

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

NUTRITION AND SUBSTANCE ABUSE

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Family and Consumer Sciences

by

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DEDICATIONS

This thesis is dedicated to:

My father and mother Drs. Donald and Deborah Wiss, who supported me unconditionally during my long educational journey. My father is my role model, who taught me how to write and act like a professional. My mother supported me with her wisdom and unconditional love. I could not have completed this thesis without their love and support.

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To all drug addicts and alcoholics who continue to suffer. Many do not have access to resources for recovery. Others will recover and lead productive lives. My hope is that eventually nutrition interventions will be standard protocol in recovery from substance abuse.

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TABLE OF CONTENTS

Signature Page	ii
Dedication	iii
Acknowledgement	iv
List of Tables	vii
Abstract	viii
CHAPTER I - INTRODUCTION	1
Statement of the Problem	1
Purpose	4
Definitions	4
Hypotheses	5
Assumptions	6
CHAPTER II - REVIEW OF THE LITERATURE	
The US Veteran Population and History	7
Veterans Affairs (VA)	7
Population	8
Current Issues	8
Chronic Disease and Nutrition	10
Obesity	10
Diabetes (DM)	11
Hypertension (HTN)	12
Nutrition	13
Mental Health and Substance Abuse	13
Mental Health	13
Substance Abuse	14
Nicotine, Caffeine	18
Self-Care and Gender	19
Self-Care	19
Gender	19
Food Addiction and Neurochemistry	20
Gray Literature	22
Behavior Change and Recovery	24
Substance Abuse Treatment	24
Behavior Change	25
Nutrition and Exercise	28
Other Proposals	29
MOVE! Weight Management Program	30
CHAPTER III - METHODOLOGY	33
Hypotheses	34
Sample	34
Survey Design	35
Procedures	37
Descriptive Analysis	38

CHAPTER IV - RESULTS	40
Research Hypothesis One	40
Research Hypothesis Two	44
Research Hypothesis Three	48
Research Hypothesis Four	50
CHAPTER V - DISCUSSION	51
Discussion of the Hypotheses Findings	51
Hypothesis One	52
Hypothesis Two	53
Hypothesis Three	54
Hypothesis Four	55
Previous Findings Within the VA System	56
Study Limitations	58
Practical Implications	59
Conclusion	61
REFERENCES	63
APPENDICES	77

LIST OF TABLES

Table 1 - Group Statistics (Hypothesis One)	40
Table 2 - Independent Samples Test (Hypothesis One)	41
Table 3 - Total Variance Explained (Hypothesis Two)	45
Table 4 - Rotated Component Matrix (Hypothesis Two)	46
Table 5 - Group Statistics (Hypothesis Two)	47
Table 6 - Independent Samples Test (Hypothesis Two)	47
Table 7 - Total Variance Explained (Hypothesis Three)	48
Table 8 - Rotated Component Matrix (Hypothesis Three)	49
Table 9 - Group Statistics (Hypothesis Three)	49
Table 10 - Independent Samples Test (Hypothesis Three)	49
Table 11 - Correlations (Hypothesis Four)	50

ABSTRACT

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Drug addiction and alcoholism represent a major health problem in the US. Veterans in particular have high rates of substance abuse and the VA healthcare system incurs a large portion of the expense. Chemical dependency is associated with malnutrition, and there is increasing evidence to suggest that nutrition can play an important role in recovery. The present study measured attitudes, beliefs, and behaviors towards nutrition, health, and self-care in a population of US veterans enrolled in the MOVE! Weight Management Program. Using anonymous surveys, individuals with a self-reported history of substance abuse were compared to individuals without a history of abuse. The study found that depression leads to overeating for individuals recovering from substance abuse ($p = 0.052$). Other findings that approached significance suggest that persistence of bad habits in this population is not due to an absence of desire for a better life, but more likely due to the impact of addiction on the brain. Disordered and dysfunctional eating behaviors persist after abstinence has been achieved. The study confirms that self-efficacy is a useful predictor of positive change beliefs. The evidence provided supports the need for greater levels of nutrition care among individuals with a history of drug addiction and/or alcoholism. The impact of nutrition interventions by trained dietitians in substance abuse treatment settings warrants further investigation.

CHAPTER I

INTRODUCTION

In 2011, nearly one quarter (22.6%) of persons aged twelve or older had participated in a binge drinking episode, which is defined as having five or more drinks on the same occasion at least once within 30 days (Substance Abuse and Mental Health Services [SAMSHA], 2012). Heavy drinking was reported by 6.2 % of persons aged twelve or older, which is defined as binge drinking on at least five days in a month. Nine percent of the population aged twelve or older reported being illicit drug users. Among those aged 50 to 59, the rate of illicit drug use increased from 2.7% in 2002 to 6.3% in 2011. Over 20 million persons (8% of population aged twelve and older) were classified with substance dependence or abuse based on criteria specified in the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV). Nearly 40% of substance abuse treatment admissions report concurrent alcohol-drug combinations (SAMHSA, 2011). According to a population wide study of the Veterans Affairs (VA) healthcare system, more than 60% of marginal costs due to substance abuse are from inpatient care (Yu et al., 2003). Substance abuse is a known problem in veterans, contributing significantly to the healthcare costs throughout the VA system.

Statement of the Problem

Malnutrition associated with substance abuse can be either primary or secondary. Primary malnutrition occurs when substance abuse displaces, reduces, or compromises food intake. Secondary malnutrition occurs when the substance of abuse causes alterations in the absorption, metabolism, utilization, and excretion of nutrients due to compromised oral, gastrointestinal, circulatory, metabolic, and neurological health.

Malnutrition negatively impacts all body systems including the immune system, leading to an inadequate response to disease. While the harmful effect of alcohol on nutritional status has been well described, the mechanisms behind illicit drug-induced malnourishment remain largely unknown. It is difficult to differentiate between primary and secondary malnourishment within drug-addicted populations. In addition, there are ethical and legal challenges in conducting controlled trials using illicit substances, as well as difficulties with patient follow-up. Most of the data that links nutritional deficiencies to substance abuse is speculative, underpowered, and retrospective.

The Academy of Nutrition and Dietetics (referred to as The Academy, formerly the American Dietetic Association [ADA]) published a position paper in 1990 supporting the need for nutrition intervention in treatment and recovery from chemical dependency (ADA, 1990). The paper promoted the concept that Registered Dietitians (RD) are essential members of the treatment team and that nutrition care should be integrated into the protocol rather than “patched on”. Nutrition professionals were urged to “take aggressive action to ensure involvement in treatment and recovery programs” (p. 1274). In the past 15 years, there has been little progress in incorporating dietitians into drug rehabilitation programs, despite the continued explosion of illicit drug abuse. The reasons for this are multifactorial and include: lack of interest, limited funding for new initiatives, non-collaboration between the public and private sector, difficulties conducting research on this population, and the associated stigmas of substance abuse.

Drug abuse appears to be a risk factor for the metabolic syndrome (Virmani, Binienda, Ali, & Gaetani, 2007), which is a cluster of cardiovascular disease risk factors that include abdominal obesity, diabetes and prediabetes, elevated cholesterol and high

blood pressure (International Diabetes Federation, 2011). Substance use disorders have also been correlated with a variety of eating disorders (Krahn, 1991; Wilson, 2010) including binge eating and purging (Fischer, Anderson, & Smith, 2004). Eating disorders among the male population remain under-diagnosed, undertreated, and misunderstood by many clinicians (Strother, Lemberg, Stanford, & Turberville, 2012). Disordered eating patterns described as “food addiction” share features with drug addiction at the neurobiological level (Kessler, 2009; Liu, von Deneen, Kobeissy, & Gold, 2010; Wilson, 2010). Drug addicts and alcoholics who eventually become sober often display altered responses to sugar, salt, and fat compared to those without a history of abuse (Gant & Lewis, 2010; Levine, Kotz, & Gosnell, 2003). Predictability and reversibility of these neurobiological and/or physiological conditions has not been established.

Due to the broad spectrum of psychological and physiologic dependence related to substance abuse, treatment should be instituted on an individual basis (Hatcher, 2008). Once sobriety has been achieved, altered biochemistry and dysfunctional behavior resulting from substance abuse often persists. The practice of making healthful food choices while abstinent from drugs and alcohol may be challenging in the early stages of recovery. Sobriety often creates new emotions, anxiety, and uncertainty (Hatcher, 2008). Patients often seek a predictable and comforting response from food, which can lead to overeating, relapse, compromised quality of life, and the development of chronic disease.

Increased caloric intake and excessive consumption of sugar, salt, and fat often leads to obesity, diabetes, and hypertension, which in turn increases the risk for cardiovascular disease and the clinical burden associated with substance abuse. Epidemiological research has linked obesity with substance use disorders in men (Barry

& Petry, 2009). Findings by Robinson and McCreary (2011) suggest that even a remote history of substance abuse can negatively impact weight loss. Evidence to date indicates that individuals in recovery may benefit from learning new behaviors with respect to food and nutrition. There is also an increasing body of literature that suggests nutrition interventions in substance abuse treatment lead to improved outcomes (Barbadoro et al., 2010; Grant, Haughton, & Sachan, 2004; Cowan & Devine, 2012). Dysfunctional eating patterns and nutritional interventions in the substance abuse population both require further investigation.

Purpose

The purpose of this study is to measure attitudes, beliefs, and behaviors towards nutrition, health, and self-care in a population of US veterans enrolled in the Managing Overweight Veterans Everywhere (MOVE!) Weight Management Program at the VA Greater Los Angeles. Based on survey responses, individuals with a self-reported history of substance abuse will be compared to individuals without a history of abuse. The goal of the study is to determine if veterans with a history of substance abuse require greater levels of care including individualized nutrition education. The aim is to evaluate the necessity of the inclusion of unique nutrition interventions into substance abuse treatment programs.

Definitions

1. *Addiction* is a physical dependence and continued use of a substance despite negative consequences. According to the American Society of Addiction Medicine (ASAM), “addiction is a primary, chronic disease of brain reward, motivation, memory, and related circuitry” (ASAM, 2012).

2. *Alcoholism* is continued abuse of alcohol despite negative consequences, often including organ damage. Alcoholism is considered a form of addiction.
3. *Substance use disorder* includes substance abuse and substance dependence (APA, 2000).
4. *Substance abuse* will include addiction, alcoholism, and is a substance use disorder.
5. *Comorbidity* is the coexistence of two or more medical conditions or diseases.
6. *Dual diagnosis* is the co-occurrence of substance abuse and mental illness.
7. *Sobriety* is the physical abstinence from non-prescribed drugs and alcohol.
8. *Recovery* refers to the restoration of physical and mental health.
9. *Treatment* refers to drug and/or alcohol rehabilitation services.

For a list of abbreviations used throughout, please see appendix A.

Hypotheses

Null Hypothesis

There are no significant differences in attitudes, beliefs, and behaviors towards nutrition, health, and self-care in individuals with a history of substance abuse and individuals without a history of abuse among participants within the MOVE! Weight Management Program.

Four Research Hypotheses

1. Individuals with a history of substance abuse will have more difficulty controlling their overeating than those without a history of abuse.

2. The attitudes, beliefs, and behaviors towards nutrition and health of individuals with a history of substance abuse will vary from individuals without a history of abuse.
3. Individuals with a history of substance abuse will express more self-destructive health attitudes than those without a history of abuse.
4. Measurements of self-efficacy will be correlated with health beliefs.

Assumptions

- Participation from veterans in the MOVE! Program will be voluntarily.
- Participants will have the mental capacity to fully comprehend the content of the questionnaire.
- Participants will respond truthfully when answering the questionnaire.
- Participants will truthfully self-report substance abuse history to reflect the presence of alcoholism, drug addiction, or substance use disorder across their lifespan.
- Validated survey tools contain no cultural, gender, or generational biases.

CHAPTER II

LITERATURE REVIEW

The purpose of this chapter is to provide an overview of the veteran population and the nutrition-related health issues they currently face, and to review existing literature linking substance abuse to nutrition, both during abuse and while in recovery. The impact of nutrition interventions in substance abuse recovery will be evaluated. Theoretical support for the research hypotheses will be provided. Additional information and support can be found in appendices A-H, which are referenced throughout the chapter.

The US Veteran Population and History

Veterans Affairs (VA)

The VA celebrated its 75th Anniversary on July 21, 2005. Originally called the Veterans Administration (VA) serving 4.6 million veterans in 1930 (US Department of Veterans Affairs [USDVA], VA History in Brief), the VA is currently responsible for providing an array of benefits and services to more than 20 million veterans (USDVA, National Survey of Veterans [NSV], 2010). In 2005, Veterans Centers handled over one million visits by veterans and their families. According to a 2009 report, the spending budget was projected at \$93.4 billion, a 7% increase from the year prior (USDVA, Fact Sheet, 2009). Data from 2009 reports 47 different residential rehabilitation treatment centers. VA's Greater Los Angeles (GLA) 2010 Annual Report indicates that the VA has implemented a new patient-centered model of care delivery, while receiving awards at the 2010 National Planetree Conference for extraordinary achievements in Patient-Centered Care. VA spokespeople emphasize evidence-based, high-quality healthcare. According to the vision statement, "this care will be delivered by engaged, collaborative

teams in an integrated environment that supports learning, discovery, and continuous improvement” (USDVA, GLA Healthcare System, 2010). For a detailed history of the VA, please see Appendix B.

Population

According to the NSV (2010), 64% of veterans are 55 years of age or older. Ninety-two percent are male, with 85% identifying as White-only. Roughly one-third report having served in a combat or war zone and a similar percentage report having been exposed to dead, dying, or wounded people. Seventy-two percent of veterans reported that they were in good health, and 28% reported using VA services at some point. Of veterans who have never used VA healthcare, 42% indicated they were not aware of VA healthcare benefits and 26% indicated they did not know how to apply for benefits. Currently active duty includes the Army, Navy, Marines, Air Force, and the Coast Guard. Non-active includes the demobilized National Guard and Reserve members. Of the non-active, 84% are between 25 and 54 years of age. Eighty-seven percent reported good health and over 39% report having used VA healthcare services at some point. Of the Active Duty Service members, 86% report being male with 92% being younger than 45 years. Eighty-three percent reported being non-Hispanic, 75% reporting White, and 15% African American. Over 60% of all Active Duty Service members indicated plans to utilize VA healthcare after separation (USDVA, NSV, 2010).

Current Issues

Patients treated at VA medical centers are older and have higher rates of chronic disease relative to the general population (Wakefield, Hayes, Boren, Pak, & Davis, 2012). Chronic conditions are among the most common causes of disability and death in the

United States (US) and patients with these conditions receive a disproportionate amount of healthcare relative to the average patient. Veterans tend to be more socio-economically disadvantaged, and in poorer health (19%) compared to 4% in the general population (Sparks & Bollinger, 2011). Veterans are at greater risk than non-veterans for becoming homeless and are overrepresented among the homeless in the US (Fargo et al., 2012). Men in the 45- to 54-year-old age group appeared to be at the highest risk for homelessness. Homelessness can either cause or precede chronic health conditions and complicate the treatment and care of such conditions. Authors state “as the VA responds to an aging veteran population through increased reliance on community-based care to treat chronic illness, those with the most tenuous ties to the community will present the most pressing challenges” (Fargo et al., 2012, p. 4).

Yu et al. (2003) assessed the cost of 29 chronic conditions at the VA, which included services such as specialized mental health, long-term care, rehabilitation, domiciliary care, and pharmacy benefits. Not including costs of contract medical services provided at non-VA facilities, healthcare expenditures totaled \$14.3 billion in fiscal year (FY) 1999. Seventy-two percent of VA patients have at least one of 29 chronic diseases, accounting for 96.5% of total VA healthcare costs. Thirty-five percent of veterans had three or more conditions or co-occurring disorders, accounting for 73% of VA’s total healthcare cost. The presence of comorbidities poses complications to health-related research, as it becomes increasingly difficult to determine accurate health status, especially when comorbidity is associated with less accuracy of self-report (Singh, 2009). For more information regarding current issues within the VA healthcare system, please see Appendix C.

Chronic Disease and Nutrition

Obesity is defined as having a body mass index (BMI) of 30 or greater. Obesity is known to increase the risk of developing multiple chronic diseases including diabetes mellitus (DM), stroke, some cancers, and heart disease, with escalated chances of disability and comorbidity (Sparks & Bollinger, 2011). Other known associations include hypertension (HTN), dyslipidemia, osteoarthritis, as well as increased healthcare costs and societal burden (Nelsen, 2006). According to Wakefield et al. (2012), DM prevalence within the VA healthcare system is 27% relative to the 18% in US population ages 65 and older, and heart failure prevalence in the VA is 4.6% compared to 2.6% in US males. In a study from a VA in Florida, 34% had hyperlipidemia and 21% had coronary artery disease (CAD) diagnoses (Neugaard, Priest, Burch, Cantrell, & Foulis, 2011).

Obesity

Sparks and Bollinger (2011) used data from the 2008 Behavioral Risk Factor Surveillance System (BRFSS) to assess predictors of obesity risk among the veteran population. Researchers concluded that male veterans have an increased risk of obesity compared to non-veterans, with no significant difference in obesity risk for female veterans after controlling for all variables. Obesity research using a national probability sample of veterans from the 2003 BRFSS yielded similar findings. Nelsen (2006) points out that BRFSS data can underestimate obesity prevalence but has good reproducibility and validity for HTN, DM, and dyslipidemia. Results indicate that veterans utilizing the VA were less likely to meet national guidelines for physical activity or eat the recommended amounts of daily fruits and vegetables compared to non-veterans. Nelsen (2006) also found low rates of preventative health behaviors. The study clearly justified a

need for weight management interventions within the VA, including bariatric surgery and the multidisciplinary Managing Overweight and/or Obesity for Veterans Everywhere (MOVE!) program, which began in 2004 as part of the HealthierUS Veterans initiative and was nationally disseminated in 2006.

Overweight and obesity have also been associated with psychiatric disorders. Petry, Barry, Pietrzak, and Wagner (2008) used data from the National Epidemiological Survey on Alcohol and Related Conditions and found BMI to be significantly associated with most mood, anxiety, and personality disorders. Currently, between 10% and 20% of the obese have a mood and/or anxiety disorder. Any lifetime alcohol use disorder was significantly elevated in all groups who exceeded normal BMI with alcohol dependence being higher among the obese. The study found no association between BMI and illicit substance abuse disorders. While this study did not look specifically at the veteran population, findings highlight the complexity of comorbidity and suggest that interventions targeting weight loss may benefit from an integrated treatment model addressing psychiatric issues (Petry et al., 2008).

Diabetes (DM)

Combined Veterans Health Administration (VHA) and Medicare data reveal a prevalence of DM among veterans in excess of 25% (Kupersmith et al., 2007). This diabetic population has impacted total inpatient spending by over \$3 billion in fiscal year (FY) 1999, including VHA plus Medicare. DM is the primary cause of renal failure, and can lead to other complications including vision loss or amputation. A quarter of diabetic patients also carry a comorbid mental illness diagnosis. Many psychotropic drugs promote weight gain and can therefore also contribute to poor outcomes. According to

Althaus (2001), “alcoholism, drug addiction, and even eating disorders are associated with abnormal glucose metabolism. When blood glucose levels drop, the addicted person will experience depression, anxiety, and moodiness and crave their usual drug, behavior, or food” (p. 62). Sugar sensitivity and abnormal glucose metabolism has been documented for alcoholics and addicts (Hatcher, 2008) however direct correlations to DM are unknown. Umhau et al. (2002) documented blunted responses in blood glucose, insulin, and glucagon in a group of 20 long-term abstinent alcoholics (six months sobriety or more) following controlled administration of glucose.

Hypertension (HTN)

According to data collected in 1999, the most prevalent chronic disease at the VA is HTN, present in over one-third of patients (Yu et al., 2003). High levels of sodium intake contribute to HTN, which is a serious health concern due to increased risk for cardiovascular disease (CVD), stroke, and kidney disease (Yalamanchili, Struble, Novorska, & Reilly, 2011). According to this study, HTN is responsible for 62% of strokes and 49% of CVD. Sodium elevates blood pressure, which is a major determinant of cardiovascular, neurological, and renal disease and mortality. Yalamanchili et al. (2011) recognized that as a large healthcare institution, the VHA is in the position to advocate for and directly benefit from efforts to reduce sodium intake among veterans, and can thus help lead this effort in the US. Gennaro et al. (2000) found that alcoholics detoxified between six and twelve months experienced abnormal responses in blood pressure and plasma rennin activity when exposed to variations in salt intake, in a fashion similar to sodium-sensitive arterial HTN. These findings highlight possible physiological

characteristics of individuals with a history of substance abuse that may contribute to the development of nutrition-related chronic disease.

Nutrition

A diet rich in fruits and vegetables is known to decrease risk of chronic diseases such as CVD, HTN, DM, and cancer (Ko et al., 2011). In a study of 289 overweight or obese veterans, researchers found that older veterans reported eating more fruits and vegetables compared to younger veterans. Veterans in this study who reported high self-efficacy, knowledge about recommended fruit and vegetable consumption, and low perceived barriers had increased consumption. These findings suggest that psychosocial factors should be considered when developing nutrition interventions for veterans. Higher self-efficacy and the use of behavior change strategies are often related to more healthful diets among overweight and obese men (Ko et al., 2011). The role of the dietitian will be critical to implementation of new initiatives for providing group education classes or individual nutrition counseling specific to each veteran. For more information regarding self-efficacy related to nutrition and substance abuse recovery, please see Appendix D.

Mental Health and Substance Abuse

Mental Health

The United States invaded Afghanistan on October 7, 2001, and Iraq on March 20, 2007. Over 1.6 million veterans have served in related operations (Seal et al., 2009). Among 100,000 veterans from these operations first seen at the VA between 2001 and 2005, 25% received mental health diagnoses. According to Seal et al. (2009), the prevalence of mental health diagnosis increased to 37% by March 2008, which is in agreement with data previously collected in the Veterans Health Study (Hankin, Spiro,

Miller, & Kazis, 1999). The number of veterans receiving disability payments for post-traumatic stress disorder (PTSD) increased 79.5% from 1999 to 2004 to \$4.3 billion annually (Frueh, Grubaugh, Elhai, & Buckley, 2007). Authors suggest that many of these diagnoses are exaggerated and disability incentives may undermine the integrity of the PTSD knowledge base. It is suggested that compensation-seeking veterans be excluded from clinical research due to biases created by disability incentives (Frueh et al., 2007).

According to Hunt and Rosenheck (2011), veterans with affective disorders and PTSD diagnosis are more likely to receive psychotherapy than others. In FY 2005, the VA provided psychiatric or substance abuse services to almost one million veterans. Authors report that of the veterans who received mental health services in FY 2006, those receiving individual therapy had an average of 4.3 visits while those receiving group therapy had an average of 15.9 visits, with substance abuse diagnoses being more likely to receive group therapy than other diagnoses (Hunt & Rosenheck, 2011). Alcohol-related disorders were diagnosed for 17% of cases while drug-related disorders were diagnosed for 14%. Approximately 12.7% qualified as having a dual diagnosis with conditions such as minor depression (39%), PTSD (32%), major depression (20%), schizophrenia (9%), and bipolar disorder (8%). Hunt and Rosenheck (2011) conclude that there is increasing evidence that psychotherapy is effective. Vega, Sribney, and Achara-Abrahams (2003) found that comorbidity associated with dual diagnoses is often marked by greater functional impairment and self-destructive behavior.

Substance Abuse

According to national data, nearly 40% of substance abuse treatment admissions report alcohol-drug combinations (Substance Abuse and Mental Health Services

Administration, 2011). According to a population wide study of the VA healthcare system, more than 60% of marginal costs due to substance abuse are from inpatient care (Yu et al., 2003). Timko, Lesar, Calvi, & Moss (2003) compared psychiatric and substance abuse acute care and recognized a need for integrated treatment models, acknowledging that substance abuse programs closely resemble psychiatric programs with respect to staff composition within VA facilities. Reported dual diagnoses were between 40% and 50%. Timko et al. (2003) also suggest that psychiatric and substance abuse care be provided within an integrated system, whereas a systematic review by Atun et al. (2011) concluded that no general conclusions can be drawn on the benefits or disadvantages of integrated health service delivery.

Grotzkyj-Giorgo (2009) stated that most addictive substances strip the brain of essential fats, as well as impair absorption and utilization of amino acids necessary for neurotransmitter synthesis. Controlled studies have linked essential fatty acid deficiency to anxiety as well as relapse (Buydens-Branchey & Branchey, 2006; Buydens-Branchey, Branchey, McMakin, & Hibbeln, 2003). Nutrient deficiencies and imbalances may cause behavior closely resembling dual diagnosis, and therefore clinical diagnoses should be postponed until nutritional issues have been addressed. According to Kaiser, Prednergast, and Rutter (2008) “better collaboration among treatment professionals is needed in order to serve the multifaceted needs of chemical dependent patients, and reduce prescriptive care contraindicated in the condition of substance abuse” (p. 129).

Rosen, Kuhn, Greenbaum, & Drescher (2008) examined substance abuse-related mortality rates among middle-aged male VA psychiatric patients. Researchers found that among psychiatric patients, the probability of dying was 55% higher for patients

diagnosed with a substance abuse disorder than those without such diagnoses.

Intervention should be treated with the same severity of other mortality risks, such as suicide (Rosen et al., 2008). With recent war activity, there are active troops and younger cohorts of veterans. Interventions now could prevent a lifetime of worsening impairment and disability (Saxon, 2011). Briggs, Magnus, Lassiter, Patterson, & Smith (2011) examined substance abuse in older adults, highlighting the social isolation that can result from the aging process. These authors acknowledge that much of this problem goes undetected and undiagnosed, as self-reports are likely to be inaccurate. Substance abuse in older adults can lead to a heightened use of healthcare resources. If treatment is considered appropriate, few programs offer age-specific interventions. Briggs et al. (2011) reviewed literature to find a high rate of prescription drug misuse among older adults, primarily benzodiazepines and opioids.

While not investigating veterans, Santolaria-Fernandez et al. (1995) examined 140 drug addicts (primarily heroin) and found that protein and calorie malnourishment was present but not severe, and was most related to female sex, intensity of drug addiction, anorexia, poor food and drink consumption, and the disturbance of social and familial links. Varela, Marcos, Santacruz, Ripoll, and Requejo (1997) documented malnutrition in all 36 heroin addicted females in their study prior to quitting the drug. After six months of detoxification, anthropometric measurements suggested an adequate recovery of nutritional status, including those diagnosed with human immunodeficiency virus (HIV). The authors recommend nutritional education as early as possible to help patients get free of drug habits, and contribute significantly to an improved quality of life.

Islam, Hoassain, and Ahsan (2001) followed 253 male drug addicts to discover that the vitamin A, C, and E status of the drug addicts was significantly lower than those of non-addict controls. These authors recommend initiating antioxidant vitamin therapy to drug addicts, who are at higher risk of HIV infection. A follow-up analysis of the same population concluded that illicit drug use impairs serum mineral value, causing an increase in copper and zinc, and a decrease in iron (Hossain, Kamal, Ahsan, & Islam, 2007). Furthermore they recognized the impact of lifestyle factors on the nutritional status of drug addicts, recommending a careful micronutrient intervention in the clinical management of drug dependent patients. Nutritional deficiencies can induce immunodeficiency and may influence susceptibility to other infections such as HIV.

In a pilot study, Nolan and Scagnelli (2007) compared the survey findings from 14 non-institutionalized patients in methadone treatment to a control group with similar demographics. Their findings suggest that methadone-treated patients reported a higher consumption of sweets, a higher eagerness to consume sweet foods, and a wish to consume quantities larger than was desired by controls. These authors recognize the limitations of the study including small sample size and concluded that the eating behavior in this population requires further study. Neale, Nettleton, Pickering and Fischer (2012) audio-recorded in-depth interviews of 77 heroin users and elicited data on eating patterns. Qualitative data can help illuminate how people make sense of their lives and environment, which can be useful for investigating the substance abuse population. These authors confirmed dysfunctional eating patterns among heroin addicts but more importantly suggested that nutritional interventions be tailored to individual needs and circumstances, as well as evaluated for the sake of establishing a future evidence base.

Saeland et al. (2011) interviewed 220 drug addicts in Norway, which included anthropometrical measurements, medical examination, and blood sampling. Dietary recalls were carried out and analyzed using computer software. Added sugar accounted for 30% of the energy intake, which was mirrored in biomarkers. Sugar and sugar-sweetened foods were preferred by 61% of the respondents. Researchers also discovered an increase in serum copper suggesting inflammation among respondents, a finding that is in agreement with previous research by Hassain et al. (2007). In another study, Ross, Wilson, Banks, Rezannah, and Daghli (2012) examined 67 detox patients (primarily alcohol) to show that 50% of all subjects were deficient in iron or in vitamins. These researchers believe that the prevalence of malnutrition in their patient population is likely underestimated because the administration of oral multivitamin supplementation and parenteral thiamine are established practices upon admission. These authors reinforce the belief that early nutritional assessment and intervention will have the potential to benefit patient groups undergoing long-term clinical treatment. For a detailed explanation of the relationship between alcohol and malnourishment, please see Appendix E.

Nicotine, caffeine. This review of literature is focused on drugs and alcohol, however it is important to recognize nicotine and caffeine dependence within the scope of chronic disease, healthcare burden, and nutrition. Tobacco is the leading preventable cause of death in the US and is disproportionately higher among veterans than non-veterans (Tsai, Edens, & Rosenheck, 2011). Among those recently utilizing VA health services, 15% were diagnosed as nicotine dependent. According to Tsai et al. (2011), substance abuse, other mental health diagnoses, and homelessness were identified as major risk factors. Nicotine suppresses appetite and will compromise sense of taste of

smell, affecting food intake and therefore all areas of nutrition (Hatcher, 2008).

Alternatively, it is well known that tobacco can assuage the early stages of recovery from alcohol and drugs, as can caffeine. Among US service members surveyed in a combat environment in Afghanistan in 2010, 45% reported consuming caffeine-containing energy drinks daily (Centers for Disease Control and Prevention, 2012), most of which are notorious for excessive sugar content. For practical implications regarding the use of nicotine and caffeine in substance abuse recovery, please see Appendix F.

Self-Care and Gender

Self-Care

Nutrition is an important component of self-care, and in an article titled “Real Men Do Not Read Labels”, the authors found that food decisions are of greater importance and relevance for females compared to males (Levi, Chan, & Pence, 2006). The authors suggest that efforts to address nutrition-related issues must recognize that men’s food choices are deeply rooted in the ideology of what it means to be female and male in contemporary American society. Kiefer, Rathmanner, and Kunze (2005) found that men were less aware of the association between nutrition, health, and the development of related disease. Other authors have identified that men are less likely to seek treatment, particularly for eating disorders (Weltzin et al., 2012). For additional information related to self-care and gender, please see Appendix G.

Gender

Straussner and Zelvin (1997) explore heroic male values within the context of substance abuse, recognizing our society as applauding the sports hero who gets injured on the field and gets up to play even though he is hurt. The authors theorize that if a man

finds it difficult to ask for help in the first place, help-seeking behavior can be seen as feminine and conflict can be expected (Straussner & Zelvin, 1997). Authors also suggest a male tendency to minimize or conceal medical problems, particularly those that result from long-term drinking. The potential for men to over-represent levels of control and self-efficacy are important considerations for research regarding both nutrition and substance abuse. Unfavorable male attitudes towards help-seeking have been thoroughly documented (Vogel, Heimerdinger-Edwards, Hammer, & Hubbard, 2011). Other findings consistent across international literature include men drinking alcohol more frequently and in higher amounts than women (Kiefer et al., 2005). A study examining the course of alcohol consumption and drinking problems from late middle age onward identified some gender differences, suggesting that the monitoring of alcohol consumption will be especially important for older men (Brennan, Schutte, Moos, & Moos, 2011).

Food Addiction and Neurochemistry

“Food addiction” is a controversial term. It is an interesting new hypothesis for obesity associated with both substance-related disorder and eating disorder (Liu, von Deneen, Kobeissy, & Gold, 2010). Neurobiological research has shown commonalities in brain reward processes between obesity and substance abuse disorders (Wilson, 2010). Qualitative research has shown respondents ages 8 to 21 exhibiting DSM-IV (Diagnostic and Statistical Manual of Mental Disorders) substance dependence (addiction) criteria when describing their relationship to highly pleasurable food (Pretlow, 2012). Eating disorders and substance abuse appear to be conditions with separate etiologies but that mutually influence one another. Wilson (2010) further recognizes that even if they did share common mental pathways, effective treatments are likely to differ. Fischer,

Anderson, & Smith (2004) found that problems of alcohol use were comorbid with binge eating and purging, and that a tendency to act rashly when distressed was associated with both behaviors. An argument can be made that if an individual replaces addiction to alcohol or drugs with addiction to food, they have not fully recovered. Individuals may use substances to control weight, and it is possible that one disorder might lead to the other. Co-prevalence of eating disorders and substance abuse has been previously reported (Krahn, 1991).

Eating behaviors are similar to other addictions since both affect dopamine (DA) levels in the brain (Liu et al., 2010). Sugar has been found to be addictive since it releases opioids and DA, both addictive neurochemicals. Ingestion of sugars can result in neurochemical changes in brain regions associated with reward, specifically the mesolimbic dopaminergic system (Levine, Kotz, & Gosness, 2003) and in particular the DA D2 receptor (Blum et al., 1996). Burger and Stice (2012) provided evidence that frequent consumption of ice cream is related to a reduction in reward-region response in humans in a fashion that parallels drug addiction, independent of body fat. To achieve the same level of reward, the person needs to eat a greater amount of rewarding food, indicating addictive potential. Changes in brain chemistry can create a stronger preference for high-sugar, high-sodium, and high-fat foods. Researchers are continuing to separate the neurobiology of appetite from hedonic overeating (Avena, Gold, Kroll, & Gold, 2012). More studies are needed on the degree and reversibility of these conditions, in both drug addicts and non-addicts.

In newly sober outpatients, sobriety time was positively associated with increased sugar use (Levine et al., 2003). These authors reviewed literature that linked increased

sugar needs in opiate addicts and alcoholics recently detoxified. Krahn et al. (2006) documented preference for sweets in abstinent alcoholics. Recognizing that many of the brain sites involved in feeding behavior are also important in drug-seeking, ingestion of fats and sugars may have an impact on self-administering drug abuse behavior. Oscar-Berman and Marinkovic (2003) provide an overview of alcohol and the brain, highlighting several disruptions of neurotransmitter (NT) systems in addition to the increased release of DA that is associated with alcohol's rewarding effects. Withdrawal from alcohol results in cravings for other mood-altering substances in order to counteract the associated depression. Because of the compelling similarities between overeating and drug addiction, Davis and Carter (2009) recommend treatment involving effective strategies for enduring life-long efforts to resist overeating while preventing relapse. For more information on food addiction, please refer to Appendix H.

Gray Literature

Gant and Lewis (2010) in *End Your Addiction Now* summarized the relationship between NT's and the addicted brain, including many important connections with nutrition. Endorphins and enkephalins are inhibitory NT's that act as natural painkillers produced in response to emotional or physical pain or exertion. Opiates and alcohol mimic its effects, and alcohol disrupts normal production of these neurotransmitters. Serotonin is another inhibitory NT known to be an emotional relaxant. Synthesis of serotonin can be artificially stimulated by carbohydrate consumption. GABA is another inhibitory NT, also associated with relaxation, with its effects being mimicked by alcohol. Inhibitory neurotransmitters work together with excitatory neurotransmitters to moderate the effects of one another. Excitatory catecholamines include DA,

norepinephrine, and epinephrine, also known as adrenaline. DA is associated with short-term bursts of concentration or euphoria, while norepinephrine causes general sustained alertness, which help maintain baseline awareness and vigilance (Gant & Lewis, 2010). Knowledge of the neurochemistry associated with drug and food addiction is essential to the development of substance abuse treatment that involves nutrition.

Kessler's (2009) text *The End of Overeating* was an instant New York Times bestseller. There are several illustrations of individuals who experience food addictions, and Kessler attempts to explain some of the biochemistry behind it. Kessler focuses on the reinforcing qualities of sugar, fat, and salt, stating: "some people are likelier than others to find food more reinforcing and are thus more willing to work harder to obtain it" (p. 34). His discussion of highly palatable foods and their connection to endorphins describes a rewarding effect of food similar to drugs such as morphine and heroin. DA allows us to engage in behaviors to recapture the remembered pleasure of such food. His descriptions of individuals being triggered by the smell or sight of a cookie are very similar to what is experienced in drug addiction. Kessler (2009) discusses motor behavior that becomes automatic, with fixed responses that are difficult to break. Momentary pleasure, emotionally valued experiences, routine behavior, and hyperpalatable food lead to what Kessler calls "conditioned hypereating" (p. 135). "Over time, a powerful drive for a combination of sugar, fat, and salt competes with our conscious capacity to say no" (p.145). Kessler describes an inability to say no, an obsession of the mind, a form of self-medication, a cycle of craving, and a self-defeating attitude related to overeating. All of these attributes are classic characteristics of substance abuse, clearly indicating a need for multidisciplinary attention and further research.

Behavior Change and Recovery

Substance Abuse Treatment

Humphreys and McLellan (2011) reviewed numerous publications and public policy experiences in the US and United Kingdom (UK) to develop strategies that may improve outcomes for substance abuse treatment. They recognized the debatable nature of outcome examination with respect to substance abuse, whether by abstinence, HIV risk reduction, reduced crime, employment rates, or “recovery” (Humphreys & McLellan, 2011). These authors also recognize that the longer the period between receipt of services and measurement of outcome, the less likely the outcome can represent the quality of those services. One recommendation is the inclusion of an independent outcomes monitoring team to follow-up patients, usually requiring resources unavailable. Another recommendation is to reward providers for in-treatment performance using an outcome improvement contract, thereby focusing the attention on the care process. Embedding careful evaluation strategies along any treatment outcome will be vital to developing new initiatives (Humphreys & McLellan, 2011).

Schinka, Casey, Kaprow, and Rosenheck (2011) investigated the impact of a sobriety requirement at program entry for transitional housing programs offered to homeless veterans. Researchers examined outcomes such as program completion, recidivism for homeless, and employment at program discharge, finding no meaningful support for requiring sobriety at program entry (Schinka et al, 2011). Benda and Belcher (2006) discuss comorbidity of homeless veterans, viewing treatment as being over-compartmentalized and often lacking interdisciplinary care. Researchers suggest that a

spiritual component be integrated into treatment focusing on the principle of forgiveness, shown to play a major role in attaining freedom from addiction (Benda & Belcher, 2006).

According to a VA publication from 2007, “substance abuse, including alcoholism, is among the top three diagnoses in VA’s healthcare system, affecting some 215,000 veteran patients each year. VA counselors typically recommend that patients become involved in community-based self-help groups, though such participation is not mandated” (USDVA, VA Research Currents, 2007). The article recognizes Alcoholics Anonymous (AA) as the most effective form of treatment and advocates a relatively rapid entry for those recognizing their problem and seeking help. Overeaters Anonymous (OA) is a fellowship based on AA’s 12-step program, which has become accepted worldwide as treatment for compulsive overeating. According to expert opinion, many individuals have co-memberships. Emerging data collectively suggests that overlaps do exist in these behaviors (Avena et al., 2012). Considerable controversy exists whether compulsive overeating should be categorized with substance abuse, or with process addictions such as gambling and shopping.

Behavior Change. Grant (2004) surveyed Registered Dietitian’s (RD) working at various VA’s across the nation as part of a dissertation titled *Nutrition Education Intervention and Substance Abuse Treatment Outcomes*. While utilizing the phrase “substance abuse” in the title, the literature review addressed alcohol and avoided the topic of illicit drugs, despite finding a polydrug abuse incidence of nearly 50%. It is possible that the relationship between nutrition and drug abuse was not addressed due to a lack of published evidence or in an attempt to maintain a narrow focus. As a portion of that study, Grant, Haughton, and Sachan (2004) measured changes in Addiction Severity

Index scores to detect a positive association between nutrition intervention and substance abuse treatment outcomes. These authors found that group nutrition education was a differentiating factor in the depth and scope of the various nutrition programs provided within substance abuse treatment programs. The role of such education in relation to the treatment outcomes measured merits closer examination, as does the specific content of group nutrition education for substance abuse recovery. These authors confirm The Academy's position in 1990 and encourage dietitians to promote the inclusion of nutrition education into substance abuse programs.

Sandwell and Wheatley (2009) build a convincing argument for the inclusion of more nutritious options for the drug-addicted prison population in the UK, stating that “the introduction of healthier food and healthy eating advice is overall likely to make sound economic sense in terms of prisoners’ physical health, mood, and behavior” (p. 26). Barbadoro et al. (2011) evaluated the impact of an educational intervention on the nutritional behavior of 58 alcohol dependent patients in Italy. Using a pre- and post-intervention questionnaire and follow-up interview, it was found that 22% of participants improved their nutrition knowledge and after six months 80% reported continued abstinence. Authors encourage educational interventions in alcohol rehabilitation programs and suggest that improved eating behavior may significantly contribute to the recovery of alcohol-dependent patients.

Cowan and Devine (2012) evaluated the implementation of a controlled, 6-week environmental and educational intervention to improve dietary intake and body composition in six urban residential drug-treatment facilities (n = 107) in Upstate New York. These authors report that poor diet quality and excess weight gain are common

among people in recovery from substance addiction. RHEALTH (Recovery Healthy Eating and Active Learning in Treatment Houses) has been designed to promote healthy eating and reduce excessive weight gain among men in residential substance-abuse treatment facilities. Of the 55 men who provided both baseline and post-intervention data, researchers analyzed differences between the six sites and found that the higher participation and implementation sites reported greater reductions in total energy, percentage of energy from sweets, daily servings of fat, oils, and sweets, and BMI over the intervention period. Researchers provide evidence that educational and environmental intervention can be successful in spite of the challenges met in residential substance abuse treatment facilities.

Clairmont (2011) recognizes that hunger and low blood sugar can cause binge eating or relapse. Proper education and counseling will have the ability to change clients' faulty thinking about nutrition concepts. Author suggests active listening, clarification when necessary, open-ended nonjudgmental probing, and the use of affirmations, all common practices of Motivational Interviewing (MI). Other suggestions include confrontation as a tool in assisting patients overcome barriers that prevent the action necessary for change. Using these techniques along with individualized meal planning, dietitians can develop a plan for change that can be monitored and evaluated. Integrating MI techniques in the earliest phase of treatment may have positive effects on patient retention in treatment (Carroll et al., 2006). Dietitians trained in nutrition education can assist substance abuse patients in the path towards behavior change. Many RD's who are involved or interested in this area of dietetics belong to the Behavioral Health Nutrition (BHN) Dietetic Practice Group (www.bhndpg.org).

Widome, Littman, Laska, & Fu (2012) highlight opportunities to develop innovative strategies to promote healthful behaviors among young veterans, particularly those returning from Iraq and Afghanistan. Currently, five years of VA care is being offered after separation from military service. Authors suggest updated data-gathering techniques to promote new knowledge about this younger cohort. Steering these veterans towards healthful behaviors including nutrition, fitness, and tobacco cessation can put an emphasis on prevention before the onset of chronic disease. According to a VA publication from 2009, the VA has collaborated with the National Institutes of Health (NIH) to fund \$7 million for research related to alcohol, tobacco, and drugs among US military personnel who served in Iraq or Afghanistan. NIH officials estimate that about 20 studies will be funded through this initiative (USDVA, VA Research Currents, 2009).

Nutrition and Exercise

A primary goal for substance abusers in recovery should be to gain self-efficacy regarding the process of behavior change. Consistent practice of self-care is the ideal way to establish a new track record of success and health. Nutrition and exercise are both avenues that can encourage patients to demonstrate self-care and promote self-efficacy. Ratey and Hagerman (2008) support the idea that exercise has a profound impact on cognitive abilities and mental health in *Spark*. Authors believe that the point of exercise is to build and condition the hardwired circuitry of the brain, stating that aerobic activity can transform not only the body but also the mind. They suggest that exercise can help to rebuild brain cells killed by alcohol and that ten minutes of exercise could blunt an alcoholic's craving. If the brain is flexible the mind becomes stronger, creating confidence in one's ability to change, ultimately developing self-efficacy. Integration of

exercise along with nutrition is critical for full recovery from substance abuse. Other benefits include increased self-esteem, elevated mood, improved energy and concentration, more relaxing sleep, relief of tension, and improved mental and physical wellness (Hatcher, 2008).

Forsyth, Deane, and Williams (2009) described lifestyle interventions involving diet and exercise for patients with depression and/or anxiety, both common co-occurrences in the substance abuse population. According to this article, exercise has been supported in the treatment of mental illness, and several nutrients including omega-3 fatty acids, folate, vitamin B12, vitamin B6, zinc, iron, selenium and antioxidant vitamins C and E have been linked to mental health. Using qualified and accredited dietitians and exercise physiologists, this lifestyle intervention pilot study reported difficulties maintaining communication with patients, ensuring appointment attendance and overall patient retention. Of the five patients who completed the pilot study, changes in nutrient intakes were inconsistent. Following the pilot study, these authors modified protocols that led to improved patient adherence.

Other Proposals

Gant and Lewis (2010) propose amino acid supplementation as well as vitamin and mineral supplementation specific to the NT deficiency that is diagnosed in response to a behavioral questionnaire. The shortcoming with this approach is that it does not adequately address behavior change necessary for full recovery from drugs and alcohol. The use of supplements to fight alcoholism had been previously proposed in a program written by Larson (1997). Both books appear to make exaggerated claims about the success of their programs. While focused on food abuse rather than substance abuse,

Kessler (2009) provides several tools promoting behavior change using nutrition. Rules of disengagement and emotional learning provide a theory of treatment and framework for sustained behavior change. Suggestions include planned eating with no room for deviation in the beginning stage, which is a type of discipline essential for recovering addicts and alcoholics. Kessler (2009) recommends exercise and eventually developing a relationship with food that is intuitive and personal.

Witherly (2007) addresses the dietitian in *Why Humans Like Junk Food* by reminding that “pleasure is the major driver of food ingestion and behavior, but without an understanding of the nature of food pleasure and perception itself, no useful modifications to food can be made. Salt, fat, and sugar, classically considered a nutritional enemy, can still be used for good” (pg. xiii). Much like tobacco and caffeine, hyperpalatable food may have beneficial functions in the early stages of recovery, as the first issue in detoxification is to get the individual past the immediate crisis. Prolonged abuse of such foods after physical recovery has been achieved may contribute to comorbid conditions, compromised quality of life, decreased likelihood of long-term recovery, and overall healthcare burden.

MOVE! Weight Management Program

The MOVE! Weight Management Program is a national weight management program designed by the VHA National Center for Health Promotion and Disease Prevention (NCP), a part of the Office of Patient Care Services, “to help veterans lose weight, keep it off, and improve their health” (USDVA, NCP, 2012). MOVE! classes are offered at every VHA hospital free to any veteran currently enrolled as a VA patient, and includes curriculum focused on behavioral health, nutrition, and physical activity.

Outcome measures from 862 veterans from Miami, FL enrolled in MOVE! suggest a significant positive treatment effect (Dahn et al., 2011), supporting the need for integrative lifestyle modification programs. According to this study, those who completed 10 weekly group sessions experienced an average weight loss of 3.5 pounds for the year.

MOVE! is an evidence-based, comprehensive and multidisciplinary patient-centered program. Educational tools can be individually tailored depending on the resources and conditions available at each site. Kahwati et al. (2011) explored variation in MOVE! program implementation and found that none of the 17 sites examined shared the same conditions. Conclusions were that “standard curriculum delivered with a group care-delivery format is an essential feature of successful VHA facility MOVE! Weight Management Programs, but alone does not guarantee success” (Kahwati et al., 2011).

While Kahwati et al. (2011) identified variation between MOVE! sites, Robinson and McCreary (2011) identified significant outcome variation within the MOVE! program at West Los Angeles. Using electronic medical records, MOVE! patients were classified for having a history of substance use disorder (SUD) on the criteria of clinical diagnosis. Almost half of the MOVE! patients had a documented history of SUD. According to this study, history of SUD was not significantly related to any demographic variables. Results revealed that during level 2 of MOVE!, those with a history of SUD gained an average of nearly four pounds and those without history lost an average of eleven pounds. Significant weight gain in alcohol dependent subjects following six months of abstinence has been previously documented (Krahn et al., 2006), as have food, eating, and weight concerns of men in recovery from substance addiction (Cowan & Devine, 2008). Epidemiological research has correlated obesity with increased risk for

lifetime alcohol abuse in men (Barry & Petry, 2009), therefore weight management may represent an important part of SUD treatment (VanBuskirk & Potenza, 2010).

These findings suggest that even a remote history of SUD can impact weight loss success. Furthermore, with respect to veterans with SUD, “individual sessions with other professionals including psychologists, nurses, and physicians were not significantly associated with increased weight loss in level 2 treatment” (Robinson & McCreary, 2011), while receiving at least one visit with a dietitian significantly predicted weight loss at post-treatment. One or more individual sessions with a dietitian led to an average weight loss of seven more pounds. This program evaluation at the VA has been used internally, indicating that veterans with a history of SUD require a greater level of care. Nutrition-related patient care for veterans with a history of substance abuse should be uniquely tailored to the needs of that population, which may decrease the clinical burden within the VHA.

The evidence collected thus far provides strong support for the primary hypothesis that individuals with a history of substance abuse will differ from individuals without history with respect to nutrition, health, and self-care. Further support for the additional hypotheses has been provided as well. Specific nutrition education and counseling may be warranted in this population. The present study will examine the attitudes, beliefs, and behaviors of individuals in the MOVE! program through an anonymous survey.

CHAPTER III

METHODOLOGY

The purpose of this chapter is to provide a detailed explanation of all protocols and procedures used in the study. The hypotheses are restated, the sample is described, and the sources of all questions used in the survey are explained. Lastly, the strategies for data measurement are outlined in the section Descriptive Analysis.

The relationship between substance abuse and nutrition is not well understood. Alcoholism and drug addiction is likely a combination of genetic and environmental factors. While certain physiological markers such as family history or blood enzyme levels (objective data) can be used to determine risk factors for alcoholism/addiction, the role of environmental and behavioral influences (subjective) are more difficult to evaluate. An individual with a genetic predisposition to substance abuse may not develop alcohol or drug dependence, while someone without a family history may slide into a cycle of abuse. Physical health and nutrition is similarly complex, influenced both by genetics and the environment. Many individuals with a family history of obesity, diabetes, and hypertension do not develop these chronic diseases, while others without a known genetic link develop these conditions secondary to dietary intake or other factors.

The present study collected and analyzed data related to physical health based on a self-reported assessment of food consumption patterns, self-care, and self-efficacy. The survey examined attitudes, beliefs, and behaviors towards nutrition and health. This study was approved by the Institutional Review Board (IRB) of the Department of Veterans Affairs Greater Los Angeles and by all required subcommittees, and the Research and Development Committee (# 2012-040517). Please refer to Appendix J. Additionally, IRB

approval for use of human subjects was granted from the Office of Research and Sponsored Projects at California State University, Northridge.

Hypotheses

Null Hypothesis

There are no significant differences in attitudes, beliefs, and behaviors towards nutrition, health, and self-care in individuals with a history of substance abuse and individuals without a history of abuse among participants within the MOVE! Weight Management Program.

Four Research Hypotheses

1. Individuals with a history of substance abuse will have more difficulty controlling their overeating than those without a history of abuse.
2. The attitudes, beliefs, and behaviors towards nutrition and health of individuals with a history of substance abuse will vary from individuals without a history of abuse.
3. Individuals with a history of substance abuse will express more self-destructive health attitudes than those without a history of abuse.
4. Measurements of self-efficacy will be correlated with health beliefs.

Sample

All subjects were veterans enrolled in the MOVE! program at the West Los Angeles (WLA) VA and North Hills VA, and were willing volunteers. According to prior MOVE! research conducted by Robinson and McCreary (2011) who examined 115 veterans, 87% percent were male. There were 56% African American, 31% Caucasian, 7% Hispanic, 1% Asian/Pacific Islander, and 2% were of “mixed” descent. Individuals

with a history of substance use disorder (SUD) represented 43% of the sample using the Diagnostic and Statistical Manual of Mental Disorders (DSM) diagnosis of substance abuse or dependence as documented in their medical records. For those with a known history of SUD who were in remission, the average length of sobriety time was five years.

The current study examined 116 veterans, 93% of whom were male. Ethnic background was not collected. Those with a self-reported history of substance abuse represented one-third of the sample. Additionally, 56% had hypertension and 44% were diabetic.

Survey Design

The first ten questions of the survey were created in order to ascertain objective data such as gender or a history of hypertension and diabetes. Questions about age, weight, and height were collected within ranges, in order to eliminate the possibility of creating data that could identify a specific veteran. Other questions about the use of nutritional supplements, consumption of energy drinks, and exercise frequency were used to consider alternative hypotheses and/or possibilities for future research. The primary question of interest in this portion of the survey was regarding history of SUD.

Alcoholism and drug addiction are conditions that can be clinically diagnosed as “substance abuse” or “substance dependence” by a qualified professional using criteria outlined in the DSM-IV (American Psychiatric Association, 2000). The term “substance use disorder” includes both substance abuse and dependence, and was chosen by this researcher to be consistent with the language used in previous MOVE! research by Robinson and McCreary (2011). Meanwhile, Alcoholics Anonymous (AA) suggests that

“you can quickly diagnose yourself” (*Alcoholics Anonymous*, 2001, p. 31) without the requirement of a qualified professional. The present study allowed subjects to self-report their history by answering yes or no: “Have you ever been diagnosed as having a substance use disorder? A substance use disorder includes a history of alcoholism or drug addiction”. Phrasing the question in this manner allows individuals to self-report their history across their lifespan, including a self-diagnosis. Examining SUD that is current or in remission helped maximize the number of SUD subjects captured, while acknowledging the assumption that certain neurobiological characteristics of addiction remain present despite any period of abstinence.

The remainder of the questionnaire was drawn from validated and reliable survey instruments in Likert-type style. Question eleven utilized a survey tool known as The Eating Self-Efficacy Scale (St. Jeor, 1997) with permission from Springer Science and Business Media. The 25-item self-report scale is designed to measure individuals’ perceptions that they can control or resist urges to overeat in high-risk situations, with scores from (1) *no difficulty controlling eating* to (7) *most difficulty controlling eating*. Question twelve utilized the Nutrition Attitude Survey (St. Jeor, 1997), which consists of 24 items addressing eating: nutritional attitudes, beliefs, and habits, rating a level of agreement to the statements from (1) *not at all* to (5) *extremely*. Permission to use this survey was granted by author Timothy Carmody, Ph.D. from University of California San Francisco.

Questions 13-18 represent a portion of the Project EAT-II Survey for Young Adults (Neumark-Sztainer, 2003), which was made available for use by the Project EAT research team at the University of Minnesota School of Public Health. This survey

explores issues related to eating patterns and weight concerns among young people. It was determined by this researcher that the questions selected were appropriate for the older aged veterans being investigated. Question 19 is the Nutrition Self-Efficacy Scale, which established the premise that self-confident clients with a higher sense of self-efficacy will be more responsive to nutrition interventions (Schwarzer & Renner, n.d.). Using a scale ranging from (1) *very uncertain* to (4) *very certain*, the NSES asks “how certain are you that you could overcome the following barriers?” Questions relate to the practice of sticking to healthful foods under a variety of circumstances. For more information regarding self-efficacy and nutrition, please refer to Appendix D. The aggregate survey utilized in this study can be found in Appendix K.

Procedures

Survey administration began on Thursday, November 8, 2012 at the 2:00pm monthly MOVE! class at the WLA VA Main Hospital. The MOVE! Coordinator for VA Greater Los Angeles met this researcher at 1:30pm to finalize strategies for data collection and set up the room. The survey requires approximately 20 minutes to complete and is completely voluntary, as veterans were given approximately ten minutes at the beginning of the MOVE! class and an additional ten minutes at the end of class. Veterans were given the option to complete the survey at their leisure and return on a later date or to abstain from participation altogether. The information sheet for “Nutrition and Substance Abuse” was carefully read and explained by the MOVE! Coordinator and made available to all subjects. The information sheet described the purpose of the study, the time commitment and procedures, risks and discomforts, and the manner used to protect confidentiality, as well as possible benefits of the study. Signatures were not

required as completion of the survey provided consent to participate. The questionnaire was titled “Nutrition and Substance Abuse” so that subjects were fully informed and not blinded to any aspect of the study. This researcher brought pens to provide to the veterans. The information sheet can be found in Appendix I.

MOVE! classes can contain up to 40 veterans. On November 8, 2012 there were 15 veterans present and twelve surveys were completed and collected. The second data collection occurred on Tuesday, November 12, 2012 at 10:00am at the WLA VA Main hospital and this researcher was not present. Completed surveys were then stored in a locked office at the VA and then transferred by vehicle to a locked office at California State University, Northridge. The MOVE! Coordinator at WLA assisted in administering and collecting surveys in MOVE! classes between November 2012 and March 2013. This researcher was present for a survey administration on February 12, 2013. Additional surveys were conducted at the MOVE! classes at North Hills VA between February 4, 2013 and March 25, 2013, which was the official “stop date”. The protocol approved by the VA IRB regarding data use and protection was carefully followed.

The data was entered into SurveyMonkey at California State University, Northridge on multiple occasions. All of the data was entered by March 25, 2013. Statistical analysis took place on Friday, March 29, 2013 and Wednesday April 3, 2013 using SPSS software at California State University, Northridge with the assistance of Family and Consumer Sciences faculty, Dr. Tom Cai.

Descriptive Analysis

Question six was the critical variable of interest, as three out of four hypotheses were based on the distinction between history of substance use disorder and no history.

Hypothesis one was linked to question eleven which contained 25 items regarding difficulty controlling overeating, and each question was analyzed using individual t-tests. This strategy allowed researchers to determine which individual item reached or approached significance when analyzed against question six. Hypothesis two was linked to question twelve, with 24 items that investigate nutrition attitudes, beliefs, and behaviors. First, factor analysis was utilized in order to determine factors present within the 24 items, and was then compared against responses from question six using a t-test. The four factors that were identified were labeled as: “Bad Habits” (component 1), “Food Enjoyment” (component 2), “Change Beliefs” (component 3), and “Meat Consumption” (component 4). Components 5 and 6 were excluded due to insignificant loading.

Hypothesis three utilized the nine responses contained in question 16- determined by this researcher to adequately measure self-destructive health attitudes, and factor analysis determined that the first four items adequately reflected self-destructive health attitudes, and were labeled as: “Self-Destructive Attitudes”. Components 2 and 3 that were identified as factors in question nine were excluded due to insignificant loading. The factor Self-Destructive Attitudes was compared against responses from question six using a t-test. Finally, hypothesis four was based on the five responses from question 19 regarding self-efficacy labeled as “Self-Efficacy”, and was used to analyze correlation with the factor Change Beliefs from question twelve. Refer to Appendix K for the survey instrument. Data tables summarizing the results are included and further referenced in the next chapter.

CHAPTER IV

RESULTS

This chapter reports the findings of the statistical tests that were linked to each research hypothesis. Only the findings linked to the individual hypotheses are reported. Statistical significance was defined at $p\text{-value} < 0.05$. “Approaching significance” was defined at $p\text{-value} < 0.10$, also referred to as “trending toward” significance.

Research Hypothesis One

The first hypothesis was that individuals with a history of substance abuse will have more difficulty controlling their overeating than those without a history of abuse.

Based on the 25 items contained in question eleven, only one response approached significance. Item 14 regarding difficulty with controlling overeating when depressed yielded a $p\text{-value}$ of 0.052. Individuals with a history of substance abuse reported more difficulty controlling their overeating when depressed. This value was of borderline significance since no other responses approached a $p\text{-value} < 0.05$. Table 1 contains the Group Statistics and Table 2 contains the results from the Independent Samples Test. Findings of interest have been bolded. The survey instrument can be referenced in Appendix K.

Table 1

Group Statistics (Hypothesis One)

	Have you ever been diagnosed as having a substance use disorder? A substance use disorder includes a history of alcoholism or drug addiction.	N	Mean	Std. Deviation	Std. Error Mean
1. Overeating after work or school?	.00	76	2.6579	1.82247	.20905
a. Yes		38	2.6053	1.63640	.26546
2. Overeating when you feel restless?	.00	77	2.9351	1.72701	.19681
a. Yes		36	2.8056	1.80189	.30032
3. Overeating around the holidays?	.00	76	3.8816	1.84005	.21107
a. Yes		37	3.5405	1.89436	.31143
4. Overeating when you feel upset?	.00	77	3.0779	1.84081	.20978
a. Yes		36	3.0833	2.10272	.35045

5. Overeating when tense?	.00	77	2.8571	1.72226	.19627
a. Yes		37	2.8649	1.94597	.31991
6. Overeating with friends?	.00	76	3.0789	1.56429	.17944
a. Yes		38	2.8684	1.64680	.26715
7. Overeating when preparing food?	.00	74	2.6216	1.32109	.15357
a. Yes		36	2.6389	1.43731	.23955
8. Overeating when irritable?	.00	76	2.7895	1.58590	.18192
a. Yes		38	2.4737	1.67230	.27128
9. Overeating as part of a social occasion dealing with food (like at a restaurant or dinner party)?	.00	74	3.3108	1.64630	.19138
a. Yes		38	2.8947	1.75206	.28422
10. Overeating with family or friends?	.00	77	3.4026	1.57497	.17948
a. Yes		38	3.0789	1.51357	.24553
11. Overeating when annoyed?	.00	77	2.5844	1.53341	.17475
a. Yes		38	2.6053	1.70118	.27597
12. Overeating when angry?	.00	78	2.4103	1.63910	.18559
a. Yes		38	2.6053	1.79398	.29102
13. Overeating when you are angry at yourself?	.00	76	2.4474	1.59495	.18295
a. Yes		37	2.7297	1.71024	.28116
14. Overeating when depressed?	.00	78	3.0256	1.79447	.20318
a. Yes		38	3.1316	2.10753	.34189
15. Overeating when you feel impatient?	.00	78	2.7051	1.66014	.18797
a. Yes		38	2.6842	1.72588	.27997
16. Overeating when you want to sit back and enjoy some food?	.00	77	3.4675	1.83951	.20963
a. Yes		38	3.3421	1.94903	.31617
17. Overeating after an argument?	.00	77	2.3766	1.51344	.17247
a. Yes		38	2.4737	1.65606	.26865
18. Overeating when you feel frustrated?	.00	77	2.5974	1.71111	.19500
a. Yes		38	2.8684	1.78842	.29012
19. Overeating when tempting food is in front of you?	.00	72	3.3472	1.88515	.22217
a. Yes		37	3.2703	1.64399	.27027
20. Overeating when you want to cheer up?	.00	76	2.5921	1.58474	.18178
a. Yes		37	2.4054	1.55384	.25545
21. Overeating when there is a lot of food available to you (refrigerator is full)?	.00	75	3.0133	1.61491	.18647
a. Yes		37	3.2973	1.63069	.26808
22. Overeating when you feel overly sensitive?	.00	76	2.4868	1.57051	.18015
a. Yes		37	2.5676	1.67565	.27548
23. Overeating when nervous?	.00	76	2.7763	1.83011	.20993
a. Yes		37	2.5946	1.77106	.29116
24. Overeating when hungry?	.00	76	3.6711	1.94174	.22273
a. Yes		37	3.7568	2.04675	.33648
25. Overeating when anxious or worried?	.00	74	2.9054	1.78402	.20739
a. Yes		37	2.8108	1.95559	.32150

Table 2

Independent Samples Test (Hypothesis One)

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
1. Equal variances assumed	.417	.520	.150	112	.881	.05263	.35031	-.64146	.74672
after work or school?			.156	81.634	.877	.05263	.33789	-.61959	.72485
2. Equal variances not assumed	.602	.440	.366	111	.715	.12951	.35353	-.57103	.83004

ing when you feel restless?	Equal variances not assumed			.361	65.920	.719	.12951	35906	-.58739	.84641
3. Overeating around the holidays?	Equal variances assumed	.129	.720	.916	111	.362	.34104	37243	-.39695	1.07902
4. Overeating when you feel upset?	Equal variances not assumed			.906	69.617	.368	.34104	37622	-.40937	1.09145
5. Overeating when you feel tense?	Equal variances assumed	1.197	.276	-.014	111	.989	-.00541	38912	-.77647	.76565
6. Overeating with friends?	Equal variances not assumed			-.013	60.971	.989	-.00541	40844	-.82215	.81133
7. Overeating when preparing food?	Equal variances assumed	.651	.421	-.021	112	.983	-.00772	35950	-.72003	.70459
8. Overeating when irritable?	Equal variances not assumed			-.021	63.911	.984	-.00772	37532	-.75754	.74209
9. Overeating as part of a social occasion dealing with food (like at a restaurant or dinner party)?	Equal variances assumed	.022	.883	.666	112	.507	.21053	31630	-.41619	.83724
10. Overeating with family or friends?	Equal variances not assumed			.654	70.807	.515	.21053	32181	-.43118	.85224
11. Overeating when annoyed?	Equal variances assumed	.160	.690	-.062	108	.950	-.01727	27632	-.56499	.53045
	Equal variances not assumed			-.061	64.461	.952	-.01727	28455	-.58565	.55111
	Equal variances assumed	.158	.691	.984	112	.327	.31579	32086	-.31995	.95153
	Equal variances not assumed			.967	70.704	.337	.31579	32663	-.33554	.96712
	Equal variances assumed	.050	.823	1.239	110	.218	.41607	33580	-.24941	1.08156
	Equal variances not assumed			1.214	70.782	.229	.41607	34265	-.26718	1.09933
	Equal variances assumed	.678	.412	1.050	113	.296	.32365	30830	-.28715	.93446
	Equal variances not assumed			1.064	76.476	.291	.32365	30414	-.28204	.92934
	Equal variances assumed	.917	.340	-.066	113	.947	-.02085	31527	-.64546	.60377
	Equal variances not assumed			-.064	67.348	.949	-.02085	32664	-.67277	.63107

12.	Equal variances Overeat assumed ing when angry?	.748	.389	-.583	114	.561	-.19501	33451	-.85768	.46766
13.	Equal variances Overeat assumed ing when you are angry at yourself?	.826	.365	-.862	111	.390	-.28236	32740	-.93113	.36640
14.	Equal variances Overeat assumed ing when depressed?	3.852	.052	-.282	114	.779	-.10594	37622	-.85122	.63935
15.	Equal variances Overeat assumed ing when you feel impatient?	.270	.605	.063	114	.950	.02092	.33270	-.63816	.68000
16.	Equal variances Overeat assumed ing when you want to sit back and enjoy some food?	.233	.630	.337	113	.737	.12543	.37193	-.61143	.86229
17.	Equal variances Overeat assumed ing after an argument?	.392	.533	-.314	113	.754	-.09706	.30958	-.71040	.51627
18.	Equal variances Overeat assumed ing when you feel frustrated?	.024	.876	-.787	113	.433	-.27102	.34432	-.95318	.41114
19.	Equal variances Overeat assumed ing when temptin g food is in front of you?	2.255	.136	.210	107	.834	.07695	.36564	-.64788	.80179
20.	Equal variances Overeat assumed ing when you want to cheer up?	.186	.667	.591	111	.555	.18670	.31568	-.43885	.81225
21.	Equal variances Overeat assumed	.005	.944	-.872	110	.385	-.28396	.32547	-.92898	.36105

ing when there is a lot of food available to you (refrigerator is full)?	Equal variances not assumed									
22. Overeating when you feel overly sensitive?	Equal variances assumed	.153	.696	-.251	111	.802	-.08073	.32181	-.71842	.55697
23. Overeating when nervous ?	Equal variances not assumed			-.245	67.454	.807	-.08073	.32915	-.73763	.57618
24. Overeating when hungry ?	Equal variances not assumed	.350	.555	.501	111	.618	.18172	.36307	-.53773	.90117
25. Overeating when anxious or worried ?	Equal variances not assumed			.506	73.610	.614	.18172	.35895	-.53356	.89700
	Equal variances assumed	.880	.350	-.216	111	.829	-.08570	.39619	-.87079	.69938
	Equal variances not assumed			-.212	68.177	.832	-.08570	.40352	-.89088	.71948
	Equal variances assumed	.332	.566	.255	109	.799	.09459	.37097	-.64066	.82985
	Equal variances not assumed			.247	66.514	.805	.09459	.38258	-.66915	.85834

Research Hypothesis Two

The second hypothesis was that the attitudes, beliefs, and behaviors towards nutrition and health of individuals with a history of substance abuse will vary from individuals without a history of abuse.

Based on the 24 items contained in question 12, factor analysis identified four factors, after excluding components 5 and 6 as described in the chapter 3. Results from the factor analysis using principal component analysis are summarized in Table 3 labeled as Total Variance Explained. Table 4 identifies the Related Component Matrix that converged in 6 iterations after utilizing the Varimax rotation method with Kaiser normalization. By selecting the largest numerical value for each of the 24 items, factors

were identified within a component. Component 1 had iterations across items 2, 4, 9, 10, 15, 16, 17, and 18. After investigating the consistent language/theme contained in these questions, the apparent factor was labeled by researchers as “Bad Habits”. Component 2 had iterations across items 6, 14, 21, 22, 24, and the apparent factor was labeled as “Food Enjoyment”. Component 3 had iterations across items 5, 11, 12, 13, labeled as “Change Beliefs”. Component 4 was based on items 1, 7, 8, 23, and was determined to represent “Meat Consumption”.

Once factors were identified and labeled, t-tests were used to compare individuals with a history of substance abuse to individuals without history, based on responses from question six. Results from these tests can be found in Table 5 Group Statistics. Factors Bad Habits and Change Beliefs have been bolded, as data from Table 6 Independent Samples Test displays p-values that both approach significance. As seen by Table 5, individuals with a history of substance abuse were in more agreement with the statements identified as Bad Habits from component 1. The p-value of 0.067 bolded in Table 6 for Bad Habits suggests that while variation in attitudes, beliefs, and behaviors approaches significance, it is not considered statistically significant. Change Beliefs (component 3) similarly approached significance ($p = 0.074$) and individuals with a history of substance abuse were in more agreement with the statements about change. While neither factor reached statistical significance, results contain some implications that will be further interpreted in chapter 5.

Table 3

Total Variance Explained (Hypothesis Two)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.358	30.658	30.658	7.358	30.658	30.658	5.341	22.252	22.252
2	2.843	11.845	42.503	2.843	11.845	42.503	3.309	13.788	36.040

3	1.912	7.968	50.471	1.912	7.968	50.471	2.460	10.252	46.292
4	1.674	6.974	57.445	1.674	6.974	57.445	2.429	10.119	56.412
5	1.264	5.266	62.711	1.264	5.266	62.711	1.420	5.916	62.327
6	1.177	4.904	67.615	1.177	4.904	67.615	1.269	5.287	67.615
7	.936	3.902	71.517						
8	.799	3.328	74.845						
9	.772	3.217	78.061						
10	.638	2.660	80.721						
11	.565	2.356	83.077						
12	.510	2.124	85.202						
13	.493	2.053	87.254						
14	.459	1.911	89.166						
15	.397	1.654	90.819						
16	.338	1.408	92.227						
17	.320	1.332	93.559						
18	.300	1.250	94.809						
19	.275	1.147	95.956						
20	.243	1.012	96.968						
21	.221	.919	97.886						
22	.191	.795	98.681						
23	.173	.721	99.402						
24	.144	.598	100.000						

Extraction Method: Principal Component Analysis.

Table 4

Rotated Component Matrix^a (Hypothesis Two)

	Component					
	1	2	3	4	5	6
1. Meat is the most important part of any meal.	.149	.174	.095	.731	.140	.072
2. It seems that almost everything I eat is bad for me.	.640	.057	.007	.391	-.040	.168
3. I am very concerned about eating foods that are nutritious for me.	.237	.020	.008	.080	.028	.793
4. Even though I know that my way of eating is not good for me, I just can't seem to change my habits.	.744	.095	.204	.133	.000	.158
5. If I changed the way I eat, I would be a much healthier person.	.419	.152	.601	.149	-.048	-.056
6. I enjoy trying new recipes.	.115	.623	.218	.218	.040	.288
7. Dinner doesn't seem right without meat.	.133	-.133	.126	.828	.195	-.144
8. I am what they call a "meat and potatoes" person.	.250	.007	-.041	.795	-.086	.135
9. Sometimes, I find myself eating "junk food" even though I know it is not good for me.	.815	.078	.187	.004	.011	.160
10. The chances that the way I eat will lead to heart disease are great.	.653	-.024	.248	.279	-.164	-.070
11. To keep from getting heart disease, I would be willing to change my eating habits.	.167	.041	.744	-.028	.054	-.080
12. A new way of eating designed to prevent heart disease would be easy to follow.	-.013	-.026	.816	.103	.070	.137
13. A new way of eating designed to prevent heart disease would be accepted by my family.	.148	.285	.623	.027	.115	-.035
14. I always enjoy trying new and different things to eat.	.096	.714	.365	.160	.047	.237
15. No matter how hard I try to change, I end up falling back into some of my old eating habits which I know are bad.	.821	.174	.105	.089	.028	.082

16. Many days, because I'm in a hurry, I eat whatever is handy.	.786	.199	.070	.106	.175	-.070
17. I eat certain foods that are available even though I know I shouldn't.	.805	.125	.081	.066	.178	-.004
18. When it comes to food, I have no willpower.	.766	-.003	-.012	.120	.240	-.031
19. I eat more when I feel down.	.481	.189	-.010	.118	.694	-.210
20. I would not like to buy anything that has the word "artificial".	.057	.180	.230	.129	.780	.215
21. I enjoy exploring and testing out new restaurants.	.215	.688	.046	-.072	.208	-.152
22. I am interested in eating in ethnic food restaurants.	.054	.826	-.091	-.053	.014	-.182
23. In the summer, my family likes to barbecue different kinds of meat on the charcoal grill.	.259	.398	.235	.372	-.191	-.428
24. I enjoy trying food from other countries.	.065	.877	.077	-.023	.087	.026

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.
 a. Rotation converged in 6 iterations.

Table 5

Group Statistics (Hypothesis Two)

	Have you ever been diagnosed as having a substance use disorder? A substance use disorder includes a history of alcoholism or drug addiction.	N	Mean	Std. Deviation	Std. Error Mean
Bad Habits	.00	74	22.0811	7.42406	.86303
	a. Yes	36	24.9167	7.76209	1.29368
Food	.00	75	15.2133	5.38339	.62162
Enjoyment	a. Yes	37	13.9459	4.33299	.71234
Change	.00	76	14.5526	3.46177	.39709
Beliefs	a. Yes	37	15.7838	3.26714	.53711
Meat	.00	77	11.0779	4.07743	.46467
Consumption	a. Yes	37	12.1622	3.90522	.64201

Table 6

Independent Samples Test (Hypothesis Two)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Bad Habits	Equal variances assumed	.089	.765	-1.852	108	.067	-2.83559	1.53119	-5.87066	.19949
	Equal variances not assumed			-1.823	66.746	.073	-2.83559	1.55513	-5.93986	.26868
Food	Equal variances assumed	3.221	.075	1.246	110	.215	1.26739	1.01728	-.74863	3.28341
	Equal variances not assumed			1.341	87.126	.184	1.26739	.94543	-.61172	3.14649
Change Beliefs	Equal variances assumed	.139	.710	-1.806	111	.074	-1.23115	.68154	-2.58168	.11937

Meat Consumption	Equal variances not assumed			-1.843	75.309	.069	-1.23115	.66796	-2.56171	.09941
	Equal variances assumed	.088	.767	-1.347	112	.181	-1.08424	.80472	-2.67868	.51020
	Equal variances not assumed			-1.368	73.979	.175	-1.08424	.79253	-2.66339	.49491

Research Hypothesis Three

The third hypothesis stated that individuals with a history of substance abuse will express more self-destructive health attitudes than those without a history of abuse.

Based on the nine items contained in question 16, factor analysis identified three components, as shown by Table 7 Total Variance Explained. Table 8 Rotated Component Matrix shows the four (bolded) items in component 1 that were labeled as “Self-Destructive Attitudes”, while the other components were excluded as explained in chapter 3. Using a t-test, the factor Self-Destructive Attitudes was analyzed against a history of substance abuse, as shown by Table 9 Group Statistics and Table 10 Independent Samples Test. With a p-value of 0.678 (bolded) in Table 10, results suggest there are no differences between individuals with a history of substance abuse compared to individuals without a history of abuse with respect to self-destructive health attitudes. Results provide no support for this hypothesis and will be discussed in chapter 5.

Table 7

Total Variance Explained (Hypothesis Three)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.800	31.111	31.111	2.800	31.111	31.111	2.470	27.440	27.440
2	1.483	16.474	47.585	1.483	16.474	47.585	1.768	19.644	47.084
3	1.241	13.787	61.372	1.241	13.787	61.372	1.286	14.288	61.372
4	.993	11.032	72.404						
5	.731	8.123	80.527						

6	.573	6.364	86.891					
7	.565	6.281	93.172					
8	.367	4.078	97.250					
9	.247	2.750	100.000					

Extraction Method: Principal Component Analysis.

Table 8

Rotated Component Matrix^a (Hypothesis Three)

	Component		
	1	2	3
a. People my age don't need to be concerned about their eating habits	.792	.050	.188
b. At this point in my life, I am not very concerned about my health	.596	.179	.279
c. People my age don't need to worry about their health	.810	-.018	.063
d. Eating healthy meals just takes too much time	.768	.302	-.296
e. Most vegetables taste bad	.240	.824	-.114
f. I sometimes skip meals since I am concerned about my weight	.232	.364	.511
g. Most healthy foods just don't taste that great	.060	.790	.090
h. I weigh myself often	-.317	.395	.457
i. Foods from fast food restaurants are generally unhealthy	.160	-.222	.768

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.
 a. Rotation converged in 5 iterations.

Table 9

Group Statistics (Hypothesis Three)

	Have you ever been diagnosed as having a substance use disorder? A substance use disorder includes a history of alcoholism or drug addiction.	N	Mean	Std. Deviation	Std. Error Mean
Self-Destructive Attitudes	.00	75	6.4000	2.66610	.30786
	a. Yes	35	6.1714	2.71689	.45924

Table 10

Independent Samples Test (Hypothesis Three)

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper

Self-Destructive Attitudes	Equal variances assumed	.146	.703	.416	108	.678	.22857	.54906	-.85977	1.31691
	Equal variances not assumed			.413	65.360	.681	.22857	.55288	-.87549	1.33263

Research Hypothesis Four

The fourth hypothesis stated that measurements of self-efficacy will be correlated with health beliefs.

Measurements of self-efficacy are represented by question 19, which contains five items. These items were turned into one factor and labeled as “Self-Efficacy”. Self-Efficacy was tested for correlation with the factor Change Beliefs. Significance was reached at 0.040 and Pearson Correlation, or $r = 0.202$, as shown in bold in Table 11 Correlations. While this correlation is considered low, it is significant nonetheless and will be discussed in conjunction with other hypothesis for the purpose of proposing nutrition interventions in the substance abuse population.

Table 11

Correlations (Hypothesis Four)

		Self-Efficacy	Change Beliefs
Self-Efficacy	Pearson Correlation	1	.202*
	Sig. (2-tailed)		.040
	N	106	104
Change Beliefs	Pearson Correlation	.202*	1
	Sig. (2-tailed)	.040	
	N	104	113

*. Correlation is significant at the 0.05 level (2-tailed).

CHAPTER V

DISCUSSION

The purpose of this study was to measure and analyze attitudes, beliefs, and behaviors towards nutrition, health, and self-care in a population of US veterans enrolled in the Managing Overweight Veterans Everywhere (MOVE!) Weight Management Program at the Veterans Affairs (VA) Greater Los Angeles. The goal of the study was to determine if veterans with a history of substance abuse require greater levels of care including individualized nutrition education. Based on survey responses, individuals with a self-reported history of substance abuse were compared to individuals without a history of abuse. There was insufficient evidence to reject the null hypothesis that there are no significant differences between the two groups. However, some of the individual hypotheses trended toward significance and contain implications for further research. This study showed that measurements of self-efficacy were significantly correlated with health beliefs. There was sufficient evidence to support the need for greater levels of care in veterans with a history of substance abuse. One of the studies objectives was to evaluate the necessity of including unique nutrition interventions into substance abuse treatment programs. There are recommendations offered in the implications section.

Discussion of the Hypotheses Findings

Alcohol and drugs affect people in unique ways, and it is difficult to predict the impact of these substances across an individual's life. For example, a heavy drinker and drug user during high school, college, or the military may eventually grow out of heavy drinking and drug using and never become an alcoholic/addict, despite the mental and physical damage it causes. On the other hand, an individual who did not use drugs during

their teens and early twenties may experience a turn of events later in life leading to substance abuse and the development of alcoholism/addiction. In the present study, subjects self-reported their history of substance use disorder. The culture at the VA West Los Angeles supports recovery from alcohol and drugs, and veterans are encouraged to be open about their addiction and recovery. This study examined the impact of substance abuse as it relates to nutrition by focusing on attitudes, beliefs, and behavior toward food and health, regardless of sobriety length.

Hypothesis One

The first hypothesis was that individuals with a history of substance abuse will have more difficulty controlling their overeating than those without a history of abuse. The only component of testing that reached statistical significance for this hypothesis ($p = 0.052$) was in individuals with a history of substance abuse who reported more difficulty controlling overeating when depressed. These findings are in agreement with previous research that has associated a tendency to act impulsively when distressed with problem alcohol users who binge-eat (Fischer, Anderson, & Smith, 2004). Other research has linked alcohol use disorders with elevated BMI's (Barry & Petry, 2009; Petry et al., 2008). More than half of veterans with dual diagnosis have co-occurring minor or major depressive disorders (Hunt & Rosenheck, 2011). Depression that leads to overeating is likely to lead to weight gain. In the MOVE! population, the majority of participants were already either overweight or obese, which may be related to overeating when depressed. Several authors have reported higher preference for sweets among recovering drug addicts (Krahn, 2006; Nolan & Scagnelli, 2007; Saeland et al., 2011). Difficulty controlling overeating among depressed substance use disorder (SUD) patients is most

likely to be with food that is associated with increased dopamine activity in the brain. Sugar has been identified as having the most rewarding properties in the mesolimbic dopaminergic system (Levine, Kotz, & Gosness, 2003). It is reasonable to conclude that abstinence from alcohol and drugs results in cravings for other mood-altering substances in order to counteract the associated depression. These habits persist well after abstinence has been achieved, and in many cases the habitual overeating worsens over time (Levine et al., 2003).

Hypothesis Two

The second hypothesis was that attitudes, beliefs, and behaviors towards nutrition and health of individuals with a history of substance abuse will vary from individuals without a history of abuse. Hypothesis two yielded two findings that trended towards statistical significance: the factors “Bad Habits” ($p = 0.067$) and “Change Beliefs” ($p = 0.074$) were in higher agreement with individuals who have a history of substance abuse. The items included in Bad Habits represent a sense of hopelessness, or persistence of bad habits despite attempts to change. Statements include: “It seems that almost everything I eat is bad for me”, “Even though I know that my way of eating is not good for me, I just can’t seem to change my habits”, “Sometimes, I find myself eating ‘junk food’ even though I know it is not good for me”, “The chances that the way I eat will lead to heart disease are great”, “No matter how hard I try to change, I end up falling back into some of my old eating habits which I know are bad”, “Many days, because I’m in a hurry, I eat whatever is handy”, “I eat certain foods that are available even though I know I shouldn’t”, “When it comes to food, I have no willpower.” These statements are often associated with food addiction, as they represent psychomotor behavior that becomes

automatic, with fixed responses that are difficult to break, and routine behaviors that Kessler (2009) describes as “conditioned hypereating” (p. 135). Persistence of bad habits despite conscious attempts to change may explain the significant weight gain in alcohol dependent subjects following periods of abstinence (Krahn et al., 2006) and other findings that suggest even a remote history of substance abuse can impact weight loss success (Robinson & McCreary, 2011). The use of the Yale Food Addiction Scale may be indicated in future research to address this question. For more information regarding this survey tool, refer to Appendix H.

Hypothesis two factor referred to as Change Beliefs produced important findings that add to the conclusions associated with Bad Habits. The items included in Change Beliefs reflect open-mindedness and willingness to change, suggesting that difficulties with changing bad habits are not necessary due to a lack of willingness to change, but are likely due to neurophysiological characteristics associated with addiction. Statements include: “If I changed the way I eat, I would be a much healthier person”, “To keep from getting heart disease, I would be willing to change my eating habits”, “A new way of eating designed to prevent heart disease would be easy to follow”, “A new way of eating designed to prevent heart disease would be accepted by my family.” Individuals with a history of SUD were in more agreement with these statements, suggesting that bad habits likely stem from disordered and dysfunctional eating behaviors that are related to history of substance abuse and associated changes in brain chemistry.

Hypothesis Three

The third hypothesis stated that individuals with a history of substance abuse will express more self-destructive health attitudes than those without a history of abuse.

Hypothesis three did not achieve statistical significance. It is safe to conclude that there are no differences between individuals with a history of SUD compared to individuals without a history of abuse with respect to self-destructive health attitudes. This finding adds to the strength of the conclusions from hypothesis two. Individuals with a history of substance abuse have bad habits, but it is not because they lack willingness to change, or have more self-destructive health attitudes. Nelsen (2006) found low rates of preventative health behaviors for veterans in general, but clearly this is not a unique characteristic of substance abusers. Achara-Abrahams (2003) identified self-destructive behavior among dual diagnosis patients, which was not investigated in the current study. This finding further emphasizes the fact that bad nutrition habits persist among recovering substance abusers- despite a willingness to change and the despite a lack of self-destructive attitude. Bad habits do not stem from an absence of concern for health- they are likely to stem from altered neurochemistry that poses additional health challenges for the substance abuse population.

Hypothesis Four

The fourth hypothesis stated that measurements of self-efficacy will be correlated with health beliefs. Hypothesis four yielded a statistically significant correlation ($p = 0.040$) between “Self-Efficacy” and “Change Beliefs”. Self-efficacy measures the degree of certainty that one could overcome barriers. The responses from Self-Efficacy are nutrition-specific, whereas the items included in Change Beliefs are related to cardiovascular disease. These results indicate that higher levels of self-efficacy are associated with the belief that change is attainable. As correlation does not imply causation, it can also be stated that the willingness to embrace change is associated with

higher levels of self-efficacy. This finding is not surprising, as these factors are closely linked. It is noteworthy because it implies that increasing overall self-efficacy in patients recovering from substance use disorder (SUD) may translate to overall positive outcomes that include changes in nutrition and health behavior. Additionally, small changes in nutrition and health behavior can increase general self-efficacy with respect to abstinence from alcohol and drugs, and may contribute to increased sobriety time and increased quality of life. These findings are in agreement with conclusions reached in Appendix D.

Previous Findings Within the VA System

Grant (2004) previously demonstrated that nutrition education is positively associated with outcomes of substance abuse treatment within the VA system. Important questions that were posed in this study include: How should nutrition education be most effectively delivered to this population? How should the effectiveness of nutrition education be measured? Standardization of intervention will assist in ruling out alternative explanations of findings thereby increasing confidence in the conclusions drawn. At a minimum, outcomes should be measured by days of abstinence (Grant, 2004). The presence of confounding variables makes the measurement of nutrition intervention effectiveness difficult. For example, patients who are willing to make behavior changes with respect to nutrition are more likely to make other behavior changes that demonstrate self-care and self-efficacy. It is difficult to know if the changes in nutrition behavior contributed to abstinence from alcohol and drugs because it is not possible to control for all other variables over time. Many addiction specialists believe that recovery from alcohol/drugs involves a spiritual component, indicating a need for qualitative evaluation in addition to quantitative measurement.

Other questions posed by Grant (2004) include: What domains of nutrition education (knowledge, practice, or learning styles) are effective in improving substance abuse treatment? Which nutrition behaviors may be most affected by participating in a nutrition education program during substance abuse treatment? Changes in which behaviors are most likely to be associated with improved outcomes? Grant (2004) suggests that learning strategies for substance abuse patients should take advantage of group dynamics (cooperative learning styles), emphasize patient empowerment and self-efficacy (health belief model), include goal-setting strategies, and be based upon readiness to alter behavior (stages of change model). Robinson and McCreary (2011) provide documentation that veterans with a history of SUD enrolled in the MOVE! program are not achieving weight loss success. During level 2 of MOVE!, those with a history of SUD actually gained weight. Results indicate that veterans with a history of substance abuse require greater levels of nutrition care.

Nutrition education should be tailored to the specific needs of the population. Should interventions on alcohol-only populations differ from interventions on heroin-only populations? Should those with substance use disorder receive specialized nutritional guidance different from those with co-occurring eating disorders? Will those who display characteristics of food addiction require food restriction or should the aim be diet liberalization and “legalization” of all foods? Which populations will the “Total Diet Approach” have contraindications? It is my opinion that nutritional needs are best assessed on an individual basis and one approach will rarely fit all individuals. Meanwhile, it will be crucial and imperative that outcomes be monitored, evaluated, and measured to establish a base for further study. The role of the Registered Dietitian will be

critical to the implementation of initiatives that support nutrition education in substance abuse recovery communities.

Study Limitations

This thesis hopefully adds to the understanding of the relationship between substance abuse and disordered/dysfunctional eating behaviors that persist during recovery.

The following limitations of the study include:

- Data was collected using self-reported questionnaires, which was not screened for education level. Additionally, the survey took upwards of 20 minutes to complete, which may have exceeded the attention span of some subjects.
- Validated questionnaires came from a variety of sources, dating as far back as 1986. A portion of the survey was taken from a questionnaire designed for high school students. Many questions appeared outdated or not applicable, and the survey did not address all of the current concerns in the substance abuse population, such as sugar use.
- Subjects were already enrolled in a weight management program therefore disordered and dysfunctional eating behavior had been established.
- Subjects were being educated on nutrition and behavior change in the MOVE! Weight Management Program therefore some of the responses may have reflected knowledge rather than actual practice, and may have captured attitudes at one particular point in time.
- The distinction between the history of alcohol abuse, drug abuse, or poly-substance abuse was not made by the questionnaire.
- Findings represent a small sample of veterans and may not be applicable to non-veterans.

- Data was collected at both VA WLA and North Hills' campuses, and no distinction between the two sites was made during analysis.
- Responses were entered into SurveyMonkey by hand, and while this researcher did it very carefully over several days, the potential for human error exists.
- Only the differences between individuals with a history of SUD versus no history that were linked to specific research hypothesis were discussed. Other significant findings may exist in the data, but were not addressed.
- Correlational findings do not imply causation.

Practical Implications

Several conclusions emerged from this study. First, individuals with a history of substance abuse reported more difficulty controlling their overeating when depressed. Nutrition education that is tailored specifically for the substance abuse population should include curriculum that provides tips for dealing with depression with activities other than food. Strategies for decreasing “emotional eating” can include taking a walk, talking with a friend, writing about feelings in a journal, drinking tea, playing a game, listening to music, or any other pleasurable activity until the urge to eat passes. Counseling, relaxation exercises, yoga, and meditation also are helpful for breaking the cycle of eating when depressed and may promote new coping mechanisms. This curriculum should be employed for substance abuse treatment settings and should be taught by a Registered Dietitian.

Second, individuals with a history of SUD engage in bad habits more often than individuals without a substance abuse history, and it is not necessarily due to lack of willingness to change or due to self-destructive health habits. Bad nutrition habits may be secondary to the impact of addiction on the brain, which makes “hyperpalatable”

foods more rewarding in this population, certain habits more difficult to break, and characteristics associated with addiction such as increased preference for sugar more persistent. It is important to remember that drastic nutritional changes in early recovery may be contraindicated when the immediate goal is abstinence from alcohol/drugs. Once detoxification has occurred, attention to food and changing dietary habits may aid in the process of recovery by nourishing the brain and rechanneling the long-established reward pathways.

Additionally, improvements in nutrition behavior may lead to an increased self-efficacy, which may contribute to positive outcomes in substance abuse settings. This finding suggests that increased self-efficacy may impact one's belief and attitudes about change. Positive change beliefs are crucial to recovery, and any method of increasing self-efficacy in the recovery process will benefit the patient. Nutrition interventions in substance abuse treatment can focus on rebuilding self-efficacy by creating realistic nutrition goals each week. An example would be the consumption of one vegetable that has not been eaten within the last year. Other attainable goals could be the consumption of yogurt once per day, or a commitment to replace sweetened beverages with water once each day.

From a practical perspective, it is known that many alcoholics and addicts do not typically respond well to classic clinical approaches to recovery. Data collected in this study confirm previous findings that nutrition education should be presented as part of an overall recovery program, both physiologically and as a path towards behavior change. Many treatment facilities favor the employment of recovered alcoholics and addicts over clinicians, including programs at the VA. It would be helpful if Registered Dietitians who

are familiar with the tenets of substance abuse recovery carry out nutrition interventions. The ability of the nutrition educator to effectively reach this population will vary, making standardization of intervention difficult. This indicates a need for specialized training. The International Nurses Society on Addictions (IntNSA, 2012) was founded in 1975 provides coursework and examination to become a Certified Addictions Registered Nurse (CARN) with options for additional Advanced Practice (CARN-AP) credentials. Registered Dietitians will hopefully be able to obtain specialty training and credentials.

Conclusion

Depression is one component that can lead to overeating in individuals recovering from substance abuse. The persistence of bad habits is not due to an absence of desire for a better life, but more likely due to the impact of addiction on the brain. Overeating and poor nutrition habits lead to obesity, diabetes, hypertension, and other forms of chronic disease. Chronic disease can lead to cardiovascular disease and is associated with significant healthcare burden. Nutrition interventions during recovery may prevent or minimize the onset of chronic illness, improving resource allocation.

The Academy of Nutrition and Dietetics position paper published in 1990 advocated for nutrition intervention in treatment and recovery from substance abuse (ADA, 1990). The paper supported the concept that Registered Dietitians are essential members of the treatment team and that nutrition care should be integrated into treatment protocols. The recommendation of nutrition professionals to “take aggressive action to ensure involvement in treatment and recovery programs” (p. 1274) did not receive adequate attention from dietitians or policy makers through public health initiatives. In recent years, research that directly connects food with addiction has gained momentum

and increased public attention. This study can be considered a follow-up on research done by Grant (2004) on the VA system and Robinson & McCreary (2011) on the MOVE! program. *Nutrition and Substance Abuse* contributes to the emerging body of literature that confirms a need for greater levels of nutrition care among individuals recovering from a substance use disorder.

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Appendix A – Abbreviations

AA – Alcoholics Anonymous

APA – American Psychiatric Association

ASAM – American Society of Addiction Medicine

BHN – Behavioral Health Nutrition

BRFSS – Behavioral Risk Factor Surveillance System

BMI – Body Mass Index

CAD – Coronary Artery Disease

CVD – Cardiovascular Disease

DA - Dopamine

DM – Diabetes Mellitus

DSM – Diagnostic and Statistical Manual

FY – Fiscal Year

GLA – Greater Los Angeles

HIV – Human Immunodeficiency Virus

HTN – Hypertension

MI – Motivational Interviewing

MOVE! – Managing Overweight Veterans Everywhere

NCP – National Center for Health Promotion and Disease Prevention

NIH – National Institutes of Health

NSV – National Survey of Veterans

NT - Neurotransmitter

OA – Overeaters Anonymous

PTSD – Post-Traumatic Stress Disorder

RD – Registered Dietitian

RHEALTH – Recovery Healthy Eating and Active Learning in Treatment Houses

SAMHSA – Substance Abuse and Mental Health Services Administration

SUD – Substance Use Disorder

VA – Veterans Affairs or Veteran Administration

VHA – Veterans Health Administration

UK – United Kingdom

US – United States

USDVA – United States Department of Veterans Affairs

Appendix B – VA History

The practice of providing pension for disabled veterans dates back to 1636 in Plymouth Colony, where money was awarded to those disabled during battle with Indians (US Department of Veteran Affairs [USDVA], n.d.). In 1776, the Continental Congress granted half pay for life for loss of a limb or other serious injury. Later, land grants were offered to those serving to the end of the Revolutionary War. The War of 1812 led to extended benefits to dependents, including widows and orphans for a period of five years. The Service Pension Law of 1818 granted a fixed pension for life for those serving in the War of Independence and qualifying for assistance, making funds also available to those not disabled. Congress established the Bureau of Pensions in 1833 and it was administered until 1840, authorizing further pensions to widows and orphan children until they reached the age of 16 (USDVA, n.d.).

The General Pension Act of 1862 during the Civil War covered military service from times of peace as well as during wartime (USDVA, n.d.). Compensation for disease incurred during service was introduced, and the National Cemetery System was established. By 1873, the National Home for Disabled Volunteer Soldiers was established to provide room, board, and medical care to veterans, regardless of the conditions surrounding the illness. By the late 1920's, the degree of medical care in these communities had elevated to hospital level (USDVA, n.d.).

Following a 1929 State of the Union message regarding veteran benefits, President Hoover signed the executive order establishing the Veterans Administration (VA) on July 21, 1930 (USDVA, n.d.). During the period between 1931 and 1941, the number of VA hospitals increased from 64 to 91 and the bed count rose from 33,669 to

61,849. The demand for hospital care grew tremendously during the Great Depression. The Disabled Veterans' Rehabilitation Act of 1943 established specific vocational rehabilitation for disabled World War II veterans, providing 621,000 veterans with job training. In 1944 the GI Bill of Rights transformed the concept of veteran benefits by including education packages, guaranteed homes with no down payment, and unemployment compensation, significantly fueling growth of the nation's economy (USDVA, n.d.).

In the post-World War II period, VA's hospital-based research program was initiated under Major General Paul Hawley (USDVA, n.d.). In 1952 there were 541 Hospitals and an average of 128,000 veterans receiving medical and domiciliary care on a daily basis. By the late 1950's, Chief Medical Director William Middleton expanded the research programs to meet the chronic problems of VA patients, including the elderly. The Vietnam War created a larger percentage of disabled veterans. There was also a culture shock due to rapid readjustment into civilian life that created new problems, and large numbers of veterans became unemployed. Several new programs and insurance coverage became available (USDVA, n.d.).

In 1976 the draft was discontinued, which led to a reexamination of veteran benefits, emphasizing those who served during wartime versus peacetime (USDVA, n.d.). In 1978 Congress passed the Veterans' and Survivors' Pension Improvement Act, which greatly reduced the number of veterans qualifying for pensions. The Veterans Health Care Amendments Act of 1979 created a program to treat veterans for drug and alcohol dependence. At this time, the VA was already training interdisciplinary teams of health-care specialists with a focus in the field of geriatric medicine. In the late 1980's,

resources became available to serving homeless and chronically mentally ill veterans. Following the Persian Gulf War, psychological counseling at Vet Centers became available to soldiers having trouble transitioning back to civilian life (USDVA, n.d.).

The Veterans Health Care Act of 1992 granted authority for gender-specific services and programs to focus on women veterans (USDVA, n.d.). The VA's Center for Women Veterans was established in November 1994 to ensure that women veterans are treated with equality, dignity, and respect. In 1997, the VA healthcare system made eligibility criteria the same for outpatient care as for inpatient care. Community-based outpatient clinics were established nationwide to increase access to healthcare. Since 1998, veterans who served in combat or comparably hostile zones have been eligible for free VA hospital care, outpatient services and nursing home care for two years following active duty for all illnesses and injuries that may be a result of their military service (USDVA, n.d.).

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Appendix C – Current Issues at the VA

Focusing on quality assessment and improvement are measures considered critical to quality medical care. Recent research suggests that the quality of care at the VA varies among common chronic diseases (Neugaard, Priest, Burch, Cantrell, & Foulis, 2011). By examining use of guidelines-sanctioned medication and proper adherence by patients, performance was deemed highest for coronary artery disease and heart failure. Diabetes mellitus (DM) also ranked high in terms of compliance, and investigators recognize this to be consistent with quality measurement and improvement efforts undertaken by the Veterans Health Administration (VHA) with respect to cardiovascular and metabolic disease. Quality of care as indexed by medication use and adherence was lowest for chronic obstructive pulmonary disease (COPD) and asthma in that particular cohort (Neugaard et al., 2011). While this data lacks external validity, it demonstrates that VHA performance-enhancement initiatives lead to a higher quality of care, whereas chronic conditions that have not been a primary focus of quality improvement efforts receive lower levels of care.

Large epidemiologic studies often use database diagnoses or patient self-report to identify disease cohorts. Singh (2009) examined accuracy between sources of information and found that diagnoses identified from database agree with self-report for DM, but not for COPD/asthma, depression, or heart disease in a VA healthcare setting. This study of elderly veterans suggests that if a disease is conceptually clear it can be easier communicated by the doctor to patient. Higher numbers of comorbidities and older age increased the discrepancy between self-report and database diagnosis (Singh, 2009). Unfamiliarity with medical terminology is an important issue when dealing with this

population. Kupersmith et al. (2007) highlight the importance of the Electronic Health Record (EHR) system in addressing medical care within the VHA. Utilization of EHR data has enabled identification of early chronic kidney disease in diabetic veterans, as well as patients at high risk for complications such as amputation or vision loss. The VHA diabetic registry has been used to construct performance profiles for administrators and clinicians to target complications such as abnormal blood pressure, and integrate pharmacists and other professionals to improve care at the point of service (Kupersmith et al., 2007).

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Appendix D – Self-Efficacy and Nutrition: Promoting Behavior Change in Substance Abuse Recovery

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Introduction

The General Self-Efficacy Scale (GSES) was developed in Germany in 1979 and has been translated for use in 33 different languages. It was created to assess perceived self-efficacy as a predictive measure of one's ability to cope with everyday obstacles and adapt to stressful life events (Schwarzer & Jerusalem, 1995). An individual's perceived self-efficacy reflects degree of self-belief in their ability to perform difficult tasks or cope with adversity. According to Schwarzer (1992), perceived self-efficacy is an operative construct directly related to past and future behavior and is therefore clinically relevant to facilitate behavior change. Other health-specific self-efficacy scales have also been developed including the Nutrition Self-Efficacy Scale (NSES), the Alcohol Abstinence Self-Efficacy Scale (AASES) and the Physical Exercise Self-Efficacy Scale (PESES).

Measurement of self-efficacy has been used to predict relapse in substance abuse patients. Using an adapted version of the AASES for drugs and alcohol, investigators found their simple measure of self-efficacy to be a significant predictor of relapse, superior to a well-established 20-item measure of self-efficacy (Hoeppner, Kelly, Urbanoski, & Slaymaker, 2011). If recovery from substance abuse (as measured by abstinence) is correlated with perceived self-efficacy, one of the goals of treatment should be to increase the general self-efficacy of patients. If an alcoholic/addict has a long record of disappointment and failed treatment attempts, the process of improving self-efficacy can be difficult requiring months or years of sustained effort. A strategy that

incorporates an exercise program and healthful dietary strategies may help patients to slowly create a new paradigm by rebuilding their self-belief system one action at a time. Conversely, lingering self-doubt can inhibit plans for abstinence and diminish hope for recovery.

Self-Efficacy and Nutrition

The Eating Self-Efficacy Scale (ESES) was developed in 1986 to assess an individual's likelihood of encountering difficulty with controlling overeating in a variety of settings (St. Jeor, 1997). The Nutrition Self-Efficacy Scale (NSES) established the premise that self-confident clients with a higher sense of self-efficacy will be more responsive to nutrition interventions (Schwarzer & Renner, n.d.). Using a 4-point Likert scale ranging from (1) *very uncertain* to (4) *very certain*, the NSES asks "how certain are you that you could overcome the following barriers?" Questions relate to the practice of sticking to healthful foods under a variety of circumstances, and can therefore be useful for dietitians in counseling.

In a study of adolescents at six alternative high schools (where students typically have higher rates of risky health behaviors including less healthy dietary practices), subjects reporting higher self-efficacy had fewer perceived barriers and higher fruit/vegetable intake (Bruening, Kubik, Kenyon, Davey, & Story, 2010). The authors suggest that by addressing the perceived barriers, self-efficacy for making healthy food choices is likely to increase. Richert et al. (2010) found that if a person lacks self-efficacy, the act of planning often fails to transform intentions into behavior, particularly for fruit and vegetable consumption. The authors suggest that individuals with a very low

self-efficacy should gain more confidence in their ability to change prior to any targeted behavioral interventions, beginning with small steps.

Discussion

According to Schwarzer and Renner (n.d.), approaches to increase self-efficacy are optimized in conjunction with general lifestyle changes, including exercise and new social support systems. When social and environmental support systems are in place, making healthful choices becomes possible and self-efficacy has an opportunity to improve (Bruening et al., 2011). Nutrition interventions in substance abuse treatment can focus on rebuilding self-efficacy by creating realistic nutrition goals each week. An example would be the consumption of one vegetable that has not been eaten within the last year. Other attainable goals could be the consumption of yogurt once per day, or a commitment to replace sweetened beverages with water once each day. As self-efficacy improves and nutrition goals continue to progress, some individuals may become interested in setting exercise goals. Coupling exercise goals with nutrition goals can be very effective, such as rewarding oneself with a brownie and milk for increasing the frequency, duration, or intensity level of a training regimen. Patients should be offered affirmations for their accomplishments, being reminded that behavior change is possible regardless of present circumstances and despite previous track record.

There is an ongoing need for dietitians to promote healthful dietary practices including regular consumption of fruits/vegetables in substance abuse treatment settings. With nutrition education, individual counseling, and exposure to fresh whole foods and exercise, individuals in recovery may increase their self-efficacy in making healthy lifestyle choices. Increased self-efficacy in relation to nutrition may translate into

increased self-efficacy regarding abstinence from alcohol and drugs. Nutrition alone is insufficient to keep an alcoholic/addict sober, and self-reported perceptions of self-efficacy may not predict long-term abstinence. However, nutrition can be a vital ingredient in the recipe for behavior change. Diet and exercise are crucial components in the development of an alternative pathway that reflects self-care and a commitment to staying sober. Measurements of self-efficacy can be very useful when promoting behavior change throughout recovery from substance abuse. Behavioral Health Nutrition (BHN) dietitians are encouraged to utilize these tools, intervene on this population, and help to establish evidence-based guidelines.

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Appendix E – Alcohol and Malnourishment

Ethanol is a psychoactive drug with an energy value of 7.1 kcal/g. Chronic and excessive alcohol intake is recognized to have adverse effects on nutritional status by reducing food intake (primary malnutrition) and interfering with digestion, absorption, and metabolism of some nutrients (secondary malnutrition). Alcohol is absorbed throughout the gastrointestinal (GI) tract, primarily the duodenum. Alcohol does not require digestion, but digestion of other nutrients are impaired due to pancreatic insufficiency leading to impaired secretion of enzymes, as well as morphologic and functional alterations of intestinal mucosa (Mahan & Escott-Stump, 2008).

Light or moderate alcohol consumption has been associated with increased risk of ill health associated with pre-existing conditions such as ulcers (Foster & Marriot, 2006). Heavy alcohol consumption is a known risk factor for high blood pressure, cirrhosis of the liver, kidney problems, GI complications and a host of other adverse conditions. Poor utilization of nutrients due to insufficient metabolism or retention may also result from alcohol-related diseases such as chronic pancreatitis and liver disease. Deficiencies of many micronutrients including thiamin and folate are extensively documented among chronic alcohol abusers (Foster & Marriot, 2006). Alcohol can also affect bone health due to interference with calcium balance and vitamin D production, as well as increased parathyroid hormone levels (NIH, NIH Osteoporosis and Related Bone Diseases National Resource Center, 2011). Alcohol abuse can also lead to lactose intolerance, which can cause diarrhea and lead to elimination of milk products, a primary source of calcium and vitamin D (Hatcher, 2008).

Several studies have examined alcohol consumption patterns among veterans, especially those serving in specific operations. Problematic drinking and consumption patterns vary by age, sex, and period of time since deployment or discharge from military service, as well as location (Coughlin, Kang, & Mahan, 2011). Alcohol use disorders have been found to be more common among people with post-traumatic stress disorder (PTSD) than people without. Authors hypothesize that problems with alcohol may occur as a consequence of PTSD. A follow-up study of veterans from the 1991 Gulf War highlights the need of sustained efforts to provide access to evidence-based treatment for veterans who abuse alcohol and have war-related conditions and illnesses (Coughlin et al., 2011).

Gastrointestinal (GI)

Alcoholism is associated with GI complications, especially involving the pancreas and small intestine (Lieber, 2000). Increased swelling of the gut can cause decreased absorption of nutrients (Griffith & Schenkner, 2006). High concentrations of alcohol in the stomach and duodenum can cause GI bleeding, gastritis, duodenitis, and increased permeability in the mucosal layer, which will aggravate the exposure of toxins to the liver and cause damage. GI inflammation may be responsible for reduced appetite in chronic alcoholics (Academy of Nutrition and Dietetics [AND], 2012). GI swelling is known to be reversible in abstinence from alcohol whereas liver conditions may not be. GI damage results in altered blood flow, inhibition of active transport essential for absorption, and disruption in cell membranes, which may contribute to pre-cancerous conditions.

Epidemiological studies have suggested a significant correlation between alcoholism and the development of upper GI tract cancer (Homann, 2001). Alcohol has a

dose-dependent carcinogenic effect. While alcohol itself is not carcinogenic, the displacement of cancer-protective nutrients in the diet is a proposed mechanism. Homann (2001) attributes acetaldehyde, a highly toxic and volatile intermediate of alcohol metabolism with mutagenic and carcinogenic effects. Toxins from ethanol and methanol can cause acute pancreatitis, and may lead to premature activation of pancreatic enzymes (Porter & Kaplan, 2011). Mechanisms for this significant correlation could include the increased production of free radicals and decreased intake cancer-protective fruits, vegetables, trace elements, and vitamins (Watson & Preedy, 2004).

Alcohol can also interfere with the uptake of essential amino acids and therefore compromise protein status, leading to a negative nitrogen balance. Observed defects in protein metabolism include decreased metabolism of aromatic amino acids, which can increase risk for hepatic encephalopathy (Lieber, 2003). Other documented consequences include increased urinary nitrogen, decreased albumin production, reduced blood-clotting factors, and reduced urea synthesis. Alcoholic patients can also experience changes in skeletal muscle, which will have major implications for whole-body metabolism (Watson & Preedy, 2004). According to authors, both chronic and acute alcohol exposure disturbs protein metabolism at the whole-body, tissue, and cellular level.

Micronutrients

Hospitalized alcoholics were reported to have impaired thiamin absorption when compared with controls using radioactive thiamin excretion (Lieber, 2000). Thiamin deficiency in alcoholics causes Wernicke-Korsakoff syndrome, leading to forms of encephalopathy. Thiamin is essential to proper brain functioning and pathological consequences can result from its deficiency, particularly in the cerebellum (Martin,

Singleton, & Hiller-Sturmhofel, 2003). Research has identified several different mechanisms by which alcoholism contributes to thiamine deficiency, including decreased intake, impaired absorption from the GI tract, reduced uptake into cells, and impaired utilization inside of cells. Recent literature suggests that increased destruction, reduced formation, and increased demand can also be contributing factors of thiamine deficiency (Porter & Kaplan, 2011).

Low folic acid status is also associated with heavy drinking. Decreased levels may be partly due to acetaldehyde, which has shown to catabolize folate (Homann, 2001). Alcohol is known to inhibit its absorption, and interfere with renal excretion and enterohepatic re-absorption (Porter & Kaplan, 2011). Recent study results indicated a reduced amount of folate and vitamin B12, and an increase in homocysteine levels among healthy volunteers (Gibson et al., 2008). Homocysteine is a known risk factor for cardiovascular disease (CVD) and is regulated through pathways dependent on folate. Pernicious anemia due to inadequate B12 has been identified in late stage alcoholics (Hatcher, 2008).

In addition to classic aspects of vitamin A deficiency due to poor intake or severe liver disease, alcohol has been shown to have direct effects on vitamin A metabolism, resulting in altered hepatic vitamin A levels. Retinol dehydrogenase is thought to be identical to alcohol dehydrogenase, therefore ethanol will competitively inhibit hepatic conversion of retinol to retinal (Gropper, Smith, & Groff, 2009). Ethanol induces metabolizing enzyme leading to hepatic depletion of retinol. An alcoholic may become tolerant to vitamin A, thereby requiring more of it. Vitamin A deficiency may contribute to liver disease (Lieber, 2003) but too much vitamin A can cause liver injury. Because

retinoic acid plays a vital role in controlling cell growth, differentiation, and apoptosis, there are disease risks for peripheral organs as well (Watson & Preedy, 2004).

Alterations in bile will impair absorption of fat-soluble vitamins A, D, E, and K. Other water-soluble B vitamins have also been observed in deficient amounts, particularly vitamin B6, which can lead to anemia. According to Lieber (2000), the active form of B6 is more rapidly destroyed in the presence of acetaldehyde, the toxic metabolite of ethanol. B vitamins may undergo inhibited absorption from the intestine as well as renal re-absorption, and storage in the liver may also be adversely affected. Vitamin C deficiencies have also been observed in alcoholic patients, as well as zinc, which is essential for the function of over 300 enzymes. Cases of hypomagnesia, as well as hypocalcemia, and hypophosphatemia have been documented in clinical settings (Mahan & Escott-Stump, 2008). Alcohol is known to influence the regulatory mechanisms for these minerals, which have all been related to increased risk for CVD (Watson & Preedy, 2004). Magnesium deficiency is one of many diagnostic tools for determining chronic alcohol abuse according to the MERCK Manual of Diagnosis and Therapy (Porter & Kaplan, 2011). Other trace elements such as selenium and copper are also often reduced at a lesser extent (Stickel, Hoehn, Schuppan, & Seitz, 2003).

Liver

It is widely accepted that the quantity and duration of alcohol consumption are principal agents in the development of alcoholic liver disease (ALD). Hepatotoxicity of ethanol was established by controlled clinical trials showing that even in the absence of dietary deficiencies, alcohol can produce fatty liver and ultrastructural lesions in humans (Lieber, 2000). An increase in liver enzymes is a common indicator of liver disease. The

first stage is hepatic steatosis, or fatty liver, followed by alcoholic hepatitis. Cirrhosis of the liver is the most serious form of ALD, where scar tissue replaces normal liver tissue and prevents it from functioning properly. Cirrhosis is associated with GI bleeding and inadequate bile secretion (AND, 2012). Complications of ALD include hepatic encephalopathy and pancreatitis. According to Stickel et al. (2003), a large trial from VA hospitals documented the prevalence of malnutrition at 100% for patients with severe alcoholic hepatitis.

Abnormal breakdown of fat results in the formation of triglycerides that are deposited in the liver. Other risk factors such as genetic predisposition, obesity, concomitant viral hepatitis infection, and poor nutrition may contribute to the development of ALD (Griffith & Schenkner, 2006). Dietary deficiencies are found to exacerbate these effects, and supplementation of deficient nutrients has shown beneficial effects. In a comprehensive review, Lieber (2000) suggests that protein deficiency may be linked to striking changes in liver lipids during the metabolism of alcohol. Also noted is that among alcoholics hospitalized for medical complications of alcohol intoxication, continued drinking results in weight loss, whereas abstinence results in weight gain (Lieber, 2000). Chronic excessive alcohol consumption common in alcoholics is associated with weight loss, while moderate drinking is associated with weight gain (Foster & Marriot, 2006). This distinction can be attributed to the primary malnutrition present in the alcoholic that is most likely absent in the moderate drinker.

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Appendix F – Caffeine, Nicotine, Nutrition: Practical Implications for Substance Abuse Recovery

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Introduction

Caffeine and nicotine have been referred to as “social drugs” (Maremmani et al., 2011) because of their ability to induce pleasurable sensations. They are often used together for their synergistic effects. Nevertheless, all mood-altering substances have the potential for abuse, as tolerance and dependence develop over time. Because these substances are widely available, individuals can self-administer potent forms legally. Some drug and alcohol treatment centers do not allow the use of “social drugs”, however other treatment centers allow their residents to utilize these substances without any formal regulation. According to Dekker (2000), caffeine and nicotine are often used as a breakfast substitute by individuals in recovery, which may have adverse effects, particularly later in the afternoon.

Prolonged caffeine and nicotine intake, toxicity and dependence are associated with a wide range of psychiatric and substance use disorders (Maremmani et al., 2011). In addition, the concentration-dose ratio of caffeine appears to be three to fourfold as high among nonsmokers compared to smokers (Leon, 2004). This higher ratio suggests that smokers require three to four times the dose of caffeine to achieve the same plasma caffeine levels. Johnson, Strain, and Griffiths (2010) documented that caffeine ingested pretreatment attenuated the subject-rated positive effects of high doses of intravenous nicotine. Researchers concluded that caffeine has complex interactions with nicotine that are dependent on multiple factors including chronicity of caffeine consumption and

history of other substance abuse. In practical terms, caffeine may operate as a cue for smoking, and this relationship is commonly seen in clients with a history of abuse.

Caffeine

Caffeine is not limited to coffee, tea, chocolate, and sodas. Supplemental caffeine is used in “energy drinks”, and caffeine pills are readily available and inexpensive.

Energy supplements often contain as much as 300 mg of caffeine per serving.

“Caffeinism” starts at 600-750 mg/day, with 1000 mg/day and above defined as toxic (Hilton, 2007). Toxicity occurs when increasing amounts are added to chronic intake and leads to wakefulness, restlessness, anorexia, vomiting, dehydration, seizures, and tachycardia (Porter & Kaplan, 2011). Dehydration exacerbates confusion, agitation, and poor concentration.

Coffee and tea have been shown to inhibit the absorption of iron in food, a nutrient needed by many individuals in recovery from drug abuse (Hossain, Kamal, Ahsan, & Islam, 2007), particularly menstruating females. Combining caffeine with nicotine can increase gastric secretions and lead to gastric irritation (Hatcher, 2008). High coffee intake is associated with increased plasma levels of low-density lipoproteins and total cholesterol. The duration and quality of sleep are also affected by caffeine, which can have a significant impact on the body’s ability to recover from alcohol and drug use.

Nicotine

Nicotine is a highly addictive drug most frequently inhaled through cigarettes, while other forms of combustible and chewing tobacco have high nicotine content. From 2000 to 2011, consumption of cigarettes in the US decreased 32.8% while consumption of non-cigarette combustible tobacco such as loose leaf or cigars increased by 123.1%

(US DHHS, 2012). The electronic cigarette (e-cigarette) now allows individuals to consume nicotine in public places where smoking is illegal. Novy, Hughes, and Callas (2001) have found that recovering alcoholic smokers were more nicotine dependent and had more internal barriers to quitting compared to non-alcoholic smokers.

Nicotine increases metabolism and acts as an appetite suppressant (Novak & Gavini, 2012), and can remove the unpleasant effects of hunger. Nicotine compromises the senses of taste and smell, affecting food intake and therefore all areas of nutrition (Hatcher, 2008). Smokers have a tendency to choose hyper-palatable snack foods and are less likely to enjoy the taste of fruits and vegetables, creating significant barriers for successful nutrition interventions. Smoking also increases the levels of free radicals in the blood stream. Plasma vitamin C levels are lower in smokers independent of dietary vitamin intake, as are total carotenoids (Dekker, 2000). Smokers should increase their intake of antioxidant rich foods such as carrots, sweet potato, red pepper, and other fruits and vegetables, rather than supplements. Avoid the “quick fix” approach whenever possible.

Interactions

Since abstinence is the hallmark of recovery programs, numerous authors have concluded that individuals in recovery should abstain from “social drugs” entirely. More realistically, the timing of caffeine and nicotine cessation or reduction should be assessed on an individual basis. Both substances have known interactions with psychiatric medications such as clozapine/Clozaril and olanzapine/Zyprexa; therefore abrupt alterations in daily intake may have psychopharmacological effects for patients taking these medications (Leon, 2004). Caffeine intake and smoking may also alter the metabolism of selective serotonin reuptake inhibitors (SSRIs) such as fluoxetine/Prozac,

sertraline/Zoloft, and citalopram/Celexa (McCabe, Frankel, & Wolf, 2003). Psychotropic agents also have known effects on appetite and weight. For many patients, the first few months of sobriety are not the optimal time to drastically alter caffeine and nicotine intake, particularly when neuropharmacologic medications have been prescribed. Dietitians should always be aware of drug interactions when dealing with the substance abuse population.

Current Cessation and Reduction Options

Complete abstinence from caffeine is not indicated for all clients. Withdrawal from caffeine should be managed gradually, as headaches, drowsiness, and lethargy are common side effects (Hilton, 2007). Caffeine causes peripheral vasodilation but vasoconstriction of vessels in the brain, leading to its use as a headache remedy (Hatcher, 2008). Limiting caffeine intake to a maximum of 450 milligrams per day (roughly 3-4 cups of coffee) is a reasonable starting goal for individuals in early recovery (Dekker, 2000).

Prescribing options to help people quit smoking include nicotine replacement therapy patches, chewing gum, sublingual tablets and spray, bupropion – an oral noradrenergic antidepressant and varenicline – an oral nicotine receptor partial agonist (Hilton, 2007). However, the majority of smokers who eventually quit do so without formal treatment, as most smokers are unwilling to attend formal cessation programs (Westmaas & Langsam, 2005). Nicotine Anonymous has spread across the globe since its inception in the early 1980's and offers assistance without dues or fees (Nicotine Anonymous, 2011). An average weight gain of 4 to 5 kg (8-10 lbs) is common following cessation of smoking and is another reason for recidivism (Porter & Kaplan, 2011),

increasing the need for dietitians in treatment settings. Meanwhile, implementing a “dieting” approach to weight control while trying to quit smoking may worsen rather than improve cessation goals (Dekker, 2000).

Discussion

There are special considerations when working with individuals in recovery from alcohol and drugs. Using scare tactics based on reports of adverse health outcomes such as cancer, cardiovascular, and pulmonary disease may be counterproductive. Strict avoidance of caffeine during early recovery may make nutrition appear to be punitive rather than a helpful component of recovery. Most people in recovery will need to draw their own conclusions based on their own experiences. If information alone was sufficient to promote recovery from substance abuse, recovery rates would be much higher and treatment programs would be better recognized and utilized.

There is a growing body of evidence that suggests nutrition education during substance abuse contributes to positive outcomes (Barbadoro et al., 2010; Grant, Haughton, & Sachan, 2004). Dietitians that are trained in nutrition education for addicts can assist substance abuse clients on the path towards behavior change. By focusing on the role of physical health in the process of recovery, clients may be better positioned to make informed choices about what they consume. By highlighting the negative impact of caffeine and nicotine on nutritional status, patients may be more open to reducing or quitting these habits. Nutrition education and counseling can become an effective adjunctive approach towards caffeine and nicotine cessation or reduction. Using motivational interviewing techniques, the dietitian can highlight the discrepancies

between current behaviors and overall treatment goals (Carroll et al., 2006; see also Velasquez et al., 2010).

By focusing on the benefits of a healthful lifestyle and the negative nutritional consequences of caffeine and nicotine, dietitians can promote behavior change favorable to recovery from alcohol and drugs. Complete avoidance may not be necessary during early recovery and may lead to relapse. Caffeine and nicotine can assuage the early stages of recovery, a period of new emotions, anxiety, and uncertainty. Clients should be reminded “first things first” and encouraged to consider the possibility that cessation is a secondary goal. Caffeine intake may not need to stop abruptly, but it can be successfully monitored and reduced. Incorporation of an exercise program may facilitate this process. An attitude change that is essential for long-term recovery must come from within, and new knowledge about the impact of nutrition on physical recovery is a good start.

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Appendix G – Self-Care and Gender

The healthcare system is increasingly shifting away from inpatient treatment towards outpatient care, where more help is required of family member caregivers (CG), often times a spouse assisting with administering medication. Estimates from research in home care suggest that the majority of care provided to older adults is unpaid and informal. Wakefield et al. (2012) explored the CG strains and satisfactions associated with caring for a veteran with long-term debilitating chronic illness such as diabetes, hypertension, heart failure, post-traumatic stress disorder (PTSD), chronic obstructive pulmonary disease, and depression. Researchers found a high level of CG strain relative to a moderate level of CG satisfaction, with different predictors for strain and satisfaction. Involvement of family in self-care will be an important consideration for veterans utilizing Home-Based Primary Care. Effective home care for chronic disease should be interdisciplinary, longitudinal, comprehensive, and integrative.

Callaghan (2006) states “self-care self-efficacy involves judgment of one’s ability to perform self-care behaviors. The productive capability of self-care operations involves the actual performance of self-care behaviors. These behaviors are learned and can be directed towards the performance of specific behaviors that lead to the promotion of health. These learned behaviors can be conceptualized as health-promoting self-care behaviors”. While this particular study by Callaghan (2006) focused on adolescents, the finding that females had more confidence in their ability to practice healthy behaviors than males is useful when studying the VA population that is 92% male (NSV, 2010).

The National Comorbidity Survey found that women have a higher prevalence than men for most affective disorders, anxiety disorders, and non-affective psychosis,

while men had higher rates for substance abuse disorders and antisocial personality disorders (Vegas et al., 2003). Other research on the veteran population came to similar conclusions, stating that female veterans were more likely to be diagnosed with depression, while males were more likely to be diagnosed with PTSD and alcohol use disorders (Maguen, Ren, Bosch, Marmar, & Seal, 2010). The population of women veterans has been growing and is projected to continue to grow, leading to an increased demand for veteran services geared toward their specific needs (USDVA, Office of Policy and Planning, 2007).

According to data from 2009, female veterans were significantly younger than males, and more likely than males to have a service-connected disability rating (USDVA, National Center for Veterans Analysis and Statistics, 2011). Current government data suggests that obesity prevalence percentages are higher for women than for men ages 20 years and older (NIH, Weight-Control Information and Network, 2011). Sparks and Bollinger (2011) found that women have 11% lower odds of being obese compared to men, after controlling for sociodemographic, behavioral, and health characteristics. Kiefer et al. (2005) examined European data to find that obesity prevalence was nearly the same for both genders.

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Appendix H – Food Addiction- Past, Present, Future

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Introduction

Is overeating a behavioral problem or a substance-related problem? Does obesity stem from high-risk people or high-risk foods? A PubMed search of the phrase “food addiction” in December 2012 yielded 85 citations- 77 of which were published since 2007. Research on food addiction is complex as it draws attention to Binge Eating Disorder (BED), compulsive overeating, and the epidemic of obesity. According to the American Society of Addiction Medicine (ASAM), “addiction is a primary, chronic disease of brain reward, motivation, memory, and related circuitry” (ASAM, 2012). ASAM recognizes food as having addictive potential. To date, the term “addiction” has not been recognized by the Diagnostic and Statistical Manual of Mental Disorders (DSM), yet disorders falling under the addiction umbrella are dispersed throughout the manual. For example, BED has been categorized under Eating Disorder Not Otherwise Specified (EDNOS) in the current DSM-IV-TR (American Psychiatric Association, 2000) but will be reclassified into its own category in the new DSM-V due for publication in May 2013. Most experts describe BED as binge eating without the compensatory purge behaviors characteristic of Bulimia Nervosa. Compulsive overeating is another clinical entity often used interchangeably with BED but has some distinct differences including habitual eating or “grazing” throughout the day. A proposed new category of “Addiction and Related Disorders” in the DSM-V will include behavioral addictions, such as disordered gambling (Albayrack, Wolfle, & Hebebrand, 2012). The Food Addiction Institute (FAI) is working diligently to convince the American

Psychiatric Association to include food addiction as a substance-related disorder in the DSM-V (FAI, 2012a).

Background and History

Food addiction is a controversial term and is not explicitly equated with binge eating or obesity. Without specific diagnostic criteria that allow insurance reimbursement for treatment, health professionals have less incentive to treat patients for food addiction. Not surprisingly, many doctors, dietitians, and therapists remain misinformed about the problem of food addiction. Proponents of *Intuitive Eating* state that current measurements of food addiction likely capture the effects of compulsive eating or “rebound dieting from chronic dieting” (Tribole, 2011). By all accounts, the number of people considered to be addicted to food is increasing. *The Carbohydrate Addict’s Diet*, published in 1991, included The Carbohydrate Addict’s Test and became a national bestseller (Heller & Heller, 1991). *Anatomy of a Food Addiction* (Katherine, 1991) remains a classic text describing the drug-like effects that certain foods have on particular individuals as influenced by their brain chemistry. Katherine (1991) affirms: “a food addict knows which foods hold a charge and which do not” (p. ii) and that “the same food can be non-addictive in small doses and highly addictive when too much is eaten” (p. iv). While the treatment for those diagnosed with eating disorders is usually to eat all foods moderately, food addiction treatment works towards abstinence from offending “drug foods” (FAI, 2012b). This approach is controversial because it is well known that specific food restriction can be a risk factor for binge eating. Animal studies have shown that food restriction increases the sensitivity of neural substrates for reward and stimulant effects of abused drugs (Cabeza de Vaca & Carr, 1998). Reciprocal relationships of food with other

substances raise the possibility that food and classic addictive substances compete for the same brain pathways (Rudd Report, 2007). Higher food consumption has repeatedly been reported in patients recovering from substance use disorders (Nolan & Stolze, 2012) and this may imply “substance substitution”. Additionally, increased food consumption may be due to “rebound appetite” in the wake of the hypothalamic suppression from drug use.

The Rader Institute in California was one of the first inpatient treatment centers to accept patients with food addiction more than 30 years ago and treat it as a chemical dependency (FAI, 2012b). Glenbeigh Hospital in Tampa, FL and other centers addressed food addiction during the 1980’s and 1990’s but no longer market such services. The psychodynamic model of addiction treatment gained widespread acceptance in the 1990’s and health insurance reimbursement was soon withdrawn for food addiction diagnosed as chemical dependency (FAI, 2012b). Meanwhile, Overeaters Anonymous’ (OA) HOW program adopted the principle of specific food abstinence (refined carbohydrates) in 1985, and offers rehabilitation services at no charge. The acronym HOW stands for Honesty, Open-mindedness, and Willingness, which are commonly referred to as “the essentials of recovery.” The first OA meeting was held over 50 years ago, and the concept of “abstinence” that was adopted from Alcoholics Anonymous (AA) originally referred to abstinence from any food between three set daily meals, in other words total abstinence from compulsive eating (“Beyond Our Wildest Dreams”, 2005). Many consider OA to be less rigid about abstinence than OA-HOW because OA does not endorse any one specific plan of eating but rather individualized plans, oftentimes in consultation with physicians and dietitians. Other food-based 12-Step programs include Compulsive Eaters Anonymous (CEA-HOW), Greysheeters Anonymous (GSA), Food

Addicts Anonymous (FAA), and Food Addicts in Recovery Anonymous (FA).

Meanwhile, Eating Disorders Anonymous (EDA) states that: “balance – not abstinence – is our goal” (EDA, 2012).

Food Addiction in the Popular Press

Before reviewing food addiction in the scientific literature, it is important to recognize that the general public receives most of their information about “food issues” from secondary sources, or “gray literature”. While such resources often come from reputable professionals with advanced degrees, they are not usually peer-reviewed and often are driven by profit from the lucrative “diet book” industry. Kessler’s (2009) *The End of Overeating*, a New York Times bestseller, cleverly avoids the term “food addiction” and introduces the term “hyperpalatable” (p. 14) when referring to sugar-, salt-, and fat-enhanced foods leading to what he calls “conditioned hypereating” (p.135). When discussing individual clients, Kessler, MD, states: “They don’t have any of the eating disorders we’ve learned to recognize and treat, but food is never far from their minds. And once they begin eating, they can’t seem to stop. Long after they’ve ceased to feel hungry, they’re still eating. No one has ever explained what’s happening to them and how they can control their eating” (Kessler, 2009, p. xvi). Kessler recommends planned eating with no room for deviation in the beginning stage, a type of discipline that is essential for recovering addicts.

Pam Peeke, MD, MPH, in her book *The Hunger Fix* asserts that food addiction is real. She coins the term “False Fixes” (p. xiii) to describe the use of food to fix unpleasant feelings. From her perspective, stressing “moderation” to addicts is a moot point because when addiction is in full swing, prefrontal cortex function is severely

impaired (Goldstein & Volkow, 2011). Food addicts will go to extraordinary lengths to obtain their “False Fix”. Expecting a food addict to kick their habit by examining food labels is like expecting a crack addict to get clean after attending a lecture on the dangers of cocaine. According to Peeke, most food addicts require a detox stage, recovery stages, and an overall eating plan. It also includes reasonable transitions between stages in preparation for lifelong recovery. The focus of this approach is on increased vigilance rather than diet liberalization. The message to practitioners in weight management is that merely advising overweight or obese individuals to get it together, stop eating so much, and just become an intuitive eater is not practical in light of advances in the science of food addiction (Peeke, 2012).

Food Addiction – The Evidence

Dopamine (DA) is a catecholamine neurotransmitter that is critical to movement, motivation, reward, and overall well-being. The role of DA in brain reward mechanisms and addictive behavior has been well established, particularly the DA D2 receptor sites (Blum et al., 1996). Researchers describe a “reward deficiency syndrome” that leads to aberrant substance seeking behavior (including food) and may have a genetic component influencing susceptibility to substance abuse. By examining multiple DNA tests, investigators have furthered the biological understanding of reward deficiency syndrome. Sugar is particularly important because of its connection to opioid release and dopamine systems (Avena, Rada, & Hoebel, 2008). Volkow, Fowler, and Wang (2003) reviewed imaging studies of the brain using positron emission tomography (PET) in an attempt to explain DA-related neurobiological factors that influence addictive human behavior, specifically the loss of control that leads to compulsive intake of a substance. Their

results highlight the need for pharmacological as well as behavioral interventions in the treatment of addiction. Other researchers (Levine, Kotz, & Goznell, 2003) have proposed that sugars and fats could affect the central reward systems via regulatory neuropeptides, thereby increasing food intake. Volkow and colleagues (2011) reviewed additional PET scans and concluded that several brain circuits beyond DA are important in the neurobiology of addiction, specifically circuits involved with conditioning/habits, motivation, and executive functions such as inhibitory control and decision-making.

Salamone and Correa (2012) challenged the simplified DA hypothesis of “reward”, stating that an accepted scientific definition of reward has not been established. Several authors have questioned the widely accepted research methods used to explain DA neuron activity and have proposed alternative views of dopamine pathways that include behavioral functions associated with learning, motivation, emotion, or stress. From an evolutionary perspective, calorically dense foods and food-related stimuli have created an “evolutionary mismatch”, where the act of dieting can stimulate the natural physiological response to food scarcity and ultimately lead to rebound overeating (Salamone & Correa, 2012). Other authors prefer to emphasize the behavioral control of food intake, while considering the metabolic and hormonal adaptations that have substantial effects on body weight. Abstinence is an important goal in treating drug addiction, but this approach is less realistic for treating food addiction (DiLeone, Taylor, & Picciotto, 2012). Overeating may be viewed as a food addiction in a small subgroup of obese individuals, however at present it may be better classified as a behavioral addiction, as the neuroscience evidence in humans is inconsistent and sometimes conflicting (Albayrack et al., 2012; Ziauddeen & Fletcher, 2012).

At the Food and Nutrition National Conference (FNCE) in 2012, Wang, MD, discussed food and addiction in the light of PET imaging research and stated that compulsive overeaters share many of the same imaging characteristics as drug addicts. Obese subjects were found to have DA receptor deficiencies similar to drug users, perpetuating pathologic overeating as compensation for the decreased activation of the reward system. Current evidence supports the role of dopamine neurotransmission in mediating “food motivation” in the human brain and may explain excess food consumption in subjects with binge eating disorder. Wang (2012) reported that binge eaters had significantly greater DA release than non-binge eaters. Dopamine D2 receptor-mediated dysregulation of regions implicated in inhibitory control may explain the inability of obese subjects to control their food intake despite conscious attempts to do so. Wang (2012) also recognized that in addition to hedonic (reward) signals that control food intake, intrinsic factors (hormonal), emotional factors (stress), and extrinsic factors (food-related cues and availability) all impact the complex computation of nutritional need in the hypothalamus. Additional research exploring the effects of food advertisements and other visual or olfactory cues in specific brain regions implicated in craving may be warranted (Fortuna, 2012).

In July 2007 at the Food and Addiction conference at Yale University, leading researchers in nutrition, obesity, endocrinology, and neurobiology, including experts in the field of addiction, debated the strengths, weaknesses, and merits of the food addiction hypothesis. The Rudd Center for Food Policy and Obesity at Yale, as well as researchers at the McKnight Brain Institute at the University of Florida College of Medicine, are at the forefront of this movement. The Yale Food Addiction Scale (YFAS) was developed

in 2008 and has since been internally and externally validated. The YFAS has been useful in predicting binge-eating behavior as measured by the Binge Eating Scale (Gearhardt, Corbin, & Brownell, 2009). A subsequent study classified food addiction in 57% of obese BED patients suggesting the existence of a more complicated subset within the spectrum of BED patients (Gearhardt et al., 2012).

Abnormal desire for sweet, salty, and fatty foods has been documented in obese adults throughout numerous studies and has been validated with YFAS (Davis et al., 2011). Diagnostic scoring using YFAS is based on seven symptoms in the DSM-IV-TR criteria for substance dependence and includes withdrawal, tolerance, and continued use despite negative consequences. Investigators utilizing the YFAS found that food addiction was similar to chronic drug addiction in that craving individuals do not expect positive reinforcement after consuming the substance (Meule & Kubler, 2012). Another study using the YFAS concluded that the pathologies associated with addiction could make adoption of healthful eating habits more difficult, which may undermine efforts to lose weight (Burmeister et al., 2013). Several authors continue to recommend incorporating substance abuse treatment strategies to improve the success rate in the battle against overeating and obesity (Pretlow, 2011). Jessica Setnick, MS, RD recommends abstinence from offending behaviors over abstinence from offending foods—a hallmark of classic eating disorder treatment (Setnick, 2012). FitRx is a multidisciplinary state-of-the-art physical wellness and weight-loss facility in Brentwood, TN that incorporates behavioral health principles including meal support, nutrition education, cooking classes and daily exercise (FitRx, 2012). Recent trends indicate growth in the private sector treatment for BED patients, many who also fit the criteria for

food addiction. ACORN Food Dependency Recovery Services markets structured residential workshops worldwide that promote food abstinence through 12-Step recovery (ACORN, 2012).

Experts from nutrition and obesity disciplines appear to be more reluctant than addiction experts to accept the notion that some foods have addictive properties in select individuals. Brownell and Gold (2012) in their text *Food and Addiction* emphasized that the word “and” in the title has profound implications. Rather than attempting to establish whether food addiction exists, these authors successfully explore the impact of food on the brain of everyday people in everyday life. “Food addiction” addresses the individual “food addict” while the concept of “food and addiction” has public health implications. Regardless, the term “addict” is associated with negative social stigmatization. “The key question is whether enough foods produce enough of an addictive effect on enough people to affect the health of the population” (p. xxii). Brownell and Gold (2012) conclude: “Food can act on the brain as an addictive substance. Certain constituents of food, sugar in particular, may hijack the brain and override will, judgment, and personal responsibility, and in so doing create a public health menace” (p. 439). Mayor Michael Bloomberg of New York City recently outlawed the sale of “supersized” sugary drinks due to public health concerns.

Conclusions

A position paper by the Academy of Nutrition and Dietetics (A.N.D., 2007) concluded that all foods can fit within a healthful eating style if consumed in moderation with appropriate portion size and combined with regular physical activity. This is known as the “Total Diet Approach” that rejects labeling foods as “good” and “bad” because it is

believed to foster unhealthful eating behaviors. This approach takes the focus away from individual foods unless they are contraindicated by an extenuating circumstance such as renal failure. A more recent position paper on the use of nutritive and non-nutritive sweeteners by The Academy addressed the plausibility of food addiction, stating that a sugar addiction present in humans has not been proven (A.N.D., 2012). This 2012 position paper is currently the only resource available through The Academy's Evidence Analysis Library (EAL) that makes any mention of the food addiction controversy.

In the ongoing battle between the homeostatic system (energy balance) and the hedonic (reward) system, the reward system is winning. Although humans need food to survive, we do not need the excessive amounts of hyperpalatable food combinations such as those prevalent in contemporary diets. Notwithstanding, it is important to remember that acceptance of food addiction in popular culture does not make the concept viable and valid, nor does clinical anecdote. The empirical evidence on food addiction in humans is in its infancy and considerable controversy remains. More research is needed, and a defensive posture from the food industry, similar to that of Big Tobacco in the smoking debate, is to be expected. Of particular importance will be the role of public policy in improving the food environment by decreasing the availability of potentially addictive foods during childhood, a crucial period of brain development. Finally, reclassifying some obese individuals as having an addictive disorder would necessitate policy changes that may be instrumental in addressing the obesity epidemic (Allen et al., 2012).

The conclusions of the Rudd Report (2007) stated that "future efforts related to food and addiction should include strong recommendations that funding agencies increase support of work in this area, especially in support of young investigators". This

should be a call to duty for dietitians active in Behavioral Health Nutrition (BHN) to be aggressive in pursuing involvement in the food addiction research movement and the practical implications that may portend.

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Appendix I – Information Sheet

VA Greater Los Angeles Healthcare System

RESEARCH INFORMATION SHEET

Nutrition and Substance Abuse

You are asked to participate in a research study conducted by Charles McCreary, Ph.D. Principal Investigator and MOVE psychologist, and associates from the California State University, Northridge, at the VA Greater Los Angeles Healthcare System (VA GLA). You were selected as a possible participant in this study because you are a patient at the VA GLA MOVE program. Your participation in this research study is voluntary.

Why is this study being done?

The purpose of this study is to explore attitudes, beliefs, and behaviors related to nutrition and health. The research will help determine if veterans with a history of substance abuse differ from veterans without a history of substance abuse.

What will happen if I take part in this research study?

If you volunteer to participate in this study, the researcher will ask you to do the following:

Pick up a questionnaire during a MOVE class. Read the directions for each question carefully and pick a number that most closely corresponds to your personal experience. Completely fill out at the questionnaire at your leisure. Return the completed questionnaire to MOVE staff, the Research Coordinator, or to the specified locked box located within the clinic.

How long will I be in the research study?

Participation in the study will take a total of approximately 20 minutes.

Are there any potential risks or discomforts that I can expect from this study?

There are no anticipated risks or discomforts associated with this study beyond those encountered in normal daily life.

Are there any potential benefits if I participate?

You will not directly benefit from your participation in this research.

However, the results of the research may justify further research or nutrition intervention programs, with the possible development of specifically tailored nutrition education for individuals with a history of substance abuse.

Will I receive any payment if I participate in this study?

You will receive no payment for your participation.

Will information about me and my participation be kept confidential?

There will be no identifiable information collected about you. There will be no information that is obtained in connection with this study that can identify you.

Withdrawal of participation by the investigator

The investigator may withdraw you from participating in this research if circumstances arise which warrant doing so. If you do not adequately and legibly fill out the questionnaire, you may be removed from the study, as the survey requires a minimum of 50% completion.

What are my rights if I take part in this study?

You may withdraw your consent at any time and discontinue participation without penalty or loss of benefits to which you were otherwise entitled.

You can choose whether or not you want to be in this study. If you volunteer to be in this study, you may leave the study at any time without consequences of any kind. You are not waiving any of your legal rights if you choose to be in this research study. You may refuse to answer any questions that you do not want to answer and still remain in the study.

Who can answer questions I might have about this study?

In the event of a research related injury, please immediately contact one of the researchers listed below. If you have any questions, comments or concerns about the research, you can talk to the one of the researchers. Please contact the:

Principal Investigator: Dr. Charles McCreary, Ph.D (310) 268-4393

Research Coordinator: David Wiss (310) 403-1874

California State University, Northridge Faculty Advisor: Dr. Joyce Gilbert, RD (818) 677-3102

If you wish to ask questions about your rights as a research participant or if you wish to voice any problems or concerns you may have about the study to someone other than the researchers, you may contact the Associate Chief of Staff for Research and Development for the VAGLAHS at the VA Greater Los Angeles Healthcare System, 11301 Wilshire Blvd, Mail Code 151, Los Angeles, CA 90073. The telephone number is 310-268-4437.

Appendix J - VA IRB Approval

Department of
Veterans Affairs

Memorandum

Date: September 20, 2012

From: Associate Chief of Staff, Research and Development (151)

Subj: New Project Approval, PCC # 2012-040517

Nutrition and Substance Abuse

IACUC Approval: N/A

IRB Approval: July 13, 2012

SRS Approval: September 19, 2012

R&DC Approval: 09/20/2012

To: Charles McCreary, PhD (116B)

1. Your request to initiate a new research project, referenced above, has been approved by all required subcommittees and the R&D Committee. You may now begin work on this research project. You will receive separate notification from Research Administration when approved documents, if needed, are ready for pick-up/delivery. You will also be informed, at that time, of the VA project number assigned to the study. Please reference that number in future submissions and communications regarding this study. Please refer to the respective approval memos for details regarding each approval and inclusive approval dates.
2. You are reminded that no changes or modifications may be implemented on this study until you have requested and received full approval from all applicable committees. If you need assistance in submitting a modification, please refer to the applicable approval memo for specific contact information.
3. You are also reminded that all study personnel must remain current with all applicable training and compliance requirements. No person will be allowed to work on the project for any period during which they are not fully compliant. Non-compliance by the principal investigator may result in study termination.
4. Continuation of an approved research study requires review and approval by all applicable committees prior to the expiration date stated in each committee's approval memo. Expiration of any applicable committee approval will result in study termination, and necessitate a complete new submission.

5. Thank you for your cooperation in helping us adhere to the rules and regulations of the Department of Veterans Affairs for the conduct of research.

A handwritten signature in black ink that reads "Dean T. Yamaguchi". The signature is written in a cursive style with a large, prominent "Y" and "G".

Dean T. Yamaguchi, MD, PhD

Appendix K – Survey

Nutrition and Substance Abuse

1. What is your gender?

- a. Male
- b. Female

2. What is your age in years?

- a. 18-29
- b. 30-39
- c. 40-49
- d. 50-59
- e. 60-69
- f. 70 or older

3. What is your current weight in pounds?

- a. Less than 100
- b. 100-149
- c. 150-199
- d. 200-249
- e. 250-300
- f. More than 300

4. What is your height?

- a. Less than 5'
- b. 5' - 5'5"
- c. 5'6" - 5'11"
- d. 6' - 6'5"
- e. More than 6'5"

5. Have you ever been diagnosed with hypertension?

- a. Yes
- b. No

Nutrition and Substance Abuse

6. Have you ever been diagnosed as having a substance use disorder? A substance use disorder includes a history of alcoholism or drug addiction.

- a. Yes
- b. No

7. Have you ever been diagnosed with diabetes? Diagnosis includes type-1 or type-2.

- a. Yes
- b. No

8. Do you currently take any nutritional supplements?

- a. Yes
- b. No

9. How many times per week do you consume energy drinks?

- a. 0
- b. 1-2
- c. 3-4
- d. 5-6
- e. 7 or more

10. How many times per week do you exercise?

- a. 0
- b. 1-2
- c. 3-4
- d. 5-6
- e. 7 or more

Nutrition and Substance Abuse

11. For each of the situations below, rate the likelihood that you would have difficulty controlling your overeating.

1-2 No difficulty controlling eating

3-5 Moderate difficulty controlling eating

6-7 Most difficulty controlling eating

Please complete every item. How difficult is it to control your...

	1	2	3	4	5	6	7
1. Overeating after work or school?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Overeating when you feel restless?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Overeating around the holidays?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Overeating when you feel upset?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Overeating when tense?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Overeating with friends?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Overeating when preparing food?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Overeating when irritable?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Overeating as part of a social occasion dealing with food (like at a restaurant or dinner party)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Overeating with family or friends?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Overeating when annoyed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Overeating when angry?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Overeating when you are angry at yourself?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Overeating when depressed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Overeating when you feel impatient?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Overeating when you want to sit back and enjoy some food?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Overeating after an argument?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Overeating when you feel frustrated?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Overeating when	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Nutrition and Substance Abuse

tempting food is in front of you?							
20. Overeating when you want to cheer up?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Overeating when there is a lot of food available to you (refrigerator is full)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. Overeating when you feel overly sensitive?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. Overeating when nervous?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. Overeating when hungry?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. Overeating when anxious or worried?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Try to answer each item and remember that it is a survey of your beliefs and attitudes, not necessarily your degree of factual knowledge.

Following are a number of statements about eating - nutritional attitudes, beliefs, and habits. Please read each item and decide the degree to which it applies to you or the extent to which you agree with the statement. Record your responses as follows:

1 Not at all

2 A little bit

3 Moderately

4 Quite a bit

5 Extremely

	1	2	3	4	5
1. Meat is the most important part of any meal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. It seems that almost everything I eat is bad for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I am very concerned about eating foods that are nutritious for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Even though I know that my way of eating is not good for me, I just can't seem to change my habits.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. If I changed the way I eat, I would be a much healthier person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I enjoy trying new recipes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Dinner doesn't seem right without meat.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I am what they call a "meat and potatoes" person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Sometimes, I find myself eating "junk food" even though I know it is not good for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. The chances that the way I eat will lead to heart disease are great.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. To keep from getting heart disease, I would be willing to change my eating habits.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. A new way of eating designed to prevent heart	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Nutrition and Substance Abuse

disease would be easy to follow.

13. A new way of eating designed to prevent heart disease would be accepted by my family.

14. I always enjoy trying new and different things to eat.

15. No matter how hard I try to change, I end up falling back into some of my old eating habits which I know are bad.

16. Many days, because I'm in a hurry, I eat whatever is handy.

17. I eat certain foods that are available even though I know I shouldn't.

18. When it comes to food, I have no willpower.

19. I eat more when I feel down.

20. I would not like to buy anything that has the word "artificial."

21. I enjoy exploring and testing out new restaurants.

22. I am interested in eating in ethnic food restaurants.

23. In the summer, my family likes to barbecue different kinds of meat on the charcoal grill.

24. I enjoy trying food from other countries.

Nutrition and Substance Abuse

13. How much do you care about...

1 Not at all

2 A little bit

3 Somewhat

4 Very much

	1	2	3	4
a. eating healthy food?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. controlling your weight?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. staying fit and exercising?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. being healthy?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. how you look?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. How strongly do you agree with the following statements?

1 Strongly disagree

2 Disagree

3 Agree

4 Strongly agree

The types of food I eat affect:

	1	2	3	4
a. my health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. how I look	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. my weight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Nutrition and Substance Abuse

15. How strongly do you agree with the following statements?

1 Strongly disagree

2 Disagree

3 Agree

4 Strongly agree

	1	2	3	4
a. I like the taste of potato chips and other salty snack foods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Milk tastes good to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Most unhealthy foods taste better than healthy foods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I think a lot about being thinner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I am too busy to eat healthy foods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. I like the taste of most fruits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. I am worried about gaining weight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. I am too rushed in the morning to eat a healthy breakfast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. I don't have time to think about healthy eating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. I like the taste of dark bread (e.g., whole wheat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. I like the taste of fast foods (e.g., McDonald's)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Nutrition and Substance Abuse

16. How strongly do you agree with the following statements?

1 Strongly disagree

2 Disagree

3 Agree

4 Strongly agree

	1	2	3	4
a. People my age don't need to be concerned about their eating habits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. At this point in my life, I am not very concerned about my health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. People my age don't need to worry about their health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Eating healthy meals just takes too much time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Most vegetables taste bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. I sometimes skip meals since I am concerned about my weight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Most healthy foods just don't taste that great	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. I weigh myself often	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Foods from fast food restaurants are generally unhealthy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. If you wanted to, how sure are you that you could eat healthy foods when you are...

1 Not at all sure

6 Very sure

	1	2	3	4	5	6
a. stressed out	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. feeling down	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. bored	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Nutrition and Substance Abuse

18. How confident are you that you could change or maintain your eating patterns so that you could...

1 Not at all confident

6 Very confident

	1	2	3	4	5	6
a. eat at least two servings per day of fruit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. eat at least three servings per day of vegetables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. eat at least three servings per day of dairy foods (e.g., milk, cheese, yogurt)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. eat at least three servings per day of whole grains (e.g., dark bread, cereals like Cheerios)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. limit soda pop to one can per day or less	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. limit eating at fast food restaurants to once per week or less	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19. How certain are you that you could overcome the following barriers?

1 Very uncertain

2 Rather uncertain

3 Rather certain

4 Very certain

I can manage to stick to healthful foods...

	1	2	3	4
1 ...even if I need a long time to develop the necessary routines.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 ...even if I have to try several times until it works.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 ...even if I have to rethink my entire way of nutrition.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 ...even if I do not receive a great deal of support from others when making my first attempts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 ...even if I have to make a detailed plan.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>