Identification Questionnaire

Identification Questionnaire (IQ)

Your Identification Number (ID) = - - - -

Please, report your ID on each questionnaire where it is indicated.

Thank you!

Please, circle a letter:

1) **Sex** a) Male b) Female

2) Race/Ethnicity Background

a) African American or Black
b) Alaskan Native
c) American Indian
d) Asian
e) Hispanic or Latino
f) Native Hawaiian
g) Pacific Islander (Other than Native Hawaiian)
h) White
i) Other (Please, specify)

3) **Age Group**:

a) 18-25 c) 36-45 e) 56-65 g) 76-85
b) 26-35 d) 46-55 f) 66-75 h) 86 & over

4) Education Level

a) High School
b) Some College
c) 2-Year College
d) 4-Year College
e) Master Degree
f) Doctoral Degree
g) Professional Degree (D.Ed., D.H.Ed, J.D., M.D., Ph.D.)

5) Income Level – Yearly

a) less than $10,000
b) $10,000-$19,999
c) $20,000-$29,999
d) $30,000-$39,999
e) $40,000-$49,999
f) $50,000-$59,999
g) $60,000-$69,999
h) $70,000-$79,999
i) $80,000-$89,999
j) $90,000-$99,999
k) $100,000-$109,999
l) $110,000-$119,999
m) $120,000-$129,999
n) $130,000-$139,999
o) $140,000-149,999
p) $150,000 & up

Appendix D

Timeline

Timeline

Projected Timeline

Dates (by or before	Progress
September 7	Location, day, and time of workshop to be finalized
September 8	Material updated with new information
September 9	Announcements of workshops
September 22	Data collection
October 7	Data analysis of qualitative results
October 11	Data analysis of quantitative results
November 22	Completion of Chapter 4

Appendix E

Fat Phobia Scale

Fat Phobia Scale

Identification Number: _ _ _ _

Please circle the appropriate test: Pre-Test Post-test

Listed below are 14 pairs of adjectives sometimes used to describe obese or fat people. For each adjective pair, please place an X on the line closest to the adjective that you feel best describes your feelings and beliefs.

1)	Lazy	_____	_____	_____	_____	_____	industrious
		5	4	3	2	1	
2)	no will power	_____	_____	_____	_____	_____	has will power
		5	4	3	2	1	
3)	attractive	_____	_____	_____	_____	_____	unattractive
		5	4	3	2	1	
4)	good self-control	_____	_____	_____	_____	_____	poor self-control
		5	4	3	2	1	
5)	fast	_____	_____	_____	_____	_____	Slow
		5	4	3	2	1	
6)	having endurance	_____	_____	_____	_____	_____	having no endurance
		5	4	3	2	1	
7)	active	_____	_____	_____	_____	_____	inactive
		5	4	3	2	1	
8)	weak	_____	_____	_____	_____	_____	Strong
		5	4	3	2	1	
9)	self-indulgent	_____	_____	_____	_____	_____	self-sacrificing
		5	4	3	2	1	
10)	dislikes food	_____	_____	_____	_____	_____	likes food
		5	4	3	2	1	
11)	shapeless	_____	_____	_____	_____	_____	shapely
		5	4	3	2	1	
12)	under eats	_____	_____	_____	_____	_____	overeats
		5	4	3	2	1	
13)	insecure	_____	_____	_____	_____	_____	secure
		5	4	3	2	1	
14)	low self-esteem	_____	_____	_____	_____	_____	high self-esteem
		5	4	3	2	1	

Appendix F

Structured Interview

Structured Interview

Identification Number: _ _ _ _

Please circle the appropriate test: Pre-Test Post-test

Question 1:

When you go shopping for food, what makes you decide what to buy, or not to buy?

Question 2:

In your opinion, what contributes to obesity?

Question 3:

In your opinion, what's going on with someone who is obese?

Appendix G

Flier for Recruitment of Participants

Essential Stressors in Obesity

Workshop

USC Faculty, Staff, & Students,

Your opinions are welcome!

You are invited to participate to a research project.

You will be asked about your attitude toward obesity with pre-and-posttests.
This is completely confidential.
Your participation is greatly appreciated.

Grace Ford Salvatori Hall l- GFS 118
Thursday September 22nd, 2011
3:30 to 4:50
Host: Dr. Nadia Judith Bijaoui, CA Research

Psychoanalyst RP 102

Bio-Health-Education
100 Wilshire Blvd., Suite 950
Santa Monica, CA 9401
310 – 776-1059

R.S.V.P. is optional

Appendix H

Coding System for Pilot Interview

Coding System for Pilot Interview

For the pilot interview of July 2010, in the answers of three participants to the open-ended questionnaires, the recurring themes were: “Healthy,” “Cheaper,” “Not so bad.” The coding system used for this pilot interview was:

Word	Code	Frequency
Healthy	1	2
Cheaper	2	2
Not so bad	3	3

A similar coding system will be established for the research and the frequency of the themes will be counted and discussed. Participants the study are expected to be 55 or more, a significant larger number than this pilot interviews. Consequently, the analysis of the coded system will be more involved and the answers scaled.

Appendix I

Syllabus Essential Stressors in Obesity

SYLLABUS

ESSENTIAL STRESSORS IN OBESITY

Instructor: Nadia Judith Bijaoui, Ph.D., CA RP #102

Workshop Location: Grace Ford Salvatori Hall-GFS 118

Date & Time: September 22, 2011 from 3:30 to 4:50 p.m.

Instructor's Contact: Telephone: 310 -776-1059 –Email: bhe@bio-health-edu.com

Course Description:

The course consists of one workshop with two parts, Part 1 & Part 2.
The content is based on published scientific evidence about obesity.
The course is designed to identify Essential Stressors in Obesity

Course Objectives:

1. Introduce research articles connecting food additives (FA) to obesity.
2. Identify common behaviors to lose weight as health damaging attempts (DA).
3. Recognize FA & DA (FADA combined) as environmental stressors.
4. Introduce research articles connecting brain activities to obesity.
5. Review general attitudes toward obesity.

Workshops Attendance:

Your presence to the workshop from its beginning to its end is greatly appreciated.

Class Requirements: No requirement

Assessment: None, only participation to pre-and-post survey and to three open-ended questions.

Course Outline

- Informed Consent - Anonymous Demographic Questionnaire – Pre-Tests
- Intermediate narrative about the health believe model
- * Part 1: Food additives (FA) causing obesity & Damaging Attempts (DA)
  - FADA (FA & DA) as environmental stressors
  - The effects of stressors on the human body (The General Adaptation Syndrome)
- Break
- Intermediate narrative about cognitive dissonance
- Part 2: Cerebral stress in obesity
  - Attitudes toward obesity
- Recap of Parts 1 & 2
- Post-Tests & Workshop Evaluation

Thank you for Participating!

Appendix J

Workshop Evaluation Form

Workshop Evaluation Form

Thank you for being here today!

Please, help me to improve this workshop with your opinion and comments.

On a scale from 1 to 5, with 1 = Poor and 5 = Excellent,
please rate the following entries by circling a number

1- Clarity

Poor	Adequate	Good	Very Good	Excellent
1	2	3	4	5

2- Content

Poor	Adequate	Good	Very Good	Excellent
1	2	3	4	5

3- Organization

Poor	Adequate	Good	Very Good	Excellent
1	2	3	4	5

4- Audio-visual

Poor	Adequate	Good	Very Good	Excellent
1	2	3	4	5

5- Resource material

Poor	Adequate	Good	Very Good	Excellent
1	2	3	4	5

Please, indicate:

What did you like the least in this presentation?

What did you like the most?

What do you think would be done to improve this presentation?

If you need more space, feel free write on the back of this page

Appendix K

Budget

Budget

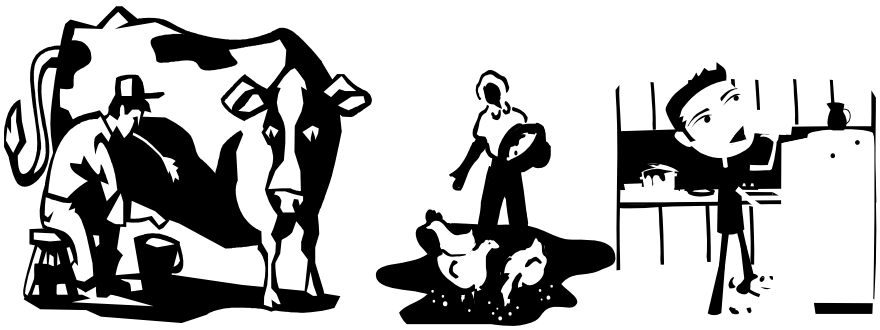
Budget

Expense	Estimated Cost$	Final Cost $
Travel		
Gasoline	165	275
Parking	150	0
Hotel		350
Workshop		
Paper cost	200	150
Printing	200	212
Projection system	500	0
Locations	500	0
Miscellaneous	140	225
Total	1,855	1,212

Appendix L

Last Flier for Recruitment of Participants

WHAT'S IN THE FOOD WE EAT?



Diseases of the intestines?
Hormones? Additives?
Type II Diabetes?
Breast
Cancer?

"THINGS WE SHOULD KNOW …"

Faculty, Staff, & Students
Your opinion is welcome!

Drawing: A $25 GIFT CERTIFICATE AT STARBUCK'S

Wednesday December 7, 2011
Taper Hall THH 112
Time: 12:00 to 1:00 p.m. (Brown Bag)

Your participation to this research project is greatly appreciated! You will be asked about your attitude toward obesity & about your behavior when eating with pre and post-tests. **Please Remember:** This is completely confidential.

See you there!

Hosted by Dr. Nadia Judith Bijaoui, CA Research Psychoanalyst RP # 102
100 Wilshire Blvd., Suite 950 Santa Monica, CA 9401

Essential Stressors in Obesity

Consent Form

Fat Phobia Survey

Demographics

Structure Interview

Introduction

ESSENTIAL STRESSORS IN OBESITY©2011

October, 25th, 2011

Dr. NADIA JUDITH BIJAOUI,
CA Research Psychoanalyst, # RP 102

Obesity, a Disease of Adaptation to Environmental & Physiological Stressors

Essential Stressors in Obesity

Content Page 1 of 2

- Pre-Test
- The Health Belief Model (HBM)
- Part 1: **Environmental Stressors**
  - Food Additives (FA)
  - Damaging Attempts (DA)
  - FA&DA = FADA
- The General Adaptation Syndrome (GAS)

Essential Stressors in Obesity

Content Page 2 of 2

- Cognitive Dissonance Theory
- Part 2: **Cerebral Stressors**
  Obesity & Attitudes
- Recap of Parts 1 & 2
- Post-Test

The Health Belief Model

(HBM) - Becker 1974

perception <-> belief <-> attitudes

behavior of overeating <-> causes obesity <-> negative attitudes of the obese population

perception ->? belief ->? attitudes

new evidence ->? new causes of obesity ->? change in attitude?

Environmental Stressors
Food Additives (FA) & Obesity

- 1 Processed Meats & Fast Food
- 3 Monosodium Glutamate (MSG)
- 4 High-Fructose Corn Syrup
- 5 Growth Hormones & Bovine Hormone
- 6 Margarine
- 7 Breast Cancer
- 8 Big Food Games

Processed Meats

Vang et al., 2008

- 17 years longitudinal study
- Population: 8,401 adults between 45 & 80
- Eating processed meat at least once a week
- Link between processed meats & weight gain?
- Results: **Processed** meats intake =

  74% chance of **obesity & diabetes**

Fast Food

Binkley et al., 2000

- 2 years study
- Population: 16,103 adults
- Food Away From Home (FAFH)
- FAFH = fast food & packaged food
- Results: Intake of **fast food**

A major contributing factor to **obesity**

Monosodium Glutamate (MSG)

He et al., 2008

- Population: 752 adults btw 40-59
- One group: Use of MSG
- Other group: No use of MSG
- Results: **MSG** users

A higher prevalence of **obesity**

High-Fructose Corn Syrup (HFCS)

Bray et al., 2004

- Population: All American from 2 & up
- Source: Food consumption tables
  U.S. Department of Agriculture
- HFCS: Added sweeteners to food and drinks
- Results: Temporal relationship btw
  obesity & HFCS
- Consumption increase in 20 years =
  1000% per person

Growth & Bovine Hormones

Hansen & Wallinga, 2007
Turner et al., 1998

*rBGH, rBST, bGH = genetically engineered hormones injected to cows

*Purpose: To increase milk production

*Results: - First, mice maintained similar weight.

- Then, experimental group→4.5 x bigger than control

No bGH

bGH + bGH + bGH + bGH + ½ bGH

Margarine

Weil, 1999

- Is margarine the ideal substitute for butter?
- Weil insisted future research would deny that!
- Experiment: Stick of margarine in garage or in dry area.
- Two days later: No change, no flies, nothing!
- Margarine hardens like plastic

arthrosclerosis and high cholesterol

- Commercial butter

pesticides

Breast Cancer

Gray, 2008

The Connection Between Breast Cancer and The Environment

- Confirmed Weil's prediction
- Pesticides
- Food additives (FA)
- rBST Growth Hormone
- Weight gain

Big Food Game

Brownell & Warner, 2009

The Perils of Ignoring History:

Big Tobacco Played Dirty and

Millions Died.

How Similar Is Big Food?

Damaging Attempts (DA) & Obesity

- **Removing sea salt**
- **Removing natural sugar**

Removing Natural/Sea Salt

McCance & Huether, 1998

- Sodium-Potassium Pump:

  Cellular transport system btw

  sodium & potassium

"Changes in the ratio" of… "available sodium and potassium" … "are responsible for many of the symptoms associated with potassium imbalance"

- **Removing salt → Perturbing cells**

Removing Natural Sugar

Whitmer (2006):

Alarming occurrence of dementia in older Type 2 Diabetics

Whitmer et al. (2009):

Correlation btw obesity & Dementia

Busko (2009):

Diabetes increases dementia & Alzheimer's risk by 125%.

Don't be alarmed!

The cure is closer & easier than we think!

Removing Natural Sugar

Swanson and Suh (2005):

Effectiveness of natural sugar/glucose for therapy of comatose diabetics to prevent neurological damages.

Honour (1997):

Glucose is the favorite food of the brain!

Bijaoui (2009):

Why was natural sugar removed in the first place? It does not guarantee weight loss but damages the brain.

Even ADA recommends sugar now!

FADA & THE G.A.S

- FADA=Food Additives & Damaging Attempts

- General Adaptation Syndrome (G.A.S), Selye, 1946

G.A.S & Stressors

- (a) Alarm Stage

  Fight? Flight? Exposure to FADA
- (b) Stage of resistance

  Mobilization of Defenses

  Absorption of FA, Habituation, Saturation
- (c) Stage of Exhaustion

  Stressors → Compensatory Mechanism

G.A.S & Stressors

- Selye (1946): Diseases of Adaptation
- Chouros & Gold (2002)

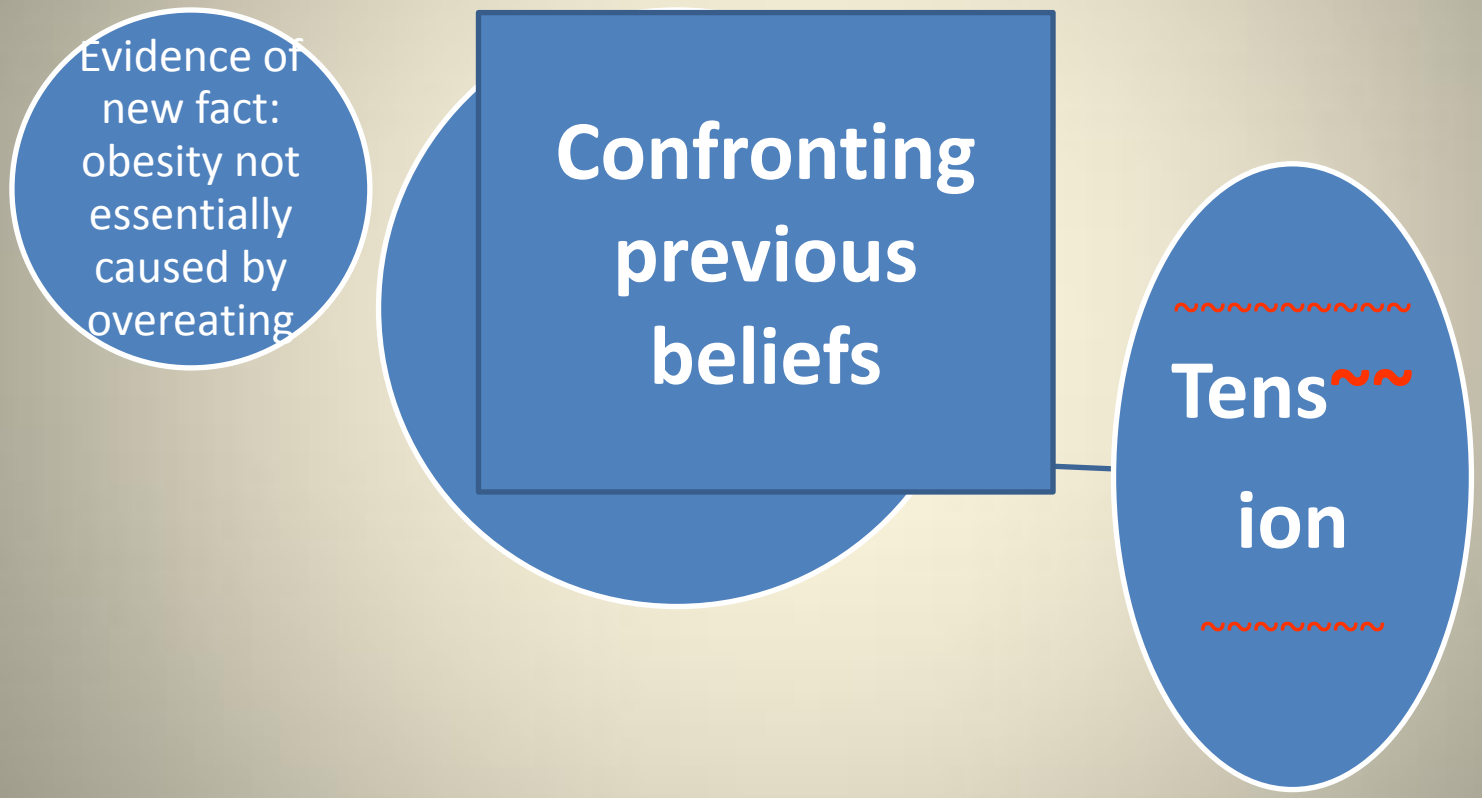
  Malfunction of the Stress-System

  → Life-Threatening Diseases

Obesity is a Disease of Adaptation & Life Threatening

Cognitive Dissonance Theory

Festinger & Carlsmith (1959)



Cognitive Dissonance Theory

Festinger & Carlsmith (1959)

Overeating is not the essential cause of obesity **but essential stressors are**

Cognitive Dissonance Theory

Festinger & Carlsmith (1959)

Previous belief:
Overeating is the essential cause of obesity

~~~~~~~~~~Tens~~ion

~~~~~~~

Dealing With Tension 1 of 2

~~~~~~~~~~Tens~~ion

~~~~~~~

Health Belief Model (HBM)

HUMOR

The Health Belief Model

perception <-> belief <-> attitudes

behavior of overeating <->

causes obesity <->

negative attitudes of the obese population

perception ->? belief ->? attitudes?

new evidence ->? causes obesity ->? change in attitude?

Dealing With Tension 2 of 2

T~~~~~~~~~~~~~ens~~~~ion

from the unconscious to consciousness

Cerebral Stressors

Pritchard et al. (2002):

Relationship btw hypothalamus, the melanocortin hormone, & obesity.

Pinkney (2004):

Hormonal imbalances correlated to obesity

Ozaki & Murphy (2003):

Obsessive-Compulsive-Disorder (OCD) correlated to genetic formation & to serotonin production

Cerebral Stressors

Eight Theories of Obesity

Genetic

Lipoprotein-Lipase

Thermogenic

Sodium-potassium-adenosine-triphosphatase pump

Psychological Causation

Fat-cell

Lipostatic

Diabetes-Associated

Obesity & Attitudes

Berryman et al. (2006):

- Dietetics & nondietetics students
- Both groups had negative attitudes

Puhl & Brownell (2006):

- Overweight & Obese
- Surveys about weight stigmatization
- 80% reported dealing with stigmas by eating more

Recap

If obesity is caused by factors other than behavior such as food composition & malfunction in the brain does the obese population, deserve to be stigmatized?

Essential Stressors in Obesity

Post-Test

Workshop Evaluations

Fat Phobia Survey

Structure Interview

Thank You very much
For your time & participation!