The Effectiveness of an Adapted SNAP-Ed Supplemental Nutrition Assistance Program-Education Curriculum for Adults with Intellectual or Developmental Disabilities

Amanda Panting
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The Effectiveness of an Adapted SNAP-Ed (Supplemental Nutrition Assistance Program-Education) Curriculum for Adults with Intellectual or Developmental Disabilities

Amanda Panting
Utah State University
THE EFFECTIVENESS OF AN ADAPTED SNAP-ED (SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM-EDUCATION) CURRICULUM FOR ADULTS WITH INTELLECTUAL OR DEVELOPMENTAL DISABILITIES

by

Amanda Panting

A thesis submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

in

Nutrition, Dietetics and Food Sciences

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UTAH STATE UNIVERSITY
Logan, Utah

2012
ABSTRACT

The Effectiveness of an Adapted SNAP-Ed (Supplemental Nutrition Assistance Program-Education) Curriculum for Adults with Intellectual or Developmental Disabilities

by

Amanda Panting, Master of Science
Utah State University, 2012

Rates of overweight and obese adults with intellectual or developmental disabilities in the United States are high and associated with increased risk of chronic diseases. Many of these adults are trying to become more independent in the community and live in group homes where care is managed by a paid employee. Group home managers assist clients with daily living such as shopping and meal preparation and play an important role in their care. Nutrition and healthy behavior choices are important to help keep this population independent and decrease risks of excess weight and related diseases. Many group home managers and clients have limited nutrition knowledge. Few nutrition education programs are available to either group home managers or their clients.

This study adapted a Supplemental Nutrition Assistance Program-Education (SNAP-Ed) curriculum to teach adults with intellectual or developmental disabilities living in group homes. SNAP-Ed is a government food assistance program targeted at
providing basic nutrition education to low-income persons. The study’s objectives were to develop, implement, and evaluate the effectiveness of the adapted SNAP-Ed curriculum by measuring nutrition knowledge among group home managers and clients and managers’ intent for behavior change. Extension paraprofessionals taught the original SNAP-Ed lessons to group home managers and trained them on the adapted curriculum (n=33). The trained managers then taught the adapted SNAP-Ed lessons to their clients (n=83).

Results from the study showed both group home managers and adults with intellectual or developmental disabilities improved nutrition knowledge from pre to post tests. Group home managers reported intent to change behavior for 12 of 18 behaviors examined. The curriculum was seen to be adaptable to fit various needs of group homes in different teaching settings, learning levels, and interests for participants.

Overall, the adapted SNAP-Ed curriculum for managers and clients living in group homes appears to increase knowledge of nutrition and may improve food behavior. Increased nutritional knowledge among group home managers and adults with intellectual or developmental disabilities may help decrease risk of nutritional related diseases.
Rates of nutrition related chronic diseases related to overweight and obese adults with intellectual or developmental disabilities in the United States are high. Many of these adults are trying to become more independent and live in group homes in the community where care is managed by a paid employee. Group home managers assist clients with daily living such as shopping and meal preparation. These managers play an important role in their care. Nutrition and healthy behavior choices are important to help keep this population independent and decrease risks of chronic diseases related to excess weight. Many group home managers and clients have limited nutrition knowledge. Few nutrition education programs are available to either group home managers or their clients.

This study assessed an adapted Supplemental Nutrition Assistance Program-Education (SNAP-Ed) curriculum taught to adults with intellectual or developmental disabilities living in group homes. SNAP-Ed is a government food assistance program targeted at providing basic nutrition education to low-income persons. The study’s objectives were to develop, implement, and evaluate the effectiveness of the adapted SNAP-Ed curriculum by measuring nutrition knowledge among group home managers and clients as well as looking at managers’ intent for improved behavior change. Extension paraprofessionals taught the traditional SNAP-Ed lessons to group home managers and trained them on the adapted curriculum (n=33). The trained managers then taught the adapted SNAP-Ed lessons to the clients (n=83) with intellectual or developmental disabilities living in the group home.
Results from the study showed both group home managers and adults with intellectual or developmental disabilities improved nutrition knowledge from pre to post tests. Group home managers reported intent to change behavior for 12 of 18 behaviors examined. The curriculum was seen to be adaptable to fit various needs of group homes in different teaching settings, learning levels, and interests for participants.

The adapted SNAP-Ed curriculum for group home managers and clients with IDD appears to increase knowledge of nutrition and may improve healthy food behaviors. This increased knowledge may help with delay or prevention of nutritional related diseases as assessed by perceived improvement in nutrition knowledge and intent for improved health behavior choices.
ACKNOWLEDGMENTS

I would like to thank Nedra K. Christensen PhD, RD and Heidi Wengreen PhD, RD for acting as my major professors. Your countless hours of assistance made the project possible. Thank you to Heidi LeBlanc MS, CFCS and Debbie Christofferson MDA, RD who helped me get to the end. Thanks to Barbara Fiechtl MS for participating on my committee and Roxane Pfister for helping with the statistics.

I give special thanks to my family and friends for their encouragement, moral support, patience, and willingness to help. It has been an adventure and I could not have done it without all of them.

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CHAPTER 1
INTRODUCTION

Abstract

Overweight and obesity in adults with disabilities are higher than the average population. Many secondary health problems and other consequences are related to excess weight. Some of the health problems correlated with overweight and obesity are related to nutrition and many persons with intellectual or developmental disabilities (IDD) have other nutrition risks related to their disability. Adults with IDD are trying to become more independent and live in the community. One important aspect of independent living is food shopping and preparation, and many of this population have received little education in this area. Many adults with IDD live in group homes with caregivers who assist in meal planning, shopping and food preparation. These group home managers are often lacking nutrition knowledge and may need to receive nutrition training to promote the selection of healthy food options available to their clients with IDD. The Supplemental Nutrition Assistance Program – Education (SNAP-Ed) is a government program aimed at providing basic nutrition education to those with low income. Nutrition education to promote healthy food and activity choices to adults with IDD and their caregivers may help facilitate positive, healthy behavior changes.
Justification Statement

Adults with IDD have high rates of being overweight and obese, which can lead to other secondary health problems. With few nutrition programs available to teach these adults, they typically have not received nutrition education. Many group home caregivers of adults with IDD assist in or primarily take responsibility for menu planning, food purchasing and preparation, but they also have limited nutrition knowledge.

Obesity and Adults with IDD

The prevalence of overweight and obese people in the United States has steadily increased 12% in the past 15 years [1]. In 2010, only 35.5% of adults were at a healthy body mass index (BMI) of 18.5-24.9 while 36.2% were overweight (BMI of 25-29.9) and 27.5% were obese (BMI>30) [1]. This nationwide obesity trend has affected the entire population ranging from youth to the elderly and does not exclude people with IDD. Adults with IDD have an increased risk of being overweight and obese when compared with a non IDD population [2]. In 2008, 36% of adults with disabilities were obese whereas only 23% of adults without disabilities were obese [3]. Obesity with or without disability is associated with and may often cause other health risks.

Consequences of Obesity

Chronic Disease

Being overweight or obese can increase the risk of chronic diseases such as cardiovascular disease (CVD), type 2 diabetes, hypertension, dyslipidemia, sleep apnea and respiratory problems [4]. Higher levels of obesity are associated with increased mortality, due primarily to CVD, diabetes and certain cancers [5,6].
CVD is the leading cause of death in the United States [7]. Extra weight and fat cause a buildup of fatty deposits in the arteries, thus reducing blood flow and supply to the heart and possibly lead to atherosclerosis, blood clots, myocardial infarction, stroke and coronary artery disease. Extra fat tissue also adds stress to the heart because of the body’s need for extra blood and oxygen to supply nutrients to the excess mass. This increases the heart’s workload, heart rate and blood pressure. Hypertension, therefore, becomes another health risk of obesity.

Excess weight can lead to insulin resistance which is why obesity is one of the major leading factors of type 2 diabetes. Over 80% of people with diabetes are overweight or obese [8]. The added stress of additional weight affects the body’s joints, especially the knees, hips and back. People who are obese have shown an increased amount of osteoarthritis usually in the knees and ankles [9]. Sleep apnea and other respiratory problems are also related to excess weight. Respiratory problems are associated with the extra weight placed on the chest wall which squeezes the lungs and restricts breathing.

Often obesity leads to not only one, but several or all of the chronic diseases described above. Metabolic Syndrome is a complex risk factor for cardiovascular disease and consists of these six major components: abdominal obesity, insulin resistance, elevated blood pressure and cholesterol, elevated blood triglycerides and low levels of high-density lipoproteins (HDL). Approximately one-third of overweight or obese people have Metabolic Syndrome [10].
Medical Costs

Not only do obesity and other health problems associated with it lead to higher risk of chronic disease, but they also carry with them a hefty medical bill for society. In 1998, medical costs for obesity were estimated to be around $78.5 billion, roughly half financed by Medicare and Medicaid [11]. In 2008, obesity’s medical burden was estimated to be about $147 billion, which was almost ten percent of all medical spending [12]. People who are obese, on average, pay $1,429 (42%) more in health care costs than those with a normal weight [12]. The estimated cost of lost productivity of Americans between the ages of 17 and 64 related to obesity was $3.9 billion dollars in 1994. This number included workdays lost, physician office visits, bed days and restricted-activity days [13].

Caring for the estimated three to seven million children and adults with developmental disabilities also comes at a high cost [14]. Many of this population are low income, are less likely to have health insurance, and receive government support for living and medical expenses. An increase in medical costs related to overweight and obesity consequences in this population would mean more money out of taxpayers’ pockets to fund Medicare and Medicaid. Medicare covers 480,000 people with developmental disabilities. About 70% of those in Medicare are also enrolled in Medicaid. Medicaid is one of the largest financial funding sources of health care for people with disabilities and covers 1.5 million non-institutionalized adults [14].
Consequences to Caregivers

Obesity can also have negative effects on caregivers of adults with IDD. Caregivers must be able to manage the client, whether through lifting, restraining or helping with daily tasks. Care becomes more difficult to give with increased size and weight because of possible back and other injuries [15]. Caregivers also assist with medications and other medical regimens such as checking blood sugars and injecting insulin for a person with diabetes. In summary, adults with IDD who are obese may suffer from related chronic diseases, burden tax payers and increase the workload of their caregivers.

Classification of IDD

The Centers for Disease Control and Prevention (CDC) defines developmental disabilities as, “… a diverse group of severe chronic conditions that are due to mental and/or physical impairments. People with developmental disabilities have problems with major life activities such as language, mobility, learning, self-help, and independent living. Developmental disabilities begin anytime during development up to 22 years of age and usually last throughout a person’s lifetime” [16].

CDC also defines intellectual disability: “Intellectual disability is characterized both by a significantly below-average score on a test of mental ability or intelligence and by limitations in the ability to function in areas of daily life, such as communication, self-care, and getting along in social situations and school activities. Intellectual disability is sometimes referred to as a cognitive disability or mental retardation.
Children with intellectual disability can and do learn new skills, but they develop more slowly than children with average intelligence and adaptive skills. There are different degrees of intellectual disability, ranging from mild to profound. A person's level of intellectual disability can be defined by their intelligence quotient (IQ), or by the types and amount of support they need” [17].

Table 1
AAIDD’s categories of mental retardation relating to IQ

<table>
<thead>
<tr>
<th>Class</th>
<th>IQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profound mental retardation</td>
<td>Below 20</td>
</tr>
<tr>
<td>Severe mental retardation</td>
<td>20–34</td>
</tr>
<tr>
<td>Moderate mental retardation</td>
<td>35–49</td>
</tr>
<tr>
<td>Mild mental retardation</td>
<td>50–69</td>
</tr>
<tr>
<td>Borderline intellectual functioning</td>
<td>70–80</td>
</tr>
</tbody>
</table>

The average person’s IQ is 90-109.

The above table (Table 1) from the American Association of Intellectual and Developmental Disabilities (AAIDD) shows the categories of mental retardation relating to IQ. The ranges in Table 1 are based on intelligence tests and are the categories used by the American Association of Mental Retardation, the Diagnostic and Statistical Manual of Mental Disorders-IV-TR, and the International Classification of Diseases-10 to help categorize the level of intellectual disability [18].

**Nutritional Risks among Persons with IDD**

Many of the individuals with IDD have medical conditions related to their disability that place them at nutritional risk. When assessing nutrition risk, personal
factors such as age, severity of the disability, functioning level, state of health, as well as environmental, educational, training and social conditions should be considered.

Treatment medications and possible drug nutrient interactions are other factors to consider. People with IDD who have limited mobility are often taking the anticonvulsants phenobarbital and phenytoin which have nutrition related side effects [19,20]. Many older adults with IDD take several medications over a long period of time causing a greater risk for medical and nutritional interactions. Table 2 describes some of the common drugs taken by people with IDD and their nutrition-related side effects [21].

Table 2
Nutrition-related side effects of common medications used by people with IDD

<table>
<thead>
<tr>
<th>Drug</th>
<th>Nutrition-related side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticonvulsants</td>
<td>Low vitamin D; low calcium; altered bone status; constipation; gum hyperplasia; constipation; nausea; vomiting</td>
</tr>
<tr>
<td>(phenobarital, phenytoin)</td>
<td></td>
</tr>
<tr>
<td>Psychotropics</td>
<td>Affect appetite; weight gain; constipation</td>
</tr>
<tr>
<td>(antidepressants, antipsychotic)</td>
<td></td>
</tr>
<tr>
<td>Psychostimulants</td>
<td>Depressed appetite</td>
</tr>
<tr>
<td>(methylphenidate)</td>
<td></td>
</tr>
<tr>
<td>Tricyclic antidepressants</td>
<td>Increased appetite; nausea; vomiting; constipation; diarrhea</td>
</tr>
</tbody>
</table>

Energy requirements for those with physical disabilities are difficult to determine because of factors such as level of disability, mobility, medications and feeding problems. Feeding problems include oral motor problems, chewing and swallowing difficulties, food allergies as well as food aversions. These factors can complicate the process of providing clients with appropriate nutrition in finding healthy foods they enjoy and are willing to eat.
Some disabilities such as Down’s syndrome, Prader-Willi and Lawrence Moon-Biedl syndromes are associated with overweight and obesity. People with these disabilities have additional nutritional risks. Those with Prader-Willi and Lawrence Moon-Biedl often have inappropriate eating practices such as pica which is the desire to eat nonfood substances. They also have an insatiable appetite and obesity is common if food intake is not controlled. People with Down syndrome have a lower resting metabolic rate than their peers. One study recommended reducing energy intake for weight maintenance as well as respecting food preferences while adhering to strict food-control procedures. The study also recommended aerobic exercise and using nutrition education with an interdisciplinary approach for behavior modification [22].

**Caregiver’s Role in Nutrition for People with IDD**

Many adults with IDD are dependent on caregivers to provide food. Group home clients are limited to the food options available to them in their group home [23]. Some group homes have managers assist clients with menu planning, grocery shopping and food preparation, but the majority are eating meals chosen and prepared by the manager. The manager then becomes a gatekeeper for those adults living in the group home by deciding what foods will be purchased, prepared and served.

This gatekeeper role is very important and can either have a positive or negative influence on the client’s nutritional status and quality of foods offered in the group home. Managers often have many concerns on their mind while working and want to find something quick and easy to prepare that is acceptable to the clients. Often this means convenient processed foods or food from outside sources being served frequently. Such
meals are often calorie dense, high in fat, saturated fat, sugar and sodium and low in essential vitamins and minerals. This may lead to inadequate intake of vitamins and minerals needed to keep the body healthy and nutritionally sound. A Swedish study showed people with intellectual disabilities living in community residences had a diet low in fruits, vegetables, fiber and some vitamins and minerals. Intake of retinol, thiamin, riboflavin, folic acid, iron and selenium were seen to be below the average requirements in this group [24].

**Educating Group Home Caregivers**

Staff working in group homes play an important role in the lives of those they work with and care for. This role includes acting as a gatekeeper, teacher, caregiver and example to their clients. Clients are learning various life skills throughout their lives and these skills are best learned in their home [25]. This learning and training in the home setting can often compensate for lack of formal education. However, there are challenges to this model of learning. Group homes have high staff turnover and the staff often lack nutrition knowledge and food skills [26,27]. Many group home providers require continual staff training which promotes increased staff knowledge and the ability to execute their job more effectively [28]. Behavior modification techniques and skills teaching were ranked as one of the top ten most important training needs for staff working in community residences [29].

One study looked at food-handling knowledge, attitudes and practices of staff and clients in community-based homes. The study found that staff’s knowledge of food safety was lacking in several areas such as storage and handling procedures. The staff reported
that they and clients had never attended a food safety training program but that it would be beneficial [30].

A study by Greene, et al showed staff working with people with IDD could be managed to implement programs effectively [31]. Zlomke and Benjamin provided an inservice training on behavior modification to staff which resulted in decreased maladaptive behaviors of residents with IDD living in an intermediate care facility. The effectiveness of a one day training program taught to staff proved to be effective at teaching basic self-help skills and vocational skills as evidenced by progress demonstrated by the students with profound disabilities [32].

Saloviita and Lehtinen evaluated client progress after in-service training for staff on adult education. The training was given to staff working with adults with IDD. The training program consisted of two, one-day workshops per year over a three year period. Earlier research has shown that verbal instruction by itself was not enough to change behaviors of paraprofessional staff in applied settings. Instead, practicum training was needed [33,34]. The study encouraged the trained participants to write and implement programs for a specific client. The results indicated paraprofessional staff can be trained in a short period of time to successfully plan and implement teaching programs for adults with IDD in institutional and community environments [35].

If staff are trained and more knowledgeable, they may be more likely to make choices consistent with what they learned and transfer that information to their clients. Learning about nutrition is not enough. Implementation and practical experience is the key to changing behavior. As managers are taught a nutrition curriculum, they increase their own nutrition knowledge. This increased knowledge may be further assimilated as
the managers teach clients with IDD a simplified and adapted nutrition curriculum. When both the manager and client have increased nutrition education, they can work together to make healthier choices. Managers are able to teach, remind and be an example to the clients, and the clients, in return, would be able to request healthier choices.

**Adults with IDD and Finances**

Finances are often an issue among people with disabilities. Many have a low income and rely on government programs to help provide for their needs. In 2006, there were 9.78 million people with a mental disability in the United States [36]. In that same year, the general population rate of employment in the United States was 70%, while only 26.8% of people with a mental disability were employed [36]. This places the majority of this population at or below the poverty level. Most are on medications or have other medical needs related to their disability, which are too expensive with their limited or lack of income. Providing for the basic needs of IDD puts a strain on current US government programs like Medicare and Medicaid. In 2001, only a small 7.1% of adults with developmental disabilities had insurance through their employer [21].

The state of Utah had a higher percentage of people with mental disabilities working than the national average. In 2006, 38.8% of the 69,884 people with a mental disability between the ages of 16 and 64 living in Utah were employed [36]. This indicates there were still about 61% of adults with disabilities who needed financial assistance.

Adults with IDD suffer from poverty because of limitations in employment options or medical conditions not allowing them to work. They have lower IQs, levels of
literacy and education and often take jobs that require less skill and thus receive lower rates of compensation. The 2006 mean weekly wages for the general population in Utah were $561 while people with a mental disability earned only $218 [36]. Lack of money for groceries, especially healthy food items is one of the concerns related to poverty and nutrition status.

One government program directed at providing low income people with healthier food is Supplemental Nutrition Assistance Program (SNAP). Because the IDD population makes less money, they qualify for medical assistance as well as other financial aid and government programs. Most adults with IDD qualify for SNAP and its nutrition education component, Supplemental Nutrition Assistance Program-Education (SNAP-Ed). Sixteen percent of SNAP benefits go to households with disabled persons [37].

**SNAP-Ed Program**

SNAP-Ed is a national federally funded program that provides basic nutrition education to people eligible for SNAP. SNAP assists qualified low-income persons in purchasing food needed for better health. The criteria of eligibility for the SNAP program are dependent on monthly income and household size (Table 3) [38].

<table>
<thead>
<tr>
<th>Household #</th>
<th>100%</th>
<th>130%</th>
<th>185%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$11,170</td>
<td>$14,521</td>
<td>$20,665</td>
</tr>
<tr>
<td>3</td>
<td>$19,090</td>
<td>$24,817</td>
<td>$35,317</td>
</tr>
<tr>
<td>4</td>
<td>$23,050</td>
<td>$29,965</td>
<td>$42,643</td>
</tr>
<tr>
<td>6</td>
<td>$30,970</td>
<td>$40,261</td>
<td>$57,295</td>
</tr>
</tbody>
</table>

Income below 130% of poverty means an individual may qualify for SNAP benefits. SNAP-Ed can be taught to individuals up to 185% of the poverty level.
SNAP-Ed coordinates with state and local partners and other contractors like public health departments, food banks, and local health organizations to reach the targeted low income audience. SNAP-Ed is taught in individual or group learning environments as well as print and other sources of media. Lessons are taught in a variety of places such as adult education and job training sites, community centers, elderly service sites, Extension offices, Head Start programs, homes, libraries, public housing, schools, shelters and worksites. The education is provided by local, trained paraprofessionals in all the counties throughout the state. SNAP-Ed focuses first on teaching individuals less than 130% of the poverty level, but can also be taught to people that are up to 185% of the poverty level. SNAP-Ed classes may be taught at locations where at least 50% of the class participants are below 185% [39].

The goal for SNAP-Ed is to provide a program to educate those eligible for SNAP to make healthy food choices on a tight budget and to make lifestyle choices consistent with the Dietary Guidelines for Americans. SNAP-Ed is learner-centered and focused on behavior change. Participants learn basic cooking skills, budgeting, shopping and menu planning, and they are also encouraged to increase physical activity and make healthier food choices. The increase in preventative diseases in the United States is evidence of the need for this program. Low-income people have a greater risk of disease associated with poor nutrition due to lack of money. Sixty-six percent of households participating in the SNAP program have health problems related to excess sodium consumption and being overweight [40].

One of the most difficult aspects of teaching a low-income population nutrition education is that it is not always a top priority. The paraprofessional teacher, also known
in Utah as the Nutrition Education Assistant (NEA), must help the person realize that nutrition education is worth their time and effort. If SNAP-Ed participants are able to see the importance of nutrition, they may have an increased desire to learn about and implement the information learned in these classes.

**SNAP-Ed Statistics**

The SNAP-Ed program is effective in educating people and promoting healthy behavior changes. Utah’s SNAP-Ed lesson surveys, behavior checklists and Food Frequency Questionnaires (FFQ) for 2009 showed at least 80% of people eligible for SNAP who participated in the SNAP-Ed lessons demonstrated intent to follow the 2005 Dietary Guidelines. This included eating more fruits and vegetables, whole grains, lean proteins, low-fat dairy products and replacing unhealthy saturated and trans fats with heart healthy unsaturated fats. The report also showed at least 70% of participants intended to follow food safety practices by properly cooking, chilling and separating foods along with cleaning food preparation surfaces. Sixty-five percent demonstrated intent to participate in physical activity for at least 30 minutes, four to five days per week and plan a food budget and menu [41].

**Need for Nutrition Education**

Most people obtain their nutrition information from media sources such as the internet, magazines, television, books and newspapers along with other sources such as family and friends [42]. Some of these sources of information may be inaccurate, unreliable and expensive. Caregivers, including managers, who may be looking for nutritional cures related to a specific disability or syndrome need sound nutrition
education in order to obtain nutrition knowledge and become aware of accurate information sources to which they can refer in the future. With greater knowledge in this area, managers should also be able to plan well-balanced, nutritious meals for both themselves and those they care for as well as live a healthier lifestyle.

Adults with IDD are becoming more integrated in their communities and have a desire to become more independent. Important life skills needed for independent living include being able to make healthy choices in areas such as planning and eating nutritious meals and exercising [43,44]. Adults with IDD have increasing life expectancies, leading to a greater risk of developing chronic diseases associated with advanced age. Obesity, one of these chronic diseases, is a complex and multifaceted problem and is difficult to treat [45]. One of the focuses from the Healthy People 2020 Objectives for people with disabilities includes prevention and management of secondary conditions. Secondary conditions are other physical or psychological complications that limit community life participation. Many of the secondary conditions are connected to food and nutrition habits. The report also encourages health promotion programs for people with disabilities and their caregivers [46].

Traditional nutrition counseling may not be effective for adults who are cognitively impaired. One of the best preventive measures to help maintain wellness as long as possible is to provide education and wellness programs to promote changes and prevent or slow the onset of disease [47]. The Academy of Nutrition and Dietetics (AND) recommends providing support programs to promote health and wellness for persons with developmental disabilities and special health care needs throughout life [14]. There should be collaboration among nutrition professionals, family members and managers to
prepare effective teaching tools [48]. Collaboration in implementing programs to educate adults with IDD and their managers may be beneficial in helping prevent and delay the onset of chronic diseases and promote healthy behaviors.

The importance of designing preventive programs such as nutrition and physical activity education become even more critical as the chronic diseases increase in the IDD population. Programs are needed to teach the skills necessary to control eating and help maintain weight with a restricted diet, regular exercise and frequent weight checks in specific disorders like Prader-Willi, Lawrence Moon-Biedl and Down syndrome [49]. Heller, McCubbin, Drum and Peterson found that health promotion intervention programs for adults with IDD can encourage enhanced nutrition, increased physical activity, better health and improved quality of life for this population as well as reduce health care costs through prevention of secondary conditions related to overweight and obesity [50].

**Conclusion**

Research has shown that adults with disabilities are at high risk of being overweight and obese. This risk is associated with many possible health complications. Nutrition education may be important in educating caregivers and adults with IDD. The SNAP-Ed program teaches the basics of nutrition education to promote healthy food and activity behaviors. This literature review supports the need for an adapted nutrition curriculum to be taught to adults with IDD as well as nutrition classes taught to their caregivers in order to facilitate and support healthy behaviors.
Hypothesis

Group home managers who participate in nutrition education classes will improve nutrition knowledge and intent for healthy behavior change. Adults with IDD who live in group homes and participate in adapted SNAP-Ed classes will have an increase in nutrition knowledge.

Objectives

The objectives of this study include:

1) To develop an adapted SNAP-Ed curriculum to teach adults with IDD living in group homes.

2) To implement the delivery of a nutrition education to group home managers and adults with IDD through a structured, adaptable SNAP-Ed curriculum.

3) To evaluate the effectiveness of an adapted SNAP-Ed curriculum in increasing nutrition knowledge in both group home managers and clients with IDD and increase group home managers’ intent to improve behavior.

References


[40] Utah State University Cooperative Extension Food Sense Nutrition Education Program. What is Food Sense? [Internet]. 2012. Available at: http://extension.usu.edu/fsne/htm/whatis


CHAPTER 2
THE EFFECTIVENESS OF AN ADAPTED SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM – EDUCATION CURRICULUM FOR ADULTS WITH INTELLECTUAL OR DEVELOPMENTAL DISABILITIES

Abstract

Background: The prevalence of nutrition related diseases is increasing in the population and is extreme in persons with intellectual or developmental disabilities (IDD). The Supplemental Nutrition Assistance Program – Education (SNAP-Ed) is a government program aimed at providing basic nutrition education to low income individuals. Comprehensive nutrition education has not been readily available for adults with IDD and their caregivers, but may promote healthy food and activity choices and facilitate positive, healthy behavior changes.

Hypothesis: Developing, implementing and evaluating the effectiveness of an adapted SNAP-Ed curriculum will improve nutrition knowledge and perceived behavior change in IDD group home managers and clients. Implementing an adapted Utah SNAP-Ed nutrition education for delivery to adults with IDD will provide a model for sustainability of this program and allow for the adaptability needed to fit the needs of those receiving the curriculum.

Methods: Ten regular and adapted SNAP-Ed nutrition lessons were taught to group home managers (n = 33); and by managers to clients (n = 83). Pre and post behavior knowledge was assessed.
Results: Group home clients had improved nutrition knowledge from pre to post tests (p = <0.001). Managers’ nutrition knowledge after lessons improved and overall intent to change behavior increased.

Conclusions: The adapted SNAP-Ed curriculum for group home managers and clients with IDD appears to increase knowledge of nutrition and may improve food behavior. This increased knowledge may help with delay or prevention of nutritional related diseases as assessed by perceived improvement in nutrition knowledge and intent for improved health behavior choices.

Introduction

The number of overweight and obese adults in the United States in the 2007-2008 National Health and Nutrition Examination Survey (NHANES) study was 68% [1]. Adults with intellectual or developmental disabilities (IDD) have an increased rate of being overweight and obese when compared with a non IDD population [2]. In 2008, 36% of adults with disabilities were obese whereas only 23% of adults without disabilities were obese [3]. Being overweight or obese has implications on health can increase the risk of chronic diseases such as cardiovascular disease (CVD), type 2 diabetes, hypertension, dyslipidemia, sleep apnea and respiratory problems [4]. Higher levels of obesity are associated with increased mortality, due primarily to CVD, diabetes and certain cancers [5,6].

Obesity is a complex and multifaceted problem that is difficult to treat [7]. With such high rates among adults with disabilities, one of the focuses of the Healthy People 2020 Objectives for people with disabilities included prevention and management of
secondary conditions. Secondary conditions include physical or psychological complications that limit community life participation. Many of these secondary conditions are connected to food and nutrition habits. The report also encouraged health promotion programs for people with disabilities and their caregivers [8]. Few studies have looked at preventative nutrition programs to help adults with IDD and their caregivers [9].

Many individuals with IDD have medical conditions that place them at nutritional risk. When assessing nutrition risk and determining energy requirements, factors such as age, severity of disability, mobility and medications should be considered. Feeding problems such as oral motor problems, chewing and swallowing difficulties, food allergies and food aversions can complicate the process of providing adults with IDD appropriate nutrition and finding healthy foods they enjoy and are willing to eat.

Clients are limited to the food options available to them in their group home [10]. Some clients with IDD in group homes participate in food selection, shopping and preparation as their skill level allows, but many are dependent on managers to provide food. Managers acquire an important role of gatekeeper when they primarily select what foods will be available, prepared and served. This gatekeeper role is very important and can either have a positive or negative influence on the nutritional quality of foods offered to group home clients with IDD. Managers often have many concerns on their mind while working and want to find something quick and easy to prepare that is acceptable to the clients. Often this means convenient processed foods or food from outside sources being served more frequently. Such meals are often calorie dense, high in fat, saturated fat, sugar and sodium and low in essential vitamins and minerals. This may lead to
inadequate intake of essential vitamins and minerals needed to keep the body healthy and nutritionally sound.

Group homes have high staff turnover and the staff often lack nutrition knowledge and food skills [11,12]. Many group home providers require continual staff training to promote increased staff knowledge and the ability to execute their job more effectively [13]. Additional nutrition training would be beneficial to managers because of their role in the clients’ food intake. The more knowledge about health and nutrition the manager has, the more capable they may be of relaying that information to their clients by implementing, providing and encouraging healthier food and activity choices in the group home setting.

Group home staff play important roles including acting as a teacher, caregiver, gatekeeper and example to their clients. Clients are learning various life skills throughout their lives and these skills are best learned in their home [14]. This learning and training can often compensate for lack of formal education in certain areas. Adults with IDD are at varying levels of disability and learning. Having an adaptable curriculum to fit the learning needs of clients in a comfortable and familiar environment may enhance learning.

Finances are often an issue faced among people with disabilities. Many have low income and rely on government programs to help provide for their needs. In 2006, there were 9,782,084 persons with a mental disability in the United States and only 26.8% were employed [15]. This small percent indicates that the majority of this population is probably at or below the poverty level. With most of the IDD population making only small amounts of money, they qualify for medical assistance as well as other financial
aids and government programs. Supplemental Nutrition Assistance Program (SNAP) is one way the government is assisting the low income population purchase healthier food needed for better health. Sixteen percent of SNAP benefits go to households with disabled persons [16]. SNAP also has a nutrition education component called Supplemental Nutrition Assistance Program-Education (SNAP-Ed).

SNAP-Ed is a national federally funded program that provides basic nutrition education to people eligible for SNAP. SNAP-Ed is learner centered and focused on behavior change. The goal is to provide a program to educate those eligible for SNAP to make healthy food choices on a limited budget and make lifestyle choices consistent with the Dietary Guidelines for Americans. SNAP-Ed can be received through individual or group learning environments as well as through print and other sources of media. The need for this preventative program can be seen by the increase in obesity and related diseases in the United States, especially among low-income individuals. Low-income people have a greater risk of disease associated with poor nutrition due to lack of money. Sixty-six percent of households participating in the SNAP program have health problems related to excess sodium consumption and being overweight [17].

*SNAP-Ed Basics*, a SNAP-Ed curriculum, was written to help people learn basic cooking skills, budgeting, shopping, menu planning, and they are also encouraged to increase physical activity and make healthier food choices. The 17 lesson curriculum was based on the 2010 Dietary Guidelines and MyPlate. Ten lessons were selected and further adapted to be taught to adults with IDD. Providing an appropriate, adaptive and flexible curriculum was important to fit varied levels of disability and learning in the IDD population.
Objectives

The objectives of this study were to 1) Adapt standard SNAP-Ed nutrition curriculum to be appropriate for adults with IDD living in group homes. 2) Implement the delivery of this adapted curriculum to group home managers and adults with IDD through the SNAP-Ed program. 3) Evaluate the effectiveness of the adapted SNAP-Ed curriculum to increase knowledge and intent to change behavior of both group home managers and adults with IDD.

Methods

Curriculum Development

Ten of the Utah SNAP-Ed Basics curriculum lessons were adapted for higher functioning adults with IDD at Utah State University in 2008. The curriculum was adapted by senior dietetic students and then reviewed by the nurse consultant for the State of Utah Department of Human Services – Division of Services for People with Disabilities and staff. The curriculum included a simplified version of the lessons in a PowerPoint presentation along with a related activity or worksheet and a simple food demonstration. A pilot study was conducted in the spring of 2008 to assess the effectiveness of the adapted curriculum and measure increased nutrition knowledge among adults with IDD. Pilot study participants completed pre and post questions designed to assess nutrition knowledge. The knowledge tests included a picture format and was interviewer assisted. Tests were evaluated by the staff at the Division of Services for People with Disabilities (DSPD) at Utah State University. A survey was also developed to assess caregivers’ perception of change of the participants with IDD. The
pilot study provided preliminary evidence of significant improvements in knowledge for four of the classes (fruits and vegetables, breakfast, snacks, and menu planning) and a trend for improvement in two other lessons (MyPlate and meats, beans and protein). Improvements were seen for all perceived assessments in knowledge, intent for behavior change and portion skills.

The adapted curriculum was then further refined to include changes to the pre and post tests, activities, and lesson outlines (Appendix A,B). This further development of the curriculum was needed to make it more adaptable to be taught in a variety of settings. Workbooks were prepared for clients and lesson outlines were made for the group home managers (Appendix C,D). DVDs were developed with each lesson’s presentation, making the curriculum more accessible for both managers and clients. Each class included a 15-20 minute lesson on a nutrition or exercise topic followed by a related activity and food demonstration, if relevant. Physical activity was encouraged, but physical limitations of the participants were taken into consideration. After the pilot study, it was determined that managers played a significant role in what foods were provided for clients to eat. The researchers decided that instead of just focusing on client knowledge, an addition of the study would be to educate and include testing managers’ nutrition knowledge and intent to change behavior.

Pre and post tests were used for the clients with IDD to assess knowledge prior to and following each lesson and then again one month after the lesson to help determine retention. Each lesson had a specific challenge or action the clients could implement after receiving the lesson (Table 1).
<table>
<thead>
<tr>
<th>Lesson</th>
<th>Regular Curriculum Description</th>
<th>Adapted Lesson Description</th>
<th>What Can I Do? (Adapted Lesson Challenge)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>Teaches information needed for a satisfying, well-balanced breakfast which is the most important meal and beginning of the day</td>
<td>Explains why breakfast is important and what foods make a healthy breakfast</td>
<td>Eat breakfast every day</td>
</tr>
<tr>
<td>Fitness</td>
<td>Teaches self-management skills needed to adopt a healthy lifestyle. The curriculum helps build a solid foundation to better interpret and understand sport and exercise physiology. Adopting these skills will make a positive difference in one's health, fitness and wellness</td>
<td>Focuses on reasons to exercise and what activities constitute as exercise</td>
<td>Play a game with your friend that makes you move</td>
</tr>
<tr>
<td>Food Safety</td>
<td>Provides participants with basic knowledge of food safety and teaches about personal hygiene, avoiding cross-contamination and following time and temperature guidelines for food safety. Participants will learn what they need to know in order to keep their food safe</td>
<td>Promotes hand washing and other means to prevent food borne illnesses</td>
<td>Wash your hands before eating</td>
</tr>
<tr>
<td>Fruits and Vegetables</td>
<td>Provides information to participants about the research related to fruits and vegetables and the health benefits related to these groups. Fruits and vegetables promote good health and reduce the risk of several chronic diseases. These food groups also provide essential vitamins and minerals, fiber and other substances important for health and a good diet. Variety in fruits and vegetables is also recommended</td>
<td>Describes benefits of eating fruits and vegetables, amounts needed and what foods are fruits and vegetables</td>
<td>Eat a fruit or vegetable for your snack</td>
</tr>
<tr>
<td>Grains</td>
<td>Describes various grain products and the role they play in human</td>
<td>Indicates foods belonging to the</td>
<td>Eat whole wheat bread instead of</td>
</tr>
<tr>
<td>Topic</td>
<td>Description</td>
<td>Tips/Recommendations</td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Nutrition</td>
<td>The lesson also provides tips for label reading, purchasing and storing grains for maximal nutrition and freshness.</td>
<td>White bread</td>
<td></td>
</tr>
<tr>
<td>Meat, Beans and Protein</td>
<td>Informs on nutritional and health benefits of different meats, poultry, fish, eggs, nuts and beans. Introduces the properties and diverse flavors of the legume family.</td>
<td>Ask for healthy meat for dinner. Ask for chicken or turkey instead of a hamburger or hot dog</td>
<td></td>
</tr>
<tr>
<td>Menu Planning and Shopping</td>
<td>Provides the participant with hints and shortcuts in the kitchen that make cooking easier and more fun. The lesson also teaches participants how to successfully plan menus and make them fit into their budget.</td>
<td>Eat colorful vegetables for dinner tonight</td>
<td></td>
</tr>
<tr>
<td>Milk and Dairy</td>
<td>Encourages 3-A-Day of dairy products. Teaches the Dietary Guidelines and MyPlate recommendations for at least three servings of dairy in the daily diet to ensure adequate consumption of calcium, magnesium and potassium. These nutrients aid in building strong bones and teeth.</td>
<td>Drink milk instead of soda or juice</td>
<td></td>
</tr>
<tr>
<td>MyPlate</td>
<td>Provides basic nutrition information and focuses on the importance of nutrition for health.</td>
<td>Help clients identify which foods belong to specific food groups</td>
<td></td>
</tr>
<tr>
<td>Snacks</td>
<td>Focuses on why healthy and delicious snacks are important and teaching how to find nutritious snacks through nutrition facts and simple recipes. After this lesson, people are not limited to high fat snacks, but instead can make informed choices about how to make or where to find a healthy snack.</td>
<td>Eat foods from all the food groups</td>
<td></td>
</tr>
</tbody>
</table>
Program Design

Participants were recruited by contacting group home providers’ regional directors in selected counties throughout Utah via phone calls or e-mail. Three urban Utah county group home providers chose to participate, which included 33 managers and 83 group home clients (Appendix E,F,G). Directors determined which teaching approach would be best for that specific site. Several options were given which included the SNAP-Ed paraprofessional nutrition education assistant (NEA) teach the individual group home manager in the group home, teach all managers at once, or meet individual managers at the group home provider’s office to receive training. Some of the group home providers’ regional directors required managers’ attendance as part of training hours. Other providers allowed the curriculum to be an optional training. At all participating group homes, clients had choice over foods eaten and could assist in food planning, shopping and preparation.

Teaching the regular and adapted nutrition occurred as follows:

1) The graduate student, under the direction of the Utah SNAP-Ed director, introduced and explained the adapted curriculum to the three NEAs selected to work with the study.

2) Once the group home providers decided to participate in the study, the NEAs communicated and worked with the providers to facilitate the program and set up a teaching schedule for the managers.

3) The NEAs taught the original curriculum to the group home managers and then taught and trained them on the adapted curriculum.
4) The group home managers then taught the adapted curriculum to the adults in their group home. Each adapted class included a short ten to fifteen minute lesson, a related activity and optional food demonstration. The lesson outlines promoted questions and adaptability for managers to fit the individual needs of their clients.

**Data Collection**

Information on each study participant’s age, gender and need for financial assistance was obtained (Appendix H). Managers were given a food frequency questionnaire (FFQ) which they filled out for themselves and helped fill out for the clients (Appendix I). The FFQs were to be administered prior to and after the study to determine changes in food choices.

After being taught each lesson of the regular curriculum, managers filled out class evaluations which assessed their understanding and knowledge of the topic before and after the lesson (Appendix J). At the conclusion of the study, a behavior checklist was given to managers to determine intent to change before and after receiving the curriculum (Appendix K). A satisfaction survey was also given to managers (Appendix L).

Managers assisted the clients as needed in filling out class participation forms for each lesson. A pre and 1st post test were administering to clients to assess their nutrition knowledge related to each topic prior to and following each lesson and a 2nd post test was given one month later (Appendix M). Questions were read to the clients and they were to circle the correct picture choice.
Statistical Analysis

Frequencies were used to assess participant demographics and FFQs. Paired t-tests were used to determine client knowledge improvement from pre to post tests as well as compare manager pre to post behavior checklists. Paired samples tests were used for the manager pre to post class evaluations to look for increased nutrition knowledge.

Results

Manager Demographics

Thirty-three managers participated in the study. Two did not provide demographic characteristic information. The majority were between 18-59 years old (90.9%), female (87.9%) and white (87.9%); three managers reported qualifying for food stamps; two reported receiving other financial assistance (WIC, Food Pantry, church, etc.).

Manager FFQ

The sample group of managers performed a pre FFQ (Table 3). Post questionnaires were not obtained due to difficulty in having managers fill out and return paperwork. The total mean of fruit and vegetable consumption was 2.45 and 2.48 times per day, respectively. Managers reported eating foods from the meat, beans and protein group an average of 2.94 times per day. The lowest amount of meat reported being eaten was fish and other seafood. The reported consumption of whole and refined grains was 1.80 times per day.
Table 2
Demographics of group home managers (N = 33)

<table>
<thead>
<tr>
<th>Category</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-59</td>
<td>30</td>
<td>90.9</td>
</tr>
<tr>
<td>60+</td>
<td>1</td>
<td>3.0</td>
</tr>
<tr>
<td>No Information</td>
<td>2</td>
<td>6.1</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>29</td>
<td>87.9</td>
</tr>
<tr>
<td>Male</td>
<td>2</td>
<td>6.1</td>
</tr>
<tr>
<td>No Information</td>
<td>2</td>
<td>6.1</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>1</td>
<td>3.0</td>
</tr>
<tr>
<td>White</td>
<td>29</td>
<td>87.9</td>
</tr>
<tr>
<td>Native Hawaiian or other Pacific Islander</td>
<td>1</td>
<td>3.0</td>
</tr>
<tr>
<td>No Information</td>
<td>2</td>
<td>6.1</td>
</tr>
<tr>
<td>Receive SNAP benefits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>30</td>
<td>90.9</td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>3.0</td>
</tr>
<tr>
<td>No Information</td>
<td>2</td>
<td>6.1</td>
</tr>
<tr>
<td>Qualify for SNAP benefits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>9.1</td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>84.8</td>
</tr>
<tr>
<td>No Information</td>
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<td>6.1</td>
</tr>
<tr>
<td>Other Assistance</td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>6.1</td>
</tr>
<tr>
<td>No</td>
<td>29</td>
<td>87.9</td>
</tr>
<tr>
<td>No Information</td>
<td>2</td>
<td>6.1</td>
</tr>
</tbody>
</table>
Table 3
Reported intake of foods as assessed by a food frequency questionnaire for group managers

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean times eaten per day</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruit</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red</td>
<td>33</td>
<td>0.53</td>
<td>0.22</td>
</tr>
<tr>
<td>Orange/Yellow</td>
<td>33</td>
<td>0.52</td>
<td>0.21</td>
</tr>
<tr>
<td>Green</td>
<td>33</td>
<td>0.47</td>
<td>0.22</td>
</tr>
<tr>
<td>Blue/Purple</td>
<td>32</td>
<td>0.44</td>
<td>0.25</td>
</tr>
<tr>
<td>White</td>
<td>32</td>
<td>0.48</td>
<td>0.28</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red</td>
<td>33</td>
<td>0.69</td>
<td>0.28</td>
</tr>
<tr>
<td>Orange/Yellow</td>
<td>33</td>
<td>0.53</td>
<td>0.22</td>
</tr>
<tr>
<td>Green</td>
<td>33</td>
<td>0.73</td>
<td>0.19</td>
</tr>
<tr>
<td>White</td>
<td>33</td>
<td>0.53</td>
<td>0.25</td>
</tr>
<tr>
<td><strong>Meats, Beans and Proteins</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beans</td>
<td>30</td>
<td>0.45</td>
<td>0.20</td>
</tr>
<tr>
<td>Eggs</td>
<td>32</td>
<td>0.51</td>
<td>0.22</td>
</tr>
<tr>
<td>Beef</td>
<td>33</td>
<td>0.56</td>
<td>0.23</td>
</tr>
<tr>
<td>Pork</td>
<td>32</td>
<td>0.43</td>
<td>0.20</td>
</tr>
<tr>
<td>Poultry</td>
<td>33</td>
<td>0.50</td>
<td>0.18</td>
</tr>
<tr>
<td>Fish/Other Seafood</td>
<td>33</td>
<td>0.08</td>
<td>0.04</td>
</tr>
<tr>
<td>Other Meats</td>
<td>33</td>
<td>0.41</td>
<td>0.17</td>
</tr>
<tr>
<td>Lean Cuts</td>
<td>32</td>
<td>0.55</td>
<td>0.31</td>
</tr>
<tr>
<td><strong>Dairy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Dairy Products</td>
<td>33</td>
<td>0.80</td>
<td>0.38</td>
</tr>
<tr>
<td>Non-Fat Dairy</td>
<td>33</td>
<td>0.53</td>
<td>0.39</td>
</tr>
<tr>
<td><strong>Grains</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole Grains</td>
<td>33</td>
<td>1.00</td>
<td>0.33</td>
</tr>
<tr>
<td>Refined Grains</td>
<td>32</td>
<td>0.80</td>
<td>0.33</td>
</tr>
<tr>
<td><strong>Discretionary Calories</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugary Drinks</td>
<td>33</td>
<td>0.70</td>
<td>0.42</td>
</tr>
<tr>
<td>Alcoholic Beverages</td>
<td>32</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Sweets</td>
<td>33</td>
<td>0.51</td>
<td>0.31</td>
</tr>
<tr>
<td>Heart Healthy Oils</td>
<td>33</td>
<td>0.71</td>
<td>0.35</td>
</tr>
<tr>
<td>Other Fats</td>
<td>33</td>
<td>0.77</td>
<td>0.32</td>
</tr>
<tr>
<td>Fatty Foods</td>
<td>33</td>
<td>0.52</td>
<td>0.27</td>
</tr>
</tbody>
</table>
Manager Class Evaluations

Managers increased their knowledge of nutrition concepts after hearing all the lessons except for fitness. No paperwork from the breakfast lesson was received, so it was omitted from analysis.

Table 4
Paired t-tests for group home managers’ class knowledge evaluations

<table>
<thead>
<tr>
<th>Class</th>
<th>N</th>
<th>Pre Mean ± SD</th>
<th>Post Mean ± SD</th>
<th>Paired t-test: Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitness</td>
<td>2</td>
<td>3.1 ± 0.1</td>
<td>3.0 ± 0.0</td>
<td>0.500</td>
</tr>
<tr>
<td>Food Safety</td>
<td>17</td>
<td>3.6 ± 0.7</td>
<td>4.3 ± 0.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Grain</td>
<td>11</td>
<td>2.9 ± 0.7</td>
<td>4.4 ± 0.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Meat, Beans &amp; Protein</td>
<td>14</td>
<td>3.2 ± 0.6</td>
<td>4.3 ± 0.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Menu Planning &amp; Shopping</td>
<td>11</td>
<td>3.6 ± 0.7</td>
<td>4.4 ± 0.6</td>
<td>0.001</td>
</tr>
<tr>
<td>Milk &amp; Dairy</td>
<td>9</td>
<td>3.4 ± 0.8</td>
<td>4.6 ± 0.5</td>
<td>0.001</td>
</tr>
<tr>
<td>MyPlate</td>
<td>9</td>
<td>2.6 ± 0.8</td>
<td>3.7 ± 1.0</td>
<td>0.027</td>
</tr>
<tr>
<td>Snacks</td>
<td>2</td>
<td>3.5 ± 0.4</td>
<td>4.5 ± 0.7</td>
<td>0.430</td>
</tr>
</tbody>
</table>

The Breakfast and Fruits and Vegetables lessons were omitted because no paperwork was returned.

Mean scores rating scale:
1 = No understanding/involvement
2 = A little bit of understanding/involvement
3 = Average understanding/involvement
4 = Quite a bit of understanding/involvement
5 = Almost complete understanding/involvement

Specific questions from the lessons that showed significant knowledge improvements between pre and post lesson evaluations included how to keep food safe at home (p = 0.031), the difference between whole, refined and enriched grains (p = 0.049), smart food shopping tips (p = 0.046), different plant and animal foods in the meat and proteins group (p = 0.005), the main nutrients in meat and proteins (p = 0.002), how
many calories I should eat a day (p = 0.002), and different forms and milk and uses for each (p = 0.007).

**Manager Behavior Checklist**

The manager behavior checklist showed an overall higher mean post than pre score (pre test mean = 3.90, post test mean = 4.15). An observed increase was found with several individual behaviors. Twelve of 18 questions mean scores improved from pre to post curriculum (Table 5).

**Client Demographics**

Information was collected on 83 group home clients (Table 6). It was reported that 21 (25.3%) out of 74 clients (89.2%) qualified for SNAP benefits. Of the 21 clients who qualified, only eight received SNAP benefits. The majority of clients (72.3%) were receiving other financial assistance.

**Client FFQ**

Fifty-seven FFQs were collected on clients prior to the study (Table 7). FFQs following the study were not obtained due to difficulty of receiving completed paperwork from managers. The pre FFQ showed a total average of fruits eaten 2.42 times per day and vegetables 2.06 times per day. Meat, beans and protein were eaten 2.95 times per day. Eggs were reported to be eaten the most in this group followed by other meats (hot dogs, lunch meats). Whole and refined grains were reported to be consumed 1.40 times per day.
Table 5
Paired samples test for the manager behavior checklist (N = 7)

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Pre Mean</th>
<th>Post Mean</th>
<th>Sig (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan meals ahead of time</td>
<td>3.1 ± 1.6</td>
<td>3.6 ± 1.4</td>
<td>0.68</td>
</tr>
<tr>
<td>Compare prices before buying foods</td>
<td>3.9 ± 1.5</td>
<td>4.9 ± 0.4</td>
<td>0.13</td>
</tr>
<tr>
<td>Do not have enough money through the end of the month</td>
<td>3.1 ± 1.3</td>
<td>3.4 ± 1.7</td>
<td>0.78</td>
</tr>
<tr>
<td>Shop with a grocery list</td>
<td>4.0 ± 1.3</td>
<td>4.0 ± 1.5</td>
<td>1.00</td>
</tr>
<tr>
<td>Refrigerate meat and dairy within two hours of shopping</td>
<td>5.0 ± 0.0</td>
<td>4.4 ± 1.5</td>
<td>0.36</td>
</tr>
<tr>
<td>Do not thaw frozen foods at room temperatures</td>
<td>4.1 ± 0.9</td>
<td>3.6 ± 1.8</td>
<td>0.51</td>
</tr>
<tr>
<td>Make food purchases based on healthy choices</td>
<td>4.0 ± 1.2</td>
<td>3.7 ± 1.4</td>
<td>0.70</td>
</tr>
<tr>
<td>Prepare foods without adding salt*</td>
<td>3.3 ± 1.4</td>
<td>3.3 ± 1.6</td>
<td>1.00</td>
</tr>
<tr>
<td>Read Nutrition Facts Labels before purchasing*</td>
<td>2.7 ± 1.4</td>
<td>4.0 ± 1.5</td>
<td>0.12</td>
</tr>
<tr>
<td>Wash hands before food preparation or eating</td>
<td>4.4 ± 1.5</td>
<td>5.0 ± 0.0</td>
<td>0.36</td>
</tr>
<tr>
<td>Choose to be physically active, at least 30 minutes 5 days a week</td>
<td>3.9 ± 1.3</td>
<td>3.9 ± 1.2</td>
<td>1.00</td>
</tr>
<tr>
<td>Choose to walk, take stairs, or be active in other ways</td>
<td>4.3 ± 1.0</td>
<td>4.4 ± 0.8</td>
<td>0.36</td>
</tr>
<tr>
<td>Prepare meals at home at least 3 times a week</td>
<td>4.4 ± 0.8</td>
<td>4.6 ± 0.5</td>
<td>0.36</td>
</tr>
<tr>
<td>Eat meals together as a family at least 3 times a week</td>
<td>4.3 ± 1.0</td>
<td>4.7 ± 0.5</td>
<td>0.20</td>
</tr>
<tr>
<td>Eat at least 3 servings of vegetables a day</td>
<td>4.0 ± 1.3</td>
<td>4.3 ± 0.8</td>
<td>0.46</td>
</tr>
<tr>
<td>Eat at least 2 servings of fruits a day</td>
<td>4.0 ± 1.3</td>
<td>4.1 ± 0.9</td>
<td>0.60</td>
</tr>
<tr>
<td>Eat at least 2 servings of dairy a day</td>
<td>4.1 ± 1.1</td>
<td>4.4 ± 0.5</td>
<td>0.36</td>
</tr>
<tr>
<td>Replace saturated and trans-fats with heart healthy fat</td>
<td>3.4 ± 1.6</td>
<td>4.3 ± 0.8</td>
<td>0.23</td>
</tr>
</tbody>
</table>

Mean Scores Rating Scale: 1 = Never; 2 = Seldom; 3 = Sometimes; 4 = Usually; 5 = Always
* (N = 6)
Table 6
Demographics of group home clients (N = 83)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-59</td>
<td>75</td>
<td>90.4</td>
</tr>
<tr>
<td>60+</td>
<td>8</td>
<td>9.6</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>48</td>
<td>57.8</td>
</tr>
<tr>
<td>Male</td>
<td>34</td>
<td>41</td>
</tr>
<tr>
<td>No Information</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian or Alaskan Native</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Black or African American</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>White</td>
<td>78</td>
<td>94</td>
</tr>
<tr>
<td>Native Hawaiian or other Pacific Islander</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td><strong>Receive SNAP benefits</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>74</td>
<td>89.2</td>
</tr>
<tr>
<td>Yes</td>
<td>8</td>
<td>9.6</td>
</tr>
<tr>
<td>No Information</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Qualify for SNAP benefits</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>21</td>
<td>25.3</td>
</tr>
<tr>
<td>No</td>
<td>61</td>
<td>73.5</td>
</tr>
<tr>
<td>No Information</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Other Assistance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>60</td>
<td>72.3</td>
</tr>
<tr>
<td>No</td>
<td>22</td>
<td>26.5</td>
</tr>
<tr>
<td>No Information</td>
<td>1</td>
<td>1.2</td>
</tr>
</tbody>
</table>
Table 7
Reported intake of foods as assessed by a food frequency for clients with intellectual or developmental disabilities

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean times eaten per day</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruit</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red</td>
<td>57</td>
<td>0.51</td>
<td>0.25</td>
</tr>
<tr>
<td>Orange/Yellow</td>
<td>57</td>
<td>0.47</td>
<td>0.22</td>
</tr>
<tr>
<td>Green</td>
<td>57</td>
<td>0.42</td>
<td>0.20</td>
</tr>
<tr>
<td>Blue/Purple</td>
<td>57</td>
<td>0.43</td>
<td>0.23</td>
</tr>
<tr>
<td>White</td>
<td>57</td>
<td>0.59</td>
<td>0.20</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red</td>
<td>57</td>
<td>0.50</td>
<td>0.17</td>
</tr>
<tr>
<td>Orange/Yellow</td>
<td>57</td>
<td>0.51</td>
<td>0.25</td>
</tr>
<tr>
<td>Green</td>
<td>57</td>
<td>0.58</td>
<td>0.17</td>
</tr>
<tr>
<td>White</td>
<td>57</td>
<td>0.47</td>
<td>0.20</td>
</tr>
<tr>
<td><strong>Meat, Beans and Protein</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beans</td>
<td>56</td>
<td>0.42</td>
<td>0.19</td>
</tr>
<tr>
<td>Eggs</td>
<td>56</td>
<td>0.55</td>
<td>0.19</td>
</tr>
<tr>
<td>Beef</td>
<td>57</td>
<td>0.49</td>
<td>0.16</td>
</tr>
<tr>
<td>Pork</td>
<td>57</td>
<td>0.42</td>
<td>0.19</td>
</tr>
<tr>
<td>Poultry</td>
<td>57</td>
<td>0.46</td>
<td>0.17</td>
</tr>
<tr>
<td>Fish/Other Seafood</td>
<td>56</td>
<td>0.09</td>
<td>0.04</td>
</tr>
<tr>
<td>Other Meats</td>
<td>56</td>
<td>0.52</td>
<td>0.16</td>
</tr>
<tr>
<td>Lean Cuts</td>
<td>55</td>
<td>0.49</td>
<td>0.21</td>
</tr>
<tr>
<td><strong>Dairy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Dairy Products</td>
<td>56</td>
<td>0.84</td>
<td>0.22</td>
</tr>
<tr>
<td>Non-Fat Dairy</td>
<td>56</td>
<td>0.59</td>
<td>0.29</td>
</tr>
<tr>
<td><strong>Grains</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole Grains</td>
<td>57</td>
<td>0.84</td>
<td>0.25</td>
</tr>
<tr>
<td>Refined Grains</td>
<td>57</td>
<td>0.56</td>
<td>0.32</td>
</tr>
<tr>
<td><strong>Discretionary Calories</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugary Drinks</td>
<td>57</td>
<td>0.54</td>
<td>0.32</td>
</tr>
<tr>
<td>Alcoholic Beverages</td>
<td>56</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Sweets</td>
<td>57</td>
<td>0.44</td>
<td>0.21</td>
</tr>
<tr>
<td>Heart Healthy Oils</td>
<td>55</td>
<td>0.57</td>
<td>0.31</td>
</tr>
<tr>
<td>Other Fats</td>
<td>57</td>
<td>0.71</td>
<td>0.30</td>
</tr>
<tr>
<td>Fatty Foods</td>
<td>57</td>
<td>0.54</td>
<td>0.29</td>
</tr>
</tbody>
</table>
**Client Pre and Post Tests**

The overall client pre to 1\textsuperscript{st} post test mean scores showed increased nutrition knowledge. Similar results were found when comparing the pre to the 2\textsuperscript{nd} post tests (Table 8).

Table 8
Client pre to post overall mean nutrition knowledge test scores

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t</th>
<th>Significance (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Test</td>
<td>71</td>
<td>0.64</td>
<td>0.26</td>
<td>-4.516</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>1\textsuperscript{st} Post Test</td>
<td></td>
<td>0.74</td>
<td>0.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Test</td>
<td>57</td>
<td>0.61</td>
<td>0.25</td>
<td>-4.981</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>2\textsuperscript{nd} Post Test</td>
<td></td>
<td>0.72</td>
<td>0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1\textsuperscript{st} Post Test</td>
<td>57</td>
<td>0.72</td>
<td>0.25</td>
<td>-0.017</td>
<td>0.987</td>
</tr>
<tr>
<td>2\textsuperscript{nd} Post Test</td>
<td></td>
<td>0.72</td>
<td>0.25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mean scores based on: 0 = Incorrect Answer; 1 = Correct Answer

Individual test questions showed the majority of clients improved nutrition knowledge from pre to both post tests. The topics that showed improvements from the pre to 1\textsuperscript{st} post test questions included recognizing the benefits of eating breakfast (p = <0.001), benefits of iron that come from the meat and protein group (p = <0.001), benefits of exercise (p = 0.005), recognizing how many grain servings are needed (p = <0.001), importance of not being hungry when going grocery shopping (p = 0.045), determining which foods belong to which food group (p = 0.011), and recognizing healthy snacks (p = <0.001). The two specific questions indicating no improved knowledge from pre to 1\textsuperscript{st} post test included determining serving sizes of dairy products (p = 0.009) and determining what activities are considered exercise (p = 0.424). The pre
to 2\textsuperscript{nd} post test individual questions the clients improved on and were still able to recognize were the benefits of exercise ($p = 0.019$) and being able to pick out healthier food options for breakfast ($p = 0.011$).

When comparing the individual knowledge questions between pre and both post tests, the overall number of correct scores increased for the majority of individual questions. Individual pre to 1\textsuperscript{st} post and pre to 2\textsuperscript{nd} post test questions showed the majority had a mean improvement. The 1\textsuperscript{st} post to 2\textsuperscript{nd} post test comparison showed 17 questions improved compared to 24 and 25 question in the pre to post tests groups.

\textbf{Qualitative Observations}

Only three manager satisfaction surveys were received back. All three agreed the SNAP-Ed lessons helped them learn about nutrition, helped the clients learn more about nutrition, and the lessons taught by the NEAs were easy to understand, helpful and informative. They also agreed that the food demos were simple to make. One of the managers who filled out the survey did not attend all the lessons taught by the NEA and disagreed the lessons were easy to teach. The two managers attending most of the lessons agreed the lessons were easy to teach and found the material easy to adapt to meet the needs of their clients.

One of the managers reported the clients enjoyed the lessons. She wrote: “The ladies listen to me when I am telling them the info but when it comes to retaining the information and taking a quiz about it, they don’t do very well.” Retention of knowledge was a common topic brought up by managers. They stated the clients would remember bits and pieces of the lessons. One manager related an instance of going grocery shopping
with the client who saw the MyPlate symbol and insisted purchasing that food item because it was a healthier choice. Other managers commented clients did not retaining the information from the lessons and had a lack of attention during the lesson.

A manager engaged her clients by pointing out certain foods the clients liked from the particular food group being discussed. This seemed to involve and excite the clients more and help them pay better attention. The managers knew the clients’ diet and areas to put more emphasis in the lesson. The clients also seemed to feel comfortable around the manager and were willing to answer questions, comment and participate.

One of the difficulties of the program was getting manager participation. Managers did not like the excess paperwork required for the study such as administering the pre and post tests to clients. This was a source of frustration reported by the NEAs in collecting paperwork as well as being a limitation to the desired data received for the study.

**Discussion**

An adapted nutrition curriculum for adults with IDD may help increase nutrition and physical activity awareness as seen by improvements in pre to post knowledge tests. A review of studies showed that promoting physical activity, better nutrition and health behavior education for adults with intellectual disabilities can have positive impacts on their health [18]. Mann et al. showed the most effective way of reducing obesity in this population was health behavior education which incorporated both healthy eating and exercise components [19]. Therefore, one of the major challenges of the IDD population is developing a program that is adaptable and addresses varied disability limitations. In
assessing differences in knowledge between pre to 1st post tests and pre to 2nd post test, both showed improved knowledge. When looking at the 1st post compared to the 2nd post test, there was virtually no difference between the test scores. This finding does not support the need for repetition of the classes, but managers reported limited retention of information in the clients. Repetition of the lessons periodically and adapting the curriculum to fit specific needs may help reinforce and increase nutrition knowledge for those with a slower learning capacity. Another reason for repeating the curriculum would be because of the high turnover rate of group home managers.

Group home managers are often the food gatekeepers for clients, thus making it important to educate the ones responsible for planning and providing nutritious food. Managers reported diets consisted of low intake of lean cuts of meat along with low fish and seafood intake. They did not report getting the recommended three servings of dairy products per day. Managers also possibly underreported amounts of grain products eaten per day (1.80 times per day). This low reported grains consumption questions the validity of the FFQ survey in this population because on average, Americans consume 6.3 ounce-equivalents of refined grains per day [20].

Low reported consumption of healthier foods (low-fat dairy and lean meats) in both groups may indicate lack of nutrients required to stay healthy. Clients FFQs showed highest consumption of foods from the meat, beans and protein group, mostly from eggs and higher calorie, fat and sodium meats. Reported dairy intake was low among this group as well. Once again, reported average grain consumption for clients was very low with higher reported fruit and vegetable consumption, thus questioning the validity of the FFQ. Draheim, Stanish, Williams and McCubbin found that only 0 to 6% of adults (N =
365) with intellectual disabilities living in a community residential setting consumed the recommended five or more fruits and vegetables per day. They also found that only 15% to 30% consumed the recommended 30% or less of calories from fat [21]. Results of a similar study also showed low intake of fruits, vegetables and fiber [22]. Group home managers helped or filled out the FFQs for the clients with IDD. Since managers may not be with clients all day long, they may not know clients’ complete food consumption. The difficulty of receiving post FFQs also show that managers may not have taken the FFQs seriously and quickly filled them out without doing so as accurately as possible. This may also be the reason why it was reported that such a high percent of clients do not qualify for SNAP benefits, even though it has been shown that the majority of adults with disabilities have low income [23]. Managers may not have known the requirements to be qualified for SNAP benefits or rushed to fill out paperwork.

Humphries, Traci and Seekins saw positive impacts from using a nutrition education program involving group home managers, staff and clients [9]. The results of this study showed overall increased nutrition understanding among group home managers as well as an increased likelihood to make better health and nutrition behavior choices. With high manager turnover in group homes, repeating the nutrition education regularly would also be beneficial to managers.

**Challenges and Adaptations**

In developing and evaluating the effectiveness of this adapted curriculum, many changes were seen and made as the program progressed. Some of the changes included providing the clients with a paper copy of the entire lesson’s slides so they could follow
along, thus helping them focus more on the lesson. Managers requested using photographs instead of clip art and color copies. Managers reported the photos were more easily recognized and helped clients connect the concepts to real life. This seemed to make a positive difference for the clients as reported by the managers. The most beneficial part of the adapted curriculum was that it was easily adapted by the NEA to fit the needs of the managers and clients. In the future, the adapted lessons could be taught to clients by NEAs, managers or jointly.

Limitations of the study included a small sample size; possible skewed data from pre and post tests due to managers leading clients toward correct answers; inability to receive complete data sets due to difficulty of getting full and willing participation from group home managers; and possible inaccurate measures from the FFQ.

Managers played a vital part of the study. Many were overwhelmed with the large amounts of paperwork and did not have the support or motivation to fully participate in the program. As a result, they did not return all required paperwork or attend all classes. Managers from group homes who received paid training for participating and had supportive leaders were more likely to be involved, teach the lessons and complete the paperwork required for the study. The large amount of paperwork required for the study may have limited participation, and so by eliminating the extra work (i.e. pre and post tests) managers may be more willing to take part. One idea to help alleviate this problem would be to find a more accurate assessment of diet among this population. One possibility would be to have the NEA assess food content in the kitchen prior to and following the study to determine if healthier food options were available. Another way to alleviate the burden of paperwork on the managers would be to have the NEA at the
lessons taught to clients to assist with paperwork. This would also help get required paperwork returned and on time.

Having the managers together in a positive learning environment gave them the opportunity to converse with fellow managers. They discussed what was working well and how to improve to make the program work more effectively for their clients. The provided peer support helped managers adapt the curriculum to fit the needs of their clients. Having only interested managers sign up and attend may also increase active participation. This could lead to more engaged managers to help excite clients to learn along with encouraging and implementing healthy food and behavior choices.

Group home managers administered the pre and post tests to the clients with IDD. The managers may have lead the clients by emphasizing certain answers. Clients may have helped each other or shouted out answers which lead others to follow. If one client was unable to circle the answer themselves, they received help from the manager who may have hinted at or directed toward the correct answer. A possible solution to this problem would be to have the NEAs administer the pre and post tests individually to the clients.

**Strengths and Successes**

One of the greatest strengths of this program is its flexibility to be taught in a variety of settings. Group home managers could be taught together at a central location as well as individually. Several of the lesson activities were modifiable to fit disability level and specific needs of the clients. Having a structured, but simple curriculum with a basic, adaptable script helped ensure correct information was being taught. The simple script
also made it easier for NEAs to train managers, so they would feel comfortable teaching to the needs and interests of clients.

This study showed overall success at implementing an adapted nutrition curriculum through the Utah SNAP-Ed program. The delivery of the program proved to be adaptable. The curriculum was easily taught by the managers to clients. Both manager and client were able to learn the nutrition information and encourage each other to make healthy choices. Although there were challenges discussed, making necessary changes to address these could make the program more successful.

Additional research could be done by having the NEA go into the group home, teach the manager the regular curriculum, and then either assisting the manager teach the clients or having the NEA teach the clients. It would be beneficial to determine the best teaching method for this program.

The adapted nutrition curriculum for SNAP-Ed was created in order to provide a structured, yet adaptable nutrition education to adults with IDD living in group homes. By implementing this program through educating managers and clients alike, nutrition knowledge was gained and intended behavior change was improved.

References


[17] Utah State University Cooperative Extension Food Sense Nutrition Education Program. What Is Food Sense? [Internet]. 2012; Available at: http://extension.usu.edu/fsne/htm/whatis


CHAPTER 3

TRAINING THE TRAINERS – ADAPTED NUTRITION CURRICULUM FOR ADULTS WITH INTELLECTUAL OR DEVELOPMENTAL DISABILITIES

Abstract

Extension has few programs targeting adults with intellectual or developmental disabilities (IDD). This article evaluates an adapted SNAP-Ed (Supplemental Nutrition Assistance Program – Education) curriculum taught to adults with IDD living in group homes to assess increased nutrition knowledge. Since group home managers often provide, prepare and fix meals, they were taught a traditional SNAP-Ed curriculum and assessed for increased knowledge and intent for improved behavior. Findings show improved nutrition knowledge in both groups and intent to change behavior in group home managers. Teaching adults with IDD and their managers can increase nutrition knowledge and promote healthy behavior change.

Introduction

The rate of overweight and obesity in adults in the United States is high at 68 percent (Flegal et al., 2010). Adults with disabilities have an even higher percentage of obesity than the normal population (Yamaki & Taylor, 2005). According to the National Heart, Lung and Blood Institute’s Obesity Education Initiative (2000), obesity increases risk of morbidity from many chronic health diseases such as cardiovascular disease, type 2 diabetes, hypertension, dyslipidemia, sleep apnea and respiratory problems.
Many adults with IDD live in group homes with managers to help care for them. The managers often act as gatekeepers in planning, purchasing and preparing foods offered to the clients. Clients are limited to food options available to them in their group home (Humphries et al., 2004). The gatekeeper role can either lead to a negative or positive influence on the nutritional quality of foods offered. Managers have many tasks and concerns while working and often want to find something quick and easy to prepare while being acceptable to clients. Often this ends up being less healthy food choices which are calorie dense, high in fat, sugar, and sodium and low in essential vitamins and minerals.

Because of high staff turnover and lack of nutrition knowledge and food skills among managers (Felce et al., 1993; Larson & Lakin, 1992), many group home providers require continual staff training. This promotes increased staff knowledge and the ability to execute their job more effectively (Wood et al., 2007). The more knowledge the manager has and applies in health and nutrition, the more capable they may be to relay that information to clients as well as implementing it into the group home setting by providing and encouraging healthier food and activity choices. Increased education may lead to behavior changes as seen in several behavior change theories such as the Transtheoretical Model and the Precaution Adoption Process Model (Glanz et al., 2008).

Group home managers’ roles include acting as a teacher, caregiver, gatekeeper and example to their clients. Clients are learning various skills throughout their lives and these skills are best learned in a natural setting for them (Saloviita & Lehtinen, 2001). This learning and training can often compensate for lack of formal education in certain
areas. Adults with IDD are at varying levels of disability and learning, so having an adaptable curriculum to fit the learning needs of clients in a comfortable and familiar environment may enhance learning.

There are few programs available to teach nutrition to adults with IDD (Humphries et al., 2008) and their caregivers. The USDA’s SNAP-Ed program aims to provide nutrition education to help promote health and nutrition behavior changes among those with IDD and those who care for them.

**Purpose of the Study**

The purpose of the study was to develop and evaluate the effectiveness of an adapted SNAP-Ed Curriculum through educating group home managers to increase their nutrition knowledge, promote healthy behavior changes and have them teach the adapted curriculum to increase nutrition knowledge in their clients with IDD.

**Methods**

Ten of the traditional SNAP-Ed lessons were adapted for higher functioning adults with IDD. A pilot study was run having senior dietetic students teach high functioning adults with IDD living in group homes who were able make food choices. Their age ranged from 18 to 58 years old. Pre and post tests were administered to the clients (n = 48). Results showed significant improvements in knowledge for four classes (fruits/vegetables, breakfast, snacks, menu planning) and improvement was seen in all assessments in knowledge, behavior and portion skills. The pilot study showed need for
additional adaptations to make the curriculum more flexible and easier to be taught by group home managers to their clients.

Program Design

The curriculum was further refined to include better photographs, a DVD developed for easier viewing, and workbooks for group home managers and clients.

Teaching the curriculum occurred as follows:

1) The graduate student, under direction of the Utah SNAP-Ed coordinator, supervised Nutrition Education Assistants (NEAs) in urban Utah counties to work with caregivers in group homes and introduced to them the adapted curriculum.

2) The NEA was placed in contact with group home provider’s regional directors who then communicated and worked with the group home managers to facilitate the program. Each provider scheduled their group home manager lessons differently varying from weekly to monthly lessons.

3) The NEA taught the traditional SNAP-Ed curriculum and then introduced the adapted curriculum to the group home managers.

4) The managers taught the adapted curriculum to their clients in their group home. Each class included a short lesson, activity and optional food demonstration.
Data Collection

Managers filled out class evaluations which assessed their understanding and knowledge of the topic before and after each lesson. At the conclusion of the study, a behavior checklist was given to managers to determine intent for behavior change before and after receiving the curriculum. A satisfaction survey was also given.

Clients received a nutrition knowledge test related to each topic prior to and following each of the ten lessons. An additional post test was administered one month after the lesson was taught to help determine retention. Each test contained three questions with picture answers.

Statistical Analysis

Paired t-tests were used to determine knowledge improvement from pre to post client tests as well as comparing managers’ behavior checklists. Paired sample tests were used on the manager class evaluations.

Results

Thirty-three managers and 83 group home clients participated in the study. Manager class evaluations showed overall increased understanding and knowledge of nutrition concepts in seven of the eight lessons assessed and all but one of those showed statistical significance. Two of the lessons did not receive an adequate number of evaluations returned to analyze the data.
The manager behavior checklist also showed overall higher post scores indicating intended healthy behavior changes after receiving the curriculum as follows:

- Choosing to be physically active at least 30 minutes five days a week (p = 0.005).
- Choosing to walk, take the stairs or be active in other ways (p = 0.003).
- Preparing meals at home at least three times a week (p = 0.005).
- Eating two servings of fruits a day (p = 0.013).

The overall client pre to post test mean scores showed improvements in nutrition knowledge (Table 12).

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<th>Mean</th>
<th>Standard Deviation</th>
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<tr>
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<td></td>
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Observations

Only three manager satisfaction surveys were received back from the managers. All three agreed the SNAP-Ed lessons helped themselves and their clients learn more about nutrition. They agreed the lessons taught by the NEAs were easy to understand, helpful and informative. They all also found the food demos were simple to make. One of the managers did not attend all the lessons from the NEA and disagreed that the lessons were easy to teach. In contrast, the managers attending most of the lessons agreed the
lessons were easy to teach and the material was easy to adapt to meet the needs of their clients.

One of the managers reported the clients enjoyed the lessons. She wrote: “The ladies listen to me when I am telling them the info but when it comes to retaining the information and taking a quiz about it, they don’t do very well.” Retention seemed to be a common topic. Managers stated the clients would remember bits and pieces of the lessons. One manager related an instance of going to grocery shopping with the client who saw the MyPlate symbol and insisted on purchasing that food item because it was a healthier choice. Other managers commented on clients not retaining the information from the lessons as well as a lack of attention during the lesson.

Observations from a class demonstrated a manager engaging her clients by pointing out certain foods they enjoyed from the food group being discussed. This seemed to get clients more excited, focused and involved. Benefits of having the managers teach the adapted curriculum was that they knew the clients’ needs and level of learning better. Managers knew the clients’ diet and areas to put more emphasis on in the lessons. The clients also feel more comfortable around the manager, which may be a better learning environment for them.

One of the difficulties of the program was getting manager participation. Managers did not like the excess paperwork required for the study such as administering the pre and post tests to clients. This was a source of frustration to the NEAs as well as a limitation to the data received for the study.
Finding Success in Training the Trainers

- Managers need support, encouragement and enthusiasm from group home providers: Having the curriculum taught as a required or paid training helped with attendance. Having only interested managers attend would increase active participation.

- Structured, but simple curriculum with a basic adaptable script helped managers more easily train and feel comfortable teaching to meet specific needs and interests of clients.

- When the manager was more excited and engaged in lessons, they could learn more. Because of managers’ enthusiasm, clients were more likely to get excited and involved. This excitement could possibly lead to clients and managers encouraging each other to make healthy food and behavior changes.

- Minimize paperwork by only having the managers fill out necessary paperwork for the NEA to get credit for the lessons taught.

- Encourage NEAs to fit the lessons to the needs of the managers as well as helping them adapt it to the needs of the clients.

- Provide flexibility in the curriculum. Allow the group home provider or manager to determine what will work best for their clientele. Give the NEA the possibility of teaching the managers individually or as a group and being able to assist the manager as needed in teaching the clients. It is important that the Extension professionals are aware of their audiences’ learning styles to adapt teaching strategies to maximize participation and learning potential (Brill, 2011).
Conclusion

Training the trainers under desirable circumstances, along with the flexibility of the adapted SNAP-Ed curriculum lead to increased nutrition knowledge and intent for behavior change among managers and increased knowledge in adults with IDD living in group homes. Repetition of the curriculum may be needed periodically due to high manager turnover and to aid in knowledge retention for the clients, especially those with more severe disabilities.

References


Abstract

There is a need for nutrition education among adults with intellectual and developmental disabilities (IDD) living in group homes. This study tested the effectiveness of developing, implementing and evaluating an adapted Supplemental Nutrition Assistance Program-Education (SNAP-Ed) nutrition curriculum to teach adults with IDD and their group home managers. Barriers were seen and addressed throughout the study, but overall, the curriculum increased nutrition knowledge among managers and adults with IDD living in group homes.

Conclusion

Obesity continues at a high rate in the United States and can lead to many chronic diseases such as type 2 diabetes, cardiovascular disease, hypertension, dyslipidemia and respiratory problems [1]. These problems extend to adults with disabilities with an even higher percentage of obesity [2]. Focusing on prevention of these diseases warrants increased nutrition education available to help educate and promote health and behavior changes. Few nutrition programs are available to educate adults with IDD [3]. Adults with IDD living in group homes have managers who assist them as needed with daily activities. The managers’ nutrition knowledge becomes important because of their role in food selection and preparation with or without the help of their clients.
The USDA’s SNAP-Ed aims to provide nutrition education to promote healthy eating and active lifestyle choices to low-income persons qualifying for Supplemental Nutrition Assistance Program (SNAP) benefits. This study looked at the effectiveness of an adapted SNAP-Ed curriculum taught by group home managers to their clients to increase knowledge and encourage healthy behavior changes. SNAP-Ed Nutrition Education Assistants (NEAs) taught managers of group homes the traditional SNAP-Ed curriculum and then trained them on the adapted curriculum. A sub-objective of the study was to examine pre and post changes in managers’ nutrition related knowledge and behaviors. Results of this study showed increased nutrition knowledge among clients and managers as well as increased intent to make healthy behavior changes among managers.

The chosen teaching method for this study was having the NEA teach the manager and then the manager taught the clients. This method seemed to be beneficial since the managers knew their clients well and were able to adapt the curriculum to fit specific learning levels, needs and interests. This adaptability is one of the major strengths of this curriculum. Managers were able to focus on certain points of interest to their clients to get more involvement and enhance learning. Lesson activities often had two options to better fit the clients’ needs. The possibility of the NEA adapting to teach group home managers individually or collectively as well as being able to go into the group home and aid the manager in teaching makes this curriculum more user friendly. More research is needed to find out what method of teaching is most effective in this setting.

Training the managers to teach the adapted curriculum can help increase their own nutrition knowledge as well as enhance the clients’ learning because adults with
IDD learn best in a natural setting like their home [4]. This learning and training can often compensate for lack of formal education in certain areas.

One of the most difficult challenges of this study was getting managers motivated to participate, fill out paperwork and return it. Possible solutions include gaining support and encouragement from group home providers or those in charge of the manager. In groups with more provider support and paid mandatory trainings, an increase in manager compliance and participation was seen. The study did require a lot of paperwork for the managers and much of that paperwork was not returned for analysis of the data. Pre FFQ tests were received, but none of the NEAs were able to get post FFQ tests back. Managers already have a lot of paperwork to fill out for their job and adding extra seemed to take its toll on managers’ willingness to participate and return paperwork to the NEAs. One idea to minimize this paperwork would and still get an accurate assessment of intake would be to have managers keep receipts of food purchased prior to and following the study. This would give a good view of intake but also of behavior changes. By minimizing required paperwork, managers may be more willing to participate.

As managers saw an importance in health and nutrition, they were more willing to participate. Because of high turnover rates, people working as group home managers are not driven to improve in their job, but are usually just there to put in the hours and get a paycheck. This made it more difficult for the managers to see the importance of the study and their participation with it. NEAs need to assess the needs and concerns of the managers to help fit the lessons into their life as well as finding ways to incorporate the ideas learned into their job as managers to help their clients with better nutrition.
Due to the difficulty of working with this population, but need for nutrition education, several institutions have been interested in the adapted SNAP-Ed curriculum for adults with IDD. Overcoming the discussed barriers to this study by selecting willing participants, decreasing paperwork, assessing level of change and adapting lessons to meet the needs of the managers and clients, and support from group home providers should help the program run more smoothly and accomplish its purpose. Because a study cannot be as flexible due to paperwork and set methods, implementing the adapted curriculum as part of the SNAP-Ed should be more easily done than the study testing its effectiveness.

The adapted nutrition curriculum can make a difference in the lives of group home managers and their clients by increasing nutrition knowledge and intent to change behaviors. This curriculum should be repeated periodically to help clients maintain nutrition knowledge as well as educating managers to provide healthier foods to the clients and encourage them to make better food choices.

References


Appendix A. Adapted SNAP-Ed Curriculum Cooking Demonstrations

Meat, Beans, and Proteins

Peanut Butter Fruit Dip
Ingredients needed:
- 2 cups skim milk
- 1 package instant sugar free vanilla pudding
- ½ cup fat free sour cream
- ¼ cup sugar
- 1 cup peanut butter
- Apples, bananas, or any other fruit you want to dip

Supplies needed:
- Mixing bowl
- Spoon

Directions: blend all ingredients together. Store in refrigerator. Serve with cut fruit.

Menu Planning and Shopping

Tuna Sandwiches
Ingredients needed:
- Can of tuna
- Low fat mayonnaise
- Whole wheat bread

Supplies needed:
- Can opener
- Bowl
- Spoon

Directions: open can of tuna and place in bowl. Add mayonnaise. Spread between two pieces of bread.

Dairy

Fruit and Yogurt Parfait
Ingredients needed:
- Vanilla yogurt
- Blueberries, strawberries, bananas or any other fruit.
- Granola, oatmeal or cereal

Supplies needed:
- Plastic cups
- Spoons

Directions: Place yogurt in bottom of cup. Add berries on top of yogurt. Add more yogurt on top of berries. Add granola on top.
Appendix B. Adapted SNAP-Ed Curriculum Sample Lesson Activity

**Fitness Lesson Activity**

**Option 1:**
Get a balloon or a ball and play balloon volleyball or hit it around in a circle. Could also use a ball and kick or throw it around.

**Option 2:**
The instructor is to lead a game of “Simon-Says.”
*How to Play:* The instructor will give commands starting with the phrase “Simon Says.” An example command would be “Simon says put your hands on your head.”
If the instructor gives a command without saying “Simon says,” then everyone who obeyed the command is out.
*Example commands:*
- Clap your hands
- Touch your toes
- Touch your eyes

**Option 3:**
Do the Hokey Pokey. Sing the song while doing the actions.
*Lyrics*
You put your right foot in,
You put your right foot out;
You put your right foot in,
And you shake it all about.
You do the Hokey-Pokey,
And you turn yourself around.
That’s what it’s all about!

Repeat first verse by switching these words in:
- left foot
- right hand
- left hand
- right side
- left side
- nose
- backside
- head
- whole self

**Option 4:**
Play tag or Frisbee or some other physically active game the participants enjoy (kickball, soccer, bowling, bike riding, swimming, etc).
Today we are going to talk about fruits and vegetables. This is a picture of a fruit bowl and a vegetable bowl.

- Can you name some of the fruits and vegetables in the bowls?
  - kiwi, peach, banana, radish, carrot, cucumber, lettuce, cabbage, snap peas

It is important to eat fruit.

- Can you name these pieces of fruit? (apples, grapes, banana, peach)
- Do you like to eat fruit?
Appendix D. Sample Client Workbook

Fruits and Vegetables

It is important to eat fruit.

Can you name these pieces of fruit?

Can you name these vegetables?

It is important to eat vegetables.

The bright colors of fruits and vegetables tell us they are good.

Pick your favorite bright color and draw a fruit or vegetable you like to eat.
Appendix E. Copy of Client Consent Form

Utah State University
Department of Nutrition and Food Sciences
8700 Old Main Hill
Logan UT 84322-8700
Telephone: (435) 797-2126

INFORMED CONSENT
The Effectiveness of an Adapted SNAP-Ed (Supplemental Nutrition Assistant Program) Nutrition Education Curriculum for Adults with Intellectual or Developmental Disabilities (IDD)

Introduction/Purpose We would like to ask you to participate in our nutrition classes. We at Utah State University (USU) are studying how effective we are in adapting some classes for people in group homes. These classes are like the classes we teach in groups or in homes for two nutrition programs funded by the government.

Procedures If you agree to be in this research study, you will be asked to do the following:
1. You will be asked to take ten classes for six weeks to three months on nutrition. The lessons will each be about 15 minutes long.
2. You will prepare some basic foods if permitted by your facility and staff.
3. You will exercise with the teachers for 15 minutes of moderate exercise if you are able.
4. You will be given pre and post tests to assess your knowledge on the topics taught.
5. Information about your height, weight and level of disability will be gathered.

Risks There are no expected risks associated with involvement in the study.

Benefits If you participate in this study, you will learn more about nutrition and physical activity. This may contribute to a healthier life.

Explanation & offer to answer questions If you have any questions about the study you can contact Dr. Nedra Christensen at (801) 484-9374.

Cost There will be no cost to you and you will not be paid any money for being in this research.

Voluntary nature of participation and right to withdraw without consequence Nothing will happen to you if you do not want to participate. If you begin the study you can stop at any time and nothing will happen to you.

Confidentiality All of your answers on the pre and post tests will be kept secret and will not be told to anyone else who is not part of our research team. The information will be safe because we will remove your name from any papers with your scores when they are filed in our offices. We will give you and your scores a special number and only our study director will know which scores are yours. When we write reports about this research, we will never tell who was in the study and we will only report what happened to everyone all together. The data will be kept for five years in a locked cabinet and then it will be destroyed.

IRB Approval Statement The Institutional Review Board for the protection of human participants at USU has approved this research study. If you have any pertinent questions or concerns about your rights or a research-related injury, you may contact the IRB Administrator at (435) 797-0567 or email
INFORMED CONSENT
The Effectiveness of an Adapted SNAP-Ed (Supplemental Nutrition Assistant Program) Nutrition Education Curriculum for Adults with Intellectual or Developmental Disabilities (IDD)

irb@usu.edu. If you have a concern or complaint about the research and you would like to contact someone other than the research team, you may contact the IRB Administrator to obtain information or to offer input.

Copy of consent You have been given two copies of this Informed Consent. Please sign both copies and retain one copy for your files.

Investigator Statement “I certify that the research study has been explained to the individual, by me or my research staff, and that the individual understands the nature and purpose, the possible risks and benefits associated with taking part in this research study. Any questions that have been raised have been answered.”

Signature of PI & Student

Nedra Christensen, Ph.D. R.D.  Amanda Panting, R.D.
Principle Investigator Graduate Student
(801) 484-9374 (208) 244-1233

Participant Assent I understand that my parent(s)/guardian is/are aware of this research study and that permission has been given for me to participate. I understand that it is up to me to participate even if my guardian says yes. If I do not want to be in this study, I do not have to and no one will be upset if I don’t want to participate or if I change my mind later and want to stop. I can ask any questions that I have about this study now or later. By signing below, I agree to participate.

Signature of Participant By signing below, I agree to participate.

Name of Participant ___________________________ Signature of Participant ___________________________ Date ____________

Name of Guardian ___________________________ Signature of Guardian ___________________________ Date ____________
Appendix F. Copy of Manager Consent Form

INFORMED CONSENT
The Effectiveness of an Adapted SNAP-Ed (Supplemental Nutrition Assistant Program) Nutrition Education Curriculum for Adults with Intellectual or Developmental Disabilities (I/DD)

Introduction/Purpose Professor Nedra Christensen in the Department of Nutrition and Food Sciences at Utah State University is conducting a research study to find the effectiveness of adapting a nutrition education classes for people living in group homes with intellectual and developmental disabilities. The purpose of this study is to develop an efficient statewide protocol to include adults with disabilities in the SNAP-Ed program. These classes are like the classes we teach in groups or in homes for two nutrition programs funded by the government (Supplemental Nutrition Assistant Program and the Expanded Food and Nutrition Program).

Procedures If you agree to be in this research study, you will be asked to do the following:
1. You will be asked to take ten nutrition classes to be completed within six weeks to three months. The lessons will each be about 30-45 minutes long. Included in the nutrition class, the teacher will teach you the adapted nutrition curriculum for the study participants in the group home.
2. You will be asked to teach the ten adapted nutrition lessons to the study participants in the group home. The adapted nutrition lessons are about 15 minutes long. One or two lessons can be taught per week.
3. You will help prepare some basic foods to teach group home participants.
4. You will facilitate the activity that goes along with each nutrition lesson.
5. You will complete pre and post tests to assess your knowledge on the topics taught.
6. You will complete behavior checklists which are a standard component of SNAP-Ed.

New Findings During the course of this research study, you will be informed of any significant new findings (either good or bad), such as changes in the risks or benefits resulting from participation in the research, or new alternatives to participation that might cause you to change your mind about continuing in the study. If new information is obtained that is relevant or useful to you, or if the procedures and/or methods change at any time throughout this study, your consent to continue participating in this study will be obtained again.

Risks There are no anticipated risks involved in the study.

Benefits By participating in this study, you will learn more about nutrition and physical activity. This may contribute to a healthier life. This may also help those you teach lead a healthier life. This may also help you gain more teaching experience and better qualifications.

Explanation & offer to answer If you have any questions about the study you can contact Dr. Nedra Christensen at (801) 484-9374.

Extra Cost(s) There will be no cost to you for participating.
INFORMED CONSENT

The Effectiveness of an Adapted SNAP-Ed (Supplemental Nutrition Assistant Program) Nutrition Education Curriculum for Adults with Intellectual or Developmental Disabilities (IDD)

Payment You will be paid with a VISA gift card in the amount of $25 for completing the requirements of this research.

**Important note to participants who will receive payments, gift cards or similar items of value for participating in this research:** The Internal Revenue Service (IRS) has determined that if the amount you get from this study, plus any prior amounts you have received from USU since January of this year total $600 or more, USU must report this income to the federal government. To do this, USU will need to collect your name and Social Security Number. In doing so, there is a possible risk of people gaining access to your personal information; however, your risk is limited by the security measures that are in place to protect your information. If you are a USU employee, any payment you receive from this study will be included in your regular payroll.

Voluntary nature of participation and right to withdraw without consequence Participation in research is entirely voluntary. You may refuse to participate or withdraw at any time without consequence or loss of benefits. You may be withdrawn from this study without your consent by the investigator.

Confidentiality Research records will be kept confidential, consistent with federal and state regulations. All of your answers on the pre and post tests and behavior checklist will be kept confidential and will not be told to anyone else who is not part of our research team. The information will be safe because we will remove your name from any papers with your scores when they are filed in our offices. Your scores will have a special number and only our study director will know which scores are yours. Reports about this research, will not disclose who was in the study, but will be reported as group results only. The data will be kept for five years in a locked cabinet and then will be destroyed.

IRB Approval Statement The Institutional Review Board for the protection of human participants at USU has approved this research study. If you have any pertinent questions or concerns about your rights or a research-related injury, you may contact the IRB Administrator at (435) 797-0567 or email irb@usu.edu. If you have a concern or complaint about the research and you would like to contact someone other than the research team, you may contact the IRB Administrator to obtain information or to offer input.

Copy of consent You have been given two copies of this Informed Consent. Please sign both copies and keep one copy for your files.
INFORMED CONSENT
The Effectiveness of an Adapted SNAP-Ed (Supplemental Nutrition Assistant Program) Nutrition Education Curriculum for Adults with Intellectual or Developmental Disabilities (IDD)

Investigator Statement “I certify that the research study has been explained to the individual, by me or my research staff, and that the individual understands the nature and purpose, the possible risks and benefits associated with taking part in this research study. Any questions that have been raised have been answered.”

Signature of PI & Student

Nedra Christensen, Ph.D. R.D.
Principal Investigator
(801) 484-9374

Amanda Panting, R.D.
Graduate Student
(208) 244-1233

Signature of Participant By signing below, I agree to participate.

Participant’s signature Date
Appendix G. Group Home Provider and Manager Study Information Sheet

SNAP-Ed Basics

**What:** Teaching ten nutrition lessons to increase nutrition knowledge in group home managers and adults living in group homes.

**Why:** 60% of Americans are overweight with many people getting cardiovascular disease and Type II Diabetes. The percentage is even higher among people with disabilities. More nutritional knowledge can help you make better choices for a healthier lifestyle.

**Who:** Utah State University, Nutrition and Food Science Department, Food Sense Nutrition Education Extension Program of the SNAP Ed (Supplemental Nutrition Assistance Program Education)

**Where:** Lessons taught in group homes. Different counties throughout the state of Utah (Weber, Box Elder, Utah, Salt Lake, Cache, Sanpete, Tooele, Millard, Iron, Wayne counties).

**Qualifications:** Higher functioning adults with intellectual and/or developmental disabilities who live in group homes. We are looking for people who have some food choices.

**Length:** 10 lessons (one or two lessons taught per week)
Lessons taught to the group home manager are approximately 30 minutes. Lessons taught to clients (about 10-15 minutes) plus activity, food demonstration (optional) and pre/post tests.

**Teaching:** Nutrition Education Assistants teach the group home manager as well as the clients. Teaching includes 10 lessons on nutrition, DVD with PowerPoint, workbook for client and manager, activities to do, food demo if desired, pre and post tests for clients, pre and post tests and behavior checklist for the group home manager.

**Incentive:** Health benefits to both clients and managers. Group home managers will receive a $25 gift card for completing the study.

**Information Collected:** Disability, level of disability (mild/moderate), pre and post tests, behavior change checklist, final evaluation of curriculum.

**Contact Information:**
Nedra Christensen, PhD, RD  Amanda Panting, RD
Professor  Graduate Student
nedra.christensen@usu.edu  amanda.panting@aggiemail.usu.edu
(801) 484-9374  (208) 244-1233
Appendix H. Sample Class Participant Form

Food Sense Class Participant Form

Instructions: Please complete this form for every class you participate in. Fill in the circles completely with a pen. If you make a mistake make an X, and then fill in the correct circle. If there are blank spaces, please write legibly.

Please write your first and last initials on the line, and then fill in the corresponding circled letter.

First letter of first name: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Last letter of last name: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Age:
○ Less than 5 years
○ 5-17 years
○ 18-39 years
○ 60 years or older

Please write month and day on which you were born, and then fill in the corresponding circled number(s). If your birthday is on the 10th or higher, please fill in the first number on the top row. For example, for the 10th fill in the [ ] on the first row and the [ ] bottom row. You must circle a number in each row.

Month: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Day: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Gender:
○ Female
○ Male

Race:

Fill in the circle that corresponds to your race
○ American Indian or Alaskan Native
○ Asian
○ Black or African American
○ Native Hawaiian or other Pacific Islander
○ White

If you claim additional race circle below
○ American Indian or Alaskan Native
○ Asian
○ Black or African American
○ Native Hawaiian or other Pacific Islander
○ White

Ethnicity: (regardless of your race do you consider yourself to be of
Hispanic origin or Latino descent?)
○ Yes
○ No
Instructions: Fill in the circle that best describes the overall class in each of the four categories.

<table>
<thead>
<tr>
<th>Rate the class</th>
<th>None</th>
<th>Little</th>
<th>Some</th>
<th>Average</th>
<th>Quite a bit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Overall usefulness of lessons</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Overall effectiveness of presentation</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. Overall Quality of Session</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. Overall knowledge gained</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Food Sense is a federally funded program. Please complete the questions below stating if you qualify for the following assistance. Please review the income chart below to help you answer the question.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you currently receive Food Stamps</td>
<td></td>
</tr>
<tr>
<td>Do you currently qualify for Food Stamps</td>
<td></td>
</tr>
<tr>
<td>Do you currently qualify for other assistance</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Family Size</th>
<th>Income @130% of Poverty</th>
<th>Income @185% of Poverty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Annual</td>
<td>Monthly</td>
</tr>
<tr>
<td>1</td>
<td>$14,079.00</td>
<td>$1,173.25</td>
</tr>
<tr>
<td>2</td>
<td>$18,941.00</td>
<td>$1,578.42</td>
</tr>
<tr>
<td>3</td>
<td>$23,803.00</td>
<td>$1,983.36</td>
</tr>
<tr>
<td>4</td>
<td>$28,665.00</td>
<td>$2,388.75</td>
</tr>
<tr>
<td>5</td>
<td>$36,127.00</td>
<td>$2,793.92</td>
</tr>
<tr>
<td>6</td>
<td>$38,389.00</td>
<td>$3,199.08</td>
</tr>
<tr>
<td>7</td>
<td>$43,251.00</td>
<td>$3,604.25</td>
</tr>
<tr>
<td>8</td>
<td>$48,113.00</td>
<td>$4,009.47</td>
</tr>
</tbody>
</table>

For family units of more than 8 members add $3,740.00 for each member.
Appendix I. Food Frequency Questionnaire

<table>
<thead>
<tr>
<th>FRUIT</th>
<th>(includes juices, fresh, canned, frozen or dried)</th>
<th>Never or less than 1 a week</th>
<th>1-3 per week</th>
<th>4-6 per week</th>
<th>1 per day</th>
<th>2-3 per day</th>
<th>4-5 per day</th>
<th>6+ per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>cherries; cranberries; pink grapefruit; pomegranates; raspberries; apples; grapes; strawberries; watermelon</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Orange/Yellow</td>
<td>apricots; cantaloupe; grapefruit; lemons; mangos; nectarines; oranges; papayas; peaches; pineapple; tangerines; yellow apples</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Green</td>
<td>avocados; green apples; grapes; honeydew; kiwi; limes</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Blue/Purple</td>
<td>blackberries; blueberries; elderberries; black currants; plums; prunes; grapes; raisins</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>White</td>
<td>bananas; pears</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VEGETABLES</th>
<th>(includes juices, fresh, canned, frozen or dried)</th>
<th>Never or less than 1 a week</th>
<th>1-3 per week</th>
<th>4-6 per week</th>
<th>1 per day</th>
<th>2-3 per day</th>
<th>4-5 per day</th>
<th>6+ per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>beets; red lettuce; red onions; red peppers; red potatoes; rhubarb; tomatoes; salsa</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Orange/Yellow</td>
<td>carrots; corn; pumpkin; sweet potatoes (yams); rutabagas; winter squash (acorn, banana, butternut, spaghetti, etc); yams; yellow peppers</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Green</td>
<td>asparagus; beans; broccoli; brussels sprouts; cabbage; celery; green peppers; winter greens (including collard, kale, mustard, and turnips); cucumbers; lettuce; okra; peas; spinach; swiss chard; zucchini</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
### Food Frequency Questionnaire Page 2

#### Participant Initials
- NEA Name/County

#### Blue/Purple
- Eggplant; purple potatoes; purple asparagus; purple cabbage; purple peppers

#### White
- Cauliflower, corn, garlic, jicama, kohlrabi, mushrooms, onions, potatoes, radishes, shallots, turnips

#### Meats, Beans and Proteins

##### Eggs
- Whole; egg whites; egg beaters

##### Beans
- Black; kidney; lentils; red pinto; white; dried peas

##### Beef
- Hamburger; jerky; roast; steak

##### Pork
- Bacon; chops; loin; roast

##### Poultry
- Fried; with skin or without skin; baked; grilled

##### Fish/Seafood
- Clams; fish; lobster; mussels; shrimp; scallops

##### Other Meats
- Hot dogs; lunch meats

**Out of all the meats—how many times a week do you select lean cuts?**

#### DAIRY

- Milk (skim, 1%, 2%, or whole); creamer; frozen yogurt; ice cream; cheese (by itself or part of a meal)

**Out of the dairy you eat in a week, how many times do you select a low or non-fat choice?**
**Food Frequency Questionnaire Page 3**

Participant Initials: 
Participant B Day Month: 
Participant B-Day date: 
NEA Name/County: 

**GRAINS**

<table>
<thead>
<tr>
<th>Whole Grains</th>
<th>Never or less than 1 per week</th>
<th>1-3 per week</th>
<th>4-6 per week</th>
<th>1 per day</th>
<th>2-3 per day</th>
<th>4-5 per day</th>
<th>6 per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>bread; bulgur; cereals; crackers; kasha; oatmeal; pancakes or waffles; pasta; popcorn; rice; wheat berries; quinoa</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Refined Grains</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**DISCRETIONARY CALORIES**

| Sugary drinks such as regular sodas, hawaiian punch; kool-aid or other similarly sweetened fruit flavored drinks; beer; wine; liquor | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sweets such as candy bars; other candy; desserts; brownies; cake; pie; cookies; oils such as olive oil; canola oil; other fats such as butter; margarine; mayonnaise; salad dressing and other oils | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fatty foods such as potato chips; fries; donuts | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

If for a dietary analysis go to MyPyramid Food Tracker at [http://www.mypyramid.gov](http://www.mypyramid.gov) and link on MyPyramid Tracker.
Appendix J. Manager Class Evaluation Form
Appendix K. Manager Behavior Checklist
Food Sense Behavior Checklist

Directions: Please reflect back before you participated in Food Sense. Rate your behaviors on the left. Now that you have completed a series for Food Sense the behaviors you plan to do. Please write legibly, fill in number circle completely.

<table>
<thead>
<tr>
<th>Prior to Food Sense I...</th>
<th>Now I will ............</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plan meals ahead of time</td>
</tr>
<tr>
<td>2</td>
<td>Compare prices before buying food</td>
</tr>
<tr>
<td>3</td>
<td>Have enough food to last through the end of the month</td>
</tr>
<tr>
<td>4</td>
<td>Shop with a grocery list</td>
</tr>
<tr>
<td>5</td>
<td>Refrigerate meat and dairy within two hours of shopping</td>
</tr>
<tr>
<td>6</td>
<td>Thaw frozen foods in the refrigerator.</td>
</tr>
<tr>
<td>7</td>
<td>Make food purchases based on healthy choices</td>
</tr>
<tr>
<td>8</td>
<td>Prepare foods without adding salt</td>
</tr>
<tr>
<td>9</td>
<td>Read Nutrition Facts Labels before purchasing</td>
</tr>
<tr>
<td>10</td>
<td>Children in household eat something within 2 hours of waking</td>
</tr>
<tr>
<td>11</td>
<td>Wash hands before food preparation or eating</td>
</tr>
<tr>
<td>12</td>
<td>Prepare raw foods separately from other foods</td>
</tr>
<tr>
<td>13</td>
<td>Choose to be physically active, at least 30 minutes 5 days a week</td>
</tr>
<tr>
<td>14</td>
<td>Choose to walk, take the stairs, or be active in other ways</td>
</tr>
<tr>
<td>15</td>
<td>Prepare meals at home at least 3 times a week</td>
</tr>
<tr>
<td>16</td>
<td>Eat meals together as a family at least 3 times a week</td>
</tr>
<tr>
<td>17</td>
<td>Eat at least 3 servings of vegetables a day</td>
</tr>
<tr>
<td>18</td>
<td>Eat at least 2 servings of fruits a day</td>
</tr>
<tr>
<td>19</td>
<td>Eat at least 2 servings of dairy a day</td>
</tr>
<tr>
<td>20</td>
<td>Replace saturated and trans-fats with heart healthy fat</td>
</tr>
</tbody>
</table>
Appendix L. Manager Satisfaction Survey

Satisfaction Survey

Please rate the following questions by circling the answer.

1. **The SNAP-Ed lessons helped you learn more about nutrition.**
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree
   - N/A

2. **The adapted SNAP-Ed lessons helped the group home clients learn more about nutrition.**
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree
   - N/A

3. **The lessons taught by the NEA (Nutrition Education Assistant) were easy to understand.**
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree
   - N/A

4. **The lessons taught by the NEA were helpful and informative.**
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree
   - N/A

5. **The adapted lessons were easy to understand.**
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree
   - N/A

6. **The adapted lessons were easy to teach.**
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree
   - N/A

7. **The adapted lesson outline was easy to understand.**
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree
   - N/A

8. **The group home clients understood the nutrition lessons.**
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree
   - N/A

9. **The activities were easy to adapt to fit the needs of the clients.**
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree
   - N/A

10. **The activities were easy to understand and implement.**
    - Strongly Disagree
    - Disagree
    - Agree
    - Strongly Agree
    - N/A

11. **The activities were acceptable to the clients.**
    - Strongly Disagree
    - Disagree
    - Agree
    - Strongly Agree
    - N/A

12. **The lessons and activities were at an appropriate level for the clients.**
    - Strongly Disagree
    - Disagree
    - Agree
    - Strongly Agree
    - N/A
13. The food demos were simple to make.
   Strongly Disagree  Disagree  Agree  Strongly Agree  N/A

14. The food demos were something the participant could prepare.
   Strongly Disagree  Disagree  Agree  Strongly Agree  N/A

15. The food demos were acceptable to the clients.
   Strongly Disagree  Disagree  Agree  Strongly Agree  N/A

16. The clients improved their way of eating.
   Strongly Disagree  Disagree  Agree  Strongly Agree  N/A

17. The workbooks were easy to use.
   Strongly Disagree  Disagree  Agree  Strongly Agree  N/A

18. The participants were willing to participate.
   Strongly Disagree  Disagree  Agree  Strongly Agree  N/A

19. The participants enjoyed learning the material.
   Strongly Disagree  Disagree  Agree  Strongly Agree  N/A

20. The class was enjoyable to you.
   Strongly Disagree  Disagree  Agree  Strongly Agree  N/A

21. The class was enjoyable to the clients.
   Strongly Disagree  Disagree  Agree  Strongly Agree  N/A

22. You would be willing to re-teach the lessons.
   Strongly Disagree  Disagree  Agree  Strongly Agree  N/A
Appendix M. Sample Client Pre/Post Test

Pre-Test
Snacks Lesson

Name: __________________________

Circle the Correct Answer

1) What food is a healthy choice for a snack?
   a. Apple  
   b. French Fries  
   c. Chips  
   d. Cupcake

2) Which of the following snack is from the grain group?
   a. Yogurt  
   b. Orange  
   c. Crackers  
   d. Carrots

3) Which food items would NOT be a healthy snack choice?
   a. Yogurt and Strawberries
   b. Cheese and Crackers
   c. Ice Cream and Gummy Bears
   d. Toast and Banana