A PILOT STUDY: EFFECTIVENESS OF BASIC COOKING SKILLS AND NUTRITION EDUCATION FOR ADULTS WITH DISABILITIES AND CAREGIVERS

A Thesis
Presented in Partial Fulfillment of the Requirements for the Degree Master of Science in the Graduate School of The Ohio State University

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ABSTRACT

The rate of lifestyle-related conditions and disease is disproportionately high among adults with intellectual and developmental disabilities (ID/DD); however, few health promotion programs target this population. The purpose of this study was to evaluate a nutrition and cooking education program by describing the participation within a sample of five adults with ID/DD and seven accompanying homecare staff. Participants attended a six week interactive pilot program focused on balanced nutrition and basic cooking skills. Data was collected through observational field notes, video-tapes and pre- and post-program participant interviews. The weekly nutrition lessons provided increased awareness of healthful eating and demonstrate a motivational phase of nutrition education. The action phase included weekly preparation of recipes, at-home challenges and grocery store tour. Participants were able to expand on their knowledge and demonstrate successful application. Lastly, participation of the homecare staff influenced environmental change. The limitations of this study include a small, convenience sample and the reliance of self-reported data and perceived observations by the note-taker. While the study was constrained by limitations, it offers information and developed themes that may set the groundwork for further research and development of health promotion for the ID/DD population. This study demonstrates evidence for promotion of healthy behavior changes and increasing knowledge among adults with DD/ID. Community healthcare professionals should consider development of additional health promotion programs targeted to DD/ID adults and their support systems. Longer-term programs may be helpful in influencing more permanent behavior change and could impact overall health outcomes.
DEDICATION

To Jeremy, thank you for coming along for the ride and your unwavering support the whole way.

To my parents, thank you for my roots and my wings.
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A Pilot Study: Effectiveness of Basic Cooking Skills and Nutrition Education for Adults with Disabilities and Caregivers

Chapter 1

Introduction

Background of the Problem

Currently more than one-third of U.S. adults are obese, and it is estimated that by 2030 half of American adults may be obese if measures are not taken to reverse the current trend (1). Marginalized populations have a greater prevalence of obesity than the general population. Adults with disabilities are at greater risk for obesity and comorbidities and receive less aid in managing these health concerns (2). The rate of obesity among adults with disabilities is currently 57% greater than the non-disabled adults, reflecting the health disparity for this group regarding the obesity epidemic (3).

Increased risk for and prevalence of obesity in adults with intellectual disabilities and/or developmental disabilities (ID/DD) is multi-factorial. Individuals with ID/DD typically have worse dietary habits and lead more sedentary lives than the non-disabled population resulting in increased incidence of comorbidities and subsequent reduced quality of life. While unclear what specific environmental or behavioral factors have contributed to the high incidence of obesity among adults with intellectual disabilities,
research has demonstrated that obesity rates increase with less restrictive living arrangements. The greatest rate of obesity is among high functioning disabled individuals living with less restricted facilities including family homes, intermediate care facilities or group homes (2).

Defined as a body mass index (BMI) greater than or equal to 30 kg/m$^2$, obesity is caused by an imbalance of energy resulting in a disproportionate amount of body fat which leads to increased health risks and reduced quality of life. Environmental factors including increased consumption of calorie-dense, convenience foods and sedentary lifestyle have led to increased obesity across populations (1). Obesity is linked to increased risk of multiple chronic diseases including type 2 diabetes, cardiovascular diseases, osteoarthritis, and certain malignancies. Adults with ID/DD face greater risk of developing comorbidities and other lifestyle-related conditions (4).

Health promotion programs have been developed and implemented to target healthy lifestyle habits that promote weight management and improvement of lifestyle-related health outcomes. These programs aim to empower participants to take a more active role in managing their health including self-advocacy and lifestyle changes. Community health promotion programs offering nutrition and lifestyle education have provided participants with the knowledge to make healthier choices and increase activity. Another focus of these programs is to educate participants regarding the relationship between their health, weight and lifestyle. Experiential learning in health promotion programs which provide students hands-on lessons has been successful in improving self-efficacy in
exercise and food preparation. Modest weight loss linked to decreased risk of chronic disease has also occurred as a result of such programs (5).

Despite the disproportionately high incidence of obesity in adults with ID/DD, there continues to be limited opportunities to participate in health promotion programs for this population. Community health promotion programs are typically designed for the general population and may not address barriers to healthy living faced by adults with ID/DD. There is limited research available on studies of health promotion programs targeted at the intellectually disabled population. However, it is clear that modifications to typical health promotion programs to address various levels of cognitive ability, physical function and independence are necessary for the success within this group (6).

Statement of the Problem

Adults with ID/DD experience obesity and other lifestyle-related diseases at a disproportionately higher rate than the general population; however, they typically have few resources available to treat or prevent these poor health outcomes. While programs to combat the obesity epidemic among the entire population are becoming more popular, community health promotion programs are typically designed for the needs of the general population and may not be relevant or accessible to the population with ID/DD. These specialized health promotion programs should address several factors including knowledge, skill level, resources and support systems. Most general health promotion programs are not designed to include all of these factors.
As the poor health outcomes related to lifestyle continue to rise in adults with ID/DD, health promotion programs designed for this population and their support systems could empower and motivate this population to make healthy behavior changes and improve health outcomes.

**Purpose of the Study**

The purpose of this study was to develop and pilot a nutrition and cooking skill program designed for adults with ID/DD and their caregivers.

**Research Objective**

The objective of this study was to describe the perceptions and participation of adults with ID/DD and their caregivers during a nutrition and cooking skills program as well as describe the effectiveness of the program for adults with ID/DD.

**Significance of the Study**

Obesity and other lifestyle-related conditions are major health concerns for adults with ID/DD. Health promotion programs can provide knowledge and skills to promote prevention of obesity and other lifestyle-related conditions; however, few programs have targeted this population. The obesity epidemic among adults with ID/DD is multi-factorial. Knowledge, skills and economics all play a role in the habits and health of adults with ID/DD. The nutrition and cooking program developed and evaluated in this study was adapted specifically for adults with ID/DD to learn to take a more active role in making healthy food choices and preparing healthful,
affordable meals. This program included support staff as fully engaged participants.

The support of caregivers in behavior modification is crucial in the population with ID/DD. Involvement of support staff in this pilot was intended to help provide regular reinforcement and practice of the concepts and skills learned during the six week program. The evaluation of the pilot program involves the perceptions of both the adults with ID/DD and their support staff. The evaluation includes changes in behavior and knowledge as well as their overall perception of the course; allowing for future modifications to improve the current curriculum and promote greater outcomes for future participants.

**Definitions of Terms**

1. **BMI** – body mass index, a measure of body fat that is the ratio of the weight of the body in kilograms to the square of its height in meters. A body mass index in adults of 25 to 29.9 is considered an indication of overweight, and 30 or more an indication of obesity. ([http://www.nhlbi.nih.gov/guidelines/obesity/bmi_tbl.htm](http://www.nhlbi.nih.gov/guidelines/obesity/bmi_tbl.htm))

2. **DD** – Developmental Disability, an all-encompassing term referring to conditions resulting from mental and/or physical impairments which may affect language, mobility, learning, self-help, and independent living.

3. **ID** – Intellectual Disability, a disability characterized by significant limitations both in intellectual functioning and in adaptive behavior, which covers many everyday social and practical skills. ([http://aaidd.org/content_100.cfm?navID=21](http://aaidd.org/content_100.cfm?navID=21))

4. **Health Promotion** – the process of enabling people to increase control over their health and its determinants, and thereby improve their health.
5. Obesity – a condition that is characterized by excessive accumulation and storage of fat in the body and that in an adult is typically indicated by a body mass index of 30 or greater. (http://www.merriam-webster.com/medlineplus/obesity)
Chapter 2

Literature Review

Introduction

This literature review investigates the current research relevant to the implementation and outcomes of a health promotion program for obese adults with ID/DD and accompanying caregivers.

Developmental disability (DD) is an all-encompassing term referring to conditions resulting from mental and/or physical impairments which may affect language, mobility, learning, self-help, and independent living. The onset of DD is considered before 22 years and will last throughout life (7). Intellectual disability (ID) is defined as significantly below average cognitive functioning impairing an individual’s ability to perform activities of daily life. Individuals are diagnosed and categorized through formal test measuring level of functioning as mild, moderate, severe or profound. Mild and moderate classifications include individuals with intellectual quotients (IQ) in the range of 52-69 and 36-51 respectively. Adults within these categories are typically capable of self-support with guidance and assistance as needed (8).

Americans with disabilities have been vastly deinstitutionalized over the past several decades and integrated into community living allowing for independence of food choice
and related health behaviors (9). Research indicates that adults with DD living in the community require more assistance and guidance from homecare staff and other resources when attempting to follow healthy habits including preparing and eating healthful foods and weight management (10).

A study conducted in the Netherlands of health records from primary care from general practice visits of 318 adults with ID compared with the records of non-disabled adults showed 50% greater prevalence of general health problems in the disabled population (11). Lifestyle-related conditions are the most prevalent and limiting secondary conditions for adults with DD (12). Nutrition plays a role as a risk or preventive factor in several health-related secondary conditions common in adults with ID including fatigue, diabetes, cancer, cardiovascular problems. These health conditions may also contribute to factors that may limit food planning, purchasing and preparation (13).

**Nutrition and Obesity**

The World Health Organization (WHO) defines overweight and obesity as the “excessive accumulation of body fat,” and recognizes them as risk factors for several chronic diseases. A body mass index (BMI) greater than or equal to 25 kg/m² and 30 kg/m² indicates overweight and obesity, respectively. Excessive body fat is linked to the intake of excessive caloric intake and sedentary lifestyle (14).

The prevalence of obesity has drastically increased for the past several decades. Over 30% of adults in America are currently obese and the rate is expected to climb.
Researchers project a continued increase of obesity rate for the next 2 decades. Severe obesity (BMI greater than or equal to 40) is predicted to increase at an even more rapid rate (1, 15).

**Obesity in Adults with ID/DD**

Research demonstrates that the prevalence of obesity in disabled adults is disproportionately greater than the non-disabled population (1, 3, 12, 16, 17). Rimmer and Wang performed a cross sectional study including direct measurements of height and weight to calculate BMI of 306 adults with cognitive and physical disabilities in Chicago. The prevalence of overweight, obesity and extreme obesity in the sample population was compared to a nondisabled cohort from 1999-2000 NHANES data. The nondisabled group consisted of a probability sample intended to represent health and nutrition status of the entire nation. The study found disabled adults to be 1.23 times more likely to be overweight, 2 times more likely to be obese and 4 times more likely to be extremely obese than the general population. (17). Yamaki used data from the National Health Interview Survey from 1985 to 2000 to compare the percentage of adults in the obese category using BMI between those with intellectual disabilities and the non-disabled population. The study shows the risk for obesity is higher for younger adults and women with ID; this population is facing weight problems and comorbidities earlier than the general population (18).

Obesity is more prevalent among certain subgroups within the population with ID/DD. Variables including severity of disability; living arrangement and gender affect
obesity risk. Obesity is least prevalent among those living in the most restrictive environments such as an institutional setting, and disabled adults living at home with one of more family members are at the greatest risk for obesity followed by those residing in community-based group homes (3, 19). Rimmer, Braddock and Marks evaluated the body composition, blood lipids and health behaviors of 329 subjects aged 17-70 years with a diagnosis of mental retardation living in an institution, group home or with one or more family members. Subjects living in institutions had lower body weight, BMI and percentage body fat than the other groups. The institutionalized group also had lower serum lipid levels (19).

A cross-sectional study of 945 adults with varying degrees of ID living in the community in greater Glasgow, Scotland, compared BMI, demographic characteristics, socio-economic deprivation, level of intellectual disability and various other health parameters. Women and men with mild disabilities were found to have 52% and 71%, respectively, greater risk for obesity than those with profound, or more severe, disabilities (20).

In a matched control comparison, Melville paired 247 adults with Down syndrome with non-Down syndrome controls for gender, age and accommodations. The study indicated men and women with Down syndrome are more likely to be overweight or obese. Women in this group are at a slightly higher risk than men which is consistent with other population studies of obesity in disabled adults (21). Women with ID/DD are generally at a higher risk for obesity than their male counterparts (3, 13).
Health and Comorbidities in Adults with ID/DD

Despite the high prevalence of obesity in disabled adults, it is not commonly recognized as a medical problem for individuals within this population, and lack of intervention leads to development of comorbidities. In a study surveying 1371 adults with ID aged 40-79 years living in group homes about their health status, most claimed to be in “good health”. However, obesity and comorbidities were overlooked as medical problems and researchers concluded these may be seen as normal health for adults with ID (22).

Data from 659 subjects was evaluated in a survey study on the frequency of preventative care and health screening in adults with DD. Findings show that adults with DD living in formal care settings receive greater preventive care than those living with family. It also indicates the population with DD receives fewer health screenings and other preventive care tests and overall reduced access to health care than the general population which is required to identify comorbidities (23).

Adults with ID/DD have increased risk for nutrition-related chronic diseases including diabetes and cardiovascular disease (24, 25). The prevalence of cardiovascular disease is greater at an earlier age for those with ID/DD and is the leading cause of death for adults with ID/DD (19, 26-28). Janicki et al described the cause of death for 2752 adults with ID over the age of 40 who died between 1984 and 1993. Cardiovascular, respiratory and neoplastic diseases were the top three causes of death (28).
In a systematic review of current literature on cardiovascular disease prevalence, disease-related mortality, and potential influences of modifiable behavioral and physiological cardiovascular disease risk factors in adults with ID/DD; results indicate that adults with mild to moderate ID/DD living in community settings have a greater disease prevalence, elevated disease-related mortality, and elevated behavioral risk compared to the population without ID/DD. Early evidence shows reduction in cardiovascular disease risk for individuals with ID/DD participating in the recommended level of physical activity and following the recommended nutrition guidelines (26).

In a population study of 202 randomly selected subjects with ID/DD, Beange et al found adults with ID/DD to have an average of 5.4 medical conditions per person with fifty percent remaining undiagnosed or not reported. The study group also had significantly increased cardiovascular risk factors, rate of medical consultation, rate of hospitalization, and mortality when compared to the general population from the same region (29).

**Nutrition of Adults with ID/DD**

Individuals with disabilities are recognized to be nutritionally at risk due to several obstacles that may interfere with the ability to receive optimal nutrition. These include oral health and hygiene issues, metabolic disorders, drug-nutrient interactions, altered growth, decreased mobility and feeding problems such as oral motor skills, difficulty chewing and swallowing, food allergies, and food aversions (24, 30).
A cross-sectional study of 500 randomly selected adults with ID/DD in a variety of residential settings in the UK indicated adults with ID/DD do not typically meet requirements for optimal nutrition. Caregivers were primary informants for the study who completed the questionnaire regarding lifestyle-related risk factors contributing to poor health. Poor nutrition and physical inactivity were the greatest risks affecting this population (31).

Researchers have demonstrated that the dietary pattern of adults with ID is consistently low in fruits and vegetables (32-34). A descriptive study of 32 adults with different levels of ID found that even though diets among the individual participants varied, similarities included consumption of fruits, vegetables and fiber well below the recommended amounts. A three day food record was kept for each participant with the help of a caregiver as well as an assisted three day physical activity record. The authors concluded that the low intake of fruits and vegetables may contribute to the low intake of several important micronutrients including retinol, vitamin C, vitamin E, folic acid and fiber in both normal and overweight disabled individuals (32). Drahiem et al compared dietary records of adults with ID living in different community residences. The results showed 0% to 6% of participants were consuming the recommended 5 servings of fruits and vegetables daily and 15% to 30% consumed the recommended ≤30% or less of calories from fat. Women living in group homes consumed a significantly greater portion of fruits and vegetables than women living with family; there was no significant difference in men’s intake of fruits and vegetables. The researchers concluded that adults with ID typically consume too few fruits and vegetables and have a higher percentage of
fat in their diet (33). McGuire completed a survey study of 157 adults with ID in Ireland regarding lifestyle and health behaviors. The surveys were completed by designated informants that were family members or paid caregivers. The results showed low levels of alcohol consumption and smoking; however, the majority of the adults in the study were overweight or obese, lacked physical activity and consumed a diet deficient in fruits, vegetables, carbohydrates, protein and dairy (34).

Bertoli’s research demonstrated similar results, finding disabled adults in Italy consumed diets disproportionately high in saturated fat and lacking complex carbohydrates resulting in deficiency in a number of micronutrients and fiber. In a study of nutritional status and intake of adults with various disabilities, more than half of the participants had abnormal cholesterol levels and/or blood glucose levels. The study included 27 disabled subjects and 25 non-disabled subjects. Anthropometric measurements, indirect calorimetry, dual-energy X-ray absorptiometry, dietary intake and biochemical parameters were collected for each subject. The disabled group showed imbalanced dietary intake and a high percentage of body fat related to altered biochemical markers (35).

Researchers have proposed numerous contributions to the etiology for poor nutritional status and obesity among disabled adults. A lower economic status is typically associated with poor nutrition status. According to a study by Yamaki utilizing data from the 1990-91 Survey of Income and Program Participation, adults with ID/DD are likely to be at or below the poverty level even with government assistance and employment. The data included monthly information from 91,234 individuals in 33,802
households across the U.S. (36). Lower income populations have poorer dietary habits and consume less than the recommended servings of fruits, vegetables and dietary fiber than higher socioeconomic populations (37, 38). Engler-Stringer examined the relationship of cooking skills to health and nutritional health disparities in a review of current literature. Findings indicate that healthful, nutrient dense foods including fruits, vegetables and lean meats are generally perceived as having greater cost than energy-dense, high sugar foods perceived as convenient and affordable leading to poor nutrition among low-income groups (39). Poor nutrition among these groups has led to disproportionate incidence of overweight and obesity in the poor. A large national study indicated BMI were higher for the population with the lowest income and the lowest level of education each year from 1986 and 2002 when compared to those with the highest income and education level (40). Related to this finding, a nationally representative sample of more than 6,000 adults showed an inverse relationship between BMI and earnings. Individuals with the lowest wages had high BMIs and increased risk for obesity (41).

Nutrition knowledge is another factor that is linked to quality of diet. The population with ID/DD may lack knowledge or understanding of the relationship between increased health risks and excess body weight, and they have fewer opportunities and limited access to health education and community services targeting the obesity epidemic when compared to the general population (42, 43). Adults with ID/DD living in less restrictive community settings have greater freedom of choice and more opportunities to consume convenience foods (19, 44). Research indicates populations with limited knowledge and
monetary resources to access healthful foods are eating poorer diets and have increased risk for excessive body weight than wealthier counterparts.

**Caregivers’ Role in Health Behaviors**

Environmental influences can greatly affect the lifestyle and health of people with disabilities. Caregiver attitudes and perceptions can have significant influence on the health behaviors of adults with disabilities. Heller et al interviewed caregivers of 83 adults with cerebral palsy living in various residential settings and with various levels of cognitive ability. Results showed subjects with caregivers that recognized the health benefits of exercise for individual with cerebral palsy were more likely to participate in regular exercise than other subjects (43).

Caregivers that lack nutrition and health knowledge may negatively influence the habits of their disabled clients (22). Additional research has concluded that adults with ID/DD residing in a community setting frequently consume meals planned and prepared by poorly trained caregivers resulting in nutritionally poor diets and a limited guidance for healthy food choices (13). A survey of 132 direct care staff and 18 dietitians, all working in residences of adults with ID, indicated that support staff requires additional training on the relationship of nutrition and health, meal planning and budgeting, and the importance of food sanitation. Subjects completed self-administered questionnaires regarding food safety, preparation and handling. The dietitian surveys asked about their perceptions of the direct care staff’s knowledge of these areas. Both sets of surveys
indicated a need for training in food preparation and proper nutrition for direct care staff (46).

**Health Promotion Programs for Adults with ID/DD**

Health promotion is defined as the process of facilitating individuals to assume responsibility for and make changes to improve overall health (47). Community health promotion programs can reach populations that may struggle with access to healthcare, including adults with ID/DD. Current research indicates programs can increase knowledge, skills and self-efficacy to influence health behaviors of adults with disabilities, effectively reducing morbidity and mortality from lifestyle-related conditions. However, adults with ID/DD and other marginalized groups who have high rates of unrecognized disease and poorly managed disease have inadequate access to such programs and services (48, 49).

The pool of research examining health promotion programs for the population with ID/DD is limited; however, some successes have been reported using this type of intervention for the target population. Bazzano et al conducted a single group pre- and post-test evaluation of 44 adults with DD participating in the Healthy Life Style Changes Program (HLSCP), designed for adults with DD that are overweight or obese and have other risk factors for comorbidities. The participants met twice a week for seven months and were educated in nutrition and exercise. Several support systems were in place including peer mentors, one-on-one education sessions, clinical and social support networks. Forty-four participants completed the program; half lost more than 1 lb. There
was a significant shift in BMIs from obese to overweight with the average decrease of 0.5 kg/m². Post-intervention participants had a significant increase in fruit, vegetable and water intake as well as a decrease in certain energy-dense foods. Physical activity increased in 61% of participants. Half of the participants were referred to primary care, nearly all were referred for preventive screening and over half were referred for dental care. Eighty-three percent of participants stated they felt confident to make medical appointments following the intervention. Researchers concluded that health promotion has an impact on the health behaviors and generate positive health outcomes for adults with ID/DD when repetition and support systems are in place (50).

The available research available indicates that this population can benefit from such programs with increased awareness of healthful habits and increased self-efficacy in performing some of these habits. Heller, Hsieh and Rimmer measured the attitudinal and psychosocial outcomes of a 12-week fitness and health education program of adults with Down syndrome and mild to moderate ID in a randomized controlled trial. Fifty-three subjects were randomly assigned to the control group or the training/intervention group which followed a fitness program that included guided cardiovascular and strength training. The program also included education to promote healthy behaviors and identified benefits of a healthy lifestyle. Results demonstrated that the intervention group had significant increases in confidence in their ability to perform exercises, increased strength and exercise with weights as well as overall improved life satisfaction. Researchers concluded that health promotion programs can be beneficial and effective for this population (51).
Ewing et al also found sustained practice of healthy habits with a study that compared the outcomes of an 8-week cardiovascular risk reduction program of 92 adult participants with mild to moderate ID and 97 adult participants without disabilities. The intervention focused on changing eating and exercise habits and decreasing BMI. Using pre- and post-test to measure nutrition knowledge, researchers found 43.5% of the ID group and 58.8% of the other group showed increased knowledge. The normal learners showed increase in post-intervention exercise; there was no significant change in the amount of exercise performed by the ID group. Forty-four percent of the normal learners decreased BMI by .75 while only 18.5% of the disabled learners lost at least this amount. The results indicated greater outcomes for the general population sample in terms of nutrition knowledge, weight loss and increase in physical activity. The researchers concluded that the ID participants gained valuable benefits from the program and received reports of sustained healthy eating habits and exercise from follow-up phone calls. This indicates that adults with ID can benefit from health promotion interventions despite modest physical outcomes in the short term (52).

Research shows that health promotion interventions can be effective in influencing healthy choices and even promoting modest weight loss in disabled adults. However, few nutrition education programs for ID/DD adults living in the community exist and limited research to supporting the effectiveness of such programs.
Involvement of Caregiver in Health Promotion Intervention for Adults with ID/DD

Self-determination and independent choice are recurring models in movements to empower the disabled population. Health education and promotion can be used to drive these concepts to support weight management for adults with ID/DD; however, research has shown that it is important to consider the role of caregivers and enlist their support in health promotion efforts for disabled adults. In a review of the literature regarding weight loss interventions for adults with ID/DD, Hamilton found that successful interventions included caregivers as active participants within the intervention, physical activity and nutrition education to modest weight loss (5). A study of 24 adult subjects in England with mild to moderate learning disabilities utilized interviews to evaluate the whether subjects receive an adequate amount of support for healthy lifestyle in terms of physical activity. Participants identified a number of barriers to regular physical activity including lack of support with residential and day service guidelines along with lack of transportation, resources and staffing to facilitate regular physical activity, limited income and limited resources within the community (53).

Support staff should be fully engaged in commitment to health promotion programs and educated to role-model appropriate lifestyle choices to disabled clients. A supportive environment and attitudes of staff and family caregivers is essential to achieve sustainable positive outcomes (54). In a pilot study of 10 adolescents with ID, Harris and Bloom found higher completion rates and greater weight loss in participants that had caregivers actively involved in the intervention. Long and short term outcomes were measured to gauge effectiveness of weight control program focusing on nutrition
education and exercise. Parents and group home leaders were invited to learn teaching techniques and positive reinforcement to encourage participants to comply with program. Weight loss, nutrition knowledge, aerobic fitness and body size were measure at baseline through the completion of the program and one year afterward. All participants showed significant change in every measure except arm girth at program completion. Weight loss was no longer significant at one year. Subjects removed from the program by home managers had significant weight gain at the one year follow up. Researchers concluded that support of caregivers or parents is crucial for successful weight control in this target population (55).

In a 10 week behavioral weight loss intervention, Fox, Rosenberg and Rotatori found obese adults with moderate ID lost significantly more weight with the support and involvement of parents in a weight management program when compared to participants attending the same program independently. Fifteen adults with moderate ID were divided in two treatment groups. The first group included 8 subjects whose parents were actively involved in the intervention by assisting subjects in following nutrition, physical activity and self-reinforcement recommendations. Parents encouraged subjects to complete program homework and provided rewards for achieving weight goals. The other 7 subjects participated in the program with insignificant parental involvement. Results demonstrated the group with parental involvement lost significantly more weight and body weight percentage at the completion of the 10 week program; the group maintained a small percentage of weight loss at 3 and 6 month follow ups; however, the weight difference at these points were no longer significant. Researchers concluded with this
preliminary study that parental support plays an important role in the successful adherence to a behavioral weight loss program (56).

Humphries, Traci and Seekins evaluated the efficacy, effectiveness and appropriateness of a pilot nutrition program aimed at weight management for adults with ID/DD at four community residences. The intervention consisted of menu and shopping changes for staff and nutrition education for residents and staff. Thirty-two adults with ID/DD, 20 direct service staff members, 4 group home manages and 2 health specialist participated in the program. Individual interviews were used to measure the usefulness and success of the program. The pilot showed that following the program resulted in greater access to healthful foods for residents and awareness of portions control. All groups were viewed as important in improving the nutrition of residents and felt that more nutrition education was needed for all groups (57).

**Nutrition Knowledge of Caregivers**

Melville et al. conducted a cross-sectional survey of knowledge and perceptions of 63 paid caregivers of adults with ID. The questionnaire included information about physical activity and diet recommendations, benefits of healthy diets and physical activity and views on barriers to change for their clients. The caregivers showed poor knowledge of healthful nutrition, only being able to recall current recommendations for fruit and vegetable intake. Over half of the participants stated they would support healthy lifestyle changes for their client and felt their client would benefit from changing their current diet and physical activity level. The survey identified poor knowledge of paid caregivers as a
barrier for adults with ID to make healthy lifestyle changes and indicated the need for caregivers to receive training in nutrition and exercise (58).

**Nutrition Interventions**

Research indicates that nutrition education interventions can successfully increase self-efficacy for choosing and preparing healthful foods, influencing behavior and promoting better health outcomes. A review of current literature by Ammerman et al adds that populations with chronic diseases or at high risk for chronic disease have greater success implementing dietary behavior changes following intervention than the general, healthy population (59). This indicates the population with ID/DD that is vulnerable to chronic disease may benefit greatly from nutrition intervention programs.

Nutrition education programs founded on student participation and tailored to meet their specific needs have been successful in influencing healthful behavioral changes. Swindle, Baker and Auld conducted an assessment of the effectiveness of a six week nutrition and cooking skills education program based on experiential learning theory. This theory’s foundation is based on classroom learning facilitated by student participation and lessons developed to meet the needs of the students based on their past experiences. This type of education creates both comfort and motivation for students gain self-efficacy and achieve success. Post-tests completed three and six months after the conclusion of the program indicated sustained improvement in shopping and eating behaviors including consumption of breakfast, washing hands before meals and appropriately storing leftovers (60).
A large control study of Women Infants and Children (WIC) participants examined behavior changes for a one year period following a nutrition education intervention centered on using the supplemental nutrition program to follow a healthful diet. Controls received normal care. Participants were surveyed for a baseline and at two points following the intervention program. Women participating in the intervention sustained significant increases in fruit, vegetable and fiber intake. These results reiterate that participants respond to and achieve behavioral change with accessible and culturally appropriate nutrition education programs (61).

Howard-Pitney et al found similar results in a randomized trial of the Stanford Nutrition Action Program (SNAP), a classroom-based nutrition curriculum focused on lowering dietary fat designed for low-literacy adults. The general nutrition curriculum used for the control group provided basic nutrition education with emphasis on nutrition-related health problems prevalent in low income households. Each class included a review of written handouts and preparation of a recipe. The SNAP curriculum was designed to match the structure of the original class. However, lessons focused on sources dietary fat and were culturally relevant to participants, thus employing the experiences and reflections of students. SNAP lessons used limited written materials and encouraged greater participant interaction. The SNAP participants were also contacted by the instructor every two weeks for 12 weeks following the program to support sustained behavior changes. 351 subjects were divided into classes and randomly assigned the experimental or control curriculum. The researchers measured effectiveness of the curricula through food frequency surveys, body mass index, and blood cholesterol at
baseline and at two post-intervention follow-ups. Both groups reduced total daily intake by more than 300 calories; however, the SNAP group showed significant change in food choice and decreased percentage of calories from fat as well as greater self-efficacy, attitude and fat-related nutrition knowledge following the intervention (62).

Other researchers have seen self-reported increases in self-efficacy and cooking confidence sustained following nutrition education interventions, even when behavioral changes are not continued. Arnold and Sobal examined the sustained benefits of the Expanded Food and Nutrition Education Program (EFNEP), a program designed to teach low-income families about nutrition and food safety. Baseline, graduation and one year follow-up data of 59 EFNEP indicated participants maintained significant improvements in 12 key food practices in the areas of budgeting, food preparation, safety and nutrition knowledge between graduation and follow-up. Eighty-six percent of participants reported greater interest in health and over 90% reported feeling that their family was in better health at follow-up. The only sustained change in dietary intake was increased fiber intake; however 68% of participants claimed food choices have further improved since completing the program (63). A similar result was seen in a six-month follow-up evaluation of a food skills education intervention of 29 adults of low socioeconomic status in urban areas. Significant dietary changes were not sustained. However, the intervention group did report sustained increase in confidence of cooking with basic ingredients and following a recipe. The increase in cooking confidence did not change the consumption of convenience foods which remain the same throughout the study and follow-up period (64). Nutrition education programs developed to meet the specific needs
of the students and lessons on active participation can be successful in achieving some positive eating behaviors, as well as building efficacy and confidence to make healthful food choices and prepare nutritious foods.

Researchers have linked education to theoretical models to successful influence health behavior change. In an analysis of 300 nutrition education program, Contento identified and described the components necessary for nutrition education success in adopting behavioral changes. A successful program includes a motivational component, action component and environmental supports. Effective program connect research, theory and practice (65). The Health Belief Model (HBM) is based on achieving action in adults, specifically changes in health behaviors (66). This theory has been applied to therapies and interventions and is based on the several interacting beliefs influencing behavior (67). Awareness of health risks, benefits of health behaviors and expected outcomes play a role in the HBM, and have successfully translated to health promotion programs (68). The Social Cognitive Theory is also states that a series of beliefs leading to action (69). This model has several close parallels to the HBM; however, the inclusion of self-efficacy is a crucial piece not explicitly discussed in the HBM (70). Self-efficacy is the confidence in one’s ability to perform an action and Bandura includes this as a significant piece of adopting new behaviors (71). Self-efficacy needs to be increased along with knowledge to influence behaviors through practice, repetition, observation and accomplishment of tasks (69).
Food Preparation and Cooking Skills Intervention for Adults with Disabilities

Nutrition and cooking skills can have a significant effect on the health of individuals. Though adults with ID/DD have an increased risk for chronic diseases directly related to lifestyle, there are few programs currently targeted towards this population and often these individuals have limited access to nutrition and cooking education. As the consumption of processed, convenience foods has increased, cooking skills appear to be less valued. The lack of cooking may be linked with poor health across populations (39). Health practitioners have indicated that cooking skills education would decrease the risk of nutrition-related disease and potential participants would find value in the programs and would be an effective way to reach a variety of groups including hard to reach populations (72).

Food preparation skills are important for individuals with disabilities for independent living, social skills and work training. Lancioni and O’Reilly compared the results of 12 studies using pictorial instructions on cards, computerized programs, systematic prompting and time delay with cards to teach food preparation techniques to adults with varying levels of disabilities. The majority of participants with mild to moderate ID had positive outcomes with all types of trainings and similar results for generalization and maintenance of skills developed through the training programs (73).

In analysis of interviews of 28 adults with DD and focus groups with 21 support workers and 7 agency managers in Canada, all groups identified poor eating habits as a significant theme to be addressed for improved health in this population. The disabled
adults and staff workers also identified safety concerns as a theme to be addressed through food preparation education. More than 50% of the disabled adults felt that they would be able to use kitchen appliances, keep food clean and safe and use kitchen tools safely by themselves. Nearly 50% felt confident that they could learn to cook and make healthy food choices with the support of others (74).

Sarber and Cuvo studied the ability of 4 adults with DD to learn how to plan a menu, create a grocery list and navigate a grocery store using a series of skills tests. Following an education program including training in all three areas as well basic healthful nutrition, the participants demonstrated significant improvements in food and nutrition knowledge over baseline and rapid skill acquisition in other measured areas. The participants were able to generalize the new knowledge to other grocery stores and demonstration sustained knowledge at one week and one month follow-ups (75).

Previous research has examined teaching techniques aimed at cooking skills for intellectually disabled adults. Researchers have employed a variety of teaching tools and adaptations from audio recordings to picture cues. Martin et al. studied the ability of three adults with mild to moderate disabilities to learn to prepare five meals in their own apartment kitchens with the use of picture cues. Trainers were responsible for observing and recording each participant’s progress. Participant scores were based on the percentage of tasks carried out correctly for each recipe prepared. The results showed a significant improvement over baseline in participants’ abilities to prepare meals independently and follow recipes depicted with pictures. Each participant was able to utilize basic cooking skills as well as follow recipe directions (76).
Trask-Tyler, Grossi and Heward examined the ability of three young adults with ID and visual impairment aged 21, 20 and 17 years to prepare foods using audio recorded recipe instructions. After training, participants were observed using audio tapes to prepare recipes and were scored based on the number of steps completed accurately. All three participants demonstrated the ability to follow audio recipe instructions and independently use kitchen appliances indicating that audio instructions of simple recipes may be an alternative to picture cues (77).

Johnson and Cuvo used a combination of written and pictorial instructions to teach a group of four adults with ID boiling, baking and broiling skills. Researchers developed a system of task analysis for several steps involved with each skill. Participants completed baseline tests and were tested following skills training sessions. All participants showed the ability to learn basic recipes, use kitchen equipment and follow simple cooking instructions and demonstrated a rapid acquisition of skills. Three of the participants demonstrated generalization between the trained recipes (78).

These studies indicate disabled adults can attain basic cooking skills and the ability to prepare meals for themselves which are essential skills for community living. An Australian study examined the generalizability and maintenance of a meal preparation skills program for four adults with DD. Caregivers were trained to use experimental teaching techniques to train participants in meal preparation. Researchers observed caregivers and participants practicing cooking skills with typical teaching techniques for baseline measures and again using the experimental technique. These techniques included materials for a cookbook designed with pictorial instructions. The results
expanded on earlier work showing that adults with mild to moderate ID can acquire cooking skills and prepare meals from pictorial instructions and that initial acquisition of cooking skills can lead to generalization with other recipes (79).

Singh et al attempted to teach three adults with profound ID cooking skills in preparation to be transferred into a community home. Participants were trained on the use of kitchen appliances and a cookbook written and field-tested for mild to profound ID. Participant and trainer variables were observed and analyzed. All three participants were able to learn to prepare a dessert within 21 training sessions and the use of the cookbook. Participants showed maintenance of skills in follow-up observations and generalization by completing recipe preparation in different settings (80).

Though research on attainment of cooking skills for Adults with ID/DD is limited and the available studies are small, the results are all similar and indicate adults with various levels ID/DD can successfully learn to use kitchen tools and appliances and visual or audio instructions for basic recipes. Those with mild to moderate disability have shown rapid acquisition of certain cooking skills and the ability to generalize skills to unfamiliar recipes providing this population with important skills for living in a community setting.

**Conclusion**

Individuals with disabilities are at increased risk for poor health related to lifestyle choices. High rates of obesity, increased risk for lifestyle-related diseases and documented poor nutrition habits indicate adults with intellectual disabilities would
benefit from interventions that promote lifestyle changes and positive health outcomes. Health promotion programs accessible to and designed for adults with ID/DD have had success changing health behaviors, increasing health knowledge and even modest success promoting weight loss and other positive health outcomes. However, few programs exist and are not easily available to this population. The most successful outcomes were found in programs that engaged support of the participant’s home staff or other caregivers. Caregivers play a significant role in the eating habits and exercise habits of adults with ID/DD. Studies show that paid caregivers are not adequately educated in healthful nutrition to provide balanced diets for clients. Health promotion programs need to target both adults with ID/DD and their caregivers to ensure success and retention of the behaviors and benefits gained from such programs. Increased cooking skills have been linked with increase healthful nutrition and decrease in less healthy foods including convenience foods. Studies have demonstrated adults with ID/DD are capable of learning cooking skills with adequate support. Research provides support that a health promotion program targeting nutrition and cooking skills for adults with ID/DD that engages paid staff would be effective in promoting healthful eating practices, increasing participation in cooking home meals and possibly increasing consumption of all food groups especially fruits and vegetables.
Chapter 3
Methods

Introduction

This study describes the participation and effects of nutrition and cooking skills education for adults with ID/DD and caregivers using the qualitative approach of ethnographic inquiry. Qualitative data has emerged as a relevant tool for building and evaluating nutrition education programs by providing in-depth study of participant perceptions, experiences and influence of education materials on the studied population (81). Pre- and post-one-to-one interviews with program participants as well as observation of class sessions provide extensive information of the subjects’ experiences and perceptions while participating in the pilot program and the program’s influence on their attitudes, level of knowledge and behaviors. The study employs inductive methods relying on research questions outlined in this chapter as a frame to guide the research in this study, rather than a hypothesis as is used in deductive research (82).

Research Questions

The following questions were the basis for describing the participation and influence of a nutrition and cooking skills education program on adults with disabilities.

1. What are the perceptions of ID/DD adults of “healthy eating”?
   a. How are these perceptions affected by the nutrition and cooking skills program?
2. What are ID/DD adults’ perceptions towards meal preparation/cooking?  
   a. How are these perceptions affected by the nutrition and cooking skills program?

3. How does a nutrition and education skills program influence the eating habits of ID/DD adults?

4. What is the overall effect of the nutrition and cooking skills program for disabled adults and caregivers?

**Program Overview**

The Cooking Matters series is an education program designed to provide low-income individuals with the knowledge and skills to prepare healthy, affordable meals. The program was developed by Share Our Strength in 1993 and is facilitated in locally in Columbus by their partner organization, Local Matters. Based on the *Dietary Guidelines for Americans* and *MyPlate*, Cooking Matters teaches participants to select healthful, low-cost foods and demonstrates meal preparation in order to maximize the participant’s nutritional intake within budget restraints. Interactive lessons instill basic cooking, food safety and food resource management skills. The program has grown to include five courses. The subjects in this study participated in an adaptation of the *Cooking Matters for Families* course.

Courses are team taught by volunteer culinary and nutrition experts trained to instruct classes based on the Cooking Matters curricula. The team technique ties basic nutrition education with cooking skills. Participants not only gain skills in food preparation they learn ways to increase healthfulness of their family’s meals. This pilot program was team taught by a researcher, trained as a Cooking Matters volunteer, and a culinary expert volunteer from Cooking Matters partner organization Local Matters. A
course coordinator and two course assistances from Local Matters attended classes as support staff as well.

Share Our Strength employs hands-on learning techniques as well as facilitated dialogue to fully engage learners in the program. Learners were asked to participate in several activities during each class related to the learning objectives as well as participate in preparing recipes during the class sessions. Learners were given take-home challenges each week including a copy of a recipe that was prepared during class and all the ingredients needed to recreate the recipe at home. The challenge is discussed during the next class. Learners are invited to share parts of the challenge that went well and what they struggled with so instructors can offer advice or review certain skills again in class.

Classes revisited and reviewed many of the same concepts each week; however each session had a specific focus. Week one focused on teaching students the five foods groups and introducing the MyPlate method for putting together balanced meals. Week two included choosing fruits, vegetables and whole grains each day. Week three focused on making quick healthy snacks and how to choose healthier foods when eating away from home. Week four’s lesson was choosing healthier beverages. Participants went on a grocery shopping tour week five and had a graduation celebration week six; healthy eating concepts were reinforced during both activities. The goals and objectives of the program were met through class discussion and a variety of activities. Participants helped prepare recipes, serve the food they have prepared and eat in a family-style setting at the end of each class session (83, 84).
The pilot program was held at the kitchen facility of Goodwill Columbus. Participants had room to interact and participated in experiential learning in a home-like kitchen facility.

**Lessons Plans**

The following lesson plans were adapted from *Cooking Matters for Families* and used as a course outline for this pilot program (83).

**Week 1: Cooking Side by Side**

Goal: Encourage clients and caregivers to work together to make healthy, enjoyable meals.

Objectives:

- Practice classifying foods into MyPlate food groups
- Discuss safe, appropriate tasks in the kitchen

Take home materials:

- MyPlate handout
- Groceries and Mini Pizza recipe

I. Introduction (20 minutes)
   - Welcome participants to class. Provide an overview of the goals of the course. Introduce volunteers
   - Invite participants to introduce themselves. Share favorite food and something they would like to learn in class.

II. Nutrition (20 minutes)
   - Display MyPlate/pass out color copies of MyPlate. Ask participants what they know about MyPlate.
     - MyPlate is a guide to help make healthy food choices.
     - Ask: What are the 5 food groups? Why is it important to eat from all food groups?
     - Review food groups. Explain that all groups are important for a healthy diet. Suggest trying to eat from every food group each day.
     - Ask: Do you think all foods in each group are ok to eat every day?
     - Describe “sometimes” foods vs. “everyday” foods. Introduce “Go Slow Whoa” technique
- Go – eat foods almost anytime. These foods are high in nutrients but low in fat, added sugar and calories.
- Slow – eat foods sometimes. These foods are higher in fat, sugar and calories
- Whoa – eat once in a while. These foods are highest in fat and sugar with few nutrients. Remember: A whoa food is not a no food!
  - Ask: What do you notice about the way food is served on MyPlate; does it look like the way you serve your plate?
    - Explain what food groups are good to eat more of and which groups we should eat in smaller amounts.
  - Ask: Can MyPlate help when we are eating a mixed dish like pizza or a taco?
    - Group will choose a mixed dish to break down into food groups and offer ideas for adding more food groups.
      - Example: Pizza- crust is grain, sauce is vegetable, cheese is dairy. Suggest adding toppings for extra food groups.

III. Cooking and Food Safety (60 minutes)
- Explain cooking portion of the lesson. This is an opportunity to learn new skills and ways to work together safely in the kitchen.
- Discuss safe but important tasks around the kitchen.
  - Cracking eggs, measuring ingredients, using eggbeater, rinse, scrub and peel produce, cut soft foods with plastic or butter knife, open cans, drain cooked pasta, clean up, etc.
  - Point out that safe tasks are marked by a hand in recipes section of the book.
- Refer to Cooking Safely handout on pg 4. Discuss the importance of kitchen safety to prevent foodborne illness and accidents.
  - Review how to wash hands properly. Washing hands is one of the most important steps we can take to prevent foodborne illness.
  - Have everyone wash their hands using proper technique in preparation for cooking today’s recipes.
  - Set policies for knife use and kitchen behaviors in class. Demonstrate proper use of knives.
    - Participants can use plastic knives if preferred. Those who are not allowed to use knives due to behavior will be assigned other tasks.
- Introduce today’s recipes.
  - Go through ingredients and ask participants to help classify into food groups.
  - Discuss new terms in recipe, have examples prepared to demonstrate certain terms (diced, chopped, etc.). Have ingredient measure prepared
for example as well. Refer to Talk like a Chef and Measure Up handouts if appropriate.

- Group cooking teams with volunteers, assign each team tasks. Delegate recipe steps appropriately. Instructors will monitor both groups and provide guidance, answer questions and comment on technique as needed.
- Prepare Recipe: **Mini-Pizzas.**

IV. Eating Together (20 minutes)
- Try to establish a family like setting for eating. Ask participants who have finished cooking to help set the table. Bring food to table on platters or other serving dishes. Ask participants to discuss how they prepared the recipes, if they learned any new skill or if they are trying any new food.
- Ask what participants enjoyed about today’s class.
- Summarize key messages.
  - Choosing foods from every food group every day.
  - Safe ways to prepare meals together.
- Challenge client and caregiver to prepare Mini-Pizza Recipe together in the next week.
  - Review food groups included in this week’s challenge.
  - Pass out groceries and recipe handout.
  - Explain that we will discuss the challenge next week and they can share their experiences.

**Week 2: Try It You’ll Like It**

Goal: Encourage clients and caregivers to incorporate more fruits, vegetables and whole grains into their meals.

Objectives:
- Discuss pros and cons of using different forms of fruits and vegetables.
- Practice identifying whole grain foods by reading label ingredient lists.
- Discuss ways to include more fruits, vegetables and whole grains into meals.

Take home materials:
- Groceries and apple salad/squash and orzo recipes

I. Introduction (15 minutes)
- Welcome everyone back. Discuss topics from last week. Have participants discuss how the recipe challenge went at home including what they learned and areas they struggled.
- Explain this week will focus on fruits, vegetables and whole grains.

II. Nutrition (25 minutes)
- Group discussion about fruits and vegetables
  - Ask: What forms of produce they usually eat: fresh, frozen or canned?
Refer to Fresh Frozen or Canned handout pg 12. Emphasize there is no best form. Discuss pros and cons of each form and ways to make smart choices about whichever form you choose.

Acknowledged that fresh produce can be more expensive than other forms, but choosing fresh fruits and vegetables when they are in season can help save money. Refer to Seasonal Produce handout pg 13.

Refer to Vary Your Fruits and Vegetable handout pg 14. Point of benefits of colorful produce. Ask participants to tell us what colorful foods they like to eat. Refer to MyPlate from last week’s lesson.

Transition to whole grains by discussing what they tasted in the activity.

Ask: If anyone knows why whole grains are healthy or different from refined grains. Explain whole grains retain nutrients and fiber that other grains loose when processed. Can use avocado to describe whole grain.

Refer to Be a Whole Grain Detective handout on pg 15. Talk what to look for on packages to know if a grain is a whole grain.

Discuss what everyone learned last week about making healthier choices within each food group (Go, Slow, Whoa foods). Emphasize what category whole grains are in and that half of our grains should be whole grains.

Provide each client-caregiver team with a grain food package. Ask them to use Be a Whole Grain Detective handout on pg 15 to figure out if the food is whole grain. Invite groups to share their findings.

Activity: Food Group Challenge

Distribute food models to participants.
Call out food groups having participants hold up a food model that belongs to that group.
Ask participants to name the food they hold up. Ask group for help when corrections are needed.

Cooking and Food Safety (60 minutes)

Introduce recipes for the day Apple Salad and Squash and Orzo.

Explain importance of food safety. Have participants help wipe off the top of cans, inspect frozen products, and rinse fresh produce to be used in recipes.

Refer to Cooking Produce and Whole Grains handout pg16 and discuss convenient ways to prepare fruits, vegetables and whole grains.

Have participants wash hands to prepare for cooking.

Group cooking teams with volunteers, assign each team a recipe. Delegate recipe steps appropriately. Instructors will monitor both groups and provide guidance, answer questions and comment on technique as needed.

Prepare Recipes: Apple Salad and Squash and Orzo (squash and orzo recipe demonstrated by chef)
IV. Eating Together (20 minutes)
- Try to establish a family like setting for eating. Ask participants who have finished cooking to help set the table. Bring food to table on platters or other serving dishes. Ask participants to discuss how they prepared the recipes, if they learned any new skill or if they are trying any new food.
- Discuss ways they can incorporate more fruits, vegetables and whole grains in their meals.
  - Ask them to share their ideas for doing so.
  - Refer to Adding Fruits, Vegetables and Whole Grains to Meals handout pg 17.
- Ask participants what they enjoyed about today’s class.
- Summarize key messages.
  - Include at least on fruit, vegetable or whole grain in a meal each day.
  - Practice identifying whole grains with tips discussed in class.
- Challenge client and caregiver to prepare apple salad and squash and orzo recipes together in the next week.
- Review food groups included in this week’s challenge. Get participants excited about next week’s class.

Week 3: Healthy Starts at Home
Goal: Encourage participants to prepare more meals and snacks at home.
Objectives – Participants will:
- Practice identifying healthy snacks that include at least 2 food groups.
- Practice identifying healthier choices when eating away from home.
- Prepare healthier versions of popular convenience foods.

Take home materials:
- Groceries and baked flaked chicken and mac and cheese recipes

I. Introduction (15 minutes)
- Welcome everyone back. Discuss topics from last week. Have participants discuss how the recipe challenge went at home including what they learned and areas they struggled.
- Explain this week will focus the differences between foods we make ourselves and foods we buy in a package or at a restaurant.

II. Nutrition (25 minutes)
- Refer to Snack Smart handout pg 21. Explain that we can make healthier snack choices by preparing snacks at home. A good rule of thumb is to include at least 2 food groups in snacks. Ask participants for share ideas for healthy snacks using handouts or ideas they come up with on their own.
o Refer to Make Your Own Trail Mix handout pg 22 as an example for on-the-go snack. *We can plan to prepare trail mix as an activity.

- Explain that packaged foods and foods we eat away from home are typically less healthy.
  o Talk about convenience foods. Ask if participants have heard the term and what they think it means. Explain these are foods that are foods that are not prepared at home with simple ingredients (prepackaged meals, takeout, fast food).
  o Ask: What convenience foods they typically eat and why.

- Activity #1: Blubber Burger
  o Write sample fast food meal on flip chart with grams of fat of each item added to total fat content for meal.
  o Below meal write equation using total fat content from sample meal. Example 82 g of fat divided by 4 = 20 ½ tsp shortening (1 tsp shortening=4 grams of fat).
  o Instruct client caregiver teams to refer to A closer look at Fast-Food Meals handout and let clients choose a meal they would typically eat.
  o Ask teams to add total grams of fat in the meal chosen. Volunteers should be available to assist with calculations.
  o Invite participants to share their totals. Use the equation to convert to tsp of shortening.
  o Have participant come up and spread the amount of shortening on bun as the group counts number of teaspoons.
  o By the end we will have several blubber burgers. Point how quickly fat can add up. Refer to Eating smart When Eating Out handout pg 24 for ways to choose healthier options at restaurants.

- Ask: What have you learned so far in class that could help you make healthier choices when eating out or eating fast foods? Point out some healthy substitutes they could choose for drinks or sides.

- Explain that many restaurants offer nutrition information for menus now. They can always ask for information before ordering.

- Briefly discuss fats. Simply explain that we need fat in our diet, but some fat is healthier for us. Explain fat from meat is less healthy and sources of healthy fats to include in their diet and leaner meats to cut unhealthy fats.

III. Cooking and Food Safety (60 minutes)
- Before introducing the recipes, highlight cooking techniques and substitutions to make healthier final products.
  - Refer to Healthy Cooking Ideas handout pg 27. Point out the substitutions listed for their favorite recipes.

- Introduce today’s recipes.
  - Point out the steps that will be taken to make these common foods healthier.

- Have participants wash hands to prepare for cooking.
• Group cooking teams with volunteers, assign each team a recipe. Delegate recipe steps appropriately. Instructors will monitor both groups and provide guidance, answer questions and comment on technique as needed.
• Prepare Recipes: Mac and Cheese and Baked Flaked Chicken. (Mac and cheese prepared as large group, chicken in small group at tables).
  • Encourage participants to try new skills.

IV. Eating Together (20 minutes)
• Try to establish a family like setting for eating. Ask participants who have finished cooking to help set the table. Bring food to table on platters or other serving dishes. Ask participants to discuss how they prepared the recipes, if they learned any new skill or if they are trying any new food.
• Discuss reasons we all eat convenience foods, but encourage tradeoffs.
  o Taste – healthier, tasty versions of these foods can be made at home.
  o Cost – these foods can be made at home for less money.
  o Satisfaction – foods can be individualized to meet preferences at home.
  o Time – next week we will learn how to plan ahead and save time in the kitchen so we don’t have to depend on convenience foods in a crunch.
• Ask participants what they enjoyed about today’s class.
• Summarize key messages.
  o Ways to make healthy snacks at home
  o Ways to eat healthier when dining out
  o Healthy cooking techniques
• Challenge client and caregiver to prepare Baked Flaked Chicken and mac and cheese Recipes together in the next week.
• Review food groups included in this week’s challenge. Get participants excited about next week’s class

Week 4: Healthy Beverages and Breakfast

Goal: Help participants prepare quick, healthy meals at home.

Objectives – Participants will:
• Discuss strategies to eat breakfast every day.
• Discuss ways the importance of drinking water and reducing intake of sugar sweetened beverages.

Take home materials:
• Groceries and Peanut Butter Banana Pockets recipe

I. Introduction (15 minutes)
Welcome everyone back. Discuss topics from last week. Have participants discuss how the recipe challenge went at home including what they learned and areas they struggled.

- Ask if anyone has the chicken in their freezer. Point out information on how to freeze and reheat pg 36. Emphasize safe ways to defrost frozen foods.

- Explain this week will focus on eating a healthy breakfast every day and drinking beverages with less sugar and calories.

II. Nutrition (25 minutes)

- Discuss the importance of starting each day with a healthy breakfast.
  - Ask: Did anyone plan a breakfast in the menu-planning activity? Do you normally eat breakfast? What do you typically eat? Emphasize we all need breakfast to get energy in the morning and prevent overeating later in the day.
  - Ask: What strategies might help you eat breakfast every day? Suggest ideas like waking up 15 minutes earlier, prepping ingredients the night before or making a breakfast in advance that can be heated up in the morning and taken on the go.
  - Refer to the Breakfast Trios handout on pg 34. Remind families that a good rule of thumb is to include at least three food groups with breakfast.
  - Give client caregiver teams a few minutes to circle the breakfast trios that sound appealing to them and that they would like to try creating together. Ask for volunteers to share new trio ideas that their team comes up with.

- Explain that replacing fluids we’ve lost throughout the day is important to staying healthy.
  - Ask: what do you normally have to drink when you’re thirsty? What do you normally drink with meals and snacks?
  - Include importance of physical activity in healthy lifestyle and the need to replace fluids with activity.

- Discuss why it’s better to drink mostly water and low-fat milk, limiting juice, soda and other sugary drinks.
  - Explain that we can create our own tasty beverages that have much less sugar and are good for us.

- Emphasize that plain tap water is free, has zero calories and helps us replace fluids we lose throughout the day. There are plenty of ways to add flavor without extra sugar.

- Discuss the benefits of choosing low-fat dairy foods.
  - Ask: Why is choosing low-fat milk and other low-fat milk products so important for our health? Remind families what they learned about making healthier choices with in each food group in week 1 and the types of fats in week 3.
    - Briefly address the role of calcium in keeping bones strong.
III. Cooking and Food Safety (60 minutes)

- Explain that today we are going to learn how to make low sugar/calorie juice spritzers and an on the go breakfast recipe.
  - Refer to Cook It Up Quick handout pg 36. Point out additional time-saving strategies participants can use. Encourage participants to circle ideas on their handout that they’d like to try, or to write in new ideas.
- Introduce today’s recipes.
  - Explain that teams will practice using recipe frameworks while preparing the recipes for today. Reassure them that as they develop confidence cooking, their ability to make simple recipe adjustments will improve.
- Have participants wash hands to prepare for cooking.
- Group cooking teams with volunteers, assign each team a recipe. Delegate recipe steps appropriately. Instructors will monitor both groups and provide guidance, answer questions and comment on technique as needed. Explain each team will have a few minutes to talk about what adjustments could be made to their recipe.
- Invite participants to share ideas they came up with and encourage them to apply their ideas if ingredients are available.
- Prepare Recipes: Juice Spritzer Peanut Butter Banana Pockets.
  - Have participants taste test green smoothie prepared by chef.
  - Encourage participants to try new skills.

IV. Eating Together (20 minutes)

- Try to establish a family like setting for eating. Ask participants who have finished cooking to help set the table. Bring food to table on platters or other serving dishes. Ask participants to discuss how they prepared the recipes, if they learned any new skill or if they are trying any new food.
- Introduce the shopping tour and talk about creating a list for next week’s class.
  - Discuss how to create a shopping list.
  - Explain that once you have planned healthy meals and snacks it is good practice to make a shopping list to take with to the store. This helps us stick to a budget, spend less time and money at the store, and account for what you have.
  - Refer to Stocking Your Pantry handout pg 35. Point out that maintaining a basic pantry will help save time by putting together quick meals using foods already on hand. Ask participants to circle ingredients that they already have at home and suggest meals they can make using just the ingredients in the handout.
- Ask participants what they enjoyed about today’s class.
- Summarize key messages.
  - Importance of meal planning
Importance of eating breakfast.
- Using recipe frameworks and simple ingredient changes.
  - Challenge client and caregiver to prepare peanut butter banana pockets Recipe together in the next week.
  - Review food groups included in this week’s challenge. Get participants excited about next week’s class.

**Week 5: Grocery Store Tour** – This class will be held a local grocery store chosen by the participants.

Goal: Help participants navigate the grocery store to find healthy products and items to keep their kitchen stocked.

Objective: Participants will:

- Practice shopping the perimeter of the grocery store
- Practice finding healthy foods while grocery shopping.

Tour:

- Participants will cover main sections of the store: Bread, Meat/Poultry/Fish, Cereal, Milk/Eggs/Dairy, Produce, Canned Goods, Snacks/Juice/Drinks, Frozen Foods.
- Emphasize the importance of shopping the perimeter, include cost savings tips, unit pricing and label reading.
- Challenge participants to select healthy options from all 5 foods groups to total under $10 to earn gift card for purchasing items.

**Week 6: Graduation – Celebrating Our Success**

Goal: Celebrate participants’ accomplishments and progress in working together to plan and prepare healthy meals.

Objectives – Participants will:

- Review principles of making smart food choices, planning and preparing meals together and maximizing food resources.
- Celebrate success in planning and preparing healthy meals.
- Set goals to continue using these lessons after the course ends.

Take Home Materials:

- Graduation Certificate
- Course Book
- Plastic cutting board
- Groceries and cookies and chips and salsa recipes

I. Introduction (15 minutes)
Welcome everyone back. Discuss topics from last week. Have participants discuss how the recipe challenge went at home including what they learned and areas they struggled.

Explain today is our last class. We will review all the important things we learned in the course and celebrate all our accomplishments.

II. Course Review (15 minutes)
- Play Cooking Matters Trivia activity to review concepts learned throughout the course. Help participants answer the questions throughout the game. Briefly discuss the answers and activities we did in class tied to the concept.
- After the activity ask if participants have any questions that have not yet been answered about eating healthy and working as client-caregiver teams to planning and prepare meals.

III. Cooking and Food Safety (60 minutes)
- Introduce today’s recipes. Explain that today’s cooking is an opportunity to review and apply things learned from previous classes and celebrate what they’ve learned.
- Have participants wash hands to prepare for cooking.
- Group cooking teams with volunteers, assign each team a recipe. Delegate recipe steps appropriately. Instructors will monitor both groups and provide guidance, answer questions and comment on technique as needed.
- Invite participants to share ideas they came up with and encourage them to apply their ideas if ingredients are available.
- Prepare Recipes: Rolled Oats and Peanut Butter Cookies and Chips and Salsa
- Encourage participants to try new skills.

IV. Eating Together (20 minutes)
- Try to establish a family like setting for eating. Ask participants who have finished cooking to help set the table. Bring food to table on platters or other serving dishes. Ask participants to discuss how they prepared the recipes, if they learned any new skill or if they are trying any new food.
- Call each client-caregiver team separately, and make a point of saying something special about each of them and the skills they developed in class. Give out the graduation certificates and incentives, and applaud each graduate.
- Thank everyone for participating in the class.

Sample

A convenience sample of five adults with ID/DD and accompanying caregivers were referred to the pilot program via recommendations from behavior support specialists of the Nisonger Center (85). The sample for this study consisted of five adults with
ID/DD and seven support staff members. The participants with ID/DD recruited were verbal with mild to moderate ID, capable of participating in group sessions and had indicated interest in participating in the study. The support staff participants were identified by their client’s home manager based on work schedule and role in grocery shopping and meal preparation for their client.

Nisonger behavioral support staff provided basic information about the pilot program to potential participants, legal guardians and home managers and asked for permission to provide the researcher with contact information of eligible clients and legal guardians if potential subjects and caregivers expressed interest in participating. Subjects, legal guardians of subjects and home managers were contacted over the phone to request participation in the study. The home managers were asked to identify a caregiver/support staff to participate in the study as well. The caregivers were contacted by researchers for request to participate in the study following their client’s agreement to participate in the study. The first five subjects, legal guardians and participating caregivers to provide consent/assent were used in the study.

This class size ensured each participant was able to interact and practice skills in each class with instructors or other volunteers offering support throughout the activities. The kitchen facility fit 15-17 individuals comfortably with sufficient workspace. Small class size gave participants access to both instructors for additional assistance.
Consent

Informed consent was received from all participants before the study commenced. Though all participants were of legal age most of the participants with ID/DD had court-appointed legal guardians. In this instance the subject’s guardian was required to provide informed consent for the subject to participate in the study, assent from the subject was sought to accompany the consent of his or her legal guardian.

Subjects without a legal guardian provided written and verbal informed consent for themselves. The study was described clearly to ensure the subject had full understanding of the study and was able to reach an informed decision regarding participation. When seeking informed consent or assent from disabled subjects a support person trusted by the subject, typically a paid caregiver, was invited to assist in the process to assure the subject understands the information and is making an informed decision. The trusted support person was able sign as a witness that the subject was informed and understood that he/she agreed to participate. Family members of subjects with ID/DD involved in helping the subject make decisions were invited to provide informed consent for his or her family member as a supplement to and validation of the subject’s own informed consent. Caregiver participants provided informed consent for themselves before the start of the study.

Data Sources

The data sources used in this study included ethnographic methods allowing the researcher an in-depth look at the subject’s behaviors and perceptions of eating, cooking
and classroom activities. Individual interviews were used to gather insight on participant perceptions, eating and meal preparation habits and nutrition knowledge before and following the program. Observational field notes were taken during class sessions to explore how participants interact and engage in the program, with each other and during food preparation. These qualitative research methods allowed for researchers to evaluate the effectiveness of the program and identify areas of strength and weakness of the program when targeting this population (86).

Three sources of information were collected and used to evaluate the pilot program. The first was pre- and post- one-to-one interviews with the participants with ID/DD using open-ended questions regarding knowledge and perception of healthful eating, cooking, basic food safety and perception of the program. Participants were encouraged to express thoughts and ideas freely. The open-ended questions were developed using material presented in the pilot program and literature related to the topic. These interviews lasted approximately 10-15 minutes each.

The second source of information was caregiver interviews which consisted of open-ended questions relating to their clients eating and meal preparation habits and the influence of the program on their habits. These interviews were one-on-one with participating caregivers and lasted approximately 15-25 minutes each prior to the start of the program and following the completion of the program. The purpose of the interviews was to determine the observed and perceived changes that the caregiver noted in their clients. All interviews with the participants and the caregivers were audio recorded utilizing a Livescribe pen.
The third source of data was observational field notes of discussion and participation in the class sessions. A designated note-taker composed notes detailing group discussions of topics relevant to the program including group and individual accomplishments and challenges, perceived attitude towards the activities, and observation of participation in class activities.

**Data Collection**

Individual pre- and post-interview times were scheduled following participant’s agreement to participate and appropriate consent/assent was received. The interviews lasted approximately 15-25 minutes and were audio recorded using a Livescribe pen. The researcher took field notes to supplement the recordings and to assist in data analysis. The interviews were transcribed to their entirety. The recordings were only listened to by the researcher transcribing the interviews and destroyed following transcription.

A volunteer note-taker was present at each class session. The note-taker was a graduate student informed of the aim of the study and given instructions for note-taking. The note-taker provided field notes on the class discussion as well as thoroughly observed and described participation throughout the remainder of the class. The notes were transcribed by a separate researcher and subsequently reviewed and confirmed for accuracy by the note-taker. A video recording of the class was used to confirm the observations provided by the note-taker; however the recordings were not used in data analysis.
Internal review board approval was obtained. Participation in the study posted no specific risk to subjects. The video and audio recordings have been destroyed and participants are identified by first name only to maintain confidentiality.

**Interview Guide**

The following questions were used as an outline for pre- and post-interviews with participants with disabilities and caregivers. The questions were used as a guide. Participants were encouraged to share thoughts and ideas freely; the interviewer used probing questions when appropriate.

**Pre-Program Interview Guide for Adults with Intellectual Disabilities:**

What are some things you know about eating healthy?
What are some reasons it is important to eat foods that are good for you?
What are some things that you have to eat and drink a lot?
Do you help cook at home? What types of things do you do to help?
What are some steps you can take to be safe and clean when cooking, helping out in the kitchen or eating?
What are some things you would like to learn about in the Cooking Matters program?

**Pre-Program Interview Guide for Caregivers:**

What are some typical foods your client eats while in your care?
What does your client typically have to drink while in your care and throughout the day?

We will be preparing recipes during the class sessions as well as sending groceries and a sample recipes home for you and your client to prepare together. What types of recipes and/or cooking skills would be helpful for you and your client to learn or review as part of this program?

We have the opportunity to include a grocery store tour in the course. Who does the grocery shopping for your client? Do you feel a grocery store tour would be beneficial for you or your client?
What does healthy eating mean to you?
Do you feel your client eats a healthy diet?
How often does your client eat fruits or vegetables?
Does your client drink milk? What kind?
Does your client eat whole wheat or whole grain products? How often?
When in your care who makes food choices for your client during meal or snack times?
Do you think your client’s diet is affecting his/her health? In what way?
How often do you and your client prepare meals or snacks together?
What cooking skills does your client currently have?
What cooking skills do you currently have?
What are some food safety precautions you and your client follow when preparing a meal or snack?

**Post-Program Interview Guide for Adults with Intellectual Disabilities**

What did you learn about healthy eating in the Cooking Matters program?
What changes have you made to the foods and drinks you choose since starting the program?
What are some reasons it’s important to eat healthy foods?
Did you like preparing recipes in class?
Do you help cook at home? What are some ways you can help cook?
What have you learned about cooking from Cooking Matters?
What are some important things you can do to be safe when you are helping out in the kitchen or eating a snack or meal?
What was your favorite part of Cooking Matters?
Would you change anything about the Cooking Matters classes?

**Post-Program Interview Guide for Caregivers**

What are general feelings about the Cooking Matters program?
Has your client changed any of his/her typical food choices?
Has your client changed his/her beverage choices consumed throughout the day?
Have you chosen to make and changes in your diet as a result of the program?
What aspects of the program did you feel were most beneficial for your client?
What aspects were most beneficial for you?
Did you prepare any of the recipes from class at home with your client? Explain that experience?
What does healthy eating mean to you?
Do you feel your client eats a healthy diet?
How often does your client eat fruits or vegetables?
Does your client drink milk? What kind?
Does your client eat whole wheat or whole grain products? How often?
When in your care who makes food choices for your client during meal or snack times?
Do you think your client’s diet is affecting his/her health? In what way?
How often do you and your client prepare meals or snacks together?
What cooking skills does your client currently have?
What cooking skills do you currently have?
What are some food safety precautions you and your client follow when preparing a meal or snack?

**Data Analysis**

Ethnographic research provides large amounts of evidence through text and direct quotations. Insights can be drawn by identifying themes, patterns and meaning in the evidence using inductive reasoning (87).
Pre- and post-interview transcriptions and class notes were reviewed and coded manually to identify common themes. Pre- and post-interviews were reviewed for shifts in responses following the participation in the pilot program. The reviewing researcher identified, analyzed and described patterns presented in the interviews and class sessions that offered answers to the research questions.

Assessing Quality

The quality of qualitative research is crucial for measuring the impact and usefulness of a study. The criteria used to assess quantitative research quality are not appropriate for qualitative techniques; however, the criteria are not completely different.

Qualitative research can be validated using the triangulation technique. Triangulation is the use of different methods of data collection within the same setting to attempt to replicate research (88). This study employed triangulation through the use of interviews and observations for data collection.

Reliability is defined as the degree to which the results of the analysis would be similar if carried out by a different observer or the same observer at a different time (88). Internal reliability was carried out by the use of note-taking and recording sessions. Field notes were confirmed with recordings. The course note-taker reviewed transcriptions of the course notes to confirm accuracy.

The small sample size makes generalizability difficult to prove. The researchers strived for theoretical generalizable results by selecting a strong representative sample of the larger population the study targets (88).
Chapter 4

Conclusions

Participants

The eleven participants in the study included five developmentally disabled (DD) adults that are clients of the Nisonger Center Behavioral Support Services. Of these five participants, two were male and three were female. They ranged in age from thirty to fifty-three years old. All were considered obese, having a body mass index equal to or greater than 30. Obesity and dietary factors are related to numerous medical diagnoses and within this population, all but one had a medical history that included these co-morbid conditions. All five were single and lived in an apartment alone or with one roommate. All of the participants were supported by twenty-four hour homecare staff. All depended, in part, on the Supplemental Nutrition Assistance Program (SNAP) for groceries and thus, all have a limited food budget. The remaining six participants for the cooking class included homecare staff for the five DD participants. All eleven participants graduated from the program by attending at least four of six class sessions throughout the program. Seven of the participants attended all classes; four participants attended five of six class sessions. They all willingly participated in the program and gave their time to discuss personal insights on cooking, nutrition and the pilot program.
Interviews

The intention of this study was to evaluate the effectiveness of the pilot nutrition and cooking education program. The following research questions were the basis of the interview questions used to evaluate the pilot program.

1. What are the perceptions of DD/ID adults on “healthy eating”?
   a. How are these perceptions affected by the nutrition and cooking skills program?

2. What are DD/ID adults’ perceptions towards meal preparation/cooking?
   a. How are these perceptions affected by the nutrition and cooking skills program?

3. How does a nutrition and education skills program influence the eating habits of DD/ID adults?

4. What is the overall effect of the nutrition and cooking skills program for disabled adults and caregivers?

Amanda

Amanda is a 35 year old female that lives with a roommate; both are assisted by full time homecare staff. Amanda was obese and had Type 2 Diabetes Mellitus. Amanda attended all six classes with Marilynn, her home care staff.

Interview – Pre-Class
Before starting the program Marilynn described Amanda’s diet as “healthy”. Both stated that Amanda eats vegetables daily and does like some fruits, but was not eating them as often as vegetables. Marilynn stated that Amanda’s meals typically include a vegetable, meat and grain. Amanda recited her favorite foods as Raman Noodles®, spaghetti and meatballs, salad, tacos and Pop Tarts®. Amanda’s regular beverages included water or water with low calorie flavor packets. She consumed low fat Lactaid® or Silk®, but typically only with cereal. Amanda stated that she is lactose intolerant. Marilynn and Amanda were unsure of how often she was eating whole wheat or whole grain foods. Marilynn believed that the house manager, who handles the shopping for Amanda tries to buy whole grain cereal and pasta when possible.

The house manager was responsible for grocery shopping for Amanda; however, Marilynn stated that she is on a limited budget and felt that a grocery store tour would be beneficial for Amanda. Amanda chose what she ate for meals and snacks. Marilynn states, “She makes the choice. When we can, we always encourage her to try something different, but ultimately she makes the choices.”

Though Amanda dictated what was to be prepared, staff actually cooked the food. Marilynn and Amanda stated that Amanda helps occasionally with food preparation. They both said her skills included adding seasoning, stirring and mixing batter. They also stated that Amanda washes her hands before dinner, cleans the preparation area and tries to keep meat separate from other foods.
Marilynn and Amanda identified a relationship between health and nutrition. Amanda stated that healthy nutrition was necessary for “energy and iron and strong bones. Milk gives you strong bones.”

She identified healthy nutrition as: “Eating healthy with exercise. [Eating] fruits and vegetables like raisins, carrots, broccoli, celery, cauliflower.”

Marilynn described her ideas on healthy eating: “To live long for one. I know my family is sick of hearing about me doing it, but every time I go to the store now I’m looking at the label for what I’m getting. I look at the carbs, sugar, fat; I do that all the time. I know in my family there’s a lot of diseases, heart, diabetes and I don’t want that. It all stems from the food you eat. I talk about it a lot; it’s very important.”

Both were asked if there was something specific they would like to learn in the program. Amanda did not have an answer; however in reference to food preparation Marilynn replied, “I just want to see Amanda participate more. She does participate some, but I want to see her keep focus better. Sometimes she just lets the staff do it all, so I just mostly want to see her participate more.”

Interview Post-Class

Following the program both women stated that Amanda’s diet had not changed drastically. Marilynn stated that Amanda was eating vegetables daily and trying to include more fruit in her diet. She was drinking fat free Lactaid ® milk. Staff was making a better effort to purchase whole grain cereals and breads. Marilynn stated, “Amanda knows what she needs to do and being that she’s diabetic she does stick to a good diet.”
Marilynn felt the nutrition knowledge gained from the class was most beneficial part for both her and Amanda. She stated that they learned how to make better food choices and the benefits of doing so. When asked what healthy eating is and why it is important Amanda replied: “You should have all the food groups every day, and it should be healthy. It’s good for your health and it’s good for your bones. Milk is good for your bones. Fruits and vegetables are good for your health. Carrots are good for your eyes. The meat group is good for your muscles.”

Amanda prepared all of the recipes from class at home; she prepared the recipes on Saturdays and Sundays with weekend staff while Marilynn was off. Amanda stated that she learned new skills in the program including, “how to put the ingredients together, how to put everything out when you start. I could use a knife in class. I was having a hard time using a can opener and now I can use one.” Marilynn confirmed, “She learned knife skills and the use of the claw; handling the knife when cleaning and away.”

They both confirmed that Amanda has taken a larger role in preparing meals and snacks at home. Amanda has been preparing recipes from class along with others including spaghetti and hamburgers. Marilynn included that Amanda packs her own lunch for work and is helping staff prepare dinner every day.

Amanda stated that she tried several new foods while participating in the program including the green smoothie, which she named among her favorites from the class, butternut squash and orzo. Her meals are shared with her roommate who she has encouraged to try new foods as well: “The macaroni and cheese was pretty good; I like
how they did that. I got my roommate to eat it with broccoli and peas added to it. She
doesn’t like vegetables and she wanted more of that too.”

   Josh

   Josh is a 30 year old male that lives alone with the aid of twenty-four hour staff.
He was obese; however, did not have any comorbid conditions related to his weight at the
time of the program. Josh attended all six class sessions with caregiver, Kenneth. Josh
was enthusiastic and participated in all class activities. Kenneth assisted Josh in preparing
recipes during class; however, did not participate in other class activities. Both spoke
freely during the interviews.

   Interview –Pre-Class

   Kenneth and Josh discussed recent changes to Josh’s diet following the advice of
his doctor to lose weight. Kenneth stated that Josh’s diet changes started about two weeks
before the start of class. He continued that they were focusing on “light” foods for Josh
and smaller portions. The recent changes also included replacing high calorie beverages
including pop and juice with water. Josh was drinking about a gallon of 1% milk daily;
staff was working with him to reduce this to a glass in the morning and a glass in the
evening. Josh was eating about twice daily, but was still not eating vegetables regularly.
He was eating whole grain bread off and on, but Kenneth stated that they were cutting
back on his overall bread intake. He added that the changes have been difficult because
Josh is picky and will refuse to eat most new foods. Josh also has friends that bring him
pop and sweets at work, and staff is unsure of how much he is eating there. Josh stated that some of his favorite foods include salad, burritos, tacos, rice and sandwiches.

Josh described healthy eating as eating a lot of vegetables, salad, chicken and drinking a lot of water. He continued that healthy eating is important for weight loss, and that exercise is an important part of being healthy as well. Kenneth’s idea of healthy eating also included managing body weight. Kenneth added that good nutrition is important in preventing chronic disease.

Josh and his staff grocery shop together. Kenneth stated that this can be difficult because Josh will choose items at the store and then refuse to eat them at home. His hope was that the program would provide tips on healthy choices at the grocery store and ways for Josh to meet his weight goal. Josh makes his own food choices; however, his staff started to redirect him with his recent dietary changes.

Kenneth and Josh both confirmed that Josh does not typically help prepare food at home. They both discussed safety concerns about Josh using the oven or stove. Kenneth stated that Josh will occasionally help with foods he likes such as sausage. He is able to use the microwave, but is often uninterested in cooking. Both confirmed that Josh washes his hands before handling food and sanitizes eating and food preparation areas.

**Interview – Post-class**

Kenneth stated that Josh has made changes to his diet including eating at home more, drinking water or low calorie drinks and has asked friends to stop bringing him treats at work. Josh eats fruits and vegetables with at least two meals each day. He drinks...
two cups of 1% milk daily. He has added whole grain cereal and oatmeal to his diet. Josh will eat white bread and whole grain bread. Kenneth feels that Josh has made strides in eating a healthier diet, stating:

_He’s really benefitted a lot from this program. Before he was asking me to eat out regularly, now he knows that this it’s not something that’s good for you to do always. He’s not harassing me about always going out; he knows we can make healthy good things here. He likes home food now. Sometimes he’s still a little picky, like yesterday we made chicken. He said it was tough, but he liked the flavor and still ate it. It brings ideas and knowledge to him about what he should have and how much. Before the classes everything he wanted was more, more, more. It was stuff he shouldn’t be having anyway. Now we sit down and decide, what are the best things we can eat for meals today? What is the best lunch we can pack today? He’s packing salad and turkey sandwiches and those things now._

Josh discussed his new diet changes as well; he explained that he is trying to improve nutrition and increase his physical activity to lose weight and become healthier. He discussed foods that he likes including spaghetti and adding extra vegetables to including several food groups in each meal. He added, “I eat oatmeal for snack, I drink tea and coffee with just a little cream. I’m drinking water every day with lunch.”

Josh made a few of the recipes at home; however it was difficult for Kenneth to motivate him to try new foods. They still had the squash from week two and, we reviewed how to prepare it. Josh did try a few new foods during the program including the green smoothie which he admits he was hesitant to try but found it to be one of his favorite recipes. Josh is helping to prepare foods at home when they are foods he’s excited about. He stated that he’s been showing staff the recipes he liked from class and helps to prepare them. The pizza and apple salad recipes were pinned to the wall above
his kitchen table. Josh said that he still does not use the stove alone but knows how to defrost frozen chicken in the microwave before cooking it now. Kenneth added that Josh is following other recipes as well; one of his new favorite meals to prepare is spaghetti. They both stated that Josh is washing his hands regularly before preparing foods and practices proper knife handling. Kenneth stated that he and other staff prepare traditional African food for Josh and he has cut back on the amount of oil used in certain recipes following class discussion about fat.

Kenneth added that Josh is aware of how his lifestyle can affect his health as well as the relationship of his weight to his health. Josh is showing greater care when it comes to what he eats and has increased activity to include 35-45 minutes of treadmill walking daily.

Misty

Misty was a 33 year old female that lives alone with the aid of homecare staff. She was diagnosed with hyperlipidemia, pre-diabetes and obesity. Misty was enthusiastic about the program and spoke openly and freely about her eating habits and cooking skills. Misty attended all class sessions with two staff members, Harriet and Ernest, who both fully participated in all class activities.

Interview – Pre-class

Misty’s staff stated that she did not follow a healthy diet before starting the pilot program. She expressed preferences for foods such as chicken nuggets and mashed potatoes. Harriet noted that Misty added a large amount of butter, cheese and sugar to
most of her foods. All three indicated that Mountain Dew is Misty’s preferred beverage. She drinks several 12 ounce cans throughout the day, going through multiple cases weekly. Misty’s other beverages include coffee and tea. All three confirmed that she does not drink water. Misty stated that she does not eat breakfast regularly; typically she waits until noon or later to eat. Harriet stated that Misty was eating fruits and vegetables four to five days per week. She was drinking whole milk, but only with cereal. Misty was not eating whole wheat foods regularly. Harriet felt that Misty’s biggest obstacle to healthy eating was poor portion control.

She needs to work on portion control more than anything because if she sees a whole box of something she needs to cook the whole box. We have a hard time with her portion control. She cooks for a family instead of one person...She is starting to like fruits. She always ate vegetables pretty well, but the only part about that is she used too much butter and lots and lots of cheese. That’s why I said portion control. I told her some of that stuff sometimes it clogs your arteries. It’s not good for your heart. So now she’ll eat grapes and strawberries, lots of bananas, but they’re dipped in sugar.

Misty’s works with staff to create a weekly grocery list based on meal plan poster provided by her doctor for the house manager to use when shopping for Misty. Harriet credits the poster for Misty’s recent increased intake of fruits and vegetables. Misty was responsible for making food choices. All three confirmed that Misty prepares her own snacks and works with staff to prepare most meals. Staff help her to use the stove, oven and help with matters of food safety including sanitation and temperature. Harriet states:

It’s more like trying to explain to her when you use chicken make sure you wash it properly and keep surfaces clean from bacteria. That’s another thing she has to work on. She doesn’t have much patience; we have to explain to her that food has to get cooked thoroughly so you need a timer on it because you can’t eat chicken that’s half cooked. She works really
hard at trying to learn. She can slice things up, open things. She’ll make her own plate and she checks on the food to make sure it’s done. She knows how to use the oven and microwave properly. She can overcook things in the microwave. Sometimes she burns the bottom of food because it’s too low in the oven. We just need to remind her about things. The main thing is just getting her to clean surfaces and not to use too high of fire, too high temperature.

All three discussed a relationship between good health and good nutrition. Misty stated that eating healthy includes eating fruits, vegetables and meat and avoiding junk foods like chips and popcorn. She also stated that when she’s healthy she feels happy. Harriet stated healthy eating is part of a healthy lifestyle. She also included that healthy foods, especially a balanced breakfast, make her feel energized. Ernest replied that he does not eat a healthy diet, but he knows that good nutrition offers many health benefits. Harriet is concerned about Misty’s diet affecting her health specifically the amount of pop she drinks as well as added butter, cheese and sugar to foods.

Misty stated that she’s interested in learning how to make more foods from scratch like oatmeal cookies in the pilot program. Harriet wanted to make sure the course covers proper timing for preparing meats and portion sizes.

Interview – Post-Class

Following the program, Misty and her staff have noticed a change in her diet. They noted an increase in fruit and vegetable intake and she has cut back on Mountain Dew intake. Misty had finished her case of Mountain Dew for that week and started drinking coffee with cream as an alternative. Misty also purchased a blender and has started making fruit smoothies. Harriet stated: “She’s eating her fruits and vegetables more now. She wasn’t really eating them a lot before. We can’t get her to drink water
which is the main thing, but she does try to cut back some [on the Mountain Dew], so maybe over time she’ll make greater cuts. She’s eating whole grain cereal; she’s not a bread eater. She’s started eating yogurt.”

Misty continued to prefer whole milk with her cereal despite attempts to switch to 2% milk. She is making an effort to eat breakfast daily. “Sometimes if I’m not hungry I have a snack, so I don’t eat as much with meals. If I’m not hungry in the morning I’ll still have a banana.”

Both caregivers noted changes in their eating habits following the program as well. Harriet stated:

It’s really strange because my sister and I went out yesterday for dinner and she like, ‘Wow, Harriet your plate looks so healthy,’ because I had more vegetables on my plate than anything. I had Brussels sprouts, asparagus, and baby red potatoes on my plate. I had a small piece of prime rib, not that much. Most everything was healthy on my plate and she was so surprised. I am trying to change my food habits to good and I feel better. I’m not dragging.

Ernest stated: “I never ate healthy before, now I am a little; I’ve been eating peaches and things. I was thinking about class the other Saturday because I sat down and looked at my plate and noticed all the colors and was like I guess I did learn something at class. My wife does a lot of stir fry and she always tries to make it more healthy. We’re doing more chicken and broccoli and brown rice now.”

Harriet felt that the most beneficial aspects of the program were learning about the food groups and the role each group plays in a healthy diet. She specifically mentioned learning about 100% whole grain foods.
Misty and her staff all noted a change in her ability to control portions. Misty stated that she is not using as much butter and has been adding more vegetables to her meals and she is not eating meals out as much. Misty also started portioning the meals she makes at home. “I get to figure out what I want to eat, like yesterday I made shells and cheese and I didn’t eat that much of it. I put the rest in the fridge and saved it for later.”

Her staff noted that Misty is aware of positive health outcomes linked to proper nutrition. Harriet stated: “She’s trying to lose weight. She knows it’s better for her. She’s working out too and exhausted afterwards, but she’s feeling good about what she’s doing and she’s proud of herself. She used to get home and go straight to eat but she’s not doing that now. She’s not constantly snacking while on her computer or listening to music.”

Misty prepares her own meals regularly now with little assistance from staff. Harriet mentioned that she’s carrying on meal preparation tasks including: measuring, chopping produces, rinsing produce and meat. Harriet and Ernest agreed that Misty is careful to wash her hands more regularly including before starting food preparation and after handling raw meat. She also sanitizes her kitchen work area before and after cooking. They mentioned they mainly help her to retrieve food from the oven. Misty noted that she feels the most prominent skill she gained through the program was learning to use a knife properly.
Rich

Rich is a 33 year old male who lived with one roommate and the assistance of twenty-four hour homecare. Rich had been diagnosed with morbid obesity, GERD, type 2 diabetes, fatty liver disease and congestive heart failure. Rich attended five of six class sessions during the pilot program with a homecare staff, Alemnji. Rich was reluctant to participate early in the program, choosing not to attend the first class and to not to participate in class activities during class two. However, Rich was an active and enthusiastic participant in classes three through six. Alemnji willingly participated in most class activities. Both spoke freely during the interview portions of the study.

Interview –Pre-Class

Alemnji stated that Rich’s staff and healthcare team were working with him to follow a 3,000 calorie diet. He adds that staff tries to provide a variety of foods and create meals with vegetable, carbohydrate and protein foods. Staff prepares breakfast and dinner for Rich at home and packs a lunch for him to take to work; they also prepare about 3 snacks for him daily. Alemnji stated that he eats fruits and vegetables a couple times a day and drinks low-fat or fat-free milk. Rich eats whole grain breads and cereals when available. He noted that his Rich’s aunt does his grocery shopping so the availability of certain foods varies with what she purchases. Rich stated that he likes to eat out often and some of his preferred foods include pizza, Chinese food, Subway and Bob Evans. Rich was drinking several servings of pop throughout the day and consuming an estimated 1000 calories this way. His staff had recently started working with him to cut
back his pop consumption by replacing pop with water and single-serving low calorie
drink mix while at home. Rich stated that he likes different diet drinks including Crystal
Light and Coke Zero. He also said he drinks sports drinks including Gatorade. Alemnji
discussed Rich’s work being a barrier for healthy change:

When he’s here we do the best we can. Not everything we make he likes so we try
to stick with things we know he’ll like. When he goes to work he kind of gets
whatever he wants. We try to pack him lunch but sometimes he would drink like
six bottles of soda at work in a day and bring back more and hide in him little
refrigerator in his room. For the most part he eats a good diet, but then he goes to
work it’s difficult to control him.

Alemnji stated that Rich has lost weight since implementing his meal plan. He has
started to understand a connection between nutrition, exercise and his health. Rich
explained why he thinks good nutrition is important. “It will help you be around a lot
longer and live a healthier life. Not die young, be around for the people that you want to
be around for.” Rich identified eating healthy as “lots of vegetables, fruits like
watermelon and oranges.”

Rich does not help prepare meals or snack regularly, but Alemnji said he was
hopeful the program will encourage greater participation at home. He stated that
including some favorites like pizza and simple recipes would motivate Rich to participate
in cooking. Rich was excited about starting the class and preparing recipes. He
specifically spoke about learning knife skills. Both described Rich’s current cooking
skills to include using the microwave, boiling vegetables, making salads, preparing eggs
or vegetables with cheese toppings.
Rich described food safety as “Washing your hands with soap and water. Make sure food is clean. Rinse off, chop off bad parts. I like hamburger, breaded fish and chicken, I keep it in the freezer. I put it in a sink of hot water and let it thaw out.”

Interview – Post-Class

Alemnji feels that Rich’s diet improved over the course of the program and curriculum complimented the meal plan Rich was trying to follow before the program.

_We had a meal plan but we needed more knowledge on exactly what the plan should focus on. Now I feel like we know what it is that a meal should look like and what we should have in each meal and why it’s important. We are trying to stick to it more now than we were before. There are things that we would normally not get but now based on the knowledge that we gained from the program; its impact the groceries we ask for. We are getting whole grain pasta and adding extra vegetables._

He stated that Rich is eating more fruits and vegetables while at home than before the program, but he is unsure of what his eating habits were at work. Rich is drinking 1% milk typically with cereal. He eats whole wheat or whole grain foods when his aunt purchases them and recently started eating oatmeal and whole grain pasta. Alemnji felt that learning about the food groups and the importance of incorporating fruits and vegetables into meals made Rich more willing to include these foods more often.

Both discussed Rich’s interest in being healthy and fit. Rich discussed what healthy eating is including eating more vegetables and healthy fats. He also explained he feels like he has more energy and has become more athletic following diet changes and increasing physical activity. “I think his health is getting better. I think he’s more
involved in making healthier decisions when he eats and he’s being active with swimming and other things,” said Alemnji.

Rich prepared most of the recipes from class at home with Alemnji. Alemnji stated that they prepared them with ease and that they were an appropriate level for Rich to understand and be able to complete. Rich prepares food regularly at home for himself and his roommate. Rich said that his favorite recipes from the class were the green smoothie, chips and salsa and oatmeal cookies. Alemnji stated, “He helps pretty much every time we make something. Every day we have him do something. Especially is he’s asking for what he wants, we make sure he’s doing something to help with preparing. Sometimes he does make breakfast and snacks for himself.”

Rich discussed the cooking skills he practiced in the program and now uses at home. ‘I either chop up stuff or put sauce on it or stuff in the pan. I follow the recipes and put everything together. If something’s hard to cut, they’ll help me cut it because I won’t want to. They’ll also help with the stove.’

Both stated they learned several tips on being safe in the kitchen. Rich talked about the importance of washing hands before touching food and how a knife should be held when chopping food. Alemnji stated: “We went out and got cutting boards. I learned the proper way to handle a knife. We learned how to preserve foods correctly and how to defrost safely. It was a lot of good information on things we kind of knew about but were just negligent with and really changed out habits at home.”
Alemnji admitted to changing his eating habits following the pilot program. He stated:

*It helped me make better decisions about things I didn’t even notice before, like having even a little something for breakfast in the morning. I’m not a breakfast person but now I make sure that I get at least something. When I pack lunch I try to have at least a bottle of water and a fruit and vegetable. I actually started making smoothies for myself at which I had never really done before. I’ve gained knowledge about new techniques and I’m making healthier choices.*

Terri

Terri is a 53 year old female that lives alone with the aid of twenty-four hour staff. Terri was diagnosed with obesity, sleep apnea, asthma, joint problems, hyperlipidemia and GERD. Terri attended five of six class sessions with caregiver Dorothy. Dorothy and Terri willingly participated in class activities. Terri had some restrictions due to behavioral problems including no contact with any knives.

**Interview: Pre-Class**

Dorothy discussed recent changes she started to implement in Terri’s diet. She stated that when she started working with Terri several months ago she was eating frozen meals regularly. Dorothy has worked with staff to have most of Terri’s food prepared from fresh ingredients. She added that now some of her regular foods include chicken, fish and salad. Terri and Dorothy confirmed her favorite foods are chicken and dumplings, beans and cucumber salad. Dorothy stated that Terri will drink a large amount of pop if allowed. She encourages Terri to drink mostly water and Crystal Light. Dorothy purchases 1% milk; however, Terri is not a regular milk drinker. Terri eats vegetables
daily and has recently started increasing her fruit intake. Terri does not eat whole grain foods often.

Dorothy discussed the greatest barrier to Terri eating a balanced diet is her behavior plan which includes rewards and daily outings focused on fast food and high calorie treats.

*She has a daily outing where she gets $3 to go and gets a frosty or slurpee or a candy bar. So that’s part of the problem. I’m trying to get them to take her to get more healthy choices, still go to McDonald’s but let’s not get a pop, let’s get a smoothie, that kind of stuff. That’s part of her behavior plan. Last week she got a special reward of $15 outing. We were going to the pet store. We could get something for the pet. Well she changed her mind and insisted that she wanted to go to Golden Corral. I was just sitting thing I had to kind of control her. She got excited. She was rushing to eat that plate so she could go get another plate.*

Terri and Dorothy grocery shop together. Dorothy stated that Terri struggles to focus while shopping so they have started creating lists from meal ideas before shopping. Dorothy added that Terri makes her own food choices, but she tries to guide her to more healthy options. Dorothy did note that she felt a grocery store tour as part of the program may be an uncontrollable situation for Terri and the other participants. She was concerned about overstimulation and behavior problems.

Staff prepares Terri’s meals and snacks. Terri’s participation is typically limited to handing them ingredients due to behavioral problems. Dorothy will prepare meals in advance to cover shifts of staff that do not cook. Terri can make a few recipes from memory on her own including cucumber salad and chicken and dumplings. Both stated that she helps clean the food preparation area before and after meals are prepared. Terri
and Dorothy both confirm that she knows how to store leftovers in the refrigerator and freezer properly.

Dorothy stated Terri’s diet has negatively affected her health. She struggled with knee problems and respiratory problems requiring use of a c-pap during at night related to her weight. Terri described a relationship between diet and conditions including diabetes and hyperlipidemia. Terri described healthy eating as eating fruits, non-fried meats, skim milk and low-fat or diet foods.

Interview: Post-Class

Following the program, Dorothy reported that Terri was asking for most of her previously preferred foods. However, she added that Terri has started to include all food groups in her meals each day. She has added more vegetables to her diet along with fruit and yogurt. Terri was drinking mostly water after the program, and occasionally 1% milk. Terri added oatmeal and whole grain pasta, bread and buns to her diet as well. Terri mentioned her favorite foods included cucumber salad, chicken and dumplings, and sausage.

When asked about what she learned from the program, Terri described going to the grocery store and picking out foods from all food groups, not eating a lot of fast food, and including low-fat and diet foods. Terri added that a healthy diet helps prevent chronic conditions affecting the heart and can help manage body weight.

Terri and Dorothy confirmed that they prepared the apple salad and pizza recipes from class at home. Terri said she struggles to help with the recipes because she cannot
read. However, she said the pizza was her favorite recipe. Dorothy added that Terri was able to assemble both the pizza and salad; however she is unable to use knives, so staff chopped food and used the oven for her. Terri added that she is careful to wash her hands when cooking and sometimes wears gloves as well. Dorothy stated, “She can help measure and mix. She can do all the prep except use knives. She can do it all, but it’s just getting her to do it. She’ll do it with making those things she likes.”

Dorothy felt that the greatest benefit of the program for Terri was the social aspect. Terri struggled to grasp many of the nutrition concepts discussed and was unable to practice some of the cooking skills. However, she clearly enjoyed participating in group discussing and sharing food with other participants. Dorothy added that Terri can identify food groups now and she thought it was helpful for Terri to hear about the importance of eating a balanced diet. Dorothy added the class has changed the way she shops for Terri and herself.

*I learned what to look for to allow her to still enjoy what she likes but be healthy at the same time. She did learn something about the food groups and she did enjoy participating. It was like she was involved in something hands-on and it helped me to help her purchase healthy options than what she wanted before. I’ve started making my own green smoothies at home each day for breakfast. I’ve learned how it’s important to cook more at home and when you don’t have time to cook what are the healthy options you do have. Instead of McDonald’s I go to Subway. I really got a lot out of it.*

**Class Themes**

**Nutrition Knowledge**

The program curriculum focused on nutrition basics including identifying food groups and eating a balanced diet. The participants had not received nutrition education
before the class but were aware that nutrition is linked to healthy. All DD participants identified eating fruits and vegetables as part of a healthy diet before starting the program.

The five foods group and the MyPlate method for eating a balanced diet were introduced in week one. The participants described MyPlate as including all food groups and recognized the importance of portion sizes. They were familiar with the food groups and could recall the dairy and vegetable groups during week one. This concept was reinforced several times throughout each class session. Terri struggled with the concept the most; however, she was able to identify some foods in the final weeks of the program. All other participants were able to identify the food groups of familiar foods by the second week. More information about the food groups was discussed in later lessons including the importance of varied colors in fruits and vegetables and whole grains. Regular repetition of these concepts helped the participants recall these concepts. Participants would shout “fiber” when asked why it’s important to eat whole grains by week four. During week six the participants took turns describing the foods they ate for Thanksgiving dinner and identifying the food groups including in each dish.

During week one, the class participated in a discussion of “go, slow and whoa” foods, identifying foods that can be eaten daily and those that should be eaten less often. The participants were aware of foods that are linked to poor health outcomes. Josh and Terri discussed the relationship between high fat foods, like butter, and heart disease. Participants identified certain snack foods and high sugar treats as “bad” foods. Josh and Rich identified the relationship between poor diet, high body weight and health. Josh and
Misty also discussed adding extras to healthy foods including sugar on fruit and high calorie dressings on vegetables. During week four the group was able to name several healthy snack ideas including yogurt, hummus, peanut butter and fruit. The group also identified healthier options when eating out including taking a portion of the meal home, ordering light salad dressing or dressing on the side and splitting the meal with another person. Terri and Amanda stated post-program goals related to food choice. Terri planned to eat turkey sausages and hot dogs instead of high fat versions. Amanda was planning to replace potato chips with healthier foods.

Breakfast was discussed in week one and again in week four. Many of the participants reported not eating breakfast regularly, waiting to eat their initial meal in the middle of the day. However, they all agreed that eating breakfast is an important part of eating a balanced diet. One participant added that breakfast is particularly important for diabetics. Amanda stated she feels shaky and tired when she skips breakfast, others agreed. The participants were encouraged to eat something each morning and advised a balanced breakfast included three food groups. Each participant took turns identifying a breakfast and naming the food groups included. All were able to complete this challenge with assistance from the rest of the class. During the post-program interviews, two participants discussed making an effort to eat breakfast each morning.

The nutrition activities throughout the course proved helpful in promoting excitement and in interest in nutrition concepts as well as understanding of more complex concepts. Blubber burger and the beverage chart illustrated the amount of fat and sugar in some of the group’s regular foods and beverages. While they knew some of these foods
were considered unhealthy, the visualization added value to the nutrition label numbers. The group was also surprised to learn salads and fruits juices were not as healthy as perceived. After seeing the amount of fat in the fast food meals, Amanda stated concern that a person eating these foods may need to go to the hospital. Many in the group discussed the surprise of seeing the amount of sugar in fruit juice being similar to that of pop. Participants were able to connect foods to health consequences with these visualizations, questions about food and drinks not represented were asked as well as questions about diabetes and heart disease. Other activities focused on identifying the food groups. Participants enjoyed displaying their knowledge in a fun, lightly competitive way. Rich stated that the games were among his favorites part of the course. “No one could figure out the one question, they said it was a fruit and it was green and small and I was the only one that could figure it out. I said kiwi. That was fun. I was paying attention and learning; I think I answered 3 of the questions by myself.”

The grocery store tour was another activity that was listed as a favorite by Rich, Josh, Terri and Misty. The activity allowed the participants to work out of the classroom with instructors to apply what they had learned in the previous weeks. Though most of the participants were not responsible for their own shopping, they were interested and engaged throughout the activity. Questions asked by participants indicated they were thinking about their current eating habits. The questions included how to find particular fruits in fresh, frozen or canned variations and which is best; if certain meats were considered lean and what alternatives would be healthier; difference between normal and Greek yogurt and individual and large packaging; and whether there is fat and sugar in
frozen produce. The entire group was engaged in reviewing nutrition labels, pricing and finding healthy, inexpensive alternatives to some of their regular foods. All participants passed the grocery store challenge of finding a low-fat dairy product, whole grain product, fruit, vegetable and lean protein for under $10. Josh and Amanda both purchased a new food for their vegetable choices: cabbage and a sweet potato.

New Food Acceptance

The participants’ regular diets varied; however, there were a few trends that were popular throughout the group. Some of these regular habits were addressed during the course and the participants made a few changes to their diets as a result of the lessons. In the first week of class all the participants discussed not eating all the food groups regularly, especially fruits and vegetables. However, the participants reported including vegetables in recipes at home more often throughout the course, and all caregivers reported an increase in fruits and vegetable intake, as well as awareness of the food groups among their clients following the program.

Participants were more likely to participate enthusiastically and eat the food prepared when the recipes were related to familiar foods. The class prepared mini pizzas week one and all participants had a role in the food preparation in class as well as making the dish at home. However, the second week included a butternut squash and orzo recipe which were new foods to all the participants. It was a challenge to engage the participant in preparing that recipe and only about half of the class was willing to taste the dish. Week two also included a food tasting activity. Participants were given a plate with
spinach, beets, edamame, fennel and grapefruit. Two participants refused to try any of these new foods; one tried a few and two tried all that were offered. The participants who refused to taste foods stated that they did not want to taste the foods because they were unfamiliar or because they had heard another person state they tasted bitter or sour. The week three recipes were macaroni and cheese and baked flaked chicken that both resembled more common foods. The entire class was excited to both prepare and eat these foods, despite that whole grain macaroni was a new food for most. The class seemed slightly more open to trying new foods during the second half of the course.

Week four included a taste test of a green smoothie which contained spinach, cucumber, juice, yogurt, banana and peaches. Eventually all participants agreed to a sip; however, most were reluctant and were scowling as some of the ingredients were added. Misty and Josh were the last to try and they were also the most reluctant to try other new foods. All participants liked the smoothie; all mentioned the recipe as a favorite in later classes or during their post-class interview. Misty had purchased a blender following class four; many of the caregivers discussed making smoothies for themselves and their clients following this class as well. Misty and Josh also selected and purchased new foods during the grocery store challenge.

Sugar-sweetened beverages include pop, juice, and lemonade were identified as some of the group’s favorites. During the interviews and week one class participants stated they drink these beverages several times daily. The sample overwhelmingly preferred sweet-tasting beverages. Few were willing to drink water plain regularly. Even when discussing lactose-free milk alternatives, participants stated they preferred a very
sweet taste. Low calorie drink packets mixed with bottled water was an alternative to sugar-sweetened beverages that all five had tried and liked by the end of the course. All participants enjoyed the juice spritzers and green smoothie introduced in week four. Several caregivers added smoothies to their clients’ diets as a way to increase fruits and vegetables and allow them a sweet beverage. Misty was a clear example of the beverage pattern. She came to the first class with a 20 ounce Mountain Dew and drank it throughout the class. The second week she downsized to a 12 ounce can of Mountain Dew; however, she did not open and drink it while in class. She brought a water bottle with ice tea mix to class week three. Misty and her staff reported to the class they had stopped purchasing Mountain Dew that week. However, by week six Misty was drinking Mountain Dew again, though she was stated that she had cut back and her post-program goal was to “slow-down” on the pop.

Cooking Skills

The participants came into class with varying levels of skills and experience preparing food. However, it was apparent that the homecare staff was responsible for preparing the majority of meals with occasional help from their clients. Throughout the course DD participants were challenged to prepare recipes alongside their homecare staff. Three of the participants prepared most of the class recipes at home with the assistance of staff. These three, along with their staff, reported regularly helping with meal preparation following the program. The remaining two DD participants only made two of the recipes from class at home by the conclusion of the course. However, these participants and their caregivers did report an increased interest in cooking and a small increase in help with
meal preparation at home. It was clear that the DD participants were most willing and excited to prepare familiar, preferred foods. Participants were most cooperative and focused when working on recipes they were excited to eat in class. They deviated from tasks when preparing and working with new foods they were not interested in eating.

Three caregivers confirmed that a similar pattern when preparing meals at home. Clients were easily motivated by familiar, preferred foods. Two participants identified post-program goals focused on cooking. Rich stated his goal is to learn to cook a turkey and Josh stated he would like to continue learning to cook more dishes on his own.

All participants showed progression in skills and knowledge related to food preparation throughout the course. All five DD participants become more comfortable with measuring and mixing ingredients, following recipe steps and assembling food. In weeks two and six, the DD participants volunteered to perform these tasks in front of the group as they prepared recipes as a group rather than as individual teams. This was an effective way to teaching the lessons and the participants seemed eager to participate and showcase their skills.

A few specific skills were in several recipes and were popular among the DD participants and caregivers. Chef demonstrated techniques for slicing an onion without crying, cracking an egg evenly on a flat surface and removing the skin on garlic clove. These techniques were new to the entire class and seemed to be favorites to practice. Rich was able to demonstrate the egg cracking technique to the class during week six after learning it week three. Josh cut an onion meticulously during week six, despite struggling with knife use throughout the course. Terri and Amanda also discussed using a can
opener week six which was a new skill, both added the importance of cleaning the top can before opening.

Three of the DD participants reported preparing most of the recipes at home; the other two made the pizza recipe and apple salad. The participants were encouraged to experiment with the recipe by adding new topping or spices. Participants were excited to share their experience with cooking at home at the beginning of each class session. All participants added new toppings to the pizza recipe. Misty and Amanda reported adding foods including dried cranberries and apricots and mixed nuts to the apple salad. Misty prepared this dish for her family’s Thanksgiving gathering and shared that she taught the recipe to her mother. Amanda also shared that she added peas and broccoli to the macaroni and cheese recipe. The participants were also challenged to make creative recipes with left over ingredients from class. Rich and Josh reported making an omelet with leftover eggs and vegetables. Josh also reported eating leftover broccoli and bananas raw. The squash and orzo recipe was the least popular and was only prepared by one participant at home; no participants discussed using the ingredients in other ways.

The importance of food safety was discussed throughout the course. The participants were able to identify key concepts starting with week one and continuing throughout the course. The most prominent practice was hand washing before touching food and while cooking to prevent cross contamination. All five DD participants practiced this and verbalized how to wash hands and why it is important. All participants also discussed how to wash produce as well and stated that they knew this before starting the program. New concepts identified by the participants included washing the tops of
canned foods before use, wiping mushrooms with a paper towel and properly thawing meats before use. Two participants stated they were not thawing meats in a safe way before learning the techniques in class. These participants and caregivers stated they have since changed their habits at home.

Knife safety and skills were introduced in the first week and used throughout the course. In week one, the chef demonstrated proper knife handling technique as well as safety while washing knives after use. Participants were interested and attentive during this lesson and continued to work diligently in following weeks on practicing these techniques. Terri did not use a knife due to her behavioral plan; however her caregiver was able to perform these tasks for her. Various physical conditions including partial paralysis, poor muscle control and tremors made knife use a greater challenge for this group. In week one, all DD participants started with paring knives and soon switched to plastic knives to reduce risk of injury. The chef introduced the skills while standing, but one participant needed to sit to stabilize and support a paralyzed arm. Week two there was little improvement; however the four DD participants able to use knives continued to practice diligently cutting apples. Volunteers were at each work station and able to provide guidance with each cut. Knives were not used in week three. Participants were taught to pull broccoli apart if they did not want to chop it with a knife. Rich and Josh commented they were happy not to use knives during that class and enjoyed preparing those recipes. Weeks four and six required the use of knife skills. During both of these weeks, the chef demonstrated the correct technique. Participants continued to work on mastering this skill while using plastic knives. Amanda was able to use the claw
technique as instructed by the chef. However, the other DD participants used a variation of this approach due to physical obstacles and frustration with learning the new skill. At the conclusion of the course, three of the DD participants and two caregivers mentioned knife skills as one of most important skills they learned in class.

Three of the five DD participants, along with their caregivers, expressed safety concerns over cooking including use of the oven stove. Throughout the six week course, all participants were able to use the stove at least once with assistance. Each participant was assigned and carried out at least one task to complete a recipe during five of the six classes. At the conclusion of the course, two of the participants and their caregiver with safety concerns reported that they had used the oven at home with the help of staff taking hot food out; all three were not using the stove. The other two participants used the oven and stove at home with supervision. All five DD participants reported the ability to use the microwave throughout the program.

Caregiver Impact

The caregivers played a key role in the success of the program overall and their clients’ individual successes. Three caregivers stated they had misgivings about the program at the start; however, all three reported they enjoyed the program and it impacted their client’s life and their own habits. The caregivers that participated the most in the program stated learning and using the knowledge to change their habits. The caregivers who did not participate in all activities did not mention any change to their own knowledge or behaviors.
The class activities were engaging and enlightening for the caregivers. Several mentioned the grocery store tour has changed their shopping habits. Many caregivers also discussed sharing nutrition tips and lessons from class with family and friends.

Harriet stated, “When I’m at the grocery store, now I know to go around the outside. I’ve been telling friends and family the same things that I learned and that have really helped out. I go around the outside the food’s much better.”

Marilynn stated: “I took pictures of the fat in the hamburger from the fast food places and showed them to other people and was like, ‘this is all the fat you’re eating and you don’t see it!’ and they were totally shocked.”

Dorothy stated: “I learned I have a bad thing for sweets, I can still have some sweets but I can choose things that are healthier. I learned a lot. I cleaned out my refrigerator and filled it will all sort of greens, fruits and vegetables.”

**Findings**

The research questions that guided data collection and evaluation of the program are summarized in the table below.

| What are the perceptions of DD/ID adults on “healthy eating”? | • High intake of fruits and vegetables  
• Decreasing “bad” or “junk” food  
• “Healthy eating” is important for decreasing disease risk including heart disease. |
| --- | --- |
| How are these perceptions affected by the nutrition and cooking skills program? | • Intake of all five food groups daily  
• Awareness of specific nutrients, i.e. fat, fiber  
• Consuming appropriate portions  
• Decreasing intake of foods from fast food restaurants  
• Healthful foods provide benefits including strong muscles and bones and eye health |
What are DD/ID adults’ perceptions towards meal preparation/cooking?
- Little interest in helping staff prepare meals
- Safety concerns with using kitchen appliances
- Aware of basic food safety including hand washing and freezing meats

How are these perceptions affected by the nutrition and cooking skills program?
- Comfortable helping with basic food preparation tasks including mixing ingredients and cracking eggs
- Aware of safety precautions in including sanitation, knife safety and proper thawing of meats
- Still uncomfortable using appliances including oven and stove
- Increasing participation in choosing recipes and helping prepare meals at home

How does a nutrition and education skills program influence the eating habits of DD/ID adults?
- Increased fruits, vegetables and whole grains intake
- Acceptance of a few new foods including green smoothie
- Gradual decrease in pop intake
- Gradual increase in water intake

What is the overall effect of the nutrition and cooking skills program for disabled adults and caregivers?
- Awareness of healthful habits for both DD adults and caregivers
- Increase knowledge of food groups and benefits of balanced diet
- Increased participation of DD adults in food preparation at home
- Short term changes in diet including increased water intake, increased whole grain, fruit and vegetable intake for both groups

**Conclusion**

The pilot program evaluated in this study effectively increased participants’ knowledge and awareness of healthful nutrition, benefits of eating a healthy diet and increased participation in food preparation with homecare staff. The program also contributed to dietary changes for both the DD participants and the participating caregivers.
Active participation in class discussion and activities and repetition of nutrition concepts and cooking skills were key strategies in the design and implementation of this program to reinforce health messages and healthful habits through the six week program. In a review analyzing more than 300 studies, evidence indicates nutrition education is most effective in influencing behavior change when it focuses on active participation. The components of effectively implemented nutrition education programs included a motivational phase which increases awareness of health benefits and practices through knowledge; an action phase, which facilitates of fostering the skills needed to take action; and environmental supports to maintain similar messages and sustain the benefits gained (65). These components can be identified in the design of this pilot program; each can be attributed with the participants’ success. The weekly nutrition lessons provided increased awareness of healthful eating and the benefits gained when practiced, and thus falls into the motivational phase of nutrition education. The action phase included weekly preparation of recipes, weekly at-home challenges and grocery store tour. Participants were able to expand on knowledge gained from motivational phase and put into practice. Lastly, the environmental factor includes the incorporation of homecare staff in the program. Caregivers play a large role in the dietary habits of DD adults (22). This pilot program included the caregivers has an integral part of the participants’ eating habits and a way to provide social support to reinforce changes at home. Earlier studies found caregiver participation was essential to behavior change success for the DD population. In this study caregivers were able to change the way food was prepared at home, help purchase healthier foods for the participants’ homes and reinforce the nutrition concepts learned in class at the participants’ homes (54-56). However, caregivers in this study also
identified struggles that their clients have maintaining healthy habits while at work. This was an environment outside the reach of this program. Overall the program components were able to provide skills and knowledge to make subtle changes with the resources available to population.

The design and outcomes of the pilot program aligns with theories that have been studied in the realm of health promotion and nutrition education. Bandura’s Social Cognitive Theory (SCT) states that behavior is based on expectancies and incentives. When applied to health behavior it translates to an individual attempting lifestyle changes based on perceived threats of current lifestyle, perceived benefit or reduction of threat due to a lifestyle change and that they are capable of implementing change, which is self-efficacy (69). The Health Behavior Model (HBM) is hinged on similar factors: the existence of health concern making health issues relevant, belief in perceived threat or susceptibility to illness or condition and belief that adopting certain health behaviors will decrease perceived risk despite potential barriers to implementing the recommended behavior (66-68). This program was implemented with the goal to increase nutrition knowledge, cooking skills and making improved dietary changes. The components fit within these theories and the results reinforce their success in achieving behavioral change. All five DD participants were obese and aware that health risks were linked to excess weight. In the SCT this relationship would be considered an expectancy about environmental cues, belief of how certain events are connected. In the HBM this would be a perceived susceptibility to illness. Throughout the program the participants became aware of benefits of balanced nutrition include weight loss, control of other biomarkers,
including cholesterol, and various other benefits. This fits within the SCT as outcome expectation, how behavior will affect results. The HBM includes perceived barriers with this concept (66-68). The barriers or cost to overcome included limited knowledge of healthful foods, financial constraints, personal taste and inability to prepare healthful foods. The program curriculum addressed all of these potential barriers. The SCT’s incentive component as well as the health motivation of the HBM include the importance of weight loss and risk reduction to the participants. Some of the participants stated that this included prolonging their lives and staying out of a hospital which indicates dietary behavior change has very high value to them. Other incentives observed during the program that influenced change was sharing accomplishments with the class, including not buying a case of pop for a week, cooking a dish from class at home, or adding a new vegetable to a meal.

The self-efficacy plays an important role in the SCT and has been indicated as crucial piece in health behavior change (71). Confidence in the ability to carry out a behavior is crucial for successful adoption of the behavior. Research indicates those who have gone through the other components of the SCT and HBM, but lack self-efficacy will have little success with implementation of new behaviors (69). Similarly, the results of this study indicate an increase in self-efficacy in subject’s ability to identify and consume a balanced, healthful diet and participate in certain food preparation activities. Performance achievements, group activities, vicarious experiences, and verbal persuasion all impact self-efficacy (69). Participation in nutrition activities and discussion of ways to fit healthful nutrition into the participant lifestyles provided them with the knowledge.
and confidence to start making these changes. Activities allowed participants to showcase their newly gained knowledge and discussions encouraged them to share cooking and dietary changes they experienced outside of the class, producing a feeling of pride and confidence to continue these lifestyle changes. Self-efficacy was increased in simple kitchen tasks through weekly repetition in class and practice at home with a caregiver. However, most subjects still felt uncomfortable using stoves, oven and knives following the program. These were tasks that were perceived as dangerous and more intimidating before the program indicating more practice may be needed before increase self-efficacy.

While these models have not been applied specifically to nutrition education geared towards this target population, the results indicate they translate well.

Excitement to practice new skills and showcase knowledge increased motivation to take a more proactive role in choosing healthier food and drink options; however changing habits long term may be difficult. The effort to initiate change indicates that the program increase nutrition knowledge and positively affected attitudes towards eating healthy.

Pre-program interviews indicated preference for convenience foods and low intake of healthful foods such including fruits and vegetables similar to the findings of prior studies of food frequency for this population (32-34). Participants and caregivers reported increased consumption in fruits, vegetables and whole grain foods following the program indicating knowledge of benefits of consuming “healthy” foods and ways to prepare these may have increase their appeal to the DD population. These results fall in line with other studies of small health promotion programs targeted to this population which reported
increases in self-efficacy of specific behaviors like exercise and minor changes in diet following group education classes (51, 52). Earlier studies focused on teaching cooking skills to adults with DD/ID reported success in training samples to prepare recipes independently (76-80). Participants in this study increased participation in food preparation, and gained specific skills including cracking an egg and measuring ingredients; however, at the end of the program they were still depend on staff to do the majority of meal preparation. Similar to prior studies, the participants felt greater confidence in their ability to perform certain food preparation tasks.

This study indicates that health promotion programs can be effective in promoting healthy behavior changes and increasing knowledge among adults with DD/ID. Community healthcare professionals and ID/DD service providers should consider the development of additional health promotion programs targeted to DD/ID adults and their support systems. Long-term programs may be helpful in influencing more permanent behavior change and could potentially lead to positive health outcomes including weight management or decreased disease risk. Programs that include specific caregiver engagement components may also solidify healthful behavior patterns at home by generating greater commitment and interest of the caregiver and in turn the DD participants. Environmental and social influences of this population should be considered in future programs, including reinforcement of healthy behavior changes at home and in the work place. Accommodations for the specific needs of this population should be considered in any health promotion program including literacy level and physical disabilities to increase self-efficacy despite barriers.
The limitations of this study include the use of a small, convenience sample including only subjects recruited from one agency as well as the use of qualitative data with dependence on the truth value of the information provided by participants and perceived observations by the note-taker. While the study was constrained by certain limitations it offers information and developed themes that may set the groundwork for further research and development of health promotion programs for the ID/DD population.
Chapter 5

A Pilot Study: Effectiveness of Basic Cooking Skills and Nutrition Education for Adults with Disabilities and Caregivers

Abstract

The purpose of this study was to evaluate a nutrition and cooking education program by describing the participation and effects on adults with intellectual and developmental disabilities (ID/DD). The rate of lifestyle-related conditions and disease is disproportionately high among adults with disabilities; however few health promotion programs target this population. A sample of five adults with ID/DD and seven accompanying homecare staff members participated in a six week interactive pilot program focused on balanced nutrition and basic cooking skills. Data was collected through observational field notes and pre and post-program participant interviews. Findings indicate that health promotion programs specifically designed or adapted for the population with ID/DD can increase knowledge, self-efficacy and influence behavioral changes.

Introduction

Obesity and other lifestyle-related conditions are major health concerns for adults with intellectual and/or developmental disabilities (ID/DD) (Draheim, 2006). Health promotion programs can provide knowledge and skills to promote prevention of obesity and other lifestyle-related conditions; however, few programs have targeted this population (Prasher, 2002; Krahn, 2006).
The rate of obesity among adults with disabilities is currently 57% greater than the non-disabled adults, reflecting the health disparity for this group related to the obesity epidemic (Obesity and overweight among people with disabilities, 2010). Individuals with ID/DD typically have poorer dietary habits and lead more sedentary lives than the non-disabled population resulting in greater weight disorders and increased incidence of comorbidities and subsequent reduced quality of life (Draheim, 2006). While it is unclear what specific environmental or behavioral factors have contributed to the high incidence of obesity among adults with intellectual disabilities, research has demonstrated that obesity rates increase with less restrictive living arrangements (Rimmer, Braddock & Marks, 1995). The greatest rate of obesity is among high functioning disabled individuals living with less restricted facilities including family homes, intermediate care facilities or in group homes (Rimmer & Yamaki, 2006).

Despite the disproportionately high incidence of obesity in adults with ID/DD, there continues to be limited opportunities to participate in health promotion programs for this population. Community health promotion programs are typically designed for the general population and may not address barriers to healthy living faced by adults with ID/DD (Krahn. 2006). Such programs have been successful in influencing health behaviors in certain populations (Ammerman et al., 2002). Modifications to typical health promotion programs addressing various levels of cognitive ability, physical function and independence are necessary for the success within this group (Saunders et al., 2011).
Problem Summary and Research Questions

Prevalence of poor health outcomes related to lifestyle is disproportionately high in adults with ID/DD; however, health promotion programs are typically designed for the general population and may not be relevant or accessible to the population with ID/DD (Krahn, 2006).

Health promotion programs developed or adapted for the ID/DD adults addressing several factors including knowledge and skill level, resources and support system, could empower and motivate this population to make healthy behavior changes and improve health outcomes.

The purpose of this study was to develop and pilot a nutrition and cooking skill program designed for adults with ID/DD and their caregivers. The program was evaluated based on the following research questions:

What are the perceptions of ID/DD adults of “healthy eating”? How are these perceptions affected by the nutrition and cooking skills program?

What are ID/DD adults’ perceptions towards meal preparation/cooking? How are these perceptions affected by the nutrition and cooking skills program?

How does a nutrition and education skills program influence the eating habits of ID/DD adults? What is the overall effect of the nutrition and cooking skills program for disabled adults and caregivers?

Methods

A convenience sample of adults with ID/DD (n=5) and caregivers (n=6) participated in a cooking and nutrition skills program. Outcomes were evaluated using a variety of qualitative measures. Internal review board approval was obtained.
Participation in the study posted no specific risk to subjects. The video and audio recordings have been destroyed and participants are identified by first name only to maintain confidentiality.

The subjects participated in an interactive nutrition and cooking skills education program consisting of a two hour class held weekly for six consecutive weeks. Lesson plans were adapted from *Cooking Matters for Families* and used as a course outline for this pilot program. The Cooking Matters series is an education program designed to provide low-income individuals with the knowledge and skills to prepare healthy, affordable meals. Based on the *Dietary Guidelines for Americans* and *MyPlate*, Cooking Matters teaches participants to select healthful, low cost foods and demonstrates meal preparation in order to maximize the participant’s nutritional intake within budget restraints. Interactive lessons instill basic cooking, food safety and food resource management skills (*Cooking Matters: Out Program*, 2012).

Classes revisited and reviewed many of the same concepts each week; however each session had a specific focus. Week one focused on teaching students the five foods groups and introducing the *MyPlate* method for putting together balanced meals. Week two included choosing fruits, vegetables and whole grains each day. Week three focused on making quick healthy snacks and how to choose healthier foods when eating away from home. Week four’s lesson was choosing healthier beverages. Participants went on a grocery shopping tour and challenge week five and had a graduation celebration week six; healthy eating concepts were reinforced during all activities. Participants helped
prepare recipes, serve the food they have prepared and eat in a family-style setting at the end of each class session (Cooking Matters for Families Instructor Guide, 2012).

Consent

Informed consent was received from all participants before the study commenced. Though all participants were of legal age, most of the participants with ID/DD had court-appointed legal guardians. In this instance, the subject’s guardian was required to provide informed consent for the subject to participate in the study, assent from the subject was sought to accompany the consent of his or her legal guardian.

Data Collection

The data sources used in this study included ethnographic data allowing the researcher an in-depth look at the subject’s behaviors and perceptions. These qualitative research methods allowed for researchers to evaluate the effectiveness of the program and identify areas of strengths and weaknesses of the program when targeting this population (Monsen & Van Horn, 2008).

Pre and post one-to-one interviews with the participants with ID/DD using open-ended questions regarding knowledge and perception of healthful eating, cooking, basic food safety and perceptions of the program were conducted. Participants were encouraged to express thoughts and ideas freely. The open-ended questions were developed using material presented in the pilot program and literature related to the topic. Similarly, participating caregivers were interviewed using open-ended questions relating to their clients eating and meal preparation habits and the influence of the program on
their habits. The purpose of the interviews was to determine the observed and perceived changes that the caregiver noted in their clients. A note-taker attended each class session and composed observational field notes of group discussion, individual accomplishments, challenges, perceived attitudes towards the activities and participation in class activities.

**Data Analysis**

Ethnographic research provides large amounts of evidence through text and direct quotations. Insights can be drawn by identifying themes, patterns and meaning in the evidence using inductive reasoning (Patton, 2001). Pre and post interview transcriptions and class notes were reviewed and coded manually to identify common themes. Pre and post interviews were reviewed for shifts in responses following the participation in the pilot program. The reviewing researcher identified, analyzed and described patterns presented in the interviews and classes sessions that offer answers to the research questions.

The data quality was confirmed with triangulation through the use of interviews and observations for data collection. Internal reliability was carried out by the use of note-taking and recording sessions. Field notes were confirmed with recordings. The course note-taker also reviewed transcriptions of the course notes to confirm accuracy. The small sample size makes generalizability difficult in this study but the researchers strived for theoretical generalizable results by using a representative sample of the larger population with mild ID/DD.
Results

Of the participants with ID/DD, two were male and three were female. They ranged in age from 30 to 53 years old. All were considered obese, having a body mass index equal to or greater than 30. Obesity and dietary factors are related to numerous medical diagnoses and within this population, all but one had a medical history that included these co-morbid conditions. All five lived in an apartment alone or with one roommate and were supported by twenty-four hour homecare staff. Participants with ID/DD depended, in part, on the Supplemental Nutrition Assistance Program (SNAP) for groceries. The other six participants were homecare staff members. All eleven participants graduated from the program by attending at least four of six class sessions. Seven of the participants attended all classes; four participants attended five of six class sessions. All willingly participated in the program and discussed personal insights on cooking, nutrition and the pilot program.

Themes

Nutrition Knowledge

All participants identified eating fruits and vegetables as part of a healthy diet before starting the program. They were familiar with the food groups and could recall the dairy and vegetable groups during week one. Most participants (N=8) were able to identify the food groups of familiar foods by the second week. During week six the participants took turns describing the foods they ate for Thanksgiving dinner and identifying the food groups included in each dish.
During week one, the class identified foods that can be eaten daily and those that should be eaten less often. The participants were aware of foods that are linked to poor health outcomes and identified certain snack foods and high sugar treats as “bad” foods. During week four the group was able to name several healthy snack ideas including yogurt, hummus, peanut butter and fruit. The group also identified healthier options when eating out including taking a portion of the meal home, ordering light salad dressing or dressing on the side and splitting the meal with another person.

Various activities throughout the course proved helpful in promoting excitement and interest in nutrition concepts as well as understanding of more complex concepts including the relationship of foods and health consequences. Participants enjoyed displaying their knowledge in a fun, lightly competitive way. The grocery store tour allowed the participants to apply what they had learned in the previous weeks. Participants were engaged in reviewing nutrition labels, pricing and finding healthy, inexpensive alternatives to some of their regular foods.

New Food Acceptance

In the first week of class all the participants discussed not eating all the food groups regularly, especially fruits and vegetables. However, the participants reported including vegetables in recipes at home more often throughout the course, and all caregivers reported an increase in fruits and vegetable intake, as well as awareness of the food groups among their clients following the program.
Participants were more likely to participate enthusiastically and eat the food prepared when the recipes were related to familiar foods. Week two included a food tasting activity. Participants were given a plate with spinach, beets, edamame, fennel and grapefruit. Two participants refused to try any of these new foods stating that they did not want to taste the foods because they were unfamiliar or because they had heard another person comment on the flavors.

The class seemed slightly more open to trying new foods during the second half of the course. Week four included a taste test of a green smoothie which contained spinach, cucumber, juice, yogurt, banana and peaches. All participants agreed to a sip and mentioned the recipe as a favorite in later classes or during their post-class interview.

The participants overwhelmingly preferred sweet-tasting beverages. Few were willing to drink water plain regularly. Low calorie drink packets mixed with bottled water were an alternative to sugar-sweetened beverages and were an agreeable alternative to sugar sweetened beverages by the end of the class for all participants; however, participants continued to struggle to give up pop.

Cooking Skills

Three of the participants prepared most of the class recipes at home with the assistance of staff. These three, along with their staff, reported regularly helping with meal preparation following the program. The remaining two participants with ID/DD only made two of the recipes from class at home by the conclusion of the course.
However, their caregivers did report an increased interest in cooking and a small increase in help with meal preparation at home.

All participants showed progression in skills and knowledge related to food preparation throughout the course. All five DD participants become more comfortable with measuring and mixing ingredients, following recipe steps and assembling food.

A few specific skills were in several recipes and were popular among the DD participants and caregivers. Chef demonstrated techniques for slicing an onion without crying, cracking an egg evenly on a flat surface and removing the skin on garlic clove. These techniques were new to the entire class and seemed to be favorites to practice.

The participants were able to identify key concepts of food safety starting with week one and continuing throughout the course. The most prominent practice was hand washing before touching food and while cooking to prevent cross contamination. All five DD participants practiced this and verbalized how to wash hands and why it is important. New concepts identified by the participants included washing the tops of canned foods before use, wiping mushrooms with a paper towel and properly thawing meats before use. Two participants stated they were not thawing meats in a safe way before learning the techniques in class. These participants and caregivers stated they have since changed their habits at home.

Three of the five DD participants, along with their caregivers, expressed safety concerns over cooking including use of the oven and stove-top. Throughout the six week course, all participants were able to use the stove at least once with assistance. Each
participant was assigned and carried out at least one task to complete a recipe during five of the six classes. At the conclusion of the course, two of the participants and their caregiver with safety concerns reported that they had used the oven at home with the help of staff. The other three participants used the oven and stove at home with supervision.

Caregiver Impact

The caregivers played a key role in the success of the program overall and their clients’ individual successes. Three caregivers stated they had misgivings about the program at the start; however, all three reported they enjoyed the program and it impacted their client’s life and their own habits. The class activities were engaging and enlightening for the caregivers. Several mentioned the grocery store tour has changed their own shopping habits. Many caregivers also discussed sharing nutrition tips and lessons from class with family and friends. The caregivers that participated the most in the program stated learning and using the knowledge to change their diet. The caregivers who did not actively participate did not mention any change to their own knowledge or behaviors.

Findings

The research questions that guided data collection and evaluation of the program are summarized in the table below.

<table>
<thead>
<tr>
<th>What are the perceptions of DD/ID adults on “healthy eating”?</th>
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<tbody>
<tr>
<td>• High intake of fruits and vegetables</td>
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<tr>
<td>• Decreasing “bad” or “junk” food</td>
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<tr>
<td>• “Healthy eating” is important for decreasing disease risk including heart disease.</td>
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<tr>
<td>How are these</td>
</tr>
<tr>
<td>• Intake of all five food groups daily</td>
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</table>
| **perceptions affected by the nutrition and cooking skills program?** | • Awareness of specific nutrients, i.e. fat, fiber  
• Consuming appropriate portions  
• Decreasing intake of foods from fast food restaurants  
• Healthful foods provide benefits including strong muscles and bones and eye health |
|---|---|
| **What are DD/ID adults’ perceptions towards meal preparation/cooking?** | • Little interest in helping staff prepare meals  
• Safety concerns with using kitchen appliances  
• Aware of basic food safety including hand washing and freezing meats |
| **How are these perceptions affected by the nutrition and cooking skills program?** | • Comfortable helping with basic food preparation tasks including mixing ingredients and cracking eggs  
• Aware of safety precautions in including sanitation, knife safety and proper thawing of meats  
• Still uncomfortable using appliances including oven and stove  
• Increasing participation in choosing recipes and helping prepare meals at home |
| **How does a nutrition and education skills program influence the eating habits of DD/ID adults?** | • Increased fruits, vegetables and whole grains intake  
• Acceptance of a few new foods including green smoothie  
• Gradual decrease in pop intake  
• Gradual increase in water intake |
| **What is the overall effect of the nutrition and cooking skills program for disabled adults and caregivers?** | • Awareness of healthful habits for both DD adults and caregivers  
• Increase knowledge of food groups and benefits of balanced diet  
• Increased participation of DD adults in food preparation at home  
• Short term changes in diet including increased water intake, increased whole grain, fruit and vegetable intake for both groups |

**Discussion**

The pilot program evaluated in this study effectively increased participants’ knowledge and awareness of healthful nutrition, benefits of eating a healthy diet and increased participation in food preparation with homecare staff. The program also
contributed to dietary changes for both the DD participants and the participating caregivers.

Active participation in class discussion and activities and repetition of nutrition concepts and cooking skills were key strategies in the design and implementation of this program. In a review analyzing more than 300 studies, evidence indicates nutrition education is most effective in influencing behavior change when it focuses on active participation. The components of effectively implemented nutrition education programs included a motivational phase which increases awareness of health benefits and practices through knowledge; an action phase, which facilitates of fostering the skills needed to take action; and environmental supports to maintain similar messages and sustain the benefits gained (Contento, 2008). These components were built into the design of this program. The weekly nutrition lessons provided increased awareness of healthful eating and the benefits gained when practiced, and thus falls into the motivational phase of nutrition education. The action phase included weekly preparation of recipes, weekly at-home challenges and grocery store tour. Participants were able to expand on knowledge gained from motivational phase and put into practice. Lastly, participation of the homecare staff influenced environmental change.

Caregivers play a large role in the dietary habits of DD adults (Janicki, 2002). This pilot program included caregivers as engaged participants and demonstrated their role in client’s eating habits and as social support and reinforcement at home. Earlier studies found caregiver participation was essential to behavior change success for the DD population. In this study, caregivers were able to change the way food was prepared at
home, help purchase healthier foods for the participants’ homes, and reinforce the nutrition concepts learned in class at the participants’ homes (Marks, 2012; Harris, 1984; Fox, 1985). However, caregivers in this study also identified struggles that their clients have maintaining healthy habits while at work. This was an environment outside the reach of this program. Overall the program components were able to provide skills and knowledge to make subtle changes with the resources available to population.

The design and outcomes of the pilot program align with theories that have been studied in the realm of health promotion and nutrition education. Bandura’s Social Cognitive Theory (SCT) states that behavior is based on expectancies and incentives. When applied to health behavior it translates to an individual attempting lifestyle changes based on perceived threats of current lifestyle, perceived benefit or reduction of threat due to a lifestyle change and that they are capable of implementing change, which is self-efficacy (Bandura, 1986). The Health Behavior Model (HBM) is hinged on similar factors: the existence of health concern making health issues relevant, belief in perceived threat or susceptibility to illness or condition and belief that adopting certain health behaviors will decrease perceived risk despite potential barriers to implementing the recommended behavior (Rosenstock, 1966; Rosenstock, 1974; Becker; 1974). The design and results of this program reinforce their success in achieving behavioral change. All DD participants were obese and aware that health risks were linked to excess weight. In the SCT, this relationship would be considered an expectation about environmental cues and belief of how certain events are connected. In the HBM, this would be a perceived susceptibility to illness. Throughout the program, the participants became aware of
benefits of balanced nutrition including weight loss, control of other biomarkers (such as cholesterol), and various other health benefits which fits within the SCT as outcome expectation, how behavior will affect expected results. The HBM includes perceived barriers with this concept (Rosenstock, 1966; Rosenstock, 1974; Becker; 1974). Several barriers or costs to overcome were addressed in the program curriculum including limited knowledge of healthful foods, financial constraints, personal taste and inability to prepare healthful foods. The SCT’s incentive component as well as the health motivation of the HBM included the importance of weight loss and risk reduction to the participants. Some of the participants stated that this included prolonging their lives and staying out of a hospital which indicates dietary behavior change has a very high value to them. Other incentives observed during the program that influenced change were sharing accomplishments with the class. These included not buying a case of pop for a week, cooking a dish from class at home, or adding a new vegetable to a meal.

Self-efficacy plays an important role in the SCT and has been indicated as a crucial component of health behavior change (Bandura, 1977). Research indicates those who have gone through the other components of the SCT and HBM, but lack self-efficacy will have little success with implementation of new behaviors (Bandura, 1986). Similarly, the results of this study indicate an increase in self-efficacy in the subject’s ability to identify and consume a balanced, healthful diet and participate in certain food preparation activities. Participation in nutrition activities and discussion of ways to fit healthful nutrition into the participant lifestyle provided them with the knowledge and confidence to start making these changes. Activities allowed participants to showcase
their newly gained knowledge and discussions encouraged them to share cooking and dietary changes they experienced outside of the class, producing a feeling of pride and confidence to continue these lifestyle changes. Self-efficacy was increased in simpler kitchen tasks through weekly repetition in class and practice with a caregiver. Little change was observed in tasks that were perceived as dangerous and intimidating before the program including knife, oven and stove use. These models have not been applied specifically to nutrition education in the ID/DD population; the results indicate they translate well.

Pre-program interviews indicated preference for convenience foods and low intake of healthful foods such including fruits and vegetables which is similar to the findings of prior studies of food frequency for this population (Adolfsson et al., 2008; Draheim et al., 2007; McGuire et al., 2007). Participants and caregivers reported increased consumption in fruits, vegetables and whole grain foods following the program. They also indicated an increase in awareness of what “healthy eating” is and the benefits for consuming “healthy” foods as well as an increase in both the caregivers’ and adults’ with ID/DD abilities to prepare “healthy” meals and snacks. These results fall in line with other studies of small health promotion programs targeted to this population which reported increases in self-efficacy of specific behaviors like exercise and minor changes in diet following group education classes (Heller et al., 2004; Ewing et al., 2004). Earlier studies focused on teaching cooking skills to adults with DD/ID reported success in training samples to prepare recipes independently (Martin et al., 1982; Trask-Tyler et al., 1994; Johnson et al., 1981; Sander et al., 1989; Singh et al., 1995). Participants in this
study increased participation in food preparation, and gained specific skills including cracking an egg and measuring ingredients; however, at the end of the program they were still dependent on staff to do the majority of meal preparation. Similar to prior studies, the participants felt greater confidence in their ability to perform certain food preparation tasks.

The limitations of this study include the use of a small, convenience sample including only subjects recruited from one agency as well as the use of qualitative data with dependence on reliability of self-reported information from participants and perceived observations by the note-taker. While the study was constrained by certain limitations, it offers information and developed themes that may set the groundwork for further research and development of health promotion programs for the ID/DD population.

Application

This study indicates that health promotion programs can be effective in promoting healthy behavior changes and increasing knowledge among adults with DD/ID. Community healthcare professionals should consider the development of additional health promotion programs targeted to DD/ID adults and their support systems. Long-term programs may be helpful in influencing more permanent behavior change and could potentially lead to positive health outcomes including weight management or decreased disease risk. Programs that include specific caregiver engagement components may also solidify healthful behavior patterns at home by generating greater commitment and
interest of the caregiver and in turn the DD participants. Environmental and social
influences of this population should be considered in future programs, including
reinforcement of healthy behavior changes at home and in the work place.
Accommodations for the specific needs of this population should be considered in any
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self-efficacy despite barriers.
References for Article


References for Thesis


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