Increasing Cooking and Nutritional Knowledge of Food Pantry Clients via Cookbook Intervention

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Increasing Cooking and Nutritional Knowledge of Food Pantry Clients via Cookbook Intervention

BY

Joshua Kleczynski

THESIS

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I HEARBY RECOMMEND THAT THIS THESIS BE ACCEPTED AS FULFILLING THIS PART OF THE DEGREE CITED ABOVE

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Increasing Cooking and Nutritional Knowledge of Food Pantry Clients via Cookbook Intervention

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Abstract

This study was designed to assess eating habits, cooking habits, and nutritional knowledge of food pantry clients. As a whole, the average American consumes a less-than-optimal intake of nutrients. This, combined with the elevated national food insecurity rate of 14.5%, produces an advantageous situation to educate food pantry clients about healthy lifestyle practice through cooking. This study utilized a quasi-experimental design including a pre-assessment, intervention, post-assessment design. Forty-nine participants were included in study, and either received a cookbook (intervention group) or were a control subject and only completed surveys. Results revealed that the cookbook intervention did not elicit any behavior change, nor was there any observable change in knowledge. This study provided support for nutrition education interventions that are rooted in hands-on programs, and concluded that take-home materials may not be an effective method.
Acknowledgments

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Chapter 1

Introduction

Food insecurity is a national concern for individuals in the United States of America. According to Coleman-Jensen, Nord, and Singh (2013), 14.5% of the United States' population is considered to be food insecure. The federal government has programs to help alleviate food insecurity. The primary food assistance program is the Supplemental Nutrition Assistance Program (SNAP), which provides participants who qualify with a monthly allowance to purchase food. During 2013, the SNAP served over 47 million individuals in over 23 million households (Supplemental Nutrition Assistance Program Annual Summary, 2013).

Privately-organized food pantries, soup kitchens, and other food assistance entities have combined forces with the SNAP to help alleviate food insecurity. Historically, privately-organized food pantries were created in order to provide an emergency source of food for families (Poppendieck, 1998). However, given the current trend of high food insecurity, there is a serious need to provide food assistance beyond acute times of emergency food shortage. Alleviation of food insecurity can, in turn, assist with the control and prevention of lifestyle related health complications.

According to the position of the Academy of Nutrition and Dietetics, proper nutrition is essential for growth and development, and is the most effective prevention against chronic disease (Stang, 2010). Food insecurity may prevent adequate nutritional intake, and can result in preventable health conditions and developmental disabilities (Academy of Nutrition and Dietetics, 2010). The nutritional deficiencies of concern are
not necessarily a lack of caloric intake, but rather a lack of essential nutrients (Campbell, Hudson, Webb, & Crawford 2011).

Typical foods provided to food pantry clients include shelf-stable items and lack fruits and vegetables (Cohen, Mabli, Potter, & Zhao, 2010). These findings are similar to the food pantries located in Kent County, Michigan (Personal Communication, Access of West Michigan, 2012). These shelf-stable, processed items, may not support a nutritionally adequate diet (Carlson, 2012).

In addition to the food's questionable nutritional value, most food pantry clients do not feel capable to prepare a nutritionally adequate meal (Seman, Compton, & Musiker, 2012). The Economic Research Service (ERS) branch of the United States Department of Agriculture (USDA) has identified that the average American spends 59.4% of their eating time at home (Hamrick, Andrews, Guthrie, Hopkins, & McClelland, 2011). This information delineates that food pantries could be an effective resource to provide nutrition education.

**Statement of Problem**

Similar to food insecurity, another problem within the United States of America is inadequate dietary intake. The Healthy Eating Index was designed to assess the quality of dietary intake of Americans (Guenther et al., 2013). Scoring of the Healthy Eating Index is based on total fruit, whole fruit, total vegetables, greens and beans, whole grains, dairy, total protein foods, seafood and plant proteins, fatty acids, refined grains, sodium, and empty calories. According to the most recent Healthy Eating Index assessment, the national score during 2010 was 53.5 points out of 100. A score of 100 points would indicate that every American meets the least restrictive guideline for nutrient intake.
based on the above criteria. The score of 53.5 indicates that the average American does not consume a nutritionally adequate diet.

Lack of adequate nutrition becomes more significant when the resources to obtain nutrient-dense foods are scarce. The typical SNAP participant runs out of monetary benefits 21 days after receiving their monthly allowance (USDA, Food and Nutrition Service, 2011). Private food pantries offer an additional resource for food assistance. However, the typical food pantry only provides food to feed a family for three days (Access of West Michigan, 2013). Private food assistance, combined with SNAP benefits, only provide an average of 24 days worth of food. Once private and SNAP benefits are exhausted, six days still remain during the average month for the food-insecure family to locate nutrition.

In addition to limited benefits, other barriers relating to inadequate nutrition of SNAP participants include cost of healthy foods, limited access to food variety, environmental factors associated with poverty (Leung et al., 2013), and lack food preparation skills and nutrition education (Seman et al., 2012). This information regarding barriers to optimal nutrition indicates the potential for an intervention targeting nutrition education and culinary skill enhancement.

**Purpose**

The purpose of this study was to determine whether a food pantry client oriented cookbook intervention would increase nutritional knowledge and expand selection of food items to include more nutrient-dense whole foods. This was attempted by providing participants with a cookbook designed to educate the reader and increase self-efficacy of cooking and nutritional knowledge.
Research Questions

Four research questions guided this research study.

1. To what extent will cooking frequency be changed due to the cookbook intervention?
2. To what extent will participants choose healthier foods after intervention?
3. To what extent will participants have learned basic nutrition information after intervention?
4. To what extent will cooking frequency differences exist between African Americans, Hispanics, and Caucasians?

Operational Definitions

The following terms were defined according to the population studied and written to clarify discrepancies that may have existed between different interpretations.

1. A food pantry client was defined in this study as any person who visited one of the food pantries included in study and was registered with the Access of West Michigan pantry network (Access of West Michigan, 2013).
2. A whole food was defined by Merriam-Webster (2013) as an unprocessed, natural food.
3. Increased frequency of cooking was determined by the participant preparing more meals oriented around the style presented in the cookbook, i.e. using whole foods with basic ingredients and not microwavable dinners or boxed meals. Increased frequency would indicate that participants from the intervention group reported higher levels of cooking on a follow-up survey than control group participants.
4. Healthier foods, referring to research question #2, were defined according to USDA MyPlate nutrition recommendations (2013), which states that half of each meal (plate)
should be fruits and vegetables, half of grains consumed should be from a whole grain source, and proteins should come from a lean source such as chicken, turkey, or fish.

**Significance of Study**

Food insecurity is a concern for the nation as a whole, and affects all counties in every state (Gunderson, Waxman, Engelhard, Satoh, & Satoh, 2013; Coleman-Jensen, Nord, and Singh, 2013). With increased use of both federal and private food assistance resources by low-income, food insecure families, a unique opportunity exists to concentrate educational efforts within this food-insecure population. As previously discussed, typical shelf-stable foods may not support a nutritionally adequate diet (Carlson, 2012). Poor dietary intake, in combination with the common food pantry clients’ inability to prepare a nutritionally adequate meal, indicates an opportunity for nutrition and culinary intervention.

**Design of Cookbook Intervention**

This cookbook is grounded in years of observation and interaction with non-profit volunteers and food pantry clients. All too often, food pantry clients stock their homes with heavily processed foods that do not require preparation and contain few whole food items (Personal Communication, Access Pantries, 2005-2012). This dietary limitation is a problem related to nutrient deficiencies (Carlson, 2012) and may be lessened by a nutrition education intervention (Holben, 2010).

The nutrition education intervention for this study was a cookbook designed by the researcher utilizing the theoretical constructs from the Health Belief Model and the Theory of Reasoned Action. Recipes included in the cookbook contain several ingredients that are commonly found on the shelves of Kent County, MI food pantries. In
addition to recipes, this cookbook also included nutrition tips for healthy eating, food substitution ideas to make recipes more healthy, food safety, and shopping tips to save money at the supermarket.

Summary

Food pantry use has risen due to the prevalence of food insecurity in the United States of America (Coleman-Jensen et al., 2011; Coleman-Jensen, Nord, & Singh, 2013). Nutrition education is necessary to provide pantry clients with the tools they need to acquire adequate nutrition. Adequate nutritional status enables individuals to achieve a heightened quality of life and prevent health complications (Stang, 2010).

Adequate nutrition is a transitional challenge being placed in the realm of food assistance programs. Historically, food pantries focused on food alone, and did not have extended resources beyond local donations. Today, most food pantries are moving toward a client-choice style, which allows for each pantry shopper to choose the foods he/she brings home (Remley, Melgar-Quinonez, & McDowell, 2004). Although each client may be able to choose their own food items, this does not imply that his/her choices will support a nutritionally adequate diet. As previously stated, processed foods may not provide adequate nutrition (Carlson, 2012). However, the incorporation of several whole food items chosen at a food pantry may enable the client to meet nutritional recommendations (Miyamoto, Chun, Kanehiro, & Nakatsuka, 2006).

This study was designed to determine whether a food pantry client oriented cookbook intervention would increase nutritional knowledge and expand selection of food items to include more nutrient-dense whole foods. The next section reviews the literature relating to food insecurity at the national and local
level within Kent County, MI, eating habits of Americans, nutrition education for food assistance participants, and the future direction of nutrition education for food assistance participants.
Chapter 2

Review of Literature

Food insecurity is an alarming issue within the United States of America. Government-sponsored food assistance programs, such as Supplemental Nutrition Assistance Program (SNAP) and Women, Infants, and Children (WIC), as well as private food assistance in the form of soup kitchens and food pantries are working to make America more food secure. However, just providing food to needy individuals may not be enough. According to the Academy of Nutrition and Dietetics (Holben, 2010), there is a need for dietetic professionals to provide nutrition education to these food assistance recipients.

This review of literature addresses current statistics related to food insecurity at the national and local level within Kent County, MI, eating habits of Americans, nutrition education for food assistance participants, and the future direction of nutrition education for food assistance participants.

Food Insecurity Statistics

The most recent statistic indicates that 14.5% of households in the United States are food insecure (Coleman-Jensen, Nord, & Singh, 2013). The SNAP is the largest government funded nutrition assistance program. Presently, 47 million Americans receive SNAP benefits (SNAP Monthly Report, April, 2014). In addition to government assistance, Feeding America estimated that they contributed food assistance to approximately 37 million Americans, during 2011 (Coleman-Jensen et al., 2011).

The percentage of food insecure individuals living in Kent County, MI is 15.2% (Michigan Public Health Institute, 2011). During 2011, over 48,000 individuals utilized...
the SNAP in Kent County (Essential Needs Task Force, 2014). Private resources of food assistance within Kent County include 75 food pantries which provided assistance to over 18,000 unduplicated participants during 2013, a 3.3% increase from 2012 (Access of West Michigan, 2014). Despite these efforts to provide nourishment to all people, food insecurity can be found in any county throughout the nation and affects all age groups and ethnicities (Gundersen, 2013).

When comparing census data with food insecurity data, ethnic diversity reveals a concerning situation. Coleman-Jensen, Nord, and Singh (2013) reported that within all of the food insecure households, 24.6% were African American, 23.3% were Hispanic, 13.0% were other, and 11.2% were Caucasian. When compared to the U.S. Census data, 72.4% of Americans were Caucasian, 16.4% were Hispanic, and 12.6% were African American (Humes, Jones, & Ramirez, 2011). These data indicate that African American and Hispanic ethnicities represent a minority of the population, yet experience the highest amount of food insecurity. In Kent County, private food assistance served 38% Caucasian participants, followed by 22% African Americans and 22% Hispanics (Access of West Michigan, 2013). These data, once again, indicate that regardless of location or ethnicity, food insecurity is a prominent concern. Each year, increasing numbers of individuals were reported to seek out food assistance (Gundersen et al., 2013). Therefore, an ever-present need for community food resources is revealed.

Despite the efforts of private and government food assistance programs designed to alleviate hunger in America, there is still a gap between food assistance and families in need. For example, 14.5% of American families are considered to be food insecure, but only about 7.1% of American families receive SNAP benefits. This large percentage of
families not receiving benefits is partially due to SNAP eligibility requirements. Aside from certain exceptions regarding disability, SNAP eligibility requires that applicants meet certain resources, income, employment, and allow for specific deductions based on life situation, which are unique for every applicant (SNAP Eligibility, 2013).

Barriers to SNAP participation have been discussed to include language, accessibility, and pride. Eslami, Leftin, Strayer (2012) discussed SNAP participation during 2010 in the *SNAP Participation Rates: Fiscal Year 2010*. They revealed that only 75% of eligible individuals are receiving SNAP benefits. This indicated that during 2010, 13 million individuals did not receive SNAP benefits, but were eligible. Algert, Reibel, and Renvall (2006) discussed language as a barrier. In this study, only 15% of the 14,317, mostly Hispanic, participant sample received government food assistance, yet all were eligible. Martin, Cook, Joseph, and Rogers (2003) discussed the accessibility restrictions of government food assistance. They concluded that some individuals may seek out nutrition assistance from private organizations as the location may be more convenient and require less documentation. In addition to accessibility, Martin et al. (2003) also discussed prideful lifestyle which reduced the likelihood of some individuals to apply for nutrition assistance.

Although private and federal food assistance programs are in place to provide nutrition to hungry families in America, the large number of food insecure households presents a challenge to provide this support to everyone in need. Regardless of location or ethnicity, more can be done to improve the nutritional standing of Americans.

**Eating Trends in America**
As discussed in the introduction, there is an inadequate nutrient intake among the majority of the American population (Guenther et al., 2013). This has not been shown to differ across various income levels (Guenther et al., 2008). During the previous 10 years, Americans have been consuming more foods in their homes, which is contributing to less money spent eating out and more time in the kitchen. In the recent years, access to fresh and local fruits and vegetables has greatly increased with farmers markets, and use of Double Up Food Bucks in some locations has resulted in increased access to these markets for low-income families.

Food consumed away from the home has been linked to poor diet quality, providing evidence for the health implication of cooking at home. Todd (2013) discussed the trend of increased cooking within the home according to the comparison of NHANES data between 2005 and 2010. Results indicated that food spending declined by 5%, eating out declined by 12.9%, and an average of 118 calories were saved each day.

The ERS has identified that the average American spends 59.4% of their eating time at home (Hamrick, Andrews, Guthrie, Hopkins, & McClelland, 2011) and low-income families spend 10% more time preparing food than higher income families (Andrews & Hamrick, 2008). When comparing SNAP and non-SNAP participants, those receiving SNAP benefits spent an additional 7% of their time preparing food.

As food preparation has increased, access to local foods, specifically fruits and vegetables, has also increased. Between 2012 and 2013, there was a 3.6% increase in the number of farmers’ markets, totaling 8144 markets in the United States (Tropp, 2014). In the low-income sector, Double Up Food Bucks was piloted in 2009 in the state of Michigan. Double Up Food Bucks matched fresh, local produce dollar for dollar, up to
$20, for SNAP participants. In other words, if a SNAP participant spends $10 at a participating farmers market, they are able to purchase another $10 worth of produce at no additional cost. Between 2011 and 2012, over 3 million SNAP dollars were spent at farmers markets participating in Double Up Food Bucks. During 2013, over 85 markets participated. Future directions include a pilot testing of grocery store Double Up Food Bucks, which will occur during the 2014 growing season.

Aside from the monetary incentives to visit the farmers’ markets, markets are becoming increasingly popular (McGuirt et al., 2014). Thirty-seven low-income, childbearing aged participants stated that they were health conscious and were interested in farmers market shopping. Barriers to market attendance included price of fresh foods and the distance from their homes.

With changing eating trends in America and increased access to local produce sources, families are doing more cooking in the home. This also applies to low-income families. However, low-income families may have a challenge to obtain adequate nutrition due to financial restrictions. Food pantries are an excellent resource to obtain part, or all, of a nutritionally balanced diet as well as provide an optional source for education.

The Need for Food Pantries

During 1996, the Personal Responsibility and Work Opportunity Act was originated. This act altered the stipulations of government assistance, lessened the amount of monthly benefits for recipients, and made it necessary for individuals receiving aid to find other sources of income (Danielson et al., 2011). According to Klerman and Danielson (2011), there has been a massive financial assistance shift over
the past 20 years. During 1989, the average SNAP (food stamp at that time) recipient received over 50% of their income from a welfare source. By 2009, less than 20% of financial assistance was received from welfare. This shift resulted in over 50% of SNAP recipients living without any monetary income. As a result of welfare limitations, many people turned to forms of private assistance, which led to the spike of food pantry and soup kitchen use.

Paynter, Berner, and Anderson (2011) found an increased use of emergency food relief when compared to previous government assistance. There were 193 participants assessed from North Carolina food pantries that were reported to be 20% more likely to receive private food assistance rather than public. Paynter, Berner, and Anderson (2011) also reviewed the duration and frequency of pantry use by participants over a two year period. Conclusions were aimed at the idea that these emergency food pantries were becoming a more regular and necessary visit for numerous families. As government food assistance fell and emergency food was being more frequently sought out, there became a need for an increase in private food assistance.

Although the government provides millions of families with SNAP benefits, these dollars still fall short of completely alleviating food insecurity. This situation warrants the need for food pantries to provide additional support.

**Nutrition Education for Food Assistance Participants**

Referencing the Academy of Nutrition and Dietetics (2010), there is nutritional concern for individuals who are food insecure, especially women who are pregnant or breastfeeding, all children, and the elderly. These are critical periods which require adequate nutrition for proper development and maintenance. The total diet approach
could support variance of dietary intake, by choosing whole foods, among food pantry clients. This may optimize the nutritional status of these clients. The total diet approach states that any food, if consumed proportionately, can fit into a healthy diet (Freeland-Graves & Nitzke, 2013). Given the total diet approach, combined with the necessity of food pantries and their high volume of clientele, nutrition education within the food pantry setting could be an effective means to improve dietary quality of low-income Americans.

Numerous education interventions have been implemented within the nutrition assistance population. This section will review common nutrition interventions including cooking demonstrations, personalized recipes, and innovative marketing. Through trial and error, different needs have been identified as well as barriers to healthy living within the low-income population.

Nutrition interventions. Numerous interventions have been conducted regarding nutrition education within the low-income population. The following studies reviewed all aim to increase nutritional knowledge and elicit behavior changes toward a healthier lifestyle. A common trait within most of these studies is the need for a multi-component education intervention such that the participants will be provided with hands-on education and take-home materials.

A multi-component education design was reviewed by Cena et al. (2008) to assess folate intake knowledge, before and after intervention, within a sample of 155 low-income women. An intervention group (received education) and control group (non-nutrition education) were created to compare results. Methods of nutrition education included cooking demonstrations, visual aids, worksheets, discussions, and presentations.
Post-assessment results favored the intervention group with reference to folate intake knowledge, nutrition facts label reading, and some participants reported increased variation of vegetable choices.

Another multi-component study was conducted by Campbell et al. (2004), where 307 WIC participants were assessed. The intervention materials included a nutrition based, soap opera-like video, an infomercial, and take-home printed materials. These educational materials focused on cooking healthy and inexpensive meals for children. Results revealed that there was an increase of knowledge for fruit and vegetable intake and low-fat food selection after intervention as well as an increase of self-efficacy regarding confidence during meal preparation. However, after reviewing food frequency questionnaires, behavior change was not observed.

Nutrition education through advertisement was organized by Gittelsohn et al. (2010) through promotion of healthy foods at inner city convenience stores in Baltimore, MD. According to the authors, the low-income neighborhoods of Baltimore did not provide resources for healthy food options. This intervention compared two similar neighborhoods, one as the intervention city, and the other as the control city. The intervention city had nine convenience stores supplied with fresh and healthy foods, coupons, fliers, posters, handouts, taste testing, and cooking demonstrations for the public to access. Participants were recruited from each area and asked to complete a survey assessing their eating habits based on food preparation, acquisition, and choice. Twelve to 18 months later, participants were contacted by phone and reassessed to determine exposure to the healthy foods intervention and whether their eating practices had changed. Unfortunately, due to lack of communication, only 84 participants were
given a post-assessment. Results revealed that the participants most influenced were individuals who had indicated the desire to become more healthy, were mostly women, and had lived in the study area for an extended period of time.

Cooking demonstrations appear to be becoming more popular as a means to have fun with food and incorporate nutrition education without the formal lecture-style session. Miyamoto et al. (2006) provided cooking demonstrations to approximately 45 families each week for eight weeks during open hours within a local Hawaiian food pantry. During each cooking demonstration, educators provided cooking tips, nutrition information, food safety lessons, and emphasized vegetable consumption. Participants reported enjoying the foods prepared during the demonstration as well as indicated that they were interested in taking their learned information home to try in their own kitchen. This study utilized a single intervention design, which limited the ability to conclude any observable behavior change.

One emerging trend that was observed within each of the above interventions is an in-person education. With the exception of Gittelsohn et al. (2010), which was based on advertisements, all interventions involved a tactile source of education such as taste testing or cooking. Each of the discussed interventions produced some form of positive result with the in-person nutrition education intervention.

Nutrition education needs of food pantry clients and barriers to change.

Barriers to healthy living, specifically regarding nutrition, are well documented with monetary restrictions noted as the primary concern limiting individuals from attaining optimal nutritional health (Hoisington et al., 2002; Seman, Compton, & Musiker, 2012; MkNelly, Nishio, Peshek, & Oppen, 2011; Reinhardt Kapsak, Smith Edge, White, &
Geiger, 2013). Other common barriers listed included time constraints, taste preferences, lack of motivation, lack of know-how regarding food preparation (Reinhardt Kapsak et al., 2013), and the misconception of fresh foods being the only healthy option (Echevarria, Santos, Waxman, Engelhard, & Del Vecchio, 2009). With a combination of nutrition education interventions, these barriers could all potentially be overcome. Hoisington et al. (2002) further discussed participants desire to have nutrition education information presented along with healthy recipes.

Evans, Clarke, and Koprowski (2010), conducted an elaborate needs assessment which resulted in the development of their cooking and nutrition education tool, Quick! Help for Meals. The researchers utilized a four-phase intervention to assess the needs of low-income individuals, specifically WIC participants. The initial phase was created to assess the effectiveness of recipes, specifically pictures, ingredient lists, preparation methods, and additional information. Phase two dealt with pictures of meals and their eye appeal. Phase three involved taste testing of recipes. The final phase created a participant coordinated flier to promote the program. When results were analyzed, researchers concluded that participants wanted to see a colorful picture of the recipe, view a clear ingredient list followed by concise instructions. Additional information requested included cooking time, whether the item can be prepared before service, and whether the item could be frozen.

The second intervention with Quick! Help for Meals involved the disbursement of the recipes in a customizable cookbook for each participant. Any individual who picked up a cookbook from the study location was able to add any picture to the cover that they desired. Also, the distribution center provided clients with fresh fruits and vegetables.
Each week, a different vegetable was used, which correlated with the majority of recipes within the cookbook. Participants were divided into three groups, control, intervention, and customized intervention. The control group received a bag of vegetables, intervention group received vegetables and a generic cookbook, and the customized intervention group received vegetables and the intervention cookbook with their choice of cover photo and special recipes in accordance with the bag of vegetables. Significant results were not acquired, however, during follow-up phone assessments, participants in the customized intervention group reported greater interest in using the cookbook with the personal picture. Although results were not statistically significant, information regarding best fit recipe design was acquired.

**Present nutrition education for low-income citizens and future directions.**

Presently, the primary government resource for nutrition education within the low-income population is the Supplemental Nutrition Assistance Program Education (SNAP-Ed) and the Expanded Food and Nutrition Education Program (EFNEP). SNAP-Ed and EFNEP attempt to encourage those receiving SNAP benefits to purchase foods that are within their budget and provide adequate nutrition according to the dietary reference intakes (SNAP-Ed Guiding Principles: Fiscal Year 2015, 2014; The Expanded Food and Nutrition Education Program, 2009).

University extension programs are a common source of nutrition education. Koszewski et al. (2011) evaluated the efficacy the SNAP-Ed and EFNEP nutrition interventions. The objectives involved change of cooking habits such as meal planning and safety, and nutritional knowledge. The initial pre-survey was administered to 4400 participants, and the final, six month post-survey, received 1100 responses. All students
participated in the Nutrition Education Program, which is part of the University of Nebraska Extension associated with SNAP-Ed and EFNEP. The intervention was an in-person education which included both lecture style and hands-on presentations. The authors concluded that individuals participating in these programs were more likely to demonstrate positive behavior change such as meal planning, healthy food choices, food safety, and financial planning, both immediately and 6 months post intervention.

Another university extension program, associated with Access of West Michigan and Michigan State University is the Cooking Matters program, which is part of the Share Our Strength foundation. Cooking Matters conducts their nutrition interventions in the form of cooking classes. The general class lasts about two hours and meets once each week for six weeks. Topics covered include meal preparation, grocery shopping, food budgeting, and nutrition. Results from Cooking Matters surveys revealed 89% of participating adults improved their cooking skills, 97% of children enjoyed the classes, 67% of teenagers increased their fruit intake, and 50% of teenagers increased their vegetable intake (McLaughlin, 2010). Cooking Matters appears to have positive results during a short-term assessment period.

Looking forward, future trends of nutrition education will most likely incorporate more technology and continue to promote early intervention with the notion of primary prevention. Neuenschwander, Abbott, and Mobley (2013) reported on technology advancements being used in the education setting due to accessibility to the internet by the majority of the population. WIC has been adding online components since before 2006 (WIC Program Nutrition Education Guidance, 2006; Personal communication with WIC RD, 11/06/2013). These online components were designed to be a compliment to
the in-person education provided by WIC staff, and in no way were designed to replace individualized counseling.

One last forecasting of nutrition education within the low-income population is through Feeding America. Feeding America could prove to be an effective method of nutrition education as it supports over 37 million Americans during times of emergency food assistance. Although limited resources are presently available delineating the current nutrition education practices within food bank hubs, there is evidence to suggest that Feeding America may be an effective entry point for nutrition education due to the high number of clients served (Handforth, Hennink, & Schwartz, 2013).

As previously stated, nutritional interventions are moving toward a hands-on approach that includes culinary education such as the Cooking Matters, EFNEP, and SNAP-Ed classes. Cooking Matters revealed favorable results immediately following the six week intervention, and EFNEP and SNAP-Ed also demonstrated favorable results six months post-intervention.

Summary

Importance of proper nutrition has been solidified time and again. Food insecure individuals are most at risk for nutritional inadequacies. These individuals can be found in any location in America and can fit any demographic profile. This problem demonstrates the need for food pantries to alleviate the debilitating effects of food insecurity as well as the need for nutrition education to assure that everyone can make knowledgeable food decisions. Cooking interventions coupled with nutrition education is a potential method to provide food pantry clients with the tools needed to select and
prepare foods that will be essential for a healthy lifestyle. The next section will explain the methodology used for this research.
Chapter 3

Methodology

The purpose of this study was to determine whether a food pantry client oriented cookbook intervention would increase nutritional knowledge and expand selection of food items to include more nutrient-dense whole foods. This was attempted by providing participants with a cookbook designed to educate the reader and increase self-efficacy of cooking and nutritional knowledge. Four research questions guided this research study.

1. To what extent will cooking frequency be changed due to the cookbook intervention?
2. To what extent will participants choose healthier foods after intervention?
3. To what extent will participants have learned basic nutrition information after intervention?
4. To what extent will cooking frequency differences exist between African Americans, Hispanics, and Caucasians?

Design of Study

This study utilized a quantitative quasi-experimental approach with a pre-assessment, intervention, post-assessment design (Martin & Bridgmon, 2012). Utilization of the quantitative quasi-experimental design was the most practical approach for this study as data collection was conducted at multiple food pantry locations and handled by numerous staff and volunteers. Length of time between pre-assessment and post-assessment was between 20 and 30 days. This duration was thought to provide enough time for the participants to read the cookbook and ideally prepare one, or more, of the recipes. This would demonstrate an action on the Stages of Change progression (Prochaska, DiClemente, & Norcross, 1992). Assessments were made utilizing a
researcher-constructed survey (Appendix A) which was designed to acquire cooking and eating habits of participants along with nutritional knowledge. The intervention consisted of a researcher-created cookbook designed to provide simple recipes and promote healthy eating.

Participants

The original sample size was intended to include 300 food pantry recipient families in Western Michigan. According to Yamane (1967), restated by Ray (2012), 300 surveys are sufficient to produce between five and seven percent precision at 95% confidence with a population size of about 6500 individuals within the included food pantries.

Recruitment. Participants were recruited using convenience sampling (Crosby, DiClemente, & Salazar, 2006). This was chosen because several food pantry volunteers assisted with data collection at different locations and times. Therefore, during cookbook disbursement, any food pantry client who met criteria was given the option to participate.

Participant Criteria

Non-English speakers, illiterate clients, participant inability to be contacted for post-assessment, and those not documented within the Access of West Michigan network were excluded from this study. These criteria were decided to increase the response rate for the follow-up survey. Documentation within Access of West Michigan was necessary to indicate that each participant was part of the population surveyed. Exclusions were coordinated by the food pantry staff according to their best judgment based on listed criteria. In addition to participant characteristic criteria, each eligible client was required to have cooking facilities within their home. A verbal assessment was done by pantry
staff to make sure each participant had access to a hot plate or stove top, oven, and basic utensils to complete the majority of recipes presented in the cookbook. Each pantry director was provided with a list of these criteria.

**Access of West Michigan**

All food pantries that participate in Access of West Michigan were provided with the opportunity to be included in this study. Access of West Michigan is a central hub that provides organizational support for private social services. Twelve pantries make up the hunger response team for Access of West Michigan (Access of West Michigan, 2012). Sixty-three more pantries feed into the 12 main pantries.

**Data collection.** Of the twelve pantries that were requested to participate, five agreed to become part of this study. Each pantry was asked to collect 60 surveys from random, approved participants during a time of their choosing. After IRB approval (study number 14-046), the principal investigator traveled to all five participating food pantries to drop off the surveys, informed consent documents, provide verbal and written instructions, and answer any questions that the pantry directors had. After documents were provided to all pantries, data collection was initiated. All food pantry clients requested to participate in study were given the clear option to not participate. Each pantry was given two weeks to complete data collection at each of their sites. Once the two weeks was over, the principal researcher retrieved the completed documents.

Of the 60 surveys, 30 were associated with the intervention group, which meant the participants received a cookbook. The other 30 surveys were from the control group, and participants did not have any incentive to participate. Pantry workers were asked to tell the participants from both groups that the survey was intended to better understand
eating habits and nutritional knowledge of food pantry clients. After each participant completed the survey and signed the informed consent, the documents were sealed in an envelope, which remained sealed until opened by researcher during data analysis.

After data was collected and 20-30 days had passed, the researcher attempted to contact each participant who completed a survey and signed the informed consent document. Contact was attempted via phone with the post-assessment survey conducted during the conversation. If the participant did not answer, a second phone call was attempted the next day during a different time period. If the second attempt at contact was not successful, the participant was removed from the study.

Conducting a telephone post-assessment was the method chosen to ideally generate the most follow-up results (Musselwhite, Cuff, McGregor, & King, 2007). Mail surveys have a poor response rate and asking the pantry staff to coordinate post-assessment surveys was not practical due to the limited ability to track participants. For post-assessment, the control group was provided with the same survey as pre-assessment, while the intervention group was given a similar survey, with the addition of four questions specific to the cookbook (Appendix B).

**Instrument.** A 19 item survey (Appendix A) was designed to assess cooking habits, eating habits, and nutritional knowledge. Questions from the survey were similar to the Food Attitudes and Behaviors Survey, such that several of the answers are hedonic and force a response to be in category rather than allow for an answer to be neutral. The Food Attitudes and Behaviors Survey was evaluated an effective tool to determine food choices (Yaroch et al., 2012).
A Flesch-Kincaid (Ridpath, Greene, & Wiese, 2007) formula was used by the online readability utility (Adamovic, 2009) referenced by Boyle and Holben (2011). This online readability utility revealed that the cookbook was written at a 7th grade level and the survey was written at a 4th grade level. This is consistent with the Health Literacy of America's Adults, which states that the average American reads at an 8th grade level (Kutner, Greenberg, Jin, & Paulsen, 2006).

**Cookbook.** The cookbook used in the intervention group was written by the researcher and specifically designed for food pantry clients. Primary topics included basic nutrition, prevention of chronic disease through lifestyle choices, cooking tips, food safety, and saving money at the grocery store. Information presented in the cookbook was designed to parallel the information presented in SNAP-Ed interventions, with the exception of the in-person setting (Sexton, 2012). Specific information provided included food preparation, food safety, saving money at the grocery store, and nutrition tips based on macronutrients and chronic disease states.

The theoretical framework used to create this educational tool incorporated constructs from the Health Belief Model and the Theory of Reasoned Action (Boyle & Holben, 2011). The Health Belief Model is based on an individuals perception of susceptibility to health ailments. This is commonly related to a recent life experience, either personal or through an acquaintance. By connecting eating behavior with health, the reader may associate healthy recipes with an improved quality of life.

Closely related to the Health Belief Model, the Theory of Reasoned Action connects health beliefs with behavior change (Boyle & Holben, 2011). Once the participant identifies healthy eating as important, the contents of the cookbook will
provide stepping stones for changes to support a healthier lifestyle. Self-efficacy completes the circle as the food pantry client begins to gain confidence in making a behavior changed. By providing recipes and health tips in a simple manner with encouragement, self-efficacy will be influenced, and hopefully increased.

Eleven of the 24 recipes included in the cookbook were informally pilot tested during summer of 2012. Food pantry clients and volunteers were provided with the recipes and all ingredients necessary to complete the item. Although data collection was not associated with this pilot testing, participants who completed the recipes stated they enjoyed the meals, confirmed the simplicity of instructions, and requested to have more of them provided.

The majority of ingredients included within this cookbook consisted of items that can be found on the shelves of the typical food pantry in West Michigan. If an item happened to not be found on a food pantry shelf, it could purchased inexpensively, or acquired through the SNAP or WIC government food assistance programs. In addition to the simplicity of recipes, each recipe included a basic nutritional assessment which consisted of calories, fat, carbohydrate, protein, and sodium along with serving sizes as calculated from the USDA nutrient database. Also, each recipe included cost information. Different from other cost analyses, both the cost of actual foods used as well as cost to purchase all ingredients was included. Although prices vary from store to store, the discrepancy of low-cost items should be minimal. The cookbook clearly stated that all costs are not to be generalized to every grocery store and that prices may vary by location.
Throughout the cookbook, extra tips and tricks to make cooking and being healthy more simple, inexpensive, and fun were included. This extra information stemmed from previous information discussed in the literature review, such as *Quick! Help for Meals*, including children in the kitchen, and SNAP-Ed points. More specifically, each recipe had neatly presented ingredients with a relevant photograph in black and white, notes indicating fun recipes for kids, and references to other pages of the cookbook for reducing salt in recipes.

The contents of the cookbook, such as saving money at the grocery store, cooking from scratch to avoid excessive salt, and bringing the family closer to the dinner table, were included to elicit a behavior change. The information presented was designed to present susceptibility to the reader relating to the Health Belief Model. The recipes and cooking instructions were designed to provide an attainable solution to increase self-efficacy and enhance healthy lifestyle behaviors according to the Theory of Reasoned Action.

**Data analysis**

All statistical analysis was completed with SPSS software version 22.

**Research question 1:** To what extent will cooking frequency be changed due to the cookbook intervention? This research question was answered utilizing a MANOVA comparing survey items 5, 8, and 9 before and after intervention.

The researcher hypothesized that participants who received the cookbook would report an increase in frequency of home meal preparation, an increase in the number of ingredients used in recipes, and an increase in the amount of time spent preparing foods.
Research question 2: To what extent will participants choose healthier foods after intervention? This research question was answered with an MANOVA analysis using survey item numbers 11, 13, 15, 17, and 18 before and after intervention. For statistical analysis, survey responses for item 13 was changed to a nominal format such that skim, 1% and 2% milk responses were grouped into a reduced fat category and whole and vitamin D milk were grouped into a high fat category. In the same way, question 17 was represented in a nominal format with beef and pork being grouped together and chicken, turkey, and fish being the second group.

The researcher hypothesized that participants who received a cookbook would demonstrate healthier food choices after intervention. More specifically, participants would report consuming more servings of fruits and vegetables, drink lower fat milk, and consume lower fat, lower salt meats on fewer days each week.

Research question 3: To what extent will participants understand basic nutrition information after intervention? This research question was answered with an MANOVA analysis using survey item numbers 12, 14, 16, and 19 before and after intervention. Similar to the previous research question, the answers to questions 14 and 19 were changed to a nominal format and healthier options were grouped together.

The researcher hypothesized that participants who received a cookbook would gain basic nutrition knowledge regarding the recommended amount of fruits and vegetables to consume daily, the importance of low fat milk, and the health implication of leaner meats that contain less sodium.
Research question 4: To what extent will cooking frequency differences exist between African Americans, Hispanics, and Caucasians? This research question was answered with an ANOVA before and after intervention.

The researcher hypothesized that Hispanic and African American participants would report a different frequency of cooking dinner in their homes.

Limitations

Given that the study design was quasi-experimental, there are several limiting factors. The primary limitation regarding research methods was the absence of a true random sample. Although participants were selected at random, each potential participant required screening, which was completed by several different food pantry workers during various days and hours. Another limitation was collection of raw data by several different food pantry workers. These pantry workers were required to effectively screen potential participants and have them fill out informed consent documents as well as keep their information confidential. As the data collectors were given information on exclusion criteria from the director of the food pantry, there were channels of communication that could have resulted in misinformation. Finally, although the telephone follow-up survey was previously discussed as the most effective method for post-assessment with this study, there are limitations to contacting participants regarding phone number changes or disconnection, caller identification screening, and refusal to participate. However, without extensive training of pantry volunteers, these limitations could not have been corrected for this study.

Summary
This study was designed to assess eating habits, cooking habits, and nutritional knowledge of 300 food pantry clients using a pre-assessment, intervention, post-assessment design. The participants were divided into two groups forming a control group, simply taking a pre- and post-survey, and an intervention group, which was provided with a survey and cookbook, then reassessed 20 – 30 days later with a post-survey. Statistical analysis was completed to delineate whether knowledge acquisition or behavior change had occurred within the intervention group compared to the control group.
Chapter 4

Results and Discussion

Of the 300 surveys distributed, 217 were reviewed for completion. After review, the number of completed surveys decreased to 188 due to failure to sign informed consent, fill out entire survey, or the absence of a phone number. Finally, after post-assessment survey was complete, the final number of individuals that consented to participate in this study was 49. The reason for such a small final sample size was due to the inability to contact the majority of participants via phone. As most of the participants were from a low-income home, phones are often disconnected and the utilization of prepaid phones may frequently lead to new phone numbers (Personal Communication, Northwest Food Pantry, April, 2014). Also, with caller identification, people who receive unfamiliar numbers may be hesitant to answer (Curtain, Presser, & Singer, 2005). This was in fact observed as numerous participants either did not answer their phones, or had disconnected lines. Other reasons for not being able to complete follow-up included ineligible handwriting, non-English speaking, not completing informed consent document, not willing to participate in follow-up, or stating that they did not open the cookbook.

Non-Study Participant Characteristics

This first section of participant characteristics included the sample of 139 participants who were part of the original survey, but were unable to be contacted for follow-up. These data can be viewed in Table 1 and Table 2.
Table 1

Non-study Participant Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Gender</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>50.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>89.00</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>M</td>
<td>48.31</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>12.94</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Caucasian</td>
<td>75.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hispanic</td>
<td>16.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>African American</td>
<td>36.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>10.00</td>
<td></td>
</tr>
</tbody>
</table>

The average age of non-study participants was about 48 years old with a standard deviation of 12.94 years. This is consistent with participants included in this study. The primary discrepancy lies within the reported ethnicity. Among participants included in study, only six reported to be non-Caucasian. Within this non-study population, 62 of the 139 reported to be non-Caucasian. Further information regarding ethnic diversity and study participation is included in the discussion for Research Question 4.

Table 2

Non-study Participant Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>48.31</td>
<td>12.94</td>
</tr>
<tr>
<td>Family Size</td>
<td>3.01</td>
<td>2.17</td>
</tr>
<tr>
<td>Eat Out (Days per week)</td>
<td>0.69</td>
<td>1.08</td>
</tr>
<tr>
<td>Cook at Home (Days per week)</td>
<td>6.08</td>
<td>2.03</td>
</tr>
<tr>
<td>Average Cooking Time</td>
<td>37.90</td>
<td>25.34</td>
</tr>
<tr>
<td>Average Number of Ingredients</td>
<td>5.13</td>
<td>2.74</td>
</tr>
<tr>
<td>Daily Fruit Servings</td>
<td>1.53</td>
<td>1.02</td>
</tr>
<tr>
<td>Daily Vegetable Servings</td>
<td>2.00</td>
<td>1.18</td>
</tr>
</tbody>
</table>
Similar to participants in this study, the majority of non-study participants also reported sub-optimal intake of fruits and vegetables, do not consume low-fat meat and milk, but appear to have a general understanding of basic nutrition. When asked optimal intake of fruits and vegetables, the average response for fruit was 3.05 and 3.37 for vegetables. When asked the optimal type of meat to eat for the average, healthy adult, 86% responded with a form of reduced fat meat. When asked the optimal type of milk to drink for the average, healthy adult, 63% responded with a form of reduced fat milk.

**Participant Characteristics**

Noteworthy items from the participant sample included cooking habits and fruit and vegetable consumption. Referencing Table 1, there is evidence that the study sample consumes the majority of their meals at home, does not frequently purchase food at restaurants, and also does not consume enough fruits and vegetables. Regarding the complexity of meals, the average number of ingredients used was between four and five, and the amount of time required to prepare an average dinner was about 41 minutes. Both average number of ingredients and average amount of cooking time generated fairly large standard deviations, 1.9 and 26.69, respectively. Age was the final interesting factor. Participant age analysis was skewed toward older adults greater than age 50 years. Participant characteristics, shown in Table 3 and Figure 1, are similar to the non-study participant characteristics shown in Table 1 and Table 2.
Table 3

<table>
<thead>
<tr>
<th>Participant Characteristics</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>56.00</td>
<td>26.00</td>
</tr>
<tr>
<td>Family Size</td>
<td>2.83</td>
<td>1.83</td>
</tr>
<tr>
<td>Eat Out (Days per week)</td>
<td>0.52</td>
<td>0.86</td>
</tr>
<tr>
<td>Cook at Home (Days per week)</td>
<td>6.38</td>
<td>1.21</td>
</tr>
<tr>
<td>Average Cooking Time</td>
<td>41.00</td>
<td>26.69</td>
</tr>
<tr>
<td>Average Number of Ingredients</td>
<td>4.67</td>
<td>1.90</td>
</tr>
<tr>
<td>Daily Fruit Servings</td>
<td>1.36</td>
<td>0.62</td>
</tr>
<tr>
<td>Daily Vegetable Servings</td>
<td>2.09</td>
<td>0.94</td>
</tr>
</tbody>
</table>

Similar to data collected from the ERS (Hamrick, Andrews, Guthrie, Hopkins, & McClelland, 2011), many families from this study reported that they rarely consume food at restaurants, but rather prepare most of their meals at home. This is also consistent with the trend, reviewed by Todd (2013), that Americans are spending less money on food and eating more meals at home. Regarding age of participants, this study revealed an average age of participants to be nearly 60 years old. This is inconsistent with food pantry clientele demographics as reviewed by Echevarria, Santos, Waxman, Engelhard, and Del Vecchio (2009), which stated that clients greater than age 60 only represent 23% of all food pantry clients. One possible explanation is seniors may have been more inclined to take the survey, and if given the option to participate in the intervention group, be more excited about the free cookbook.
Research Questions Analysis

Research question 1: To what extent will cooking frequency be changed due to the cookbook intervention? This research question was answered utilizing a MANOVA test comparing survey items 5, 8, and 9 before and after intervention. This question hypothesized that participants who received the cookbook would report an increase of home meal preparation, an increase in the number of ingredients used in recipes, and an increase in the amount of time spent preparing foods. Overall differences
were not found using the MANOVA general test of Wilks' Lambda $F(6, 27) = .672$, $p=.673$, partial eta squared = .130. This indicates that the cookbook intervention did not influence any behavior change regarding meal preparation. These data can be found in Table 2.

Results shown in Table 4 are consistent with ERS data collected by Hamrick, Andrews, Guthrie, Hopkins, and McClelland (2011) such that the low-income participants surveyed in this study reported the majority of their meals were consumed at home with little time spent eating at restaurants. This is also consistent with the Share Your Strength (2012) report on low-income family cooking, which concluded that eight out of ten families eat dinner at home at least five nights each week.

Smith, Ng, and Popkin (2013) also concluded the same general information that Americans are consuming more meals at home. However, this does not necessarily suggest that increased cooking frequency has occurred. Smith et al. described the situation that families may pick up fast food for dinner at home. They still report eating dinner at home, but there is no connection to food preparation. Smith et al. also described the trend of cooking, which has significantly decreased since the 1990's. Results from the NHANES data revealed that roughly 50% of Americans spend some time with food preparation each day (Smith et al., 2013).

Results from this study indicated that most participants spend between 30 and 50 minutes preparing food at their home. This does indicate that cooking was routine, but it does not indicate how often cooking is being done. For example, a participant may respond that they eat at home everyday and spend 35 minutes cooking, when in fact they
bring fast food home 6 days each week and only spend the 35 minutes with food preparation on Sunday afternoon.

Table 4

<table>
<thead>
<tr>
<th>Cooking Frequency</th>
<th>Pre-Intervention With Cookbook</th>
<th>Pre-Intervention Without Cookbook</th>
<th>Post-Intervention With Cookbook</th>
<th>Post-Intervention Without Cookbook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooking Habit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days Cooking at</td>
<td>M 6.00</td>
<td>6.48</td>
<td>6.36</td>
<td>6.33</td>
</tr>
<tr>
<td>Home</td>
<td>SD 1.52</td>
<td>1.09</td>
<td>1.45</td>
<td>1.23</td>
</tr>
<tr>
<td>Average Number of Ingredients Used</td>
<td>M 4.93</td>
<td>4.60</td>
<td>4.68</td>
<td>4.45</td>
</tr>
<tr>
<td>Average Cooking</td>
<td>SD 1.98</td>
<td>2.43</td>
<td>1.49</td>
<td>1.87</td>
</tr>
<tr>
<td>Time</td>
<td>M 34.57</td>
<td>32.70</td>
<td>40.36</td>
<td>51.50</td>
</tr>
<tr>
<td></td>
<td>SD 20.14</td>
<td>15.94</td>
<td>16.04</td>
<td>39.67</td>
</tr>
</tbody>
</table>

Research question 2: To what extent will participants choose healthier foods after intervention? This research question was answered with a MANOVA analysis using survey item numbers 11, 13, 15, 17, and 18 before and after intervention. Overall differences were not found using the MANOVA general test of Wilks’ Lambda $F(10, 32) = .365, p=.953$, partial eta squared = .102. This indicates that the cookbook intervention did not influence any behavior change regarding food selection (see Table 5).

Results indicated that the average food pantry client consumed a suboptimal amount of fruits and vegetables, consumed higher fat milk and meats, and consumed meat on most days of the week. This is consistent with the results from Zachary, Palmer, Beckham, and Surkan (2013), which stated that most low-income individuals are aware of healthy foods, however, do not consume an appropriate amount of them. This is based on clients perceptions that fresh food spoils rapidly, healthy food is more expensive, and energy dense foods are less expensive and more filling, despite the nutritional deficiencies. Time was also stated to be a reason for less healthy food purchasing at the
grocery store. All participants assessed by Zachary et al. (2013) were women with children who stated they did not have enough time to cook, but only were able to make convenience foods.

The elevated frequency of high fat meat consumption can be attributed to the cultural norm (Popkin, Siega-Riz, & Haines, 1996) of regularly consuming meat and the reduced cost of high fat meat products (Drewnowski and Eichelsdoerfer, 2009).

Although high fat meat may be detrimental to health in light of chronic disease (Stang, 2010), this energy source is very high in protein and several other essential nutrients.

<table>
<thead>
<tr>
<th>Table 5</th>
</tr>
</thead>
</table>

**Food Choice**

<table>
<thead>
<tr>
<th>Food Item</th>
<th>Pre-Intervention With Cookbook</th>
<th>Pre-Intervention Without Cookbook</th>
<th>Post-Intervention With Cookbook</th>
<th>Post-Intervention Without Cookbook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit Servings</td>
<td>M</td>
<td>1.52</td>
<td>1.52</td>
<td>1.86</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>0.68</td>
<td>1.02</td>
<td>1.00</td>
</tr>
<tr>
<td>Vegetables</td>
<td>M</td>
<td>1.95</td>
<td>2.05</td>
<td>2.17</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>0.82</td>
<td>0.89</td>
<td>0.99</td>
</tr>
<tr>
<td>Milk</td>
<td>M</td>
<td>1.19</td>
<td>1.64</td>
<td>1.24</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>0.40</td>
<td>0.49</td>
<td>0.44</td>
</tr>
<tr>
<td>Meat</td>
<td>M</td>
<td>1.71</td>
<td>1.86</td>
<td>1.29</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>0.46</td>
<td>1.04</td>
<td>0.46</td>
</tr>
<tr>
<td>Meat Frequency</td>
<td>M</td>
<td>5.24</td>
<td>5.27</td>
<td>5.29</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1.79</td>
<td>1.89</td>
<td>1.65</td>
</tr>
</tbody>
</table>

**Research question 3: To what extent will participants understand basic nutrition information after intervention?** This research question was answered with an MANOVA analysis using survey item numbers 12, 14, 16, and 19 before and after intervention. Overall differences were not found using the MANOVA general test of Wilks’ Lambda $F(8, 32) = .479, p=.862$, partial eta squared = .107. This indicates that the cookbook intervention did not influence any nutritional knowledge change. These data can be found in Table 6.
Based on the USDA MyPlate (2013) recommendation of Five a Day fruits and vegetables, the average pantry client assessed in this study stated that the optimal intake for fruits and vegetables was greater than three of each, for all interventions, which adds to greater than five servings daily. Both questions regarding milk and meat resulted in participants stating the leaner choice was more healthy. This can be viewed in Table 6, and is indicated by lower numbers being a lower fat selection.

These results are inconsistent with Speirs, Munger, Messina, and Grutzmacher (2012) who indicated that only about 37% of their low-income population studied were health literate regarding nutrition. Speirs et al. based their assessment on lifestyle behaviors, which may have contributed to a reduction in health literacy. This was also observed by Song, Grutzmacher, and Kostenko (2014). They reported that their 131 participants were only 43.5% health literate. Both Speirs and Song conducted their research according to the daily behaviors of their participants. Participants in low-income settings often have monetary constraints and may only be able to eat or drink what is provided to them rather than make a decision to be healthy (Echevarria, Santos, Waxman, Engelhard, & Del Vecchio, 2009). These low health literacy results may only indicate life situation that restricts nutrient intake rather than a lack of knowledge.
Table 6

*Nutrition Knowledge*

<table>
<thead>
<tr>
<th>Food Item</th>
<th>Pre-Intervention With Cookbook</th>
<th>Pre-Intervention Without Cookbook</th>
<th>Post-Intervention With Cookbook</th>
<th>Post-Intervention Without Cookbook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ideal Fruit Servings</td>
<td>M 3.08</td>
<td>3.19</td>
<td>3.60</td>
<td>3.29</td>
</tr>
<tr>
<td></td>
<td>SD 1.51</td>
<td>1.20</td>
<td>1.31</td>
<td>1.36</td>
</tr>
<tr>
<td>Ideal Vegetable Servings</td>
<td>M 3.65</td>
<td>3.57</td>
<td>4.10</td>
<td>3.62</td>
</tr>
<tr>
<td></td>
<td>SD 1.52</td>
<td>1.65</td>
<td>1.61</td>
<td>1.85</td>
</tr>
<tr>
<td>Healthiest Milk</td>
<td>M 1.10</td>
<td>1.10</td>
<td>1.05</td>
<td>1.10</td>
</tr>
<tr>
<td></td>
<td>SD .31</td>
<td>.30</td>
<td>.22</td>
<td>.30</td>
</tr>
<tr>
<td>Healthiest Meat</td>
<td>M 1.00</td>
<td>1.10</td>
<td>1.05</td>
<td>1.05</td>
</tr>
<tr>
<td></td>
<td>SD .00</td>
<td>.30</td>
<td>.22</td>
<td>.22</td>
</tr>
</tbody>
</table>

Research question 4: To what extent will cooking frequency differences exist between African Americans, Hispanics, and Caucasians? This research question was not able to produce results because only Caucasians participated in the intervention group and only six participants of the 49 were non-Caucasian.

Speirs et al. (2012) agreed with the hypothesis that ethnic groups would differ based on cooking frequency. However, due to the lack of diversity among participants in this study, these results are not available. According to Access of West Michigan (2013), Caucasian food pantry clients only represent 38% of the food pantry client population, yet almost exclusively represented the participants in this study. Although there appeared to be a trend that non-Caucasian clients may be unwilling to participate in research studies, this has not been concluded throughout other sources. Research has shown that there is no difference between ethnic groups and research participation. Murphy, Wickramaratne, and Weissman (2009) surveyed 353 New York City citizens and Wendler et al., surveyed over 70,000 individuals across the world, with 66% of study sites being located in America. Both studies concluded that there was not a significant
difference between ethnic groups regarding the willingness to participate in research studies.

The next section will summarize this study, state conclusions based on results, and discuss future implications for practice and research.
Chapter 5
Summary, Conclusions, and Implications

Summary

This study was designed to determine whether a researcher-designed cookbook could be an effective nutrition education intervention. The primary theoretical frameworks utilized to complete this intervention was the Health Belief Model and the Theory of Reasoned Action. Research questions were written to determine if cooking frequency, healthy food choices, and nutrition knowledge could be influenced by the cookbook intervention. The fourth research question was written to determine whether discrepancies exist between ethnic diversity regarding cooking frequency. The methods used to collect data involved a quasi-experimental design which included an intervention group (received cookbook) and a control group (received nothing). Three hundred food pantry clients completed a survey, half of whom received a cookbook. After 20 – 30 days, the participants were assessed via telephone post-survey, which was the same as the initial survey with the inclusion of four items for the intervention group. Forty-nine participants completed both pre- and post-survey.

Analysis of results revealed no significant differences between control and intervention group. This indicated that the cookbook intervention was ineffective at increasing cooking frequency, promoting healthier food choices, or increasing nutritional knowledge. Of the 49 participants, only six reported an ethnicity other than Caucasian, and were all in the control group. During telephone post-surveys, the intervention group was rarely able to recall any information, including recipes, presented in the cookbook.
This indicated that not only was the intervention ineffective, but participants did not utilize the cookbook.

Despite the results from this study, evidence exists for an in-person or incentivized nutrition education intervention to elicit a behavior change. An interactive cooking class for the food pantry clients may have changed the results to be more favorable regarding increased cooking frequency and duration. Future directions for nutrition education interventions should include hands-on demonstrations and learning to better influence the participant.

Conclusions

Results of this study indicate that the cookbook nutrition education intervention was ineffective. Participants in the intervention group generally were not able to recall information presented in the cookbook and therefore did not demonstrate any learning or behavior change.

Research question 1: To what extent will cooking frequency be changed due to the cookbook intervention?

There was not a significant difference between control and intervention groups regarding average number of days spent cooking at home, average number of ingredients used in meals, or average cooking time for meals. Across all groups, the average number of days the participant cooked at home was between 6.00 and 6.48. Even if the intervention was successful, significant results would have been difficult to achieve as the majority of participants were already cooking on most days of the week. The average number of ingredients actually decreased by .25 ingredients between pre- and post-intervention when the cookbook was provided. Average cooking time did increase from
34.57 minutes to 40.36 minutes after intervention. However, this mild increase was not enough to produce significant results. Overall, the cookbook intervention was ineffective at increasing cooking frequency among participants.

**Research question 2: To what extent will participants choose healthier foods after intervention?**

There was not a significant difference observed between pre- and post-assessment regarding healthy food choices. The survey specified intake of fruits, vegetables, milk type, meat type, and days per week eating meat. Slight variations existed between pre- and post-assessment in both control and intervention groups, indicating that dietary intake was not affected. Reported intake of both fruits and vegetables was less than 2.20 servings for each item, which is less than the recommended intake according to MyPlate (USDA Food Groups, 2013). This is indicative of inadequate nutrient intake among the participants reviewed.

**Research question 3: To what extent will participants understand basic nutrition information after intervention?**

There was not a significant difference between nutrition education assessment before and after intervention. Specific parameters assessed were ideal servings of fruit and vegetables each day, the healthiest milk choice, and the healthiest meat choices based on the needs of a healthy adult. Despite the lack of significant results, most participants appeared to understand the basic nutrition questions presented. Across all groups, participants responded with the ideal fruit and vegetable serving each day to be greater than three fruits and three vegetables. Participants also responded by identifying the most healthy milk and meat choices, for the average adult, being lower in fat. If every
participant had read the cookbook and studied the material, these results would not have been greatly altered as the survey questions were correctly answered by most participants.

**Research question 4: To what extent will cooking frequency differences exist between African Americans, Hispanics, and Caucasians?**

This research question was not able to produce results as only six participants reported to be non-Caucasian, and all of these non-Caucasian participants were from the control group.

**Limitations**

**Participation limitations.** The original plan of this study was to assess 300 food pantry clients. However, once data collection was complete, only 49 participants were successfully contacted for the follow-up survey. The reason for such a small final sample size was due to the inability to contact the majority of participants via phone. As most of the participants were from a low-income home, phones are often disconnected and the utilization of prepaid phones may frequently lead to new phone numbers (Personal Communication, Northwest Food Pantry, April, 2014). Also, with caller identification, people who receive unfamiliar numbers may be hesitant to answer (Curtain, Presser, Singer, 2005). This was in fact observed as numerous participants either did not answer their phones, or had disconnected lines. Other reasons for not being able to complete follow-up included ineligible handwriting, non-English speaking, not completing informed consent document, not willing to participate in follow-up, or stating that they did not open the cookbook.
Survey limitations. The survey (Appendix A) was designed to assess the participants cooking habits, nutritional status, and nutritional knowledge. Unfortunately, several of the questions appeared to be challenging to answer.

Asking the number of ingredients used in average meals, survey item 8, was misinterpreted and often included a response that counted side dishes and entrees. This question was designed to ascertain the complexity of meals, such that a from scratch entree would require more ingredients than one that can comes in a microwavable package.

Another frequent complication was survey item 9, which asked how many minutes the average meal takes to prepare. Participants were very confused because of the variation between days and types of food prepared. This question was designed to determine whether the participant is placing a prepackaged meal in the microwave, or actually chopping, seasoning, and preparing from scratch meals.

The final question that appeared to confuse participants was survey item 10, which asked how often the individual tried to cook healthy. As each definition of health is different, the answers are very open to interpretation. Initially, this question was designed to identify how often an individual would prepare dinner and add less fat if frying, or add less sugar if baking, or use oil instead of lard. However, this question may have been inappropriate due to the financial restriction among the participants. Although 67% of participants reported the intent to cook healthy everyday, the actual eating patterns based on meat and milk choices and the frequency of eating fruits and vegetables from survey items 11, 13, 15, and 17 did not reflect healthy eating.
A short pilot-testing of this survey may have revealed the discussed limitations, which could have allowed for a more practical tool to be developed. Non-participating food pantries could have been used as the pilot-testing site to avoid reassessing clients in the experimental group.

**Implications for Future Interventions and Research**

Despite the low sample size and confusion among selected questions, there are key results to be noted. The fact that very few participants viewed the cookbook, and even fewer were able to recall a recipe or piece of information discussed within the cookbook displays the need for an in-person education activity to provide a nutrition intervention. Based on this study, utilizing nutrition education intervention that is to be completed as desired by the participant is not an effective method to elicit a behavior change based on acquisition of knowledge.

Although few participants actually read the cookbook, survey results were parallel to the ERS research (Andrews & Hamrick, 2008), which stated that most low-income individuals eat at home. This indicates that if there is a knowledge deficit regarding nutrition and healthy eating, these families are eating at home and may benefit from an intervention utilizing a hands-on approach.

The majority of participants appeared to have a general understanding of basic nutrition. When asked which type of milk was most healthy for the average adult, survey item 14, 92% answered with a form of reduced fat. When asked which meat was the most healthy for the average adult, survey item 19, 95% answered with a leaner choice. Finally, when asked the optimal amount of servings for fruits and vegetables, survey items 12 and 16, the average number was 6.9, which is above the recommended “Five a
Day” according to the USDA (USDA Food Groups, 2013). This is a promising misconception as overestimation of the optimal intake of fruits and vegetables indicates awareness of the need to eat more of these foods.

One of the pantries involved in data collection took the opportunity to speak with each of the participants regarding their home eating habits as they filled out the survey. This particular pantry, through speaking with clients, discovered that there was an inappropriately low intake of fruits within the common food pantry client. This pantry then decided to increase the amount of fruit they give away to each family. Given this awareness of low fruit consumption, it is important for pantries to assess how they are serving their clients. A simple survey may bring awareness to a situation that can be changed without much work or policy drafting, yet have a valuable impact, such as increasing the amount of fruit given away to pantry clients.

As previously discussed, among the 49 food pantry clients assessed, most of them appear to have a general understanding of the need to consume several fruits and vegetables, choose leaner portions of meat, and drink less fatty milk. However, access to the resources of lean meat, skimmed milk, and large quantities of fruits and vegetables may be limited. When Reinhardt Kapsak, Smith Edge, White, and Geiger (2013) assessed the education needs of food pantry clients, they observed the general request for shopping on a budget more than any other need. Although shopping on a budget was reviewed in the cookbook used for this study, many participants did not recall this information during telephone follow-up. This is an indication that the growing trend of supermarket tours, led by dietitians, may be an advantageous intervention to not only
teach shopping on a budget, but also to promote healthy living. Grocery store tours are one of the innovative methods of nutrition education.

Access to nutritious foods was not inquired within the survey tool. Future research may look into a more qualitative design to better understand the intimate needs of food pantry clients. This study was designed to be quantitative and ascertain the general cooking and nutrition habits and knowledge of the participants. However, little was accomplished to reveal the specific needs of the participants. A more thorough investigation, utilizing more specific survey tools is indicated for future research to better serve this food pantry client population.

As mentioned in the review of literature, Neuenschwander, Abbott, and Mobley (2013) discussed the integration of nutrition education into an electronic form for basic information. As we move through the age of technology, most Americans have access to a reliable internet source. In addition, institutions such as WIC and some SNAP-Ed sites are beginning to utilize computerized nutrition education for topics that can be taught without personal interaction. Neuenschwander et al. (2013), concluded that certain topics can be self-learned through computerized education with short-term recall. However, these authors described the need for personal interaction as a computer will never be able to counsel specific circumstances and provide feedback to individualized situations.

As previously discussed, several participants from this study were not able recall specific recipes or information presented in the cookbook, but merely stated that they flipped through it. The lack of interest from the participants indicates that there is a need for in-person, on-site, or incentivized interventions to be in place to effectively
communicate nutrition education. Several institutions are currently employing these practices.

Cooking classes designed by Share Your Strength, supermarket tours by dietitians around the country, health fair information disbursement in local communities, and SNAP and WIC interventions at the national level are already in place to achieve enhanced healthy living, many of which focus on low-income individuals and families. The above listed programs, which are discussed in the review of literature, are excellent sources of education which are typically free to low-income participants, but are few and far between. As stated by Feeding America, 37 million families are impacted by food assistance annually. This number is far too large to affect each individual. However, with strategic planning, interventions can be put into action that may empower the communities to spread information about healthy living, set up more physical activity opportunities, and promote healthy foods through advertisements.
References


http://www.fns.usda.gov/sites/default/files/NUTRI.PDF


http://www.uri.edu/research/cprc/Publications/PDFs/ByTitle/In%20Search%20of%20How%20People%20Change%20Applications%20to%20Additive%20Behaviors.pdf


Song, H. J., Grutzmacher, S. K., & Kostenko, J. (2014). Personal weight status


Appendix A

From Our Pantry to Yours

This survey was created to help understand people’s habits of cooking and eating. Please answer by writing your answer in the blank or circling the choice that best fits you. The nutrition questions are intended for an average healthy adult.

1. What is your gender? Male Female

2. What is your age? _______ years

3. What is your ethnicity? Caucasian Hispanic African American Other

4. How often do you buy food at a restaurant? _______ days each week.

5. How often do you cook dinner at home? _______ days each week.


7. Do you eat as a family? Yes No

8. When you make dinner at home how many ingredients do you use? _______ ingredients.

9. When you make dinner at home how long does it take? (not including time in the oven) _______ minutes.

10. How often do you cook healthy? Every day once a week once a month rarely

11. How many servings of fruit do you eat each day? _______ servings.

12. How many servings of fruit should you eat each day? _______ servings.

13. What type of milk do you drink? Skim 1% 2% Whole Vitamin D

14. What type of milk is best for you? Skim 1% 2% Whole Vitamin D

15. How many servings of vegetables do you eat each day? _______ servings.

16. How many servings of vegetables should you eat each day? _______ servings.

17. What type of meat do you normally eat? Beef Pork Chicken Turkey Fish

18. How many days each week do you eat meat? _______ days.

19. What is the most healthy type of meat to eat? Beef Pork Chicken Turkey Fish

Thank you for participating. Your results will be kept confidential. Please provide your contact information below. You will be given a follow up survey in 3-4 weeks by telephone.

First name __________________ Last Name __________________________

Date _______ Phone number _______________________________
Appendix B

From Our Pantry to Yours – Post Survey (Telephone)

1. What is your gender? Male Female

2. What is your age? _______ years

3. What is your ethnicity? Caucasian Hispanic African American Other

4. How often do you buy food at a restaurant? _______ days each week.

5. How often do you cook dinner at home? _______ days each week.


7. Do you eat as a family? Yes No

8. When you make dinner at home how many ingredients do you use? _______ ingredients.

9. When you make dinner at home how long does it take? (not including time in the oven) _______ minutes.

10. How often do you cook healthy? Every day once a week once a month rarely

11. How many servings of fruit do you eat each day? _______ servings.

12. How many servings of fruit should you eat each day? _______ servings.

13. What type of milk do you drink? Skim 1% 2% Whole Vitamin D

14. What type of milk is best for you? Skim 1% 2% Whole Vitamin D

15. How many servings of vegetables do you eat each day? _______ servings.

16. How many servings of vegetables should you eat each day? _______ servings.

17. What type of meat do you normally eat? Beef Pork Chicken Turkey Fish

18. How many days each week do you eat meat? _______ days.

19. What is the most healthy type of meat to eat? Beef Pork Chicken Turkey Fish

20. What was your favorite recipe from the cookbook? ____________________________

21. Did you find the information in the cookbook helpful/useful? __________________

22. Would you recommend this cookbook to a friend? ____________________________

23. Do you have any questions, or is there anything you would like to add to this discussion?