Nutrition Education in the Treatment of Alcohol Abuse Disorders

A Thesis

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by

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Authorization to Submit Thesis

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Abstract

The goal of this research was to examine the importance of nutrition education, identify the components of nutrition education programs, and understand how dietary intake was evaluated in the treatment of alcohol abuse disorders. A web survey was offered to 56 treatment facilities in Idaho, Oregon, and Washington. Nutrition education and dietary intake evaluation were examined using qualitative data extracted from the survey results. Eighteen surveys were completed and analyzed. The survey results indicated that 77% of alcohol treatment facilities provide nutrition education. The majority of respondents indicated that nutrition education is an important component of the treatment of alcohol abuse disorders; however, 100% reported they did not perform dietary intake evaluations on their clients, primarily due to a lack of funding and the large number of individuals seeking treatment. These results suggest that future research should continue to promote nutrition education in the treatment of alcohol abuse disorders and increase dietary intake evaluation in alcohol-dependent individuals while in treatment and following discharge from the facilities. Future research should also evaluate dietary behavior change in recovering individuals prior to treatment, and following discharge from residential alcohol treatment facilities.

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Chapter One

Nutrition education programs in residential alcohol treatment facilities have not been thoroughly examined (Grant, Haughton, & Sachan, 2004). Research regarding the components, frequency, and benefits of nutrition education are limited, and the majority of information available dates back to the 1960's and 1970's. Seventeen million individuals in the United States suffer from alcohol abuse disorders (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2014). A relationship between excessive alcohol consumption and poor diet quality has been identified among alcohol-dependent individuals (Breslow, Guenther, Juan, & Graubard, 2010). Therefore, examining the components and frequency of nutrition services offered in alcohol treatment facilities is a valid point of research.

The research by Breslow et al. (2010) suggests that the negative effects of alcohol may be attributed to the poor diet quality of alcohol drinkers. Studies of individuals who regularly consume alcohol show an increase in total energy intake, but a decrease in overall nutrient intake (Colditz, Giovannucci, Rimm, Stampfer, Rosner, Speizer, et al., 1991). Alcohol-dependent individuals are generally malnourished due to poor food choices resulting in nutrient deficiencies, and because they consume 50% of their calories from alcohol (Bunout, 1999; Santolaria, Perez-Manzano, Milena, Gonzalez-Reimers, Gomez-Rodriguez, Martinez-Riera et al., 2000). Excessive alcohol consumption is associated with poor food choices leading to malnutrition, a phenomenon frequently observed in alcohol-dependent individuals (Santolaria et al., 2000). The consequences of malnutrition negatively impact an individual's ability to use the educational and behavioral information and tools offered in treatment programs, and therefore adversely affect treatment outcomes (Beasely & Knightly, 1994; Bunout, 1999; Santolaria et al., 2000). Alcohol consumption also has the potential to

adversely affect diet quality by interfering with nutrient metabolism. Improving diet quality during treatment may result in the decreased incidence of chronic diseases associated with alcohol consumption, and reduce the frequency of recurrence by improving physical and nutritional health (Breslow et al., 2010; Colditz et al., 1990; Kim, Breslow, Ahn, & Salem et al., 2007). When treating alcohol abuse disorders and dependence, nutrition-related problems are commonly only addressed in severe situations such as detoxification. Unfortunately, at this stage, much of the physical damage has already occurred due to nutrient deficiencies.

The importance of this study is evident in the limited amount of research on the topic, and the minimal use of nutrition education when treating alcohol-dependent individuals. Studies on other disease processes have shown how nutrition education and improved diet quality can improve treatment outcomes (Grant et al., 2004). Research findings indicate that an alcohol-dependent individual's return to healthy eating habits should be the first step toward recovery, because it can mitigate the resulting physiological and psychological symptoms of chronic heavy alcohol consumption (Barbadoro, Ponzio, Pertosa, Aliotta, D'Errico, & Prospero et al., 2010; Breslow et al., 2010; Guenther, 1983). Improvement in diet quality in the early, withdrawal stages of treatment may relieve a variety of symptoms, including but not limited to alcohol cravings, low blood sugar levels, and depression. This research suggests that nutrition education programs that include improvement of diet quality positively influences success in recovery.

Some researchers have found that poor diet quality, poor food choices, and malnutrition in alcohol-dependent individuals are largely ignored in residential alcohol treatment facilities (Grant et al., 2004). The content and frequency of nutrition services offered in nutrition education programs could play a vital role in the treatment of alcohol

abuse disorders and dependence. Implementation of a comprehensive nutrition education program in residential alcohol treatment facilities that focuses on nutrition and diet quality during treatment could prove to be an effective strategy in successful treatment.

Statement of the Problem

Many nutrition education programs in residential alcohol treatment facilities do not address the significant relationship between diet quality and alcohol consumption and positive treatment outcomes. Consequently, individuals in recovery could be severely malnourished, resulting in a multitude of unpleasant symptoms, including but not limited to alcohol cravings, dizziness from low blood sugar levels, and gastrointestinal disorders, all of which could develop into chronic diseases. Therefore, recognizing and addressing the relationship between alcohol consumption and diet quality could be beneficial in the treatment of alcohol abuse disorders.

Purpose Statement

The purpose of this study was to explore the importance and frequency of nutrition education in the treatment of alcohol abuse disorders; and to examine the components of nutrition education programs in residential alcohol treatment facilities. Initially, residential alcohol treatment facilities in Idaho were surveyed to examine the use of nutrition services currently offered; however, due to a low response rate, facilities in Oregon and Washington were added.

Significance of the Study

Current research on nutrition education offered in residential alcohol treatment facilities is limited. By addressing diet quality in the early stages of treatment, and relieving the resulting physical symptoms of alcohol withdrawal and development of chronic disease, many of the psychological symptoms may be mitigated, which will allow the individual to focus on behavioral issues, process information, and effectively use the nutritional tools they are given in treatment programs (Beasley & Knightly, 1994; Breslow et al., 2010; Gunther, 1983; & Teixeira, Mota, & Fernandes, 2011). The results of this study will increase awareness of the importance of nutrition education in alcohol treatment facilities.

Objectives

The four research objectives in this study were to explore the importance of nutrition education in the treatment of alcohol abuse disorders, and to identify the content of nutrition education sessions, the frequency of nutrition education sessions, and the methods for delivering nutrition education to clients.

Summary

This chapter has given background information on the need for this study, the purpose of the study, and the significance of the study. The second chapter is a review of the literature, thoroughly addressing all aspects of the topic to complete the study. The third chapter is a research report to be submitted to the Journal of Nutrition Education and Behavior. Due to the research report format of this paper, there will be some repetition in chapters two and three.

Chapter Two

Review of Literature

Residential alcohol treatment facilities have not addressed the importance and benefits of nutrition education in the treatment of alcohol abuse disorders, even though extensive research illustrates the negative physiological and nutritional effects of excessive alcohol consumption (Breslow et al., 2010; Grant et al., 2004; Kesse, Clavel-Chapelon, Slimani, van Lier, & the E3N Group, 2001; Teixeira et al., 2011). The physical consequences of chronic alcohol use have been well documented (Addolorato, Capristo, Greco, Stefanini, & Gasbarrini, 1998; Beulens, Rimm, Ascherio, Spiegelman, Hendriks, & Mukamal et al., 2007; Bode & Bode, 1997; Bunout, 1999; Guenther, 1983; Worden & Rosellini, 1978). Alcohol abuse has negative effects on every organ system, resulting in acute and chronic symptoms and diseases. Some of these include malnutrition, hypertension, hypoglycemia, and fatigue. Research has found that many of these physical consequences can be alleviated with abstention from alcohol and improved diet.

Studies on the significant relationship between diet quality and alcohol consumption demonstrate the need for nutrition education. Research has observed that as alcohol consumption increases, diet quality decreases. A significant portion of calories are consumed through alcohol, inhibiting the absorption of vital nutrients leading to malnutrition. Malnutrition affects a variety of functions resulting in unpleasant symptoms experienced by alcohol-dependent individuals. Research suggests that a focus on nutritional education messages may lessen the negative symptoms of alcohol consumption and malnutrition (Breslow et al., 2010; Colditz et al., 1990; Kim et al., 2007).

The concept of alcohol craving is extremely complex and a thorough definition has yet to be agreed upon by researchers. Researchers do agree; however, that cravings for alcohol are a central component of alcohol abuse disorders. Cravings for alcohol are extremely common in individuals with an alcohol abuse disorder often resulting in relapse.

Dietary behavior change requires more than relaying information on the importance of nutrition and improving diet quality. A model of behavior change that encourages individuals to make adjustments in their dietary behavior should also be considered. The Transtheoretical Model, or Stages of Change Model is a behavior-change model based on an individual's readiness to change and then progression through five stages of change. Progression through these stages helps the individual understand and control their behavior, resulting in successful behavior change (Prochaska, DiClemente, & Norcross, 1992). Educational messages should reflect the client's readiness to change, and to understand the relation of nutrition and the chronic disease risk associated with excessive alcohol intake and poor food choices (Breslow, Guenther, & Smothers et al., 2006; Breslow et al., 2010; Prochaska et al., 1992).

This literature review will explore the importance of nutrition education and the components of nutrition education in the treatment of alcohol abuse disorders. Though the content of the literature review is more in depth physiologically than the purpose of this study, the information lays the foundation for why nutrition education is important in treatment. The review is divided into four sections, and will expand on the topics previously discussed. The first section will discuss the relationship between diet quality and alcohol consumption. The second section explores the importance of nutrition education in the treatment of alcohol abuse disorders by examining the physical consequences of chronic alcohol consumption, the impact of chronic alcohol consumption on nutritional status, and how these can be positively

influenced by nutrition education. The third section will discuss alcohol cravings, a major complaint among recovering individuals, and a high predictor of relapse, and how nutrition education that focuses on diet quality can relieve cravings. The fourth section will address nutrition education and dietary behavior change in treatment. The review will conclude with a discussion of why nutrition education is important, the benefits of improved diet quality, and the need for future research.

Diet Quality and Alcohol Consumption

Research on the association between alcohol consumption, diet quality, nutrient intake, and resulting psychological impairment began in the 1960's and 1970's, tapered off in the 1980's and 1990's and reemerged in the 2000's (Breslow et al., 2006; Breslow et al., 2010; Teixeira, et al., 2011). A relationship between diet quality and alcohol consumption has been identified showing that as alcohol consumption increases, diet quality decreases. Higher energy intakes have also been observed with alcohol consumption which can be attributed to the combination of the higher energy intake of alcohol and poor diet quality (Barbadoro et al., 2010). Nutrition and diet are known to affect cognitive and emotional functioning. Research has illustrated that individuals who are malnourished do not possess the same cognitive abilities as those who are consuming adequate nutrients (Green, Rogers, Elliman, & Gatenby, 1992).

Improving diet quality has been found to be an important component of nutrition education (Breslow et al., 2006; Grant et al., 2004; Lieber, 2003). The study by Barbadoro et al. in 2010 suggests that alcohol-dependent individuals are receptive to educational messages regarding nutritional health. A more in-depth understanding of nutritional topics seemed to encourage individuals to improve the quality of their diet, given that most of the patients

retained healthier eating habits up to six months following treatment with nutrition education. Research consistently shows that a focus on diet may help individuals deal with problems related to their alcohol abuse, resulting in more efficient and productive counseling. By emphasizing the importance of healthy food choices and dietary behavior change, alcohol cravings are decreased, blood sugar levels are stabilized, vitamin deficiencies are restored, and long-term sobriety is achieved (Barbadoro et al., 2010; Breslow et al., 2010; Gunther, 1983).

When identifying and treating nutrition related problems, the effect of diet quality on an individual's physical well-being and subsequent nutritional status has been demonstrated by research over the past 50 years (Addolorato et al., 1998; Breslow et al., 2006; Breslow et al., 2010; Barbadoro et al., 2010; Bunout, 1999; Colditz et al., 1991; Santolaria et al., 2000). An individual's nutritional status has been found to influence physical outcomes during acute illness (Teixeira et al., 2011). Alcohol-dependent individuals are generally malnourished due to poor food choices resulting in nutrient deficiencies, and because they consume 50% of their calories from alcohol (Bunout, 1999; Santolaria et al., 2000). Increased consumption of alcohol contributes to malnutrition by displacing other nutrients due to its high-energy content (Colditz et al., 1991; DiCecco & Francisco-Ziller, 2006; Griffith & Schenker, 2006; Kim et al., 2007; Lieber, 2000). Teixeira found that 53% of the patients studied were at medium or high risk of malnutrition, indicating that nutritional intervention is essential in the treatment of this population. Malnutrition has many consequences, including but not limited to reduced muscle strength and fatigue, apathy, and depression, symptoms commonly reported by individuals in treatment (Teixeira et al., 2011; Worden & Rosellini, 1978). All of these consequences can impair a patient's recovery and potential for recurrence.

Physical consequences of alcohol consumption and the impact on nutrition status

Research has shown that alcohol interferes with every organ system from the central nervous system, to the cardiovascular system, to digestion and absorption of nutrients (Alderazi & Brett, 2007; Bode & Bode, 1997; Buelens et al., 2007; Lieber 2003). Malnutrition, low height-to-weight ratio, weight loss, and reduced muscle mass have been observed in individuals hospitalized with an alcohol abuse disorder (Lieber, 2000). Chronic alcohol users complain of numerous physical symptoms resulting from their alcohol consumption, including but not limited to abdominal pain, nausea, diarrhea, headaches, and muscle aches. These physical symptoms can be improved and possibly reversed with abstention from alcohol and improved diet quality (Breslow et al., 2010; DiCecco & Francisco-Ziller, 2006; Griffith & Schenker, 2006; Kim et al., 2007; Lieber, 2003). The nutritional status of an individual is related to the availability of nutrients to support metabolic processes (Medical Dictionary, 2014). Addressing the physical consequences of chronic alcohol consumption and the impact on nutritional status are essential when examining nutrition education programs in the treatment of alcohol abuse disorders (Addolorato et al., 1998; Breslow et al., 2010; Hurt, Higgins, Nelson, Morse, & Dickson, 1981; Lieber, 2000; Santolaria et al., 2000).

Alcohol is a macronutrient providing 7 kcal/g, and therefore impacts nutritional status by supplying calories and energy to the body (Santolaria et al., 2000). Numerous studies have concluded that the poor nutritional status of alcohol-dependent individuals is due to their poor dietary habits and increased energy intake from alcohol (Breslow et al., 2010; Santolaria et al., 2000). Malnutrition is commonly associated with chronic alcohol consumption due to malabsorption of nutrients caused by gastrointestinal complications associated with alcohol

abuse disorders (Lieber, 2000). The following explores the effects of alcohol on the major organ systems, resulting disease processes, and the impact on nutritional status found in individuals with high alcohol intake.

Disease processes. Alcohol interferes with every organ system and life sustaining process (Breslow et al., 2010). Heavy, continuous alcohol intake has been linked to numerous chronic diseases including but not limited to hypertension (high blood pressure), digestive disorders, colon cancer, and alcohol related liver disease (Alderazi & Brett, 2007; Athyros et al., 2008; Bode & Bode, 1997; Buelens et al., 2007; Lieber 2000).

Central nervous system. Alcohol abuse has direct and indirect negative effects on the brain, with acute and chronic complications. Chronic alcohol consumption can lead to abnormalities in the brain detected through imaging that are associated with impairment of perceptual and cognitive function, reduced attention span, and impaired memory. Radiographic studies have suggested that physiological changes in the brain are partially reversible with abstinence from alcohol; however, these changes return and progress if drinking resumes. The resulting nutritional deficiencies from excessive alcohol intake may have an indirect effect on brain function, as these individuals tend to eat less and consume most of their calories from alcoholic beverages. These results suggest that chronic heavy drinkers are susceptible to difficulties with memory function, thinking capabilities, and perception. (Alderzi & Brett, 2007).

Hypertension (high blood pressure). A close relationship between alcohol abuse and hypertension has been identified. It is well known that hypertension and other cardiovascular problems can be mitigated with improved diet quality; therefore, this same benefit would

apply to individuals with an alcohol abuse disorder (Ceccanti, Sasso, Nocente, Balducci, Prastaro, Ticchi et al., 2006; Chobanian, Bakris, Black et al., 2003).

Gastrointestinal system. The basic function of the digestive system is to transport food through the different digestive organs. Alcohol interferes with this function, decreasing the time it takes for food to pass through the gastrointestinal (GI) tract. Alcohol is absorbed into the bloodstream and broken down by the body through the GI tract. Direct contact of alcohol with the lining of the upper GI tract can cause numerous metabolic changes. These changes result in gastroesophageal reflux or "heartburn," nausea, vomiting, and diarrhea, symptoms commonly reported by chronic alcohol users. These changes can also cause marked damage, and result in acute and chronic diseases such as gastrointestinal bleeding, diarrhea, malnutrition due to impaired absorption of nutrients, and cancers of the GI tract. These changes and damage also disrupt the digestion and absorption of vital nutrients, contributing to malnutrition and the weight loss frequently noted with alcohol abuse disorders (Bode & Bode, 1997).

Acute and chronic alcohol consumption interferes with normal functioning of the stomach. Beverages high in alcohol concentration tend to inhibit gastric motility and delay emptying of the stomach. Even small amounts of alcohol can alter gastric acid secretion, cause gastric mucosal injury, and interfere with gastric and intestinal motility. Chronic heavy alcohol consumption is known to increase the risk of shrinkage or atrophy of the gastric mucosa, and decreased gastric secretory capacity. The decrease in acid production inhibits the stomach's ability to eliminate the bacteria that enter with food, and thus potentially harmful bacteria build up in the upper small intestine. The resulting gases lead to feelings of fullness and abdominal pain commonly reported by alcohol-dependent individuals. This phenomenon

would need to be addressed when evaluating an individual's nutritional status, and improving diet quality (Bode & Bode, 1997).

In the small intestine, alcohol inhibits muscle movement that helps retain food for further digestion. These effects may contribute to an increased sensitivity to high sugar content foods, shortened transit time, and diarrhea frequently found in alcohol abuse disorders (Lieber, 2000). Most nutrients are absorbed into the blood stream through the small intestine. Chronic alcohol consumption reduces the absorption of water and sodium; carbohydrate, protein, and fat; xylose (sugar), thiamine, folic acid, and vitamin B12 (Bode & Bode, 1997; Lieber, 2003).

Alcohol also interferes with the function of many enzymes essential for digestion. One of these enzymes is lactase, which breaks down lactose (milk sugar), and results in lactose intolerance. Alcohol also inhibits the enzymes responsible for transporting nutrients from the intestine into the bloodstream. Consequently, all of these symptoms can be lessened by an examination of nutritional status, improvement of diet quality, and abstinence from alcohol (Bode & Bode, 1997).

Liver disease. The effects of alcohol on the liver have been extensively researched and are well documented (Bunout, 1999; Griffith & Schenker, 2006; Lieber, 2003). The liver is the largest metabolic organ in the body responsible for the breakdown of nutrients into useable energy (Stickel, Inderbitzin, & Candinas, 2008). When alcohol is present, the liver focuses on alcohol metabolism, which alters the metabolism of sugars and carbohydrates, fats, and proteins. Awareness of this phenomenon would be of primary concern when examining an alcohol-dependent individual's nutritional status. Initially, researchers hypothesized that malnutrition was the primary cause of impaired liver function and liver damage in alcoholic

liver disease (ALD), and not a consequence of excessive alcohol intake (Griffith & Schenker, 2006; Mezey, 1991). Malabsorption and maldigestion of nutrients may be related to impaired output of bile from the liver, resulting in decreased absorption of fat and fat-soluble vitamins. Escalating liver dysfunction is noted when calories from alcohol increase and calories from food decrease (Griffith & Schenker, 2006; Hirsh, de la Maza, Gattas, Petermann, Gotteland, Muñoz et al., 1999; Mezey, 1991). Malnourished alcohol-dependent individuals break down alcohol more slowly than their non-alcohol-dependent counterparts. Higher blood alcohol levels sustain them longer, which decreases the individual's desire to eat (Lieber, 2003). Researchers now acknowledge that the quantity and duration of alcohol consumption are the key components in the development of ALD (Griffith & Schenker, 2006). The decreased desire for food, decreased absorption of vital nutrients, and subsequent malnutrition illustrate the need for examination of diet quality and the importance of nutrition education programs in alcohol treatment facilities.

Diabetes. Diabetes is a metabolic disorder disrupting the way the body processes food. Type 2 diabetes is the most common form found in millions of people in the United States. In type 2 diabetes, the body produces sufficient insulin, but cannot use it effectively. When food is ingested, it is broken down into glucose, the primary energy source for the body. Insulin, a hormone produced by the pancreas, transports glucose from the blood to the rest of the cells in the body. If the body does not respond to the insulin, glucose builds up in the blood and is excreted in the urine. Therefore, the body loses its primary source of energy (American Diabetes Association [ADA], 2014; National Institute of Health [NIH], 2014).

Excessive alcohol consumption has been found to be a potential risk factor in the development of diabetes by decreasing sensitivity to insulin (Baliunas, Taylor, Irving,

Roereck, Patra, Mohapatra, & Rehm et al., 2009; Bunout, 1999). Alcohol consumption above 50 g/day for women and 60 g/day for men increases the risk for diabetes. Alcohol-dependent individuals are known to be glucose intolerant, likely due to alcohol's interference with insulin production and hepatic glucose production (Bunout, 1999). Alcohol consumption can lead to hypoglycemia (low blood sugar), which produces symptoms of dizziness, lightheadedness, and fatigue. These symptoms could also inhibit an individual's attention span and ability to focus. However, a causal relationship between alcohol consumption and the development of diabetes remain unclear and warrant further research (Baliunas et al., 2009).

It is well known that humans, in general like sweets, which has been noted within hours of birth (Kampov-Polevoy, Garbutt, & Janowsky, 1999). There is consistent evidence showing a relationship between carbohydrate or sugar consumption and alcohol intake (Colditz et al., 1991; Fisher & Gordon, 1985; Gruchow, Sobocinski, Barboriac, & Sheller 1985). Studies have found that when alcohol consumption increased, carbohydrate intake decreased (Colditz et al., 1991; Gruchow et al., 1985). Researchers therefore concluded that the consumption of sweets and sugary foods are related to appetite for alcohol. A significant difference in sweet preferences among alcohol-dependent individuals and non-alcohol-dependent individuals was found by Kampov-Polevoy et al. (1999). The study observed that alcohol-dependent individuals preferred sweeter foods over their non-alcohol- dependent counterparts. A consistent decrease in the use of added sugar with increasing alcohol consumption was also observed. Therefore, consumption of sweets may significantly decrease alcohol intake in alcohol-dependent individuals (Colditz, et al., 1991; Kampov-Polevoy et al., 1999). Researchers have found the opposite to be in true in newly sober

individuals. In the absence of alcohol, intake of carbohydrates and sweets increased dramatically (Kampov-Polevoy et al., 1998). Yung and colleagues found that the longer an individual remained sober, the more sugar he or she consumed (Yung, Gordi & Holt, 1983). It has been speculated that this phenomenon may be due to carbohydrate consumption suppressing the appetite for alcohol (Colditz et al., 1991). Examining an individual's diet for carbohydrate content and the effect on nutritional status would be an important component of a nutrition education program to assist the dietitian in developing a diet plan specific to the individual.

Vitamin and mineral deficiencies. Vitamin deficiencies are extremely common in individuals who consume large amounts of alcohol. The absorption and storage of fat-soluble vitamins is decreased in the presence of chronic alcohol consumption (DiCecco & Franciso-Ziller, 2006; Lieber, 2000). Alcohol is a diuretic, and therefore the excretion of water-soluble vitamins is increased through urine in heavy, chronic drinkers (Lieber, 2000). Paresthesia and numbness are common symptoms reported in alcohol abuse disorders. These symptoms result from inadequate nutrition, specifically thiamine, and other B vitamins (Alderazi & Brett, 2007).

Alcohol Cravings

Alcohol craving has been identified as one of the core components of alcohol abuse disorders, and a strong predictor of relapse since the 1950's (Yoon, Kim, Thuras, Grant, & Westermeyer, 2006). Clients in alcohol treatment facilities commonly report cravings for alcohol in the early stages of recovery and immediately following treatment, often resulting in recurrence (Biery, Williford, & McMullen, 1991; Guenther, 1983; Oslin, Cary, Slaymaker, Colleran & Blow, 2009). The concept of alcohol craving is highly complex and has been

loosely defined as a strong urge to consume alcohol; however, researchers have not yet agreed on a common, thorough definition of alcohol craving (Anton, 1999; Leggio, 2009).

All models of alcohol cravings assume its complexity as well as its centrality to alcohol dependence. The models of cravings suggested include two categories: the conditioning model and the cognitive model. The conditioning model is based on the components of classic conditioning. This model suggests that when alcohol triggers are encountered, such as seeing a bar or an alcoholic drink, and are matched with alcohol consumption, they become conditioned stimuli. They induce the same response as alcohol consumption itself (Anton, 1999). Cognitive models suggest that an individual's response to alcohol or alcohol related stimuli involves different cognitive functions, such as the reward effect of alcohol (Anton, 1999).

Alcohol cravings have been linked to specific nutrients and overall diet quality (Biery et al., 1991; Leggio, 2009; Moorhouse, Loh, Lockett, Grymala, Chudzik, & Wilson et al., 2000). Craving for alcohol has been noted in the absence of carbohydrates as mentioned in the discussion about diabetes. Many alcohol-dependent individuals crave sweet foods, especially during the withdrawal stage (Biery et al., 1991; Guenther, 1983; Kampov-Polevoy et al., 1999). It was observed that a high carbohydrate, low protein diet suppressed voluntary alcohol consumption, whereas a low carbohydrate, high protein diet increased the desire to drink (Biery et al., 1991). Therefore, it is suggested that alcohol replaces the low carbohydrate content of the diet. One study encouraged clients in a residential treatment facility to consume frequent wholesome snacks during the day to control blood sugar levels and thus reduce cravings for alcohol (Guenther, 1983). Following the study, clients reported a

reduction in cravings and generally "feeling better." This result shows how a nutrition education program can have a positive impact on treatment.

Diet quality has been found to affect insulin response and ultimately brain function, which might affect alcohol craving. Dietary factors may also increase a biologic "thirst" for alcohol by means of a metabolic control mechanism affected by nutrient intake. Alcohol has been found to acutely alter blood glucose levels, and therefore could contribute to alcohol cravings and drinking (Leggio, 2009). Hypoglycemia (low blood sugar) is prevalent in recovering individuals, and can adversely affect their nutritional status and desire to consume alcohol (Biery et al., 1991; Guenther, 1983; Moorhouse et al., 2000). Fortunately, blood sugar levels respond quickly to changes in food choices, and regular meals help stabilize blood sugar levels (Biery et al., 1991; Guenther, 1983). Therefore, regulating blood glucose levels with improved diet quality would be important to address when developing a nutrition education program and relaying educational messages. Recurrence is extremely common across any population attempting behavior change. Among recovering individuals, if dietary behaviors are not addressed, individuals remain malnourished long into sobriety, triggering emotional states and cravings for alcohol that can lead to recurrence. The individual may stop drinking, but continue to consume unhealthy foods, skip meals, or binge. Therefore, improving diet quality and restoring nutritional health are critical in decreasing intensity of cravings (Guenther, 1983; Oslin et al., 2009; Santolaria et al., 2000).

Nutrition Education and Dietary Behavior Change

The development and delivery of educational messages is essential in any nutrition education program attempting to elicit behavior change. Chronic alcohol users have been found to be receptive to educational messages regarding nutrition during treatment

(Barbadoro et al., 2010). The study by Breslow et al. in 2006 concluded that to achieve the desired behavior change, it is important that nutrition education target the disease risk associated with increased alcohol intake and poor food choices. Nutrition educators can use a variety of methods, including written material, hands-on activities, and face-to-face sessions to engage their clients when developing their programs, disseminating education materials, and relaying educational messages. Researchers have described how nutrition education can be integrated into the counseling process and the development of programs in alcohol treatment facilities (Barbadoro et al., 2010; Breslow et al., 2006; Worden & Rosellini, 1978). Alcohol abuse disorders are accompanied by mental, emotional, behavioral, and social issues, and nutritional components are often overlooked when developing treatment programs. One of the counselor's roles in treatment is to assist the client in exploring the possibility of a connection between eating habits, alcohol consumption, and life problems. This can be accomplished by examining a client's present symptoms and diet quality to develop a dietary program specific to the individual's needs. Focusing on diet-related factors may enhance the treatment process. In some cases, psychological therapy alone is not enough when the root of behavioral problems is biological. Evidence suggests that attention to dietary factors may help clients deal with problems and make the counseling process more efficient, productive, and effective (Breslow et al., 2010; Worden & Rosellini, 1978). The approach to eliciting the behavior change discussed here is the Transtheoretical Model (TTM) or Stages of Change Model.

Research in application of the TTM in dietary behavior is relatively new (Kristal, Glanz, Curry, & Patterson, 1999; Spahn, Reeves, Keim, Laquatra, Kellogg, Jortberg et al., 2010). The first study to use the stages of change in dietary intervention was conducted in

1992 (Curry, Kristal, & Bowen). Since then, research studies have used the stages as a part of dietary assessment (Greene, Rossi, Reed, Willey, & Prochaska, 1994; Kristal et al., 1999). The TTM was conceptualized by James Prochaska and Carlo DiClemente, and originally intended to explain the progression of behavior change in addictive behaviors through five stages (Povey, Conner, Sparks, James, & Sheperd, 1999; Prochaska, et al., 1992). The model is based on the premise of an individual's readiness to change (Prochaska, 1994). Successful change in a health behavior involves a progression through the five stages to help an individual better understand, predict, and control their behavior (Prochaska et al., 1992). The TTM contends that both cessation of high-risk behaviors and development of healthier alternatives involve progress through the five stages (Prochaska, 1994). (See figure 1, chart 1)

Figure 4, Chart 1 Transtheoretical Model of Behavior Change

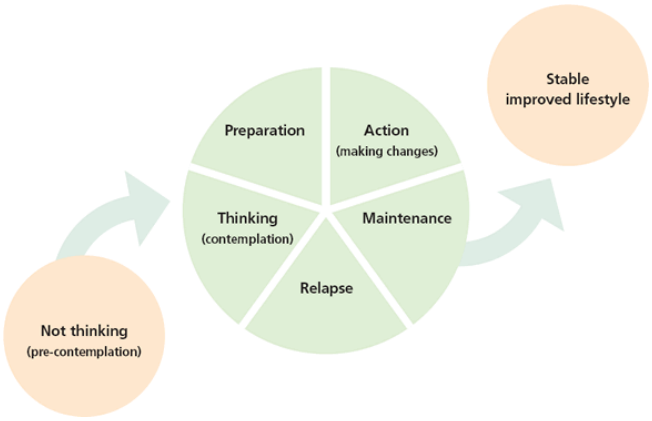


CHART 1
Behavior change stages and their characteristics

Stages	Characteristics
Precontemplation	Individual does not intend to change behavior in the next six months
Contemplation	Individual is strongly inclined to change behavior in the next six months
Preparation	Individual intends to act in a near future (generally next month)
Action	Behavior has already been incorporated for at least six months
Maintenance	Action already happens for over than six months and the chances to return to old behavior are few

Source: Adapted from Prochaska and Marcus (1994).

The first stage is the precontemplation stage, where the individual has no intention to change. Individuals in this stage are unaware that they have a problem, or deny that they have a problem. Others close to them, however, do see that they have a problem, and pressure them to seek help. Precontemplators often feel pressured into therapy for their addiction and may attempt to change their behavior, but once the pressure is off, they revert to their previous behavior. The second stage is the contemplation stage, where the individual is aware that a problem exists and is seriously considering change, but has not made a commitment to change. Contemplators weigh the pros and cons of their problem. They struggle with the

positive aspects of the addictive behavior, and weigh these against the amount of effort, energy, and loss it will cost. Individuals can remain in this stage for long periods of time (Prochaska & DiClemente, 1992). The third stage is the preparation stage, where the individual is intending to take action. This stage combines both intention and behavioral components. The individual intends to change a behavior and has already made small behavioral changes. A time element is a part of this stage, where an individual intends to take action in the next month, but has unsuccessfully taken action in the past year. Individuals in this stage may have already decreased some of their problem behaviors, but they have not reached the action stage where there is complete abstention from the behavior. The fourth stage is the action stage, where individuals modify their behaviors, experiences, or environment. Modification of a behavior to an acceptable goal, and significant effort to change the behavior are what define this stage. Individuals in this stage are committed to changing and modifying their behaviors, and change made in this stage tends to be the most noticeable and externally recognized. Individuals in this stage have successfully modified their behavior for one day to six months, where success is defined as reaching a specific criterion such as abstinence. The fifth stage is the maintenance stage, where the individual is working on the behavior to prevent relapse and maintain the changes they made during the action stage. Maintaining the behavior change and avoiding relapse are keys to this stage. In addictive behaviors, this stage extends from six months to an indeterminate time past the initial action. Individuals in this stage are able to abstain from the addictive behavior and adopt a new, positive behavior for more than six months (Prochaska et al., 1992).

Dietary behavior change is unique and more complex than addictive behaviors such as chronic alcohol consumption. Interpretation of the stages of dietary change requires some

modification to be helpful in dietary intervention and evaluation (Kristal et al., 1999; Hornik & Kelly, 2007). It is relatively simple to measure a target behavior for an addictive behavior such as alcohol consumption: "Have you had a drink in the past 24 hours?" (Kristal et al., 1999). However, determining a target behavior in dietary behavior change has proven difficult, because an individual cannot simply stop the behavior of consuming food. One approach may be to examine dietary patterns rather than specific nutrients or individual foods. This can be accomplished by having individuals self-report on their dietary intake, indicating how much and how frequently they are consuming a specific nutrient. Increased alcohol consumption has been found to be associated with increased intake of some nutrients such as total fat, protein, vitamin C, calcium, magnesium, and potassium, but decreased overall diet quality as measured by the Healthy Eating Index-2005 [HEI-2005] (Breslow et al., 2010). It has also been suggested that a focus on diet quality and food choices rather than nutrients has more practicality in educational messages concerning nutrition and prevention of chronic disease in alcohol-dependent individuals (Barbadoro et al., 2010; Breslow et al., 2010).

The TTM contends that individuals should make predictable changes in their dietary behavior (Kristal et al., 1999; Prochaska et al., 1994). Research by Kristal et al. (1999) found the largest change occurred between precontemplation and maintenance, average change between contemplation into action or action to maintenance, and minimal change in the no change stage. Results of the studies showed that dietary change was primarily related to an individual's stage at follow up. The largest change was found in the maintenance stage, and average in the action stage. There was no change among individuals in pre-action (precontemplation and contemplation). They also study found the mean reduction in fat to be similar for individuals in the maintenance stage to those progressing into the maintenance

stage and concluded that individuals already consuming a healthful diet can make additional dietary changes. This conclusion can be applied to alcohol-dependent individuals who report they are consuming a "healthy" diet and eating "three square meals." They can still make dietary changes, and as stated previously, may be consuming a healthful diet, but their bodies are not utilizing what they consume due to the negative effects of alcohol on their body (Greene et al., 1994; Kristal et al, 1999; Prochaska et al., 1994).

The research makes clear that progression through the stages is cyclical, where behaviors can revert to a previous stage (Vallis, Ruggiero, Greene, Jones, Zinman, Rossi et al., 2003). Individuals typically recycle through these stages several times before termination of the addiction or behavior change (Prochaska et al., 1992). The goal is to target this behavior and provide a powerful intervention tool that encourages individuals to start and progress through the stages again. Therefore, it would be important that educational messages provide individuals with practical, effective tools to assist them in achieving the desired dietary behavior change.

Application of a model to dietary behavior change requires a method of classifying individuals into a stage of dietary change (Bensley, Brusk, Anderson, Mercer, Rivas, & Broadbent, 2006; Kristal et al., 1999). Researchers have developed formulas for categorizing individuals into stages of change for three dietary components: low-fat diets, high-fiber diets, and diets high in fruits and vegetables, all of which are essential in alcohol abuse disorders (Kristal et al., 1999; Breslow et al., 2006). The methods used to place people into stages of change are based on self-rated diet, previous attempts to change diet, and intention to change diet; similar to individuals rating their alcohol consumption and attempts to "cut back" or quit (Kristal et al., 1999).

Kristal et al. (1999) suggest two perspectives to address the uniqueness of dietary behavior. The first is that the dietary change construct is most useful when the target behavior is defined using a self-rated diet. Secondly, the action and maintenance stages should be viewed as the optimal time for developing and maintaining individual's thoughts and behaviors about healthful food choices. Dietary patterns and food choice should be self-rated upon admission to a treatment facility, and their stage of readiness to change evaluated by clinical personnel. These findings suggest that the stage of readiness to change, and progression through the stages of change continuum has practical application in dietary behavior change. However, other studies using the stages of dietary change consistently found significant differences in diet across stages of change, and therefore diet interventions "can be relevant and effective regardless of the stage" (Kristal et al., 1999). A nutrition education program in residential alcohol treatment facilities should include educational messages that elicit movement or progression through the stages, with the end goal being permanent dietary behavior change. The effectiveness of nutrition education messages in a program, progression through the stages, and the end result of a change in behavior demonstrate the importance of nutrition education and behavior change in the treatment of alcohol abuse disorders (Kristal et al., 1999).

Summary

Alcohol is the most commonly used drug in the United States, with 50% of Americans age 18 and older consuming alcohol (NIAAA, 2014). Approximately 18 million Americans fall into the category of alcohol abuse. There are approximately 88,000 alcohol related diseases and deaths documented in the United States each year, thus the need to target this neglected population (Centers for Disease Control, 2014). The significance of the relationship between alcohol consumption and diet quality is evident in the multiple nutrition-related diseases diagnosed in alcohol-dependent patients, and the noted benefits with improved diet quality. The significant occurrence of malnutrition in individuals diagnosed with an alcohol abuse disorder is evidence of the need to improve diet quality. Focusing on the benefits of an improved diet to relieve symptoms of malnutrition and alcohol cravings can assist an individual in making better use of the tools offered in treatment to improve cognitive, emotional, and behavioral functioning.

The impact of chronic alcohol use on nutritional status and physical well-being is evident in the numerous resulting disease processes. The research has shown how alcohol affects every organ system, producing unpleasant symptoms, and increasing the risk of chronic disease. Nutritional status deteriorates as alcohol metabolism inhibits absorption of vital nutrients consumed. The individual is thus hindered by a compromised cognitive and nutritional state to fully utilize the information and tools offered in treatment programs.

Alcohol cravings are to be expected in the early stages of recovery as the body adjusts to the absence of alcohol. The strong relationship between alcohol cravings and diet quality, specifically carbohydrates and sugars, is observed in the high carbohydrate diets of individuals in treatment. It would be important to be aware of this relationship when

developing and implementing a nutrition education program, and assist individuals in controlling carbohydrate intake to reduce alcohol cravings.

Educating alcohol-dependent individuals about nutrition and diet quality is simply not enough to elicit dietary behavior change. A nutrition education program should also incorporate educational messages that encourage behavior change. Adaptation of a model of behavior change is a useful tool when developing a nutrition education program. The TTM encourages an individual through several stages of change based on their readiness for change, which will determine their success in the behavior change.

Further research is warranted on the impact nutrition education has in the treatment of alcohol abuse disorders. Addressing the importance of nutrition education and the components of nutrition education programs could yield an increase in positive treatment outcomes. Evaluation of nutrition services should be conducted to measure their validity, and dietary behavior change should be monitored to assess effectiveness of the program. Focusing on the importance of nutrition education and the nutritional components of a treatment program may strengthen treatment and increase positive treatment outcomes.

Chapter Three

Research Report

Nutrition Education in the Treatment of Alcohol Abuse Disorders

Abstract

Nutrition education in the treatment of alcohol abuse disorders has not been adequately addressed or thoroughly examined. The objectives of this study were to explore the importance of nutrition education in the treatment of alcohol abuse disorders, and to identify the content of nutrition education sessions, the frequency of nutrition education sessions, the methods for delivering nutrition education to clients, and how dietary assessment and nutrition evaluation are administered.

Fifty- six residential alcohol treatment facilities in Idaho, Oregon, and Washington were invited to participate in this study through an email invitation. The treatment centers were contacted via email during February-October 2013. Thirteen potential facilities were eliminated because they refused to participate, did not provide nutrition education or contact information was not identified. To examine the components of nutrition education programs in residential treatment facilities, a web-based survey consisting of 14 questions was offered to 18 residential treatment facilities in Idaho, Oregon, and Washington. These components were analyzed using qualitative data extracted from the survey results. Results revealed that 77% of facilities provided nutrition education in their treatment program, but none of the facilities provided nutrition evaluation. The findings reveal the importance of nutrition education and their components, but a lack of funding and resources to support comprehensive nutrition education programs. This indicates a need for further research on

funding and resources for nutrition education programs in residential alcohol treatment facilities.

Introduction

Alcohol abuse is a degenerative, progressive disease with nutritional and physical consequences. Alcohol abuse disorders affect 18 million Americans, and remain the number one drug problem in the United States (Grant et al., 2004; National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2014). Alcohol abuse is defined as a pattern of drinking that negatively affects an individual's health, relationships, or ability to work, and alcohol dependence is simply a strong craving for and dependence on alcohol (Center for Disease Control and Prevention [CDC], 2014). The *Diagnostic and Statistical Manual of Mental Disorders* in its fifth edition (DSM-V) combines alcohol abuse and alcohol dependence into a single disorder called alcohol use disorder (AUD) with mild, moderate, and severe sub-classifications (NIAAA, 2014).

A relationship between alcohol consumption and dietary pattern has been identified among individuals who regularly consume alcohol. Alcohol consumption has also been shown to influence food choice and diet quality (Breslow, Guenther, Juan, & Graubard, 2010; Colditz et al., 1991; Kim, Breslow, Ahn, & Salem, 2007). Studies of individuals who regularly consume alcohol show an increase in total energy intake, but a decrease in overall nutrient intake (Colditz et al., 1991). The significance of examining the impact of nutrition education in the treatment of alcohol abuse disorders is evident in the lack of attention on nutrition and diet quality in alcohol treatment programs.

The purpose of this report was to examine the components, frequency, and methods of nutrition education in residential alcohol treatment facilities. The study will address the

current gaps in the literature by providing a descriptive analysis of nutrition services currently offered in alcohol treatment facilities. Residential alcohol treatment facilities in Idaho, Oregon, and Washington were surveyed to examine the components of their nutrition education programs and dietary intake assessment in their facilities.

Materials and Methods

Data for this project was collected through QuestionPro, a web-based survey program (QuestionPro online survey software, 2013). For the initial study, facilities were selected through an exhaustive internet search of residential alcohol treatment facilities in Idaho, which resulted in 17 potential facilities. The facilities were sent an introductory email in February 2013 explaining the research and to expect a web-based survey in two weeks. The survey was emailed two weeks following the introduction and a reminder email sent two weeks later. Due to a low response rate of only four facilities, the facilities were called for telephone interviews or to identify a contact person to complete the survey. Following the phone calls, the response rate increased slightly to seven, and the survey was closed in March 2013.

Due to the small sample size, residential alcohol treatment facilities in Oregon and Washington, were added. An open-ended question was added to the survey, and the objectives of the study were revised to include identifying (1) the content of nutrition education sessions, (2) the frequency of nutrition education sessions, and (3) the methods for delivering nutrition education to clients.

Following an internet search, 39 facilities in Oregon and Washington were located. The survey was resent to the seven Idaho facilities who responded to the initial survey with the open-ended question requesting that they complete only this question. An introductory

email was sent in September 2013 and two days later the survey was sent. Two follow up emails were sent due to a low response rate of only six facilities. The facilities that did not respond were called to complete the survey. Following the phone calls, the response rate increased slightly, and 11 surveys were returned, one of which was completed by phone. A total of 18 facilities in the states of Idaho, Oregon, and Washington completed the survey.

Survey Development and Content

Survey content included questions to elicit respondent's knowledge about the content of their programs. The survey questions were developed and written by the researcher, and reviewed and evaluated by the committee.

The facilities were asked two sets of questions. The first section asked which topics were covered in their nutrition education programs, the number of sessions clients received, who provided the education, and how the education was delivered. The second section of the survey asked facilities if they assessed dietary intake for their clients, who provided the assessment, and how nutrition and diet quality was assessed.

The survey consisted of 15 questions where two questions were excluded due to a change in the focus of the study. The study focused on the components, frequency, and methods of nutrition education therefore questions regarding dietary behavior change were excluded.

Table, 1 Survey Questions

Nutrition Education	**Nutrition Evaluation**
1. Do you include nutrition education in your alcohol treatment program?	1. Does your alcohol treatment program conduct nutrition evaluations on their clients?
2. How many nutrition education sessions do clients receive in your program?	2. Who evaluates dietary intake on clients in your facility?
3. What topics are covered in your nutrition education program?	3. How is dietary intake evaluated upon admission to your facility?
4. How is nutrition education presented in your facility?	4. How is dietary intake evaluated at discharge from your facility?
5. How is face-to-face nutrition education delivered in your facility?	5. What type(s) of dietary assessment is administered to clients upon discharge from your facility?
6. Who administers nutrition education in your facility?	
7. How is follow-up nutrition education delivered to clients when they are discharged from your facility?	
8. Why do you think nutrition education and evaluation are important in the treatment of alcoholism?	

Data Analysis

Qualitative data collected from the survey responses was analyzed using descriptive statistics.

Human Subject Approval

This study was approved by the University of Idaho Institutional Review Board and certified as exempt in 2013.

Results

Nutrition Education

For discussion of the survey results, "(n=x)" refers to the number of respondents who answered the specific question being discussed. This applies to all sections discussing the results of the survey.

The survey was completed by 18 respondents, 17 of which were web surveys and one completed by phone.

Table 2 Nutrition Education and Nutrition Evaluation-Survey Results for Alcohol Treatment Centers in Idaho, Washington, and Oregon

Question	Result
1. Do you include nutrition education in your alcohol treatment program?	(n=18) 77% yes 23% no
2. How many nutrition education sessions do clients receive in your program?	(n=14) 64% 1-2 sessions per week 36% various (once a month, once a week, twice during treatment stay)
3. What topics are covered in your nutrition education program?	(n=14) 21% nutrition 7% effects of drugs on the body 29% multiple topics* 43% all topics*
4. How is nutrition education presented in your facility?	(n=15) 20% face-to-face 13% written 13% hands-on activities 20% other (classroom, group) 34% multiple methods**
5. How is face-to-face nutrition education delivered in your facility?	(n=15) 33% group 7% individual 60% both

6. Who administers nutrition education in your facility?	(n=14) 22% chemical dependency counselors 14% dietitians 7% nutrition counselors 43% multiple staff members (chemical dependency counselors, physicians, dietary staff) 14% other personnel (cook, nurse, and dietary staff)
7. How is follow-up nutrition education delivered to clients when they are discharged from your facility?	(n=12) 8% hand outs 8% follow-up, face-to-face 25% multiple (handouts, face-to-face, other) 34% Other (referred to outpatient recovery support team who stays in contact with clients, referral to primary care physician) 25% Comments, no follow up
8. Does your alcohol treatment program conduct nutrition evaluations on their clients?	(n=18) 100% no
9. Who evaluates dietary intake on clients in your facility?	(n=6) 17% physicians 17% dietitians 16%% medical technicians 50% multiple staff members (physicians, dietitians, chemical dependency counselors)
10. How is dietary intake evaluated upon admission to your facility?	(n=6) 67% face-to-face interview 33% other, clients with special needs such as diabetes
11. How is dietary intake evaluated at discharge from your facility?	(n=3) 33% face-to-face interview 67% no follow up or not answered
12. What types of dietary assessment is administered to clients upon discharge from your facility?	(n=3) 33% face-to-face interview 33% other types; select questions, exit interview and after-care planning, or medical referral as appropriate 33% multiple types; face-to-face and clinical evaluation

*Topics included (1) nutrition, (2) mind and/or mood altering substances (alcohol and drugs), (3) dietary intake, (4) drug/nutrient interaction, and (5) effects of drugs on the body.
**Multiple methods included a combination of written materials, hands-on activities, and face-to-face sessions.

When asked if the facility provided nutrition education to its clients, (n=18), 77% reported yes and 23% reported no. The majority of respondents, 64% (n=14), reported providing 1-2 sessions per week and when asked about topics covered in their programs, 21% (n=14) reported nutrition as one of the topics. Twenty-nine percent (n=14) reported multiple topics, and 43% (n=14) covered all five topics; (nutrition, mind and/or mood altering substances (alcohol and drugs), dietary intake, drug/nutrient interaction, and effects of drugs on the body). However, this study did not go into the extent these topics are addressed. (See figures 1 and 2)

Figure, 1 Topics Covered in Nutrition Education Program

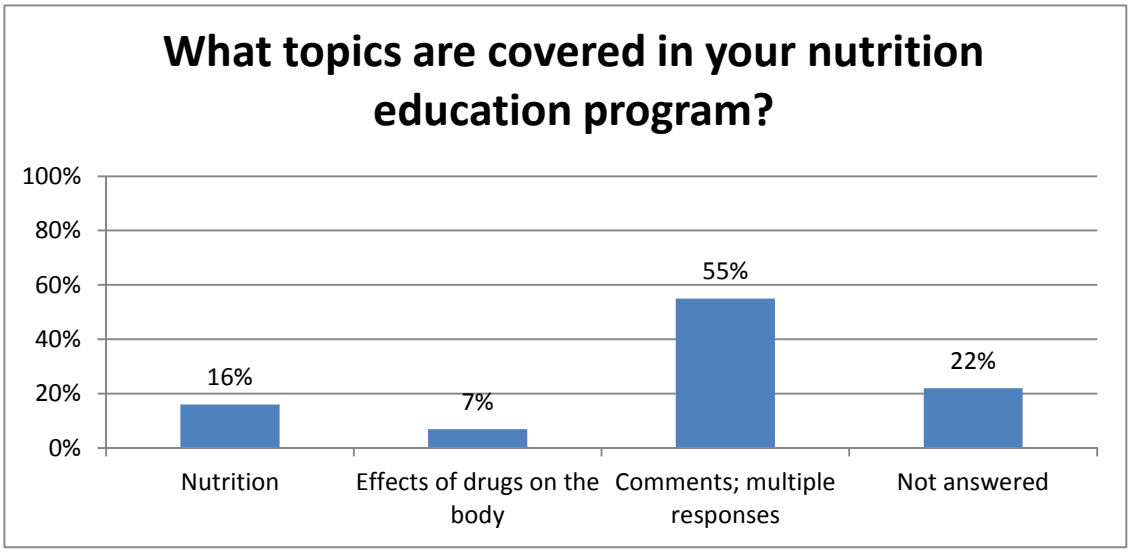
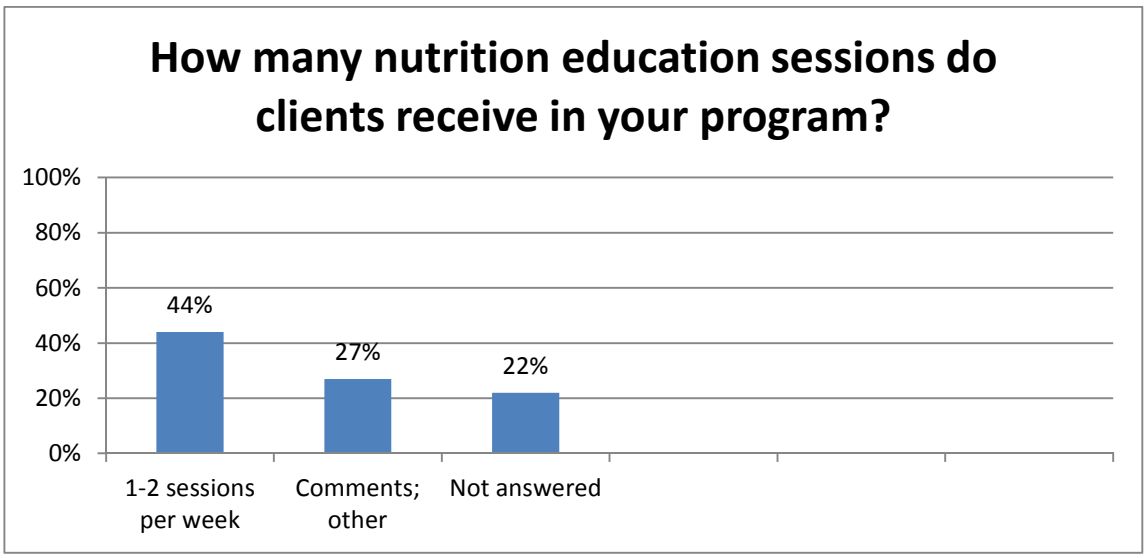


Figure 2 Number of Sessions in the Program



Thirty-four percent (n=15) of the facilities reported using multiple methods to present nutrition education to their clients. These methods included face-to-face sessions, written material, and hands-on activities. The remaining respondents indicated nutrition education was presented in a group setting or in a classroom. Thirty-three percent (n=14) of face-to-face

education was delivered in a group setting; however, 60% (n=14) of the facilities provided both individual and group education. The majority of the facilities reported that multiple staff members provide nutrition education, 43% (n=14). Twenty-two percent (n=14) of the facilities indicated that chemical dependency counselors administer nutrition education to their clients. Fourteen percent (n=14) of the facilities identified cooks, dietary staff, EMS, physicians, and nursing staff as providing nutrition education.

When asked how follow-up nutrition education is delivered to clients when they are discharged from their facility, 8% (n=12) reported that they provide clients with handouts and 8% (n=12) follow-up with clients face-to-face. Twenty-five percent (n=12) of the respondents reported that no follow-up nutrition education is delivered to clients when they are discharged from the facility. Comments included "We serve residents who are low income and low functioning from all over the state of ***. We are not able to follow- up," and "… I believe many clients would benefit by individual counseling, but funding does not allow for the number of nutrition education contacts your questions seem to envision." The remaining facilities reported referral to a primary care provider, referral to outpatient services, or self-referral to a registered dietitian in the medical clinic.

Dietary Intake Evaluation

None of the respondents reported that they provide dietary intake evaluation in their facilities. The facilities may have misinterpreted the term "evaluate" in the questions because although they indicated they did not perform dietary intake evaluation, they did respond to the follow-up questions. The results of the dietary intake evaluation are included because responses indicated that evaluation is performed in some facilities for various reasons including physical and/or nutritional need as evaluated by clinical personnel.

Sixty-seven percent (n=6) of the facilities reported conducting face-to-face interviews with clients upon admission to the facilities regarding dietary intake. In contrast, 67% (n=3) of the facilities either did not evaluate dietary intake upon discharge from the facilities or did not respond to the question. When asked what types of dietary assessment are administered to clients upon discharge from their facilities, 33% (n=3) reported other types including an exit interview, after care planning, or medical referral as appropriate. Thirty-three percent (n=3) indicated face-to-face interviews were conducted and the last third reported multiple types including face-to-face interviews and clinical evaluations. Half of the facilities (n=6) reported that multiple staff members evaluate dietary intake including physicians, dietitians, and chemical dependency counselors. Seventeen percent were physicians, 17% were dietitians, and the remaining 16% were medical technicians.

The open-ended survey question elicited a number of positive and negative comments. There was a consensus among respondents that alcohol abuse can severely damage the body, and that in general alcohol-dependent individuals are in poor nutritional health, and diet quality and proper nutrition is largely neglected. Positive feedback included comments such as "Personally I strongly believe it is vital to address diet and exercise as part of treatment and recovery planning for numerous and obvious reasons", "Nutrition education though is something we spend a lot of time on." All respondents agreed on the importance of nutrition and diet quality in the treatment of alcohol abuse disorders, commenting on the benefits to physical health, prevention of recurrence, and maintenance of sobriety. Negative feedback included references to the lack of resources and funding needed for nutrition education and evaluation. This feedback revealed that adequate funding and resources are needed to provide a comprehensive, quality nutrition education program in residential treatment facilities.

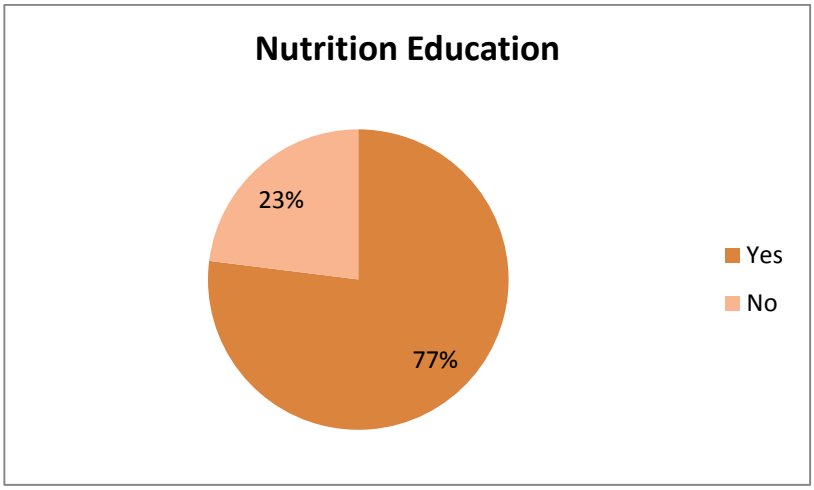
Limitations

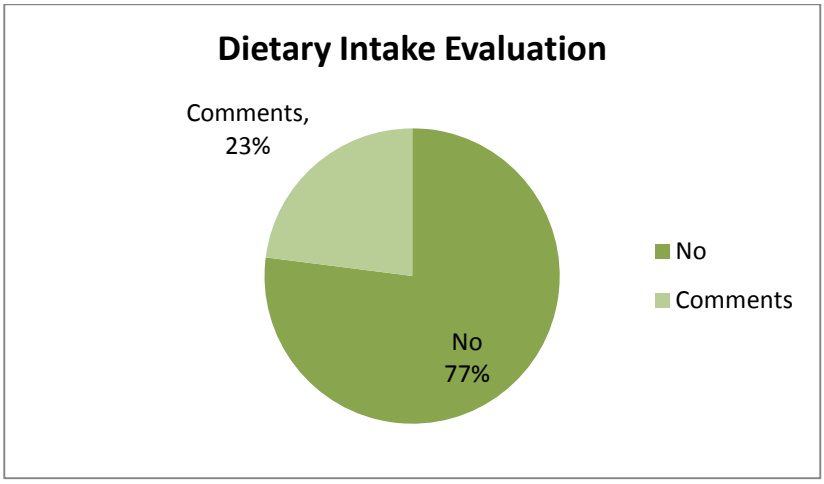
This study was limited by the small sample size of residential alcohol treatment facilities in Idaho, Oregon, and Washington. Idaho is a largely rural state with a relatively small population in comparison to the other states. Some of the facilities were unwilling to participate for lack of staff. There appeared to be confusion in regard to the terms "evaluation" and "assessment," and what these meant in reference to this study. Use of a web-based survey limited the study because of difficulty sampling email addresses, and the number of inactive addresses and non-responses. Non-responses were followed up by telephone; however, identifying a qualified contact person made this difficult. Because of the relatively small sample, the results may not be generalizable to residential alcohol treatment facilities in other states.

Discussion

An interesting finding in the current study was the opposing results of whether or not facilities provided nutrition education or evaluation. Seventy-seven percent of the facilities reported including nutrition education in their facilities; however, all of the facilities responded "no" to conducting dietary intake evaluation. It is possible they misinterpreted the question and did not realize it was asking about dietary intake. Although all of the facilities reported that they do not conduct nutrition evaluation, 23% of them responded to questions on the nutrition evaluation portion of the survey. They made comments such as "CD [chemical dependency] staff is supposed to refer to RD [registered dietitian] if patients have special dietary needs or problems" and "Our physician covers with patients." (See figure 3)

Figure 3 Comparison of Nutrition Education and Dietary Intake Evaluation





This finding raises concerns about the frequency of nutrition education services and evaluation of those services. Since evaluations are not being performed, the impact or potential benefit of the frequency and components of services cannot be determined. Assessing a client's dietary intake upon admission would be beneficial in identifying nutrient deficiencies and providing information to tailor diet plans specific to the individual. Examining the client's dietary intake at discharge may show evidence that the clients are incorporating components of the program. Participants commented that nutrition is important

for improving physical health, success of recovery, and prevention of recurrence. However, the nutrition education provided in these facilities was not evaluated, and it would therefore be difficult if not impossible to determine clients' state of physical health, successful recovery, and rate of recurrence.

A significant number of the facilities reported covering multiple topics or all five topics, which included (1) nutrition, (2) mind and/or mood altering substances (alcohol and drugs), (3) dietary intake, (4) drug/nutrient interaction, and (5) effects of drugs on the body. Facilities reporting nutrition as one of the topics they cover may have been influenced by the focus of the study. Those facilities that reported having 1-2 sessions a week of nutrition education consistently reported covering more topics. This may be because of the time it takes to cover each of the topics, and/or that the facilities may perceive that if they cover more topics, their program is more comprehensive. Grant et al. (2004) also found that substance abuse treatment programs that offer group nutrition and substance abuse education offered significantly more nutrition services.

The findings revealed that 33% of facilities provided nutrition education services in a group setting, 7% were individualized, and 60% provided both. A study conducted in 2004 by Grant et al. found that 50% of the facilities surveyed provided nutrition education services in a group setting. They concluded that group education was more cost effective than individual education. Group education was also associated with other nutrition education services, including group nutrition/substance abuse education. Those facilities that provided group education also provided a wide variety of other nutrition services as compared to other participating facilities. It was concluded that group nutrition education is a differentiating factor in the frequency and content of nutrition programs in these facilities. This conclusion

could apply to the current study as well, given that a majority of nutrition education was provided in a group setting, which would be more cost effective than individual sessions (Grant et al., 2004).

Half of the facilities reported using different methods when presenting nutrition education to their clients, including face-to-face sessions, written material, and hands-on activities. This approach would address the individual learning styles of the clients. Learning patterns in adults are developed during childhood (Russel, 2006). One approach to learning styles is based on the senses, and this is the most frequently used method of identifying and categorizing learning styles. These are described as visual, auditory, and kinesthetic learners. Assessing learning style is crucial prior to initiating any educational program. Determining the learning style of individuals will assist the instructor in presenting information in a format that is likely to be the most effective for all participants.

Not all facilities employ dietitians or individuals with a background in nutrition, and depend on other clinical personnel to deliver nutrition education, including chemical dependency counselors. Grant et al. (2004) found that 34% of the facilities surveyed employed dietitians as treatment members; however, only 29% of the patients actually received treatment from dietitians. The study did not identify other treatment members who may have provided nutrition education. In the current study, 14% (n=2) of the facilities reported a dietitian delivering nutrition education. Half of the facilities reported that chemical dependency counselors deliver nutrition education. This result may be due to the developing relationship between the client and the counselor, and the need to reduce the cost of the program.

The results of the dietary intake evaluation portion of the survey are disturbing in that it is not performed by these facilities, and non-response to subsequent questions is indicative of a need for evaluation. In comparison, Grant el al. (2004) found that only about one-third of patients were provided with nutrition assessment, but they were provided throughout the patient's treatment program. This finding may be due to the sample being limited to treatment programs within the Veteran's Administration.

Referrals to medical personnel for nutrition evaluation are only made in special cases, depending on the client's physical health and nutritional needs. Based on non-response and comments, evaluations are more than likely not performed due to lack of resources and funding. Many of the facilities surveyed were non-profit and did not have the funding to follow up with clients once they were discharged. This may be due to an inability to contact clients after discharge, client relapse, or other factors. Awareness and knowledge of this population's behavior is crucial in their treatment, as many are low income, low functioning, homeless, and lack social support.

A common theme among the facilities was knowledge of the importance of nutrition education, but a lack of funding and resources to provide it. This finding is supported by the number of people suffering from an alcohol abuse disorder in the United States. Of the 18 million people suffering from an alcohol abuse disorder, approximately 14% receive treatment (NIAAA, 2014). This could be due to financial issues, denial of a problem, embarrassment, lack of resources, family problems, or lack of social support.

Conclusions and Recommendations

This study explored the importance of nutrition education, the content, frequency, and methods of nutrition education sessions, and dietary intake evaluation in the treatment of

alcohol-dependent individuals. Examination of topics covered, sessions delivered, how material was presented, and comments from respondents in these programs demonstrates that nutrition education is an important component of an alcohol treatment program. There is agreement among the respondents that nutrition education enhances the potential for positive outcomes, reduces relapse, and sustains recovery. Additionally, the detrimental effects of chronic alcohol use on the body and the poor nutritional health and poor eating habits of alcoholics were reported. These findings indicate an awareness of the importance of nutrition education.

Nutrition education in the participating treatment facilities were limited in the topics they covered and the frequency of nutrition education sessions. Addressing nutrition, diet quality, food choice, and alcohol-nutrient interaction are key components of a nutrition education program. As previously discussed, improved physical health will assist individuals in the other areas of their treatment program. Educating individuals on improvement of diet quality, food choices, and reduction of the risk of chronic disease associated with alcohol abuse disorders could prove to increase an individual's physical health, thereby increasing their success in treatment, and reducing the incidence of recurrence. The frequency of nutrition education sessions was limited to only one or two sessions per week while in treatment. However, the facilities that provided one or two sessions per week also covered more topics. Half of the facilities reported using multiple methods when delivering nutrition education to their clients. This approach would be beneficial in addressing the various learning styles of the clients. It is suggested that nutrition education programs in alcohol treatment facilities present materials in a format that is likely to be the most effective for all participants. Face-to-face sessions, written material, and hands-on activities should all be

included. Therefore, it is suggested that alcohol treatment facilities spend more time on nutrition and dietary topics, increase the frequency of sessions clients receive, and deliver messages using a variety of methods to increase successful treatment outcomes and sustain recovery.

Dietary evaluation, however, did not yield the same results. None of the facilities indicated that they perform evaluations on their clients. Some of the facilities reported that dietary evaluation at admission and at discharge were only provided if the client had special needs that warranted it. Again, this is likely due to a lack of funding and resources in residential treatment facilities.

These results indicate a need for comprehensive, quality nutrition education and dietary intake evaluation in residential alcohol treatment facilities. Nutrition and diet quality should be an integral component of treatment to facilitate successful recovery. Restoring nutritional health and focusing on repairing physical damage greatly benefits the individual prior to addressing behavioral and psychological issues. Physicians and chemical dependency counselors specialize in and treat the physical, behavioral, and psychosocial issues that come along with alcohol abuse disorders. Dietitians, on the other hand, specialize in nutrition and its effects on the body and therefore, nutrition education should be facilitated and evaluated by dietitians. They should be on staff and readily accessible to educate clients and provide them with the tools they need to improve diet quality, repair organ damage, and restore nutritional health. Employing a dietitian would be a tremendous asset to facilities to improve successful recovery of their clients, and allow chemical dependency counselors and other staff to focus on their clients' behavioral issues.

Evaluation of nutrition education programs needs to be performed to determine the effectiveness of them. Follow-up on clients by dietitians, preferably face-to-face, is needed at timely intervals to assess diet quality and nutritional health. Lack of funding and resources would need to be addressed, and warrants further research. Future studies should include face-to-face interviews with nutrition personnel in these facilities to gather more in-depth information about their programs in regards to nutrition education and dietary intake evaluation. Increasing the use of nutrition education has potential positive benefits in the treatment of alcohol abuse disorders, and implementation of a comprehensive nutrition education program in residential treatment facilities that focuses on nutrition and diet quality could prove to be an effective strategy that warrants further research.

References

Addolorato, G., Capristo, E., Greco, A., Stefanini, G., & Gasbarrini, G. (1998). Influence of chronic alcohol abuse on body weight and energy metabolism: Is excess ethanol consumption a risk factor for obesity or malnutrition? *Journal of Internal Medicine, 244,* 387-395.

Alderazi, Y. & Brett, F. (2007). Alcohol and the nervous system. *Current Diagnostic Pathology, 13*, (3), 203-209.

American Diabetes Association ®. (2014). Facts about Type 2. Retrieved April 16, 2014 from http://www.diabetes.org/diabetes-basics/type-2/facts-about-type-2.html?loc=db-slabnav

Anton, R. (1999). What is craving? Models and implications for treatment. *Alcohol Research and Health, 23,* (3), 165-173.

Athyros, V., Liberopoulos, E., Mikhaildis, D., Athanasios, A., Papageorgiou, A., Gantokais, E., et al. (2008). Association of drinking pattern and alcohol beverage type with the prevalence of metabolic syndrome, diabetes, coronary heart disease, stroke and peripheral arterial disease in a Mediterranean cohort. *Angiology, 58,* (6)*,* 689-697.

Baliunas, D., Taylor, B., Irving, H., Roereck, M., Patra, J., Mohapatra, S., & Rehm, J. (2009). Alcohol as a risk factor for type 2 diabetes. *Diabetes Care, 32,* (11), 2123-2132.

Barbadoro, P., Ponzio, E., Pertosa, M., Aliotta, F., D'Errico, M., Prospero, E. (2010). The effects of educational intervention on nutritional behavior in alcohol-dependent patients. *Alcohol and Alcoholism, 46,* (1), 77-79.

Beasley, J. & Knightly, S. (1994). *Food for Recovery: The complete nutritional companion for recovery from alcoholism, drug addiction and eating disorders*. New York: Crown Trade Paperbacks.

Bensley, R., Brusk, J., Anderson, J., Mercer, N., Rivas, J., & Broadbent, L. (2006). Wichealth.org: Impact of a stages of change-based internet nutrition education program. *Journal of Nutrition Education and Behavior, 38*, 222-229.

Beulens, J., Rimm, E., Ascherio, A., Spiegelman, D., Hendriks, H., & Mukamal, K. (2007). Alcohol consumption and risk for coronary heart disease among men with hypertension. *Annals of Internal Medicine, 146,* 10-19.

Biery, J., Williford, J., & McMullen, E. (1991). Alcohol craving in rehabilitation: assessment of nutrition therapy. *Journal of the American Dietetic Association, 91,* 463-466.

Bode, C. & Bode, J. (1997). Alcohol's role in gastrointestinal tract disorders. *Alcohol & Research World, 21,* (1), 76-83.

Breslow, R., Guenther, P., & Smothers, B. (2006). Alcohol drinking patterns and diet quality: the 1999-2000 national health and nutrition examination survey. *American Journal of Epidemiology, 163,* (4), 359-366.

Breslow, R., Guenther, P., Juan, W., & Graubard, B. (2010). Alcoholic beverage consumption, nutrient intakes, and diet quality in the US adult population, 1999-2006. *Journal of the American Dietetic Association, 110,* (4), 551-562.

Bunout, D. (1999). Nutritional and metabolic effects of alcoholism: Their relationship with alcoholic liver disease. *Nutrition, 15,* (7-8), 583-589.

Ceccanti, M., Sasso, G.F., Nocente, R., Balducci, G., Prastaro, A., Ticchi, C., et. al. (2006). Hypertension in early alcohol withdrawal in chronic alcoholics. *Alcohol & Alcoholism, 41,* (1), 5-10.

Centers for Disease Control and Prevention. (2014). Fact Sheets-Alcohol Use and Health. Retrieved April 16, 2014 from http://www.cdc.gov/alcohol/fact-sheets/alcohol-use.htm

Chobanian, A., Bakris, G. Black, H., Cushman, W., Green, L, Izzo, J. Jr et al. (2003). The seventh report of the Joint National Committee on prevention, detection, evaluation and treatment of high blood pressure. *JAMA*, 289, 2560-2572.

Colditz, G., Giovannucci, E., Rimm, E., Stampfer, M., Rosner, B., Speizer, F., et al. (1991). Alcohol intake in relation to diet and obesity in women and men. *The American Journal of Clinical Nutrition, 54,* 49-55.

Curry, S., Kristal, A., & Bowen, D. (1992). An application of the stage model of behavior change to dietary fat reduction. *Health Education Research*, 7, 319-325.

DiCecco, S. & Francisco-Ziller, N. (2006). Nutrition in alcoholic liver disease. *Nutrition in Clinical Practice, 21,* 245-254.

Fisher, M. & Gordon, T. (1985). The relation of drinking and smoking habits to diet: The lipid research clinics prevalence study. *American Journal of Clinical Nutrition*, *41*, 623-630.

Grant, L., Haughton, B., & Sachan, D. (2004). Nutrition education is positively associated with substance abuse treatment program outcomes. *Journal of the American Dietetic Association, 104,* (4), 604-610.

Greene, G., Rossi, S., Reed, G., Willey C., & Prochaska, J. (1994). Stages of change for

reducing dietary fat to 30% of energy or less. *Journal of the American Dietetic Association, 94*, (10), 1105-1112

Green, M., Rogers, P., Elliman, N., & Gatenby., S. (1994) Impairment of cognitive performance associated with dieting and high levels of dietary restraint. *Physiology & Behavior, 55,* (3), 447-452.

Griffith, C. & Schenker, S. (2006). The role of nutritional therapy in alcoholic liver disease. *Alcohol Research and Health, 29,* (4)*,* 296-306.

Gruchow, H., Sobocinski, K., Barboriac, J., & Sheller, J. (1985). Alcohol consumption, nutrient intake and relative body weight among US adults. *American Journal of Clinical Nutrition, 42,* 289-295.

Guenther, R. (1983). The role of nutritional therapy in alcoholism treatment. *International Journal of Biosocial Research, 4,* (1), 5-18.

Hirsch, S., De La Maza, M., Gattas, V., Petermann, M., Gotteland, M., Muñoz, C. et al. (1999). Nutritional support in alcoholic cirrhotic patients improves host defenses. *Journal of the American College of Nutrition*, *18,* (5), 434-441.

Hornik, R. & Kelly, B. (2007). Communication and diet: An overview of experience and principles. *Journal of Nutrition Education and Behavior, 39,* S5-S12.

Hurt, R., Higgins, J., Nelson, R., Morse, R., & Dickson, R. (1981). Nutritional status of a group of alcoholics before and after admission to an alcoholism treatment unit. *The American Journal of Clinical Nutrition, 34,* 386-392.

Kampov-Polevoy, A., Garbutt, J., & Janowsky, D. (1999). Association between preference for sweets and excessive alcohol intake: A review of animal and human studies. *Alcohol & Alcoholism, 34,* (3), 386-395.

Kesse, E., Clavel-Chapelon, F., Slimani, N., van Liere, M., & the E3N Group. (2001). Do eating habits differ according to alcohol consumption? Results of a study of the French cohort of the European prospective investigation into cancer and nutrition (E3N-EPIC). *American Journal of Clinical Nutrition, 74,* 322-327.

Kim, S., Breslow, R. Ahn, J. & Salem, N. (2007). Alcohol consumption and fatty acid intakes in the 2001-2002 national health and nutrition examination survey. *Alcoholism: Clinical and Experimental Research, 31,* (8), 1407-1414.

Kristal, A., Glanz, K., Curry, S., & Patterson, R. (1999). How can stages of change be best used in dietary interventions? *Journal of the American Dietetic Association, 99,* (6), 679-684.

Leggio, L. (2009). Understanding and treating alcohol craving and dependence: Recent pharmacological and neuroendocrinological findings. *Alcohol & Alcoholism, 44,* (4), 341-352.

Lieber, C. (2000). Alcohol: Its metabolism and interaction with nutrients. *Annual Review of Nutrition, 20,* 395-430.

Lieber, C. (2003). Relationships between nutrition, alcohol use, and liver disease. *Alcohol Research and Health, 27,* (3), 220-228.

Medical Dictionary. (2014). Nutritional status. Retrieved July 25, 2014 from http://medical-dictionary.thefreedictionary.com/nutritional+status

Mezey, E. (1991). Interaction between alcohol and nutrition in the pathogenesis of

alcoholic liver disease. *Seminars in Liver Disease*, *11,* (4), 340-348.

Moorhouse, M., Loh, E., Lockett, D., Grymala, J., Chudzik, G, & Wilson, A. (2000).Carbohydrate craving by alcohol-dependent men during sobriety: Relationship to nutrition and serotonergic function. *Alcoholism: Clinical and Experimental Research, 24, (5),* 635-643.

National Institute on Alcohol Abuse and Alcoholism. (2012). Retrieved April 16, 2014 from http://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption/alcohol-facts-and-statistics

National Institutes of Health. (2010). Exploring treatment options for alcohol use disorders. Retrieved April 16, 2014 from http://pubs.niaaa.nih.gov/publications/AA81/AA81.htm

Oslin, D., Cary, M., Slaymaker, V., Colleran, C., & Blow, F. (2009). Daily ratings measures of alcohol craving during an inpatient stay define subtypes of alcohol addiction that predict subsequent risk for resumption of drinking. *Drug and Alcohol Dependence, 103,* 131-136.

Povey, R., Conner, M., Sparks, P., James, R., & Shepherd, R. (1999). A critical examination of the application of the transtheoretical model's stages of change to dietary behaviours. *Health Education Research: Theory and Practice, 14,* (5), 641-651.

Prochaska, J., DiClemente, C., & Norcross, J. (1992). In search of how people change applications to addictive behaviors. *American Psychologist, 47,* (9), 1102-1114.

Prochaska, J. (1994). Strong and weak principles for progressing from precontemplation to action on the basis of twelve problem behaviors. *Health Psychology, 13,* (1),

47-51.

Russel, S. (2006). An overview of adult-learning processes. *Urologic Nursing*, *26,* (5), 349-370.

Santolaria, F., Perez-Manzano, J., Milena, A., Gonzalez-Reimers, E., Gomez-Rodriguez, M.,Martinez-Riera, A. et al. (2000). Nutritional assessment in alcoholic patients: Its relationship with alcoholic intake, feeding habits, organic complications and social problems. *Drug and Alcohol Dependence, 59,* (3), 295-304.

Spahn, J., Reeves, R., Keim, K., Laquatra, I., Kellogg, M., Jortberg, B. et al. (2010). State of evidence regarding behavior change theories and strategies in nutrition counseling to facilitate health and food behavior change. *Journal of the American Dietetic Association, 110,* (6), 879-891.

Stickel, F., Inderbitzin, D., & Candinas, D. (2008). Role of nutrition in liver transplantation for end-stage chronic liver disease. *Nutrition in Clinical Care, 66,* (1), 47-54.

Teixeira, J., Mota, T., & Fernandes, J. (2011). Nutritional evaluation of alcoholic inpatients admitted for alcohol detoxification. *Alcohol and Alcoholism, 46,* (5), 558-560.

Vallis, M., Ruggiero, L., Greene, G., Jones, H., Zinman, B., Rossi, S. et al. (2003). Stages of change for healthy eating in diabetes. *Diabetes Care, 26,* (5), 1468-1474.

Worden, M. & Rosellini, G. (1978). Role of diet in people-work: Uses of nutrition in therapy with substance abusers. *Orthomolecular Psychiatry, 7,* (4), 249-257.

Yoon, G., Kim, S., Thuras, P., Grant, J., & Westermeyer, J. (2006). Alcohol craving in outpatients with alcohol dependence: Rate and clinical correlates. *Journal of Studies on Alcohol, 67, 770-777.*

Yung, L., Gordis E., & Holt, J. (1983). Dietary choices and likelihood of abstinence among alcoholic patients in an outpatient clinic. *Drug and Alcohol Dependence, 12,* (4), 355-362.

Appendix A

IRB Approval

University of Idaho

Office of Research Assurances (ORA)
Institutional Review Board (IRB)
PO Box 443010
Moscow ID 83844-3010

Phone: 208-885-6162
Fax: 208-885-5752
irb@uidaho.edu

To: Deringer, Nancy
Cc: Bowman, Stacy

From: IRB, University of Idaho Institutional Review Board

Subject: Exempt Certification for IRB project number 13-032

Determination: February 12, 2013
Certified as Exempt under category 2 at 45 CFR 46.101(b)(2)
IRB project number 13-032: Nutrition Education in the Treatment of Alcoholism

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This study may be conducted according to the protocol described in the Application without further review by the IRB. As specific instruments are developed, each should be forwarded to the ORA, in order to allow the IRB to maintain current records. Every effort should be made to ensure that the project is conducted in a manner consistent with the three fundamental principles identified in the Belmont Report: respect for persons; beneficence; and justice.

It is important to note that certification of exemption is NOT approval by the IRB. Do not include the statement that the UI IRB has reviewed and approved the study for human subject participation. Remove all statements of IRB Approval and IRB contact information from study materials that will be disseminated to participants. Instead please indicate, "The University of Idaho Institutional Review Board has Certified this project as Exempt."

Certification of exemption is not to be construed as authorization to recruit participants or conduct research in schools or other institutions, including on Native Reserved lands or within Native Institutions, which have their own policies that require approvals before Human Subjects Research Projects can begin. This authorization must be obtained from the appropriate Tribal Government (or equivalent) and/or Institutional Administration. This may include independent review by a tribal or institutional IRB or equivalent. It is the investigator's responsibility to obtain all such necessary approvals and provide copies of these approvals to ORA, in order to allow the IRB to maintain current records.

This certification is valid only for the study protocol as it was submitted to the ORA. Studies certified as Exempt are not subject to continuing review (this Certification does not expire). If any changes are made to the study protocol, you must submit the changes to the ORA for determination that the study remains Exempt before implementing the changes. The IRB Modification Request Form is available online at: http://www.uidaho.edu/ora/committees/irb/irbforms

Appendix B

Research Components

Email Invitation to Participate in Research Study

My name is Stacy Bowman and I am a graduate student at the University of Idaho. I am conducting research on nutrition education and nutritional services offered in in-patient alcohol treatment facilities. This study has the potential benefit of assisting recovering alcoholics in their treatment and maintenance of long-term sobriety.

I will be conducting an online survey in the near future and I am requesting email contact information for the appropriate staff member to complete the survey.

Thank you for your time and I look forward to hearing from you.

Stacy Bowman
Graduate Student
School of Family and Consumer Sciences
University of Idaho
stacyb@uidaho.edu

Second Email Invitation to Participate in Research Study

Subject: Graduate Research Study-Nutrition Education and Evaluation in the Treatment of Alcoholism

My name is Stacy Bowman and I sent you a survey in March/April 2013 and I greatly appreciate your participation in this important study. I am a graduate student at the University of Idaho in Family and Consumer Science with an emphasis in nutrition. I am conducting research on nutrition education and evaluation in the treatment of alcoholism in inpatient treatment facilities in the state of Idaho. This study has the potential benefit of assisting recovering alcoholics in their treatment and maintenance of long-term sobriety.

After reviewing the data I received, my faculty advisor and I decided to expand my research to the Pacific Northwest and collect more data. I have added one open-ended question to the survey and your answer(s) would be extremely beneficial to my research and conclusions.

I have posted the question below and I have emailed you the link to the survey. You can either respond with your answer to this email or if you choose to answer the question in the survey form, you only need to answer the last question as I still have the results of the survey you completed in March. We have contracted with QuestionPro, an independent research firm, to field your confidential survey responses. Please check your in-box and your junk mail for this email.

Once again, I appreciate your participation and look forward to hearing from you.

Stacy Bowman, Master's Candidate 2013
Nancy Deringer, PhD, Faculty Advisor
School of Family and Consumer Sciences
University of Idaho
stacyb@uidaho.edu

**Why do you think nutrition education is important in the treatment of alcoholism?

Survey Questions

Nutrition Education

1. Do you include nutrition education in your alcohol treatment program?
   Yes
   No
   Comments

   If no, then please go to the next section on **Nutrition Evaluation.**

2. How many nutrition education sessions do clients receive in your program?

   1-2 sessions per week
   3-4 sessions per week
   5-6 sessions per week
   7 or more sessions per week
   Comments

3. What topics are covered in your nutrition education program?

   Nutrition
   Mind and/or mood altering substances, i.e. Alcohol and drugs
   Dietary intake
   Drug/nutrient interactions
   Effects of drugs on the body
   Comments

4. How is nutrition education presented in your facility? **Circle all that apply.**

   Face-to-Face
   Written
   Hands-on activities
   Comments

5. How is face-to-face nutrition education delivered in your facility?

   Group
   Individual
   Both
   Comments

6. Who administers nutrition education in your facility? **Circle all that apply.**

   Physicians
   Dietitian
   Nutrition counselor
   Chemical dependency counselor
   Comments

7. How is follow-up nutrition education delivered to clients when they are discharged from your facility? **Circle all that apply.**

   Hand-outs
   Follow-up visits, face-to-face
   Comments

Dietary Intake Evaluation

1. Does your alcohol treatment program conduct nutrition evaluations on their clients?

   Yes
   No
   Comments

   If no, please go to the comment section at the end of this survey.

2. Who evaluates dietary intake on clients in your facility?

   Physicians
   Dietitians
   Nutrition counselors
   Chemical dependency counselors
   Comments

3. How is dietary intake evaluated upon admission to your facility? **Circle all that apply.**

   24-hour diet recall
   Food frequency questionnaire
   Face-to-face interview
   Comments

4. How is dietary intake evaluated at discharge from your facility? **Circle all that apply.**

   Diet recall
   Food frequency questionnaire
   Face-to-face interview
   Comments

5. What type(s) of dietary assessment is administered to clients upon discharge from your facility? **Circle all that apply.**

   Diet recall
   Food frequency questionnaire
   Face-to-face interview
   Anthropometric evaluation
   Biochemical evaluation
   Clinical evaluation
   Comments

6. How is dietary behavior change measured following discharge from your facility? **Circle all that apply.**

   Telephone interviews
   Mailed surveys
   Face-to-face visits
   Web-based surveys
   Comments

7. At what intervals is dietary behavior change assessed?

   One, three, and six months
   One, three, six, and nine months
   One, three, six, nine, and twelve months
   Three and six months
   Three, six, and nine months
   Three, six, nine, and twelve months
   Comments

8. Why do you think nutrition education and evaluation are important in the treatment of alcoholism?

Comments

Do you have any information you would like to share with us on your alcohol treatment program?

Thank you for taking time to complete this survey.

Appendix C

Tables

Table 3 Respondents by State

State	# of responses	Percentage
Idaho	7	39%
Oregon	2	11%
Washington	9	50%
Totals	18	100%

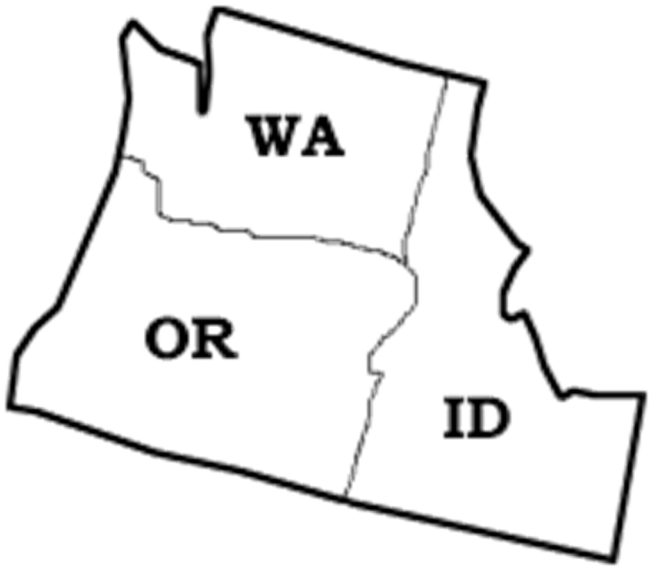

Table 4 Nutrition Education and Evaluation Survey Categories

Nutrition education

Question	Categories-Responses sorted into:
1. Do you include nutrition education in your alcohol treatment program?	Nutrition education (NE)
2. How may nutrition education sessions do clients receive in your program?	NE, information (IN)
3. What topics are covered in your nutrition education program?	IN
4. How is nutrition education presented in your facility?	Learning styles (LS)
5. How is face-to-face nutrition education delivered in your facility?	NE, LS
6. Who administers nutrition education in your facility?	Knowledge (KN), NE
7. How is follow-up nutrition education delivered to clients when they are discharged from your facility?	NE, LS, nutrition evaluation (NEV)

Nutrition evaluation

Question	Categories-Responses sorted into:
1. Does your alcohol treatment program conduct nutrition evaluations on their clients?	NEV
2. Who evaluates dietary intake on clients in your facility?	NEV
3. How is dietary intake evaluated upon admission to your facility?	NEV, IN
4. How is dietary intake evaluated at discharge from your facility?	NEV, IN
5. What type(s) of dietary assessment is administered to clients upon discharge from your facility?	NEV

Table 5. Participant Comments

Why do you think nutrition education and evaluation are important in the treatment of alcoholism?

Yes	
Help prevent relapse and sustain recovery	RE(relapse), RC(recovery)
I will keep it short. Could write a long essay on this. We treat addiction with a holistic approach (mind, body, spirit) using a variety of evidence based practices. Personally I strongly believe it is vital to address diet and exercise as part of treatment and recovery planning for numerous and obvious reasons. Greatly enhances the potential for positive outcomes, speeds up healing time, positively effects overall health, reduces relapse, elevates mood, energy, sleeping patterns and so on…	RE, RC, HO(holistic)
Alcohol does organ system damage and depletes nutrients, vitamins, neurochemicals from the body and takes time for it to mend. Most addicts and alcoholics have not paid any attention to their bodies and to dietary needs for many months or many years.	DC(diet quality) DAM(damage to the body/organs)
Substance abuse frequently results in poor nutrition. Healthy recovery is dependent on healthy nutritional habits.	RC, DC
We don't evaluate, the nurse does check for allergies upon admission. Nutrition education though is something we spend a lot of time on. Our cooking staff and traditional specialists teach on a daily basis food portions and the benefits of foods that make them healthy versus artificial foods. Examples: the cook letting someone know why whole grain bread is better than white. Alternate milk choices. How traditional foods affect different areas of their body and the benefits. These are just a couple examples, we could go on forever.	NE(nutrition education)
Aids in recovery.	RC
I am a RD consultant to my agency's inpt CD facility. I attend x2/month, teach a nutr group at each visit, and do evals and education by referral. I believe many clients would benefit by individual counseling, but funding does not allow for the number of nutr ed contacts your questions seem to envision. When I am	NE

at the CD facility, I am fairly high profile and accessible on the grounds or in the dining room; thus clients wanting nutr ed can self select by approaching me; I thinks this works well.	
When individuals are actively drinking alcohol they, generally, are not eating healthy meals regularly. Many times their calorie intake is from alcohol. Teaching them how to eat healthy in recovery is vital to their body repairing the damage caused by drinking and keeping them healthy.	DC, DAM
Yes	
Nutrition is not a priority for clients. If individuals have a healthy body, they have a healthy mind which aids in success and managing their lives. If they address nutrition and diet they may not turn to substances. Holistic approach.	RC, HO