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# Training Group Home Staff on Nutrition

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# Training Group Home Staff on Nutrition

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A Thesis

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Requirements for the Degree of

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# APPROVAL PAGE

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## Training Group Home Staff on Nutrition

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## **Abstract**

Currently, more than one-third of adults (more than 72 million people) in the United States are obese (Centers for Disease Control and Prevention [CDC], 2014), and therefore obesity is a major public health concern. The prevalence of obesity in the population of individuals with disabilities has been shown to be 2.1 times higher than compared to the general population, and the prevalence is higher in less restrictive settings such as group homes (Saunders et al., 2011). Therefore, interventions aimed to decrease obesity should be created for this population. The purpose of this study is to investigate the need for a nutrition and food safety training intervention for the direct care support staff of group homes. The investigators worked together with a group home agency, and performed a needs assessment at three of their group homes (N=3). The study used direct observation at the group homes to assess the food/nutrition environment in the homes. A score on a scale from one-to-ten was given to each home based on the availability of nutritious food, the food safety methods used, and the cooking equipment available in each home. The average of each home's three scores was 6.3/10, 3.7/10, and 6.7/10. The results show that there is a need for training and improvements in the group home/assisted community living environment for individuals with disabilities. The researchers suggest an intervention related to nutrition to increase the information, motivation, and behavioral skills of the staff of these homes.

## Introduction

Obesity has increased dramatically in the US since 1990, with rates increasing from about 15% of the adult population in 1990 to about 25% and higher by 2010 (Harvard University, 2014). The obesity epidemic is a relatively new healthcare issue, as the prevalence of obesity steadily increased throughout the US population starting around twenty-five years ago. Currently, more than one-third of adults (more than 72 million people) in the United States are obese (Centers for Disease Control and Prevention [CDC], 2014). Being overweight or obese dramatically increases the risk for a number of secondary health conditions such as heart disease, diabetes, high blood pressure, cancer, sleep problems, stroke, and osteoarthritis (Heller, McCubbin, Drum, & Peterson, 2011; Humpries, Traci, & Seekins, 2008; Saunders et al., 2011). For these reasons, there is a great demand for successful public health interventions to prevent the incidence of obesity from increasing, and to decrease the current prevalence of obesity. Obesity rates overall have steadied since 2003 in the general population (Harvard University, 2014). However, increased rates still persist in some groups such as African American, Hispanic, and Mexican American adults.

Obesity is a chronic disease defined and diagnosed through a measure called body mass index, or BMI (Saunders et al., 2011). This number is determined using a person's weight in kilograms divided by their height in meters, which is squared ( $\text{kg}/\text{m}^2$ ). The healthy BMI range is from 18-24.9, the overweight range is from 25-29.9, and a person is considered obese if they have a BMI above

30 (CDC, 2014). In addition to BMI, waist circumference is also an important factor to consider when addressing the problem of overweight and obese individuals, as a larger waist is usually a consequence of increased visceral fat, which can lead to numerous health issues and an elevated health risk for individuals (Harvard University, 2014).

Although obesity affects people across demographic boundaries, certain populations have higher relative rates of obesity (CDC, 2014). Individuals with an intellectual disability (ID) and/or developmental disabilities have an increased prevalence of being overweight or obese when compared to the general population (Heller, McCubbin, Drum, & Peterson, 2011; Saunders et al., 2011) and as such are an important target for public health. Specifically, the harmful effects of obesity (such as type 2 diabetes, coronary heart disease, and cancer), impact individuals with ID to a greater extent than the general population, as these individuals often have additional co-occurring debilitating conditions (Saunders et al., 2011). ID is defined by the American Association of Intellectual and Developmental Disabilities (AAIDD) as a disability originating before the age of 18 that is characterized by significant limitations in both intellectual functioning and in adaptive behavior, which covers many everyday social and practical skills (such as interpersonal skills, occupational skills, activities of daily living, and schedules/routines) (AAIDD, 2013). The AAIDD further explains that Developmental Disabilities is an umbrella term that includes ID but also includes other disabilities apparent during childhood that are severe, chronic, and can be

cognitive, physical, or both. Examples of developmental disabilities include Cerebral Palsy, Epilepsy, Down Syndrome, and Fetal Alcohol Syndrome” (AAIDD, 2013).

The CDC reports that adults with disabilities have about a 57% increase of obesity compared to adults without disabilities, and children with disabilities have a 38% increase of obesity rates compared to children without disabilities (CDC, 2014). Other studies have reported that the prevalence of obesity in the population of individuals with disabilities is 2.1 times higher than the general population, and that the prevalence is higher in settings, such as group homes, that provide individuals with less restrictions (Saunders et al., 2011). These individuals may be at greater risk of obesity due to a lack of healthy food choices, difficulties in chewing or swallowing, medications, physical limitations, pain, lack of energy, lack of resources, lack of accessible environments, and general lack of knowledge about health and physical activity (Saunders et al., 2011).

In order for obesity prevalence to be halted or reversed, the health behaviors of the population need to be improved through treatment of individuals already diagnosed and prevention for individuals at risk for developing obesity in the near future. Weight management can be achieved through increased physical activity and proper nutrition through a complete diet. However, most people are aware that they should exercise but they choose not to for reasons such as embarrassment, limited access to equipment, poor motivation, and seeing no immediate reason to lose weight (such as a life threatening illness related to/a

result of their weight). These are all barriers that are common in both the general population, as well as the population of individuals with disabilities. Health behaviors are often learned at a very young age and become a permanent part of one's daily routine throughout adulthood. Therefore, it is important for health promotion interventions to be sensitive to the fact that it may be a slow process to get individuals to be accepting of change.

The problem of obesity, specifically in the population of individuals who are diagnosed with ID, is one of great public health concern. Therefore, it is very important to perform research to establish health promotion interventions that can help to reduce the prevalence of obesity in this population. This research is a needs assessment to determine if further intervention is necessary and worthwhile. The research goal of this project is to determine the need for future nutrition education intervention for the staff of individuals residing in three group homes. Group homes are those residences within non-profit corporations/agencies that contract with the state to provide residential, supported living, work, and transportation services to adults with intellectual/developmental disabilities (Humphries, Traci, & Seekins, 2004). Ultimately the future implication of this research is to decrease the incidence of obesity for individuals served, as a result of the suggested intervention combined with additional exercise and health interventions. The researchers anticipate that with the necessary information regarding proper nutrition, and the support and motivation from employees and executives of the company, the staff of the group homes will have and use the

behavioral skills formed to make changes that better serve the individuals living in the group homes. Although this research will not track any data about the individuals living in the group homes, the hope is that these individuals will have some weight loss and obesity status changes as a result of changes in their food intake after the suggested intervention occurs.

### **Background and Significance**

The literature suggests that due to the higher prevalence of obesity in persons with Intellectual and Developmental Disabilities (I/DD) in comparison to those without I/DD (Heller, McCubbin, Drum, & Peterson, 2011; Saunders et al., 2011), there is need for public health promotion/interventions. These interventions will help to achieve social justice by reducing the prevalence of obesity in these vulnerable individuals (Doody & Doody, 2012; Froehlich-Grobe & Lollar, 2011). Within this population the rates of obesity differ between groups. Studies have shown that in the population of individuals with ID, there are risk factors that may lead to higher rates of obesity including being female, being older, and having a co-morbid genetic condition that often is associated with obesity (such as Down syndrome) (Casey & Rasmusen, 2013). Other research claims that there are particularly alarming increased rates of obesity in adults with ID residing in the United States in smaller, less supervised settings (such as group homes and family households) compared to those living in larger, more supervised settings (such as institutions) and compared to other countries (Casey & Rasmussen, 2013; Doody & Doody, 2012; Rimmer & Yamaki, 2006; Saunders et al., 2011).

There are potential barriers and risk factors within this population that lead to their increased prevalence of obesity. Financial barriers of individuals with ID are often associated with the purchasing of cheaper unhealthy foods, as they often are not provided with enough assistance to purchase more expensive, healthy foods (Bodde & Seo, 2009). Previous research examined group home pantries and found that less than 45% of the recommended daily amounts of vegetables were available for consumption (Humphries, Traci, & Seekins, 2008). In addition to a poor diet, sedentary behavior and low physical activity level are major risk factors of obesity (CDC, 2014). A review of current research reported that adults with ID have a high rate of sedentary behavior and participate in much less physical activity than the general population. It was found that the barriers of cost, transportation, lack of support, and fall/injury concerns were reported frequently as reasons for this lack of physical activity (Bodde, & Seo, 2009). A study focused on measuring physical activity of 131 mild-moderate ID individuals residing in community settings. The study found that the physical activity levels of majority of the sample were insufficient to achieve health benefits and only about 15% of the participants reached the public health guidelines for activity (Peterson, Janz, & Lowe, 2008). Focus on breaking/modifying these barriers and increasing awareness of caretakers and individuals with ID about the need for physical activity and healthy food choices is crucial in order to prevent obesity from continuing to rise in this population. Currently, there is limited evidence-based information on which to develop effective treatment programs (Saunders et al.,

2011). Therefore, this study is needed in order to expand the knowledge base on this topic.

Obesity is often measured through body mass index (BMI), and it serves as a reasonably good measure to identify individuals with the greatest danger of obesity (CDC, 2014). However, research suggests that BMI alone may not be adequate, specifically when focusing on a population of individuals with ID who often have disproportionate body types (Casey & Rasmussen, 2013). Research is showing that abdominal fat tissue is the most detrimental to health status, reporting that individuals with abdominal obesity may be up to ten times more likely to have resulting conditions such as hypertension, high blood sugar, and low HDL cholesterol levels than those who are not abdominally obese (Casey & Rasmussen, 2013). This suggests that abdominal fat tissue measures should be a target measure for interventions and programs aiming at and measuring decreases in obesity/weight status and increasing health status of individuals with ID. Reduction of abdominal fat starts with an improved diet, therefore this pilot study will help lead to changes in this measure.

In the group home setting, due to functional limitations of many residents, staff (rather than the individuals themselves) prepares meals for the individuals. Therefore, rather than teaching the individuals themselves about nutrition and healthy eating, research should be focused on teaching and changing staff behavior. One study reported that group home food systems are complicated by high staff turnover, staff's lack of food preparation skills and nutrition knowledge,

and inadequate direct care staff training in foods and nutrition (Humphries, Traci, & Seekins, 2008). This emphasizes the need for a training program designed to teach the staff of group homes about nutrition and healthy meal preparation, such as the one proposed in this paper.

### **Literature Review**

Previous research that considers the impact support staff has on the health of individuals residing in group homes is limited. However, Healthy People 2010, a national initiative for better health outcomes, has introduced a focus for people with disabilities aimed at lowering health disparities through prevention and management of secondary conditions (Humphries, Traci, & Seekins, 2004). This national initiative has helped expand recent research on nutrition interventions for obesity in this population.

### **Results of Preliminary Assessments of the Nutrition Environment of Group Homes**

Recent research began with preliminary assessments of the nutrition and foods systems environment in group homes. A scoping review study that included English-language peer-reviewed primary literature and review articles, in which authors examined health promotion interventions among adults with disabilities found five studies to review in detail. The criteria for these studies to be included were a nutrition and a screening component, health behavior education (including both nutrition and exercise information), and on-site home visits (Heller, McCubbin, Drum, & Peterson, 2011). The studies included in the review that had a

nutritional component had outcomes of changes in the participants' BMI or weight. Specifically, they found that interventions with health behavior education including both healthy eating and exercise were the most effective in reducing obesity. Other outcomes reported in the studies examined included participants' increased knowledge of nutrition, self-reported healthier diet, and improved life satisfaction.

The study by Heller, McCubbin, Drum, and Peterson (2011) discussed the challenges that existed in the reviewed studies for addressing this population such as intellectual limitations, other cognitive and social emotional barriers (such as lack of motivation and lack of self-efficacy), and issues of accessibility. The study concluded that there is a significant need for community-based interventions that lead to improved health outcomes for this population. Furthermore, there is a need for development of interventions that address staff training, knowledge and motivation of people with intellectual disabilities regarding health promotion and nutrition. They also noted the need for increased organizational capabilities of community-based organizations/agencies to promote health behaviors and health promotion programs to improve conditions for individuals with disabilities.

A second study assessed the nutrition and food-system environment of adults with intellectual disabilities, specifically for those living in supported arrangements in the community [group homes] (Humphries, Traci, & Seekins, 2004). This study took place in Montana, and used methods of direct observation, data collected through secondary data (menus, shopping lists, and store receipts), and data collected through interviews with group home direct-care staff. Direct

observation techniques included observations of food preparation, storage, and food pantry examination. Semi-structured interviews were conducted between the researcher and staff members who were responsible for food service. These interviews included questions about the residents' food habits and the methods of food service delivered to the residents. In addition, three staff members were asked to complete a series of three dietary recall interviews by phone to determine if the food served in the homes matched the foods originally planned on the menus. Nineteen weeks worth of menus were collected from the group homes (9 weeks from one and 10 from the other). The researchers randomly selected shopping lists and grocery receipts for two weeks from each group home.

The researchers coded the menus based on the USDA Food Guide Pyramid, assigning each menu item to one of five food groups (grains, vegetables, fruits, dairy, and protein). Then they compared the mean number of servings of each food group per person per day between the homes and compared to the suggested number of servings from the Food Guide Pyramid for the average individual. The grocery lists and receipts were analyzed to determine if the food purchased corresponded with the menus planned. Additionally, the dietary recall interviews from the staff were compared to the planned menus for further correspondence analysis.

The analysis found strong agreement between grocery receipts and foods planned on the menus. The recall interviews of staff also showed no significant changes made to the meals prepared and the meals planned. However, analysis

of grocery receipts shows that foods not on the menus that were often purchased for ready consumption were snack or treat items such as cookies, ice cream, and salty snacks. The coding of menus based on the Food Guide Pyramid found that the diets in the sample were not adequate and contained excessive amounts of energy-dense, nutrient-poor food and dietary fats. The observations of the pantries revealed foods high in saturated fat, trans fat, and total fat; large quantities of butter, half-and-half, mayonnaise, salad dressings, sour cream, and higher fat popcorn; significant sources of sodium such as processed cheese slices, luncheon meats, soups and canned vegetables; and many high-sodium prepared sauces/condiments. The findings also showed that fiber sources such as fruits, vegetables, and whole grains were low for both households.

This study concluded that improvements in the diets of the individuals residing in these group homes could be made through improvements in the menus planned. It was suggested that these improvements could be accomplished through additional guidance of food groups represented in meals, and more healthful cooking methods and recipes to accompany the menus. One limitation of this study methodology mentioned is that measuring food availability is not the same as, or as strong as, measuring dietary intake. However, a person cannot eat food that is not available to them.

### **Results of Nutritional Intervention Studies for Individuals with Intellectual and/or Developmental Disabilities**

The literature consists of a few studies that create and implement nutrition interventions for individuals with ID/DD. A study performed by Kneringer and Page (1999) at Temple University was designed to evaluate the nutritional practices in community-base group homes using a multiple baseline study design. In this study, thirteen direct-care providers who worked in two community-based group homes served as subjects. The researchers made unscheduled visits to the group homes and collected data on three categories of staff behavior including storage (percentage of food correctly stored in either the refrigerator or cabinets), menu development (percentage of menu items that adhered to recommended dietary allowances from the US Department of Agriculture), and meal preparation (visibly posted menu and adherence to that day's planned menu, appropriate portion sizes, and staff-consumer interactions such as hand washing and consumer involvement in meal preparation and table setting) (Kneringer & Page, 1999). This study also assessed biological indices (body weight, blood pressure, cholesterol level, and triceps fat fold) of five consumers during the baseline and maintenance phases.

Following the baseline measures/observations, staff received three one-hour sessions of didactic instruction with written handouts and checklists focusing on proper storage of food, menu development, and meal preparation. The results of this study reported that staff behaviors improved after their training and remained appropriate during the maintenance portion of the study. Correct storage for refrigerated items increase from a baseline mean of 54% to 89% after training

and from 82% to 96% for cabinet items. Healthy menu development increased from 28% to 81% after training. Correct meal preparation increased from 38% to 97% for menu posting, 59% to 98% for menu adherence, 29% to 90% for portion sizes, 37% to 92% for meal preparation, and 34% to 97% for staff-consumer interactions. Positive changes were recorded for the biological indices measured in this study. Body weight was reduced for three of the four individuals who were overweight initially, three individuals showed decreased triceps fat fold measures, three hypertensive individuals showed decreased blood pressures, and one individual with high cholesterol levels initially showed decreases after the intervention. This study suggests that interventions focused on nutritional training for staff of group homes can lead to positive changes in the individuals residing in those homes.

Saunders et al. (2011) took a different approach to implementation of a nutrition intervention. The researchers enrolled 79 overweight adults with intellectual or developmental disabilities who received state funding for home and community based services to participate in a weight loss intervention. The intervention focused on consumption of high volume, low calorie foods and beverages (such as fruits, vegetables, and water-based soups) that provide the sensation of fullness, in addition to meal-replacement shakes (Saunders et al., 2011). The study period included a 6-month diet phase and a 6-month follow up phase. The study included an initial meeting with each participant to explain the diet in detail and collect baseline data of height, weight, waist circumference, a 24

hour dietary recall, current medications, recent history of attempts to lose weight, living arrangements, and other demographic variables. This study included a very specific diet in the intervention. There were then monthly meetings with participants to discuss any problems they were having with sticking to the diet, and to measure the variables being studied.

During the initial meeting examples of food items were reviewed with the participant to determine their individual likes and dislikes. From this list, the most preferred items were organized into a visual aid called a “Stoplight Guide”. This guide included items of 60 calories or less labeled as green, items between 60 and 100 calories labeled as yellow, and items 100+ calories labeled as red. The researchers explained that participants should eat as many green items as they wanted, use moderation with yellow items, and avoid red items. The authors stated that the specific recommended diet had been tested extensively and proven effective for adults without disabilities. They suggested that this diet could work well for the target population because it included inexpensive and easy to prepare items (such as the meal replacement shakes and frozen entrees), while also controlling for portion size. The participants were instructed that the diet consisted of at least 5 servings of fruits and vegetables, up to 3 meal replacement shakes, 2 packaged entrees of less than 300 calories each, and other low calorie items.

In addition to the monthly data collection measures, participants were encouraged to weigh themselves daily, around the same time each day if possible, and circle the number for that weight on a weight chart created for them. They

were also asked to keep record of the foods they consumed on a pictorial document created for them, by marking next to each food, every time they consumed them throughout the day (fruits, vegetables, shakes, entrees, a red stop light for 100+ calorie items, a green stop light for 60 or less calorie items, and a tennis shoe to represent exercise). Participants received 5 cents in cash for each icon marked on the tracking form at their monthly meetings, and an additional 5 cents per icon marked was deposited in a savings account that would be paid at the end of the diet phase or upon withdrawal from the study.

Of the 73 participants who completed the diet phase, there was an average weight loss of 13.12 pounds (6.3% of the baseline measure), or 2.7 BMI points. On average, there was a change from about 1660 kcal/d at baseline to 1375 kcal/d at 6 months. Forty-three of the 73 participants who completed the diet phase continued through the entire 6-month follow-up phase. Of these, 29 out of 43 continued to lose weight, and 14 regained some weight. Four of the 14 individuals who regained weight gained as much or more than they had lost. This study suggests that individuals with intellectual or developmental disabilities care about their health, and are able to follow a simple/easy to use and understand diet in order to lose weight. The weight loss results in this intervention were found to be clinically significant in a majority (about 85%) of the participants, and this weight loss was continued in many individuals after the intervention phase of the study. These findings are fairly novel results in this field, and therefore the research

performed should be replicated for improvements and support of the original findings.

### **Results of MENU-AIDDS Research**

A number of studies focused on improving the nutrition environment for individuals with ID/DD. The researchers Humphries, Traci, and Seekins (2008) saw the need for a program aimed at providing nutrition education to individuals in group homes, and therefore attempted to create an effective intervention to increase dietary adequacy in the population. Their research reflects a program they created titled MENU-AIDDS (Materials supporting Education and Nutrition of Adults with Intellectual and Developmental Disabilities) based on the results of their needs assessments. The program is based on the USDA's Dietary Guidelines for Americans (1995) and the Food Guide Pyramid (1996), and emphasizes an adequate diet and healthier food choices including whole grains, low-fat dairy, fruits and vegetables, soy and fish proteins, less high-fat/processed meats, and beneficial oils such as olive oil (Humphries, Traci, & Seekins, 2008).

MENU-AIDDS has five main components to the program; basic, flexible menu; food group options chart; shopping organizer; recipe book; and coordinating poster. The basic menu listed three meals and snack options for each day of the week. The meals and snacks provided about 1,800 kcal/d with additional calories added depending on the individual's snack needs. The menu was flexible in that it would specify the amount and type of food (for example 3 oz. of beef), but allowed the staff and consumers to decide how to prepare and serve the meal. The food

group options chart allowed for substitutions to the menu, by providing a chart/guide with equivalents of one serving of each of the five food groups in the Food Guide Pyramid. The shopping organizer provided a list of common items from each of the basic food groups arranged based on their location in the grocery store. The recipe book contained 35 examples of inexpensive, healthful recipes that were reflected in the menus provided. The coordinating poster was intended to be displayed in the kitchen/food prep area of the home, to display the menu of the day along with general information about nutrition standards, the Food Guide Pyramid, and instructions about the MENU-AIDDS program.

The first pilot test of this program took place in Montana and included a total of four group homes from two community residence providers, each home had eight people resulting in a total of 32 individuals participating in the study. A health specialist from each agency was taught in detail at a 6-hour training how to use the MENU-AIDDS program. Those specialists then taught their respective group home managers and direct care staff. The study used a multiple baseline approach, collecting baseline data at time one when Cohort A began using the MENU-AIDDS program. After 8 weeks, the data were assessed again and Cohort B began using the program. After an additional 8 weeks the assessments were taken again for all four homes. The assessments included interviews with group home managers and senior staff, with topics covering the degree to which they used each of the MENU-AIDDS components, changes that have occurred in the home's food system routines and procedures, the reactions of the consumers and

staff to implementation of the program, foods planned and available to eat in the home, and the group home's food expenditure.

Three of the four group homes scored a 2.4/3 for usage of the program on a scale of 1-3 with 1 being they "did not use components" and 3 being "used components consistently". The fourth group home scored a 1.6, showing less usage of the program. Group homes found the menu planning system (the basic menus, food group chart, and recipe book) the most useful, with average scores of 2.0, 2.7, 3.0, and 3.0 for these three components. The shopping organizer and poster were less frequently used. The staff of three of the group homes reported becoming increasingly aware of portion sizes. The data showed healthful changes in meals served, and reported consumption of all food groups changed in the desired direction. Overall, the food expenditure did not change during the intervention period.

A follow-up paper was published using the same study and data. However, this time the researchers coded the menus by food group to create averages per week for each group home and then comparing pre and post averages. They coded each food listed into one of five food groups (grains, vegetables, fruits, dairy, meat, and beans) and then further into eight subgroups (whole grains; green, yellow, or orange vegetables; potatoes; low-fat protein; high-fat protein; processed meats; beans and peas; junk food) (Humphries, Pepper, Traci, Olson, & Seekins, 2009). The researchers found statistically significant increases in improvements in the number of times whole grains, vegetables (specifically

green/yellow/orange vegetables), and low-fat proteins appeared on menus. The number of times “junk food”, high-fat proteins, and potatoes were on the menus showed a significant decrease. Additionally, the number of times portion sizes were included on the menus increased significantly. All other changes that occurred in each of the food groups occurred in the desired direction, however not significantly. Although these studies used a small sample size, the results indicate that a program such as MENU-AIDDS can improve group home staff members’ ability to plan, prepare, and serve healthy meals.

Based on a review of the literature, the researcher found that further investigation about the quality of the nutrition environment of group homes for individuals with ID/DD is necessary. The purpose of this study is to perform a needs assessment to determine the need for an intervention that educates the staff of group homes about providing proper nutrition to the individuals they support. Based off of the results of the needs assessment performed in this study, future studies can be performed to determine the success of nutrition/obesity reduction interventions created and implemented with this target population.

## **Methods**

### **Participants**

The UCONN Center for Excellence in Developmental Disabilities had an established partnership with a non-profit group home agency located in the Northeast. This agency serves over 400 individuals with disabilities and employs more than 250 people to provide support to these individuals. In this study, three

community-based supported living residences/group homes participated. The agency was responsible for the recruitment process of choosing which group homes to include in the study. The group homes recruited for this study were located in residential neighborhoods, with three people residing in Group Home A, three people residing in Group Home B, and six people residing in Group Home C. All individuals served at the agency have a diagnosis of Intellectual and/or Developmental Disability. Direct care staff provides support 24 hours a day at these residences. Direct care support staff at this agency are responsible for menu planning, grocery shopping, meal preparation and clean up, and food storage/safety practices. Each of the three group homes had varying amounts of resident input/help with menu planning, shopping, and meal preparation.

## **Design**

Based on the literature review and conversations with employees at the agency, it was clear that there is a need for a nutritional intervention for this target population. After the partnership between the agency and the research institution was made, the two worked together to come up with the best and most realistic methodological process for this project to use. First, the agency randomly chose the three group homes that would be involved in the intervention. The original plan was to use a multiple baseline study design for the three group homes, with a total study period of 4 months. The first month would be used to collect baseline data. Then, at the beginning of each following month one group home would receive the intervention. All group homes would be followed throughout the entire study

period. The data that would be studied throughout this time would include the menus that each home was required to submit per week, as well as receipts for groceries purchased for the homes. The receipts would be used to show the accuracy of the menus that were submitted, because if the food was not purchased it could not be provided to the consumers.

A preliminary survey was distributed to the three group homes to assess the time they had to prepare each meal, the typical types of meals most often prepared in the home, and any foods that would not be eaten by the consumers either for dietary restriction purposes or because they would refuse. The results of these surveys were returned to the researchers along with the baseline data of menus for the first month. After analysis of the data it was determined that the menus were often not completed with the level of detail necessary extrapolate nutritional information from them in order to have accurate data for analysis to show a change post-intervention.

Therefore, the researcher decided that a needs assessment was necessary to first tailor a future intervention to the context of these group homes. The needs assessment would be an analysis of the foods present in the group home kitchens, the results of a brief nutrition/food safety quiz taken by staff at the group home, and a literature review. Once the needs assessment was complete, the researchers would propose an intervention tailored to the specific needs found and would present it to the group home for approval and implementation.

In this study, an observational approach will be used. The researcher began with an in-home assessment of the foods present in the group homes within the agency included in the study. A total of three group homes were assessed during the study period. No human materials were involved in the study, and the University of Connecticut Health Center IRB determined that the research is not human subjects research. The data collected is labeled so that each group home is indicated with an alphabetical label (Group Home A-C). The research staff does not have any knowledge of any specific information about the staff or residents at the group homes, and the data is not traceable to any individuals. Data included in this study are the observations made at the group home of the variables being assessed, as well as the results of the brief quiz that is given to the staff present at the home during the assessment. The variables that will be assessed are the food content within the homes, the equipment present in the homes, the way foods are stored within the home, the menus present within the group home, and the knowledge of the staff on 10 multiple choice nutrition and food safety related questions.

### **Procedure**

The researcher initially created a preliminary survey to be distributed to the staff of the three group homes. The survey helped give the researchers a general consensus of what the staff frequently cooks, how they cook (oven, stove, slow cooker, etc.), and what they will not cook. This information collected from the survey helped to tailor the proposed intervention to be more effective for the target

population, and to help create menus consisting of meals that are realistic for this population to prepare. The survey results showed that on average the group home staff have about 15-30 minutes to prepare breakfast, about 15-30 minutes to prepare lunch, and about 90 minutes to prepare dinner. Most of the reports stated that staff felt residents would eat almost anything, with a few exceptions including an individual who is vegetarian and an individual who will not eat any seafood except canned tuna. The methods/equipment most often used to prepare meals was reported as the oven, Crockpot, and stove. Table 1 shows the results of this survey in more detail, and Appendix A contains a copy of the survey.

Table 1: Group Home Preliminary Survey Results

	<b>Group Home A</b>	<b>Group Home B</b>	<b>Group Home C</b>
Time to prepare Breakfast	30 minutes	15 minutes	30 minutes
Time to prepare Lunch	15 minutes	30 minutes	15 minutes
Time to prepare Dinner	60 minutes	90 minutes	120 minutes
Most frequent recipes for Breakfast	Oatmeal, dry cereal, eggs, frozen waffles	Cold cereal, oatmeal, pancakes/waffles, eggs, sausage, toast	Oatmeal, eggs, pancakes, cereal, toast/bagel
Most frequent recipes for Lunch	Leftovers, sandwiches, salad	Leftovers, sandwiches, frozen entrees	Leftovers
Most frequent recipes for Dinner	Stir fry, chef's salad, fish fillets, pasta, chicken pot pie	Chicken, meatloaf, pasta, burgers, hot dogs, pizza, fish	Pasta w/ meat sauce, baked chicken, meatloaf, roasted chicken
Most frequent methods of cooking	Sautéing/stove, Broiling/oven	Stove, Crock pot, oven	Stove, oven, Crock pot

Next, the researchers entered the three group homes to perform a needs assessment. The goal of the needs assessment was to determine the availability of nutritious food, the equipment available, and the methods of food safety practiced in the home. The researchers observed the food present in the home, equipment available for the staff to use for cooking, menus/recipes used for meal preparation, and ways that food was stored in the home. To determine a measure of the quality of the food present in the home, the researcher created a score based on what was present in the home on the day of observation. Foods that positively affected the score were the amount of fresh fruits and vegetables, lean meats, whole grains, and healthy fats. Foods that negatively affected the score were the amount of high sodium foods, high fat content foods, sugar-sweetened beverages, and highly processed foods.

Lean meats were defined as any cut of meat with less than 10 grams of fat per 3-ounce serving (U.S. Department of Agriculture). Based on the Harvard Food Plate, whole grains were defined as foods with a whole grain (whole wheat flour, whole grain oats, brown rice, bulgur, etc.) listed as the first ingredient. Examples of healthy fats/oils included avocado, olive oils, nuts, seeds, and fish. High sodium foods were defined as those that had greater than 140mg of sodium per serving. The United States Food and Drug Administration defines processed foods as "any food other than a raw agricultural commodity and includes any raw agricultural commodity that has been subject to processing, such as canning, cooking, freezing, dehydration, or milling" (CDC, 2012). However, using this definition would

include almost every food available in the grocery store. The CDC further distinguishes processed foods as those that involve the use of added ingredients, including sodium-containing additives and sugars, which could make the product less healthy (CDC, 2012). Examples of items that were included in this section are sugary breakfast cereals, packaged baked goods, frozen meals, and canned meals. Sugar sweetened beverages are those that have sugar added, and included items such as sodas, energy drinks, sports drinks, and fruit juices with sugar added.

A worker from the agency who has a background in culinary arts assisted the researcher in analyzing the cooking equipment in the home. The score for the equipment available in the home was based on the overall amount of different types equipment present (such as a crock pot, blender, food processor, oven, skillets, etc.), the quality of the equipment, and the overuse of equipment present (for example a very grooved/overused cutting board, dull/sharpness of knives, etc.). The same worker had a background in environmental local health departments and helped the researcher to score the home based on the food safety practices seen. The food safety score was based on food storage (properly storing food in the refrigerator versus freezer versus pantry), the methods used to de-thaw food, the cleanliness of the environment used for cooking/food preparation, ways to avoid cross-contamination, proper methods for using appliances, and proper usage of thermometers to ensure food is thoroughly cooked.

Based on what was present in the home at the time of assessment, each home was given a score on a scale out of 10 for each of the three areas assessed, for a total of three separate scores. Homes that had over 70% of their overall food available that are unhealthy foods/missing and poor quality equipment/more bad food safety practices than good, received a score low on the scale between a 2-4 for that area. Homes that had an equal amount of healthy versus unhealthy foods/an equal amount of available and unavailable equipment/an equal amount of good and bad food safety skills, received a score of about 5 for that area. Homes that had over 70% of the food in the home that are healthy foods/well maintained and available equipment/great food safety skills, received a score between 6-8. If a home had extreme findings, either outstanding or extremely poor, in any of the three areas assessed they scored between 8-10 and 0-2 respectively for that specific area being considered.

## **Results**

**Group home A.** Group Home A serves three individuals. In this group home, the staff reported that they do their grocery shopping primarily at the grocery store (Shoprite or Stop and Shop), and get supplemental groceries from Foodshare, a regional food bank that receives food from wholesalers and private individuals and distributes that food for free to soup kitchens and food pantries across the greater Hartford, CT region (Foodshare, 2015). The refrigerator at the home contained many positive food sources, including iceberg lettuce, red bell peppers, zucchini, yellow squash, carrots, celery, tomatoes, mushrooms, onions,

grapes, strawberries, sweet potatoes, and potatoes. There was also milk, eggs, and yogurts in the refrigerator. On the counter there were bananas and apples. The freezer was mostly stocked with lean meats (chicken and pork) and frozen vegetables. However there were some negative findings as well, including ice cream and frozen waffles. Inside one cabinet there was a good variety of herbs and spices as well as olive, grape-seed, and vegetable oils. The pantries contained whole grain breads and whole-wheat pastas. However, there were also high sodium items (including canned soups, canned vegetables, canned chili) and high sugar items (including sugary cereals, juices, and soda). Overall, 70% of the canned items contained in the pantries were high in sodium, and 80% of drinks had added sugar. The researchers also found an abundance of high-fat dressings and condiments that are not recommended. Overall, the home had a good variety of food available to provide healthful meals and there was more food that was healthy than unhealthy (about 70% healthy) in the house. Therefore, Group Home A received a nutritional score of a 7/10.

Group Home A's food safety assessment was rated as a 7/10, as they stored their food in the proper locations and kept a clean kitchen environment. However, there were some minor safety concerns such as the methods used to de-thaw meat as observed by the researchers, the safety/quality of some of the equipment, no distinguished methods for using different cutting boards for meats versus vegetables, and no meat thermometer available to ensure food is properly cooked. The lowest score that this home received was its equipment score, which

was a 5/10. They did have many of the items being assessed for in their home, such as a grill, Crock-pot, stove, oven, pots and pans, blender, mixer, and bowls. However, many of their cooking tools were overused and unsafe such as having dull knives with loose handles, pans where the non-stick surface was destroyed and the handles were loose, and cutting boards that were overly grooved and stained.

**Group home B.** Group Home B serves three individuals. In this group home, staff reported that they most often get their food from Food Share, and supplement that food with additional groceries from the local grocery store. The assessment at this group home revealed less positive results than Group Home A. The refrigerator was almost empty, holding some condiments/dressing in the door, butter, some carrots on the shelf, a little bit of lettuce, a small container of milk, and a small container of orange juice. In the freezer there were some healthy items such as fish, tofu, ground chicken, chicken, pork chops, pork loin, turkey burgers, vegetarian hot dogs, low calorie frozen meals, and frozen vegetables. However, there was also an abundance of unhealthy items such as frozen waffles, bacon, piecrusts, ravioli, bologna, beef burgers, and breaded/processed chicken patties. In the pantry there were many unhealthy items such as canned vegetables, canned soups, pasta, numerous different high sodium marinades/sauces for dinners, high-fat dressings, instant mashed potatoes, white rice, high-sugar fruit cups, white hot dog buns, high-sodium quick dinner mixes (such as a jambalaya mix and numerous boxes of macaroni and cheese), and

mayonnaise. 80% of the items in the pantry fell under the category of either high sodium or high fat, processed foods. Positive items found in the pantry include oatmeal, a loaf of whole grain bread, a multigrain bread mix, wheat crackers, and olive oil. One notable finding in this home is that there were no drinks with added sugar in the home, as the residents most often drink water or a glass of milk. Overall the score for this home's nutritional quality was rated as a 3/10 for having over 70% of there food fall in the unhealthy category due to the lack of fresh fruits and vegetables and the abundance of high-fat/sodium/sugary foods.

The food safety score at Group Home B was a 5/10 due to the lack of organization of where some foods should be stored, no distinguished methods of different cutting boards for meats and vegetables, no meat thermometer available, and an the overall cleanliness of the kitchen environment was not conducive to avoiding contamination of food. The assessment of equipment available in Group Home B resulted in negative findings. The knives were dull, the cutting boards were extremely grooved and stained, the pans available were scratched and overly used, and there was no sauté pan or stockpot present. However, they did have a working grill, a Crockpot, a griddle, and a functioning stove/oven. Overall, the score for this home's equipment was about a 3/10.

**Group home C.** Group home C serves six individuals. The food at this home is primarily received from Food share, with very little purchased at the grocery store. There were very little fresh fruits and vegetables present in this home. However, the refrigerator revealed low-fat milk, almond milk, eggs, carrots,

hummus, and Greek yogurt. Aside from the milk, 90% of the drinks in the refrigerator were sugar-sweetened beverages including Hawaiian Punch, Gatorade, and iced teas. The freezer was stocked with some healthy and some unhealthy food including items such as, frozen vegetables; hash browns; hot dogs; bologna; turkey; ground chicken; prepared meatballs; and kielbasa. The pantry had some good items such as vegetable-enriched and whole-wheat pastas, coconut water, some healthy cereals, olive oil, herbs and spices, and applesauce. However about 70% of the items in the pantry were unhealthy items such as pancake mix, high-sodium soups, canned vegetables, sugary cereals, and snacks. Overall the nutrition score for this home was a 5/10 as they had an equal amount of healthy and unhealthy food.

Food safety methods seen at this home were better than the other homes. Food storage and safety practices were seen as recommended, the environment was kept clean, they had a meat thermometer to ensure proper cooking, and properly used the equipment/appliances as seen by the researcher. However, there was no distinguished method of using different cutting boards for raw meats versus vegetables was seen and there were some items that were not properly stored. Therefore, the food safety score of this home was an 8/10. Group Home C had the most available and least over-used equipment out of the three homes. This home had a double oven, a separate stove, a food processor, a Crock-pot, toaster, and a very good quality set of pots and pans. However, there was a need

seen for more knives and new cutting boards, as their current supply is slightly overused. The equipment score for Group Home C was a 7/10.

## **Conclusions**

As shown in the results, Group Home A scored a 7/10 for their nutrition assessment, a 7/10 for their food safety assessment, and a 5/10 for their equipment assessment. This shows that Group Home A needs to improve the equipment they have available in the home, as well as small improvements in nutrition and food safety. Group Home B scored a 3/10 for their nutrition assessment, a 5/10 for their food safety assessment, and a 3/10 for their equipment assessment. Group Home B needs improvements in all of the areas that were assessed. Most of all, they need to see improvements in the amount of healthy versus unhealthy foods available in the home, and the quality and availability of reliable equipment to safely prepare nutritious meals. Group Home C scored a 5/10 for their nutrition assessment, an 8/10 for their food safety assessment, and a 7/10 for their equipment assessment. This shows that Group Home C needs to make improvements to the amount of nutritious food available in their home, while decreasing the amount of unhealthy food (such as the sugar-sweetened beverages).

The researchers computed an overall score for each home based on the three-area assessment. The overall score was calculated by taking the average of the three scores given to each home. The overall score for each home is 6.3/10, 3.7/10, and 6.7/10 respectively. When comparing the overall scores, group homes

A and C performed better than group home B. However, the scores for each component assessed varied by home, with all homes having at least one area that needed some major improvements. Table 3 in Appendix B shows a table of the scores/data for the three areas assessed for each group home.

In addition to the food environment assessment, one staff member from each group home took a 10-question multiple-choice assessment that covered basic nutrition and food safety information. Each group home scored an 8/10 on the assessment, with slight differences in which questions they got incorrect. Table 2 shows the overall results of the quiz. Questions that were answered correctly are marked in the table with a check (√) and questions that were answered incorrectly are marked with an X. The results of the quiz show that the staff of group homes need training on nutrition related information (such as foods that contain fats that should only be eaten in small amounts, foods that are a sources of protein that need to be limited, and the number of servings of dairy that should be consumed in one day), in addition to food safety information (such as what internal temperature chicken needs to reach before being served).

Table 2. Results of the Multiple-Choice Nutrition and Food Safety Quiz.

	Group Home A	Group Home B	Group Home C
What is an example of a food that contains fats that you should eat in small amounts?	X	X	X
What is an example of a food that contains fat that is healthy?	√	√	√
Which of the following is a healthy source of protein?	√	√	√
Which of the following is a source	√	√	X

of protein that you should limit?			
How many servings of dairy should you consume per day?	√	X	√
How much of your plate should be whole grains?	√	√	√
If you need to cut vegetables and raw meat, in what order should you chop the food on your cutting board?	√	√	√
Which is the best way to de-thaw frozen meats?	√	√	√
When should you wash your hands while cooking?	√	√	√
What temperature should chicken reach before serving?	X	√	√

The assessment shows that there is a need for training and improvements in the group home/assisted community living environment for individuals with disabilities. There are numerous barriers that have been found that contribute to individuals being served less than recommended quality of meals. These barriers include time, poor working equipment, lack of skills necessary, lack of knowledge about basic nutrition, lack of knowledge about food safety, and lack of motivation to provide healthy foods or healthier versions of what they typically cook. Another barrier that was identified in this assessment that is notable is the lack of funding sources for these homes. Many of the homes need to get most of their groceries from Food Share for financial reasons, which means they are not able to pick and choose what food they have available in their pantry.

### **Theoretical Background**

The researcher suggests an intervention that on an individual level is based off of the Information Motivation Behavior Skills Model (IMB Model) created by

William and Jeffery Fisher (Fisher & Fisher, 1992). This model says that once individuals receive the necessary information (the knowledge important to performing health behavior) combined with motivation (a positive attitude, subjective norms, and the intention to make the change) they will gain the behavioral skills (self-efficacy and the ability to perform the behavior) to go through with changing behaviors to improve health (Fisher & Fisher, 1992). In this intervention we will give participants the knowledge needed on proper nutrition/diets as well as how to safely prepare and store food. This information will be combined with motivation from other staff members and executives of the company, who will work to promote the practice of improved health behavior skills when preparing meals in the group homes. The framework for this theory as applied to this research is shown in Figure 1 in Appendix B.

This intervention will also consider the Social Ecological Model framework, as there are often environmental and social barriers that prevent individuals from performing this behavior change, especially when considering a population of individuals with disabilities. This theoretical framework focuses on the larger societal/environmental barriers (such as funding, social supports, and access) to create breakthroughs that will trickle down to the individual level. With these larger improvements, individuals will become more likely to make the necessary behavior change. Policy changes such as increasing food stamp benefits for the intellectually disabled would be difficult to achieve within this program. However, the researchers intend to motivate the organizations/agencies involved to create

policy and funding changes to increase the health of their clients. Although this is difficult to achieve in non-profit organizations, any small changes will help to increase access and availability to nutritious foods.

### **Future Intervention**

The researcher along with the agency have worked to create a suggested training program to be provided to the staff of group homes. The training program is based on previously existing curriculums such as “Cooking Matters”, and cooking/food safety lesson programs previously created for local health department programs. The suggested program will teach the staff how to provide proper nutrition to the individuals they serve, by giving the staff information about what foods make up a healthy diet and giving them sample recipes of healthy meals. The program focuses on increasing fruit and vegetable intake, decreasing sugar and fat intake, changing to whole grains, limiting processed foods, and monitoring sodium intake. The Harvard Food Plate model is used as a visual representation of the portion sizes of each food type that should be provided in each meal. It is suggested that the group home manager and the staff that are most frequently scheduled during meal preparation times should be required to participate in the training. Then, those staff will be required to use their training information to train the additional staff from the home that did not get the training, so that everyone has the information provided to them.

Time was identified as a barrier of complete nutrition and a major concern for staff in group homes, as they often have a lot of tasks to get accomplished

(such as showering, administering medications, etc.) in a short period of time. Therefore, the staff usually only have a small segment of time for meal preparation (about 30-60 minutes). In consideration of timing, the training session will also provide the staff with sample menus and recipes of meals that are healthy and easy to prepare. This will help to cut down on time, while still allowing for preparation of nutritious food. Another barrier to the changing of the types of foods prepared is that some individuals may require their food to be pureed. Staff may only have a few recipes that can be easily pureed for those individuals. The researchers will take this into consideration when designing the menus and sample recipes for dietary restrictions such as this.

It is suggested that as many staff persons from each group home attend the training as possible. Those who are responsible for grocery shopping and meal preparation (especially at dinner time) are the main target group of this intervention. Managers and executives are also suggested to attend the training in order to show the support and encouragement from the top of the agency to help motivate down to the front line workers. With the entire preparatory work already done prior to the start of the training, the researchers anticipate the training lasting about 4 hours.

The training will be divided equally between a nutrition education session and a culinary/food safety session. The nutrition education will focus on general nutrition information, as well as specific tips and tools tailored to the target population, with the financial barriers present in mind. This segment of the

intervention will also walk the staff through how to properly read nutritional information labels on food, proper portion control, and healthy substitutes for snacks/treats. The culinary segment will walk the staff through the meal preparation of five (one work-week's worth) healthy recipes, similar to those that were mentioned by staff and shown on the menus as popular meals in the homes. Examples of these meals are a healthy version of stir-fry, turkey meatloaf, a chicken dish, turkey chili, and a tex-mex type of meal. All recipes were found on reliable sources, such as the Harvard School of Public Health website, and all recipes included detailed nutritional information per serving.

In order to determine the efficacy of the intervention created, the researcher suggests using a multiple baseline approach that would show that any changes seen were due to the intervention rather than a chance event. The study should continue over the course of one year, including a baseline and a follow-up period. The study should also include an equal amount of group homes that do not receive the intervention. Randomization should occur to determine what group homes belong to the treatment versus the control group. If feasible, it may also be important to include more than one group home agency to improve generalizability of the results.

### **Limitations**

This pilot study is limited by the sampling method, in that purposive sampling is used, and includes a very small sample size. This could lead to limited generalizability of the sample to other group homes in the agency, to other group

home agencies/staff, and to the entire population of individuals with disabilities. An additional limitation to this study is that the data observed was purely observational. Future research that includes human subjects and data variables based on weight and nutritional status of the individuals involved would make this research more complete.

Some limitations to the proposed intervention include the possibility that the staff trained by the researchers may not reiterate the nutrition and food safety information to the rest of the staff in the same manner as they were trained. Additionally, the staff may know that they are being studied and be aware of the intentions of the study, and therefore may report menus as healthier due to the knowledge that they are being studied, and not due to the intervention. Because the researchers will not be present on a daily basis to oversee the meals actually being provided in the group homes, the data provided would have to be assumed to be an accurate representation of what is given to the individuals. However, previous research has reported a high degree of correspondence between menus planned and the meals actually served in group homes (Humphries, Traci, & Seekins, 2008).

## **Discussion**

The review of the literature and the needs assessment performed in this study show that there is a great need for public health interventions aimed at providing proper nutrition to individuals with disabilities residing in group homes. The researcher suggests that the proposed intervention be performed to

determine its benefit. This intervention is extremely feasible as it is inexpensive and easy to complete, and has minimal risk to both the staff and individuals involved. As previously stated, obesity in the population can cause numerous adverse outcomes and co-morbid conditions. This intervention has the potential to help individuals with disabilities, who cannot always control the food they are being provided, to have more nutritious meals prepared for them. This intervention combined with an exercise program could lead to changes in obesity status for many in this population, which would decrease mortality and morbidity. Additionally, the intervention will positively affect the staff being trained on nutrition in their own personal lives. With the increased knowledge about healthy eating these individuals may make change to their and their family's dietary intake.

This study will help to expand the evidence-based knowledge of health promotion interventions and programs that can help to lead to a reduction in the prevalence of obesity in the population of individuals with intellectual and developmental disabilities. If this intervention is successful, further research may be welcomed to create additional interventions for this specific population that include increases in physical activity and monitoring decreases in abdominal fat/obesity status changes. If the results of this study are positive, significant, and can be replicated to show that the intervention achieves the research goals, it will help to expand public health practice in this field. Policies may be created based on this information, such as making it mandatory for group home agencies to provide their staff with health and nutrition training.

## Appendix A

### Group home nutrition/meal preparation survey

1) Generally, how much time (in minutes) do you have to prepare the following meals?

a. Breakfast \_\_\_\_\_

b. Lunch \_\_\_\_\_

c. Dinner \_\_\_\_\_

2) Please list any specific foods that you feel your residents will not eat.

\_\_\_\_\_

3) Please list the top 5-7 recipes/meals that are most often made at your group home for breakfast.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

4) Please list the top 5-7 recipes/meals that are most often made at your group home for lunch.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

3) Please list the top 5-7 recipes/meals that are most often made at your group home for dinner.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

7) What is the method/appliance you use most often for meal preparation? (e.g. slow cooking/crock pot, sautéing/stove, broiling/oven, etc.)?

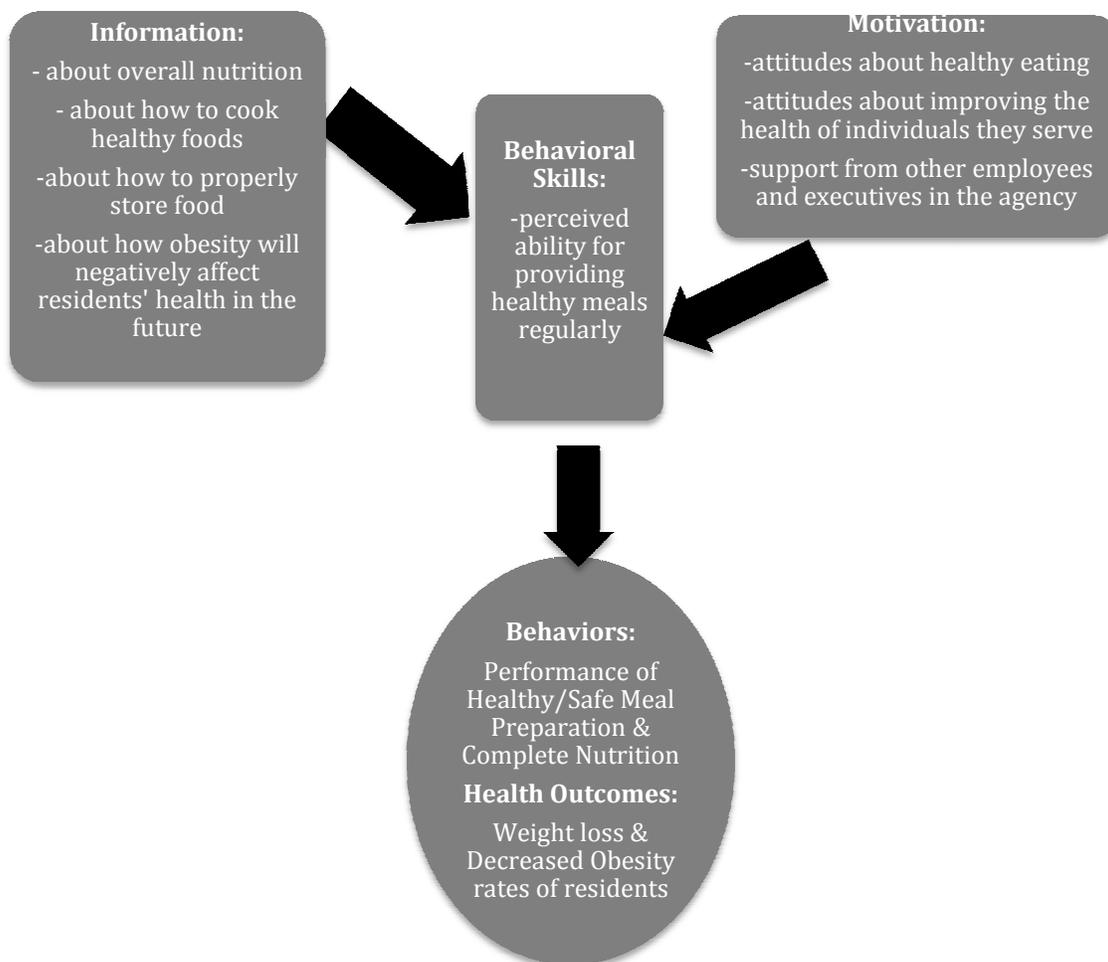
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## Appendix B

Table 3. Raw Data Calculated from the Needs Assessment

	Group Home A	Group Home B	Group Home C
<b>Nutrition Score</b>	7/10	3/10	5/10
<b>Food Safety Score</b>	7/10	5/10	8/10
<b>Equipment Score</b>	5/10	3/10	7/10
<b>Average</b>	6.3/10	3.7/10	6.7/10

Figure 1. IMB Constructs (Fisher & Fisher, 1992)



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