

REPORTED SELF-EFFICACY AMONG PARTICIPANTS OF NUTRITION SERVICES
AT A LOCAL FOOD BANK AND RESOURCE CENTER IN RURAL NORTH
CAROLINA

A Thesis
by
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Submitted to the Graduate School
at Appalachian State University
in partial fulfillment of the requirements for the degree of
MASTER OF SCIENCE

May 2018
Department of Nutrition and Health Care Management

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Abstract

REPORTED SELF-EFFICACY AMONG PARTICIPANTS OF NUTRITION SERVICES AT A LOCAL FOOD BANK AND RESOURCE CENTER IN RURAL NORTH CAROLINA

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This research explored a community-academic partnership and the feasibility of designing and implementing initiatives aimed to increase nutrition-related self-efficacy to improve food selection behaviors, and ultimately food security among food-pantry clients in rural Appalachia. The study utilized a three-step, mixed-methods design for the purpose of identifying the client's self-assessed level of self-efficacy and food security, as well as to measure their involvement in a local food bank's nutrition-related programs. Qualitative data were collected through open-ended survey questions and observations by the investigator. Quantitative data were collected using numeric and scaled answers on a survey. A total of fifty ($n=50$) usable surveys were completed and analyzed using SPSS (IMB, Version 24, 2016). The investigator utilized observation field notes to empower and enhance the clients' experience while shopping in the Fresh Market, a client-choice focused market at the food bank, filled with fresh produce and bread goods. Renovations included painting shelves, adding bilingual clip-on labels to produce bins, strategically placing nutrient-dense food selections, and providing nutrition education handouts as well as personal shopping

assistance. Of the 50 study participants, 39 were low to very low food security and 38% had been receiving food resources from the food bank for more than 2 years. Self-efficacy items based on clients' ability to plan ahead averaged a low self-efficacy score while those items based on client's ability to make decisions in the moment averaged a high self-efficacy score. With these findings, it is apparent that there is a need for future nutrition-related interventions to focus on the importance of planning for both the near and far future. Clients with lower self-efficacy and food security ratings reported greater participation in nutrition services offered by the food bank, suggesting that services are reaching the population in most need. These findings call for future initiatives aimed at increasing the self-efficacy of food bank clientele with measures of longer term efficacy and sustainability in improving food security.

Acknowledgments

I would like to express my gratitude to the Office of Student Research at Appalachian State University for their financial support of this research. I would also like to thank the faculty at the Hunger and Health Coalition in Boone, North Carolina for allowing the research to be conducted at their facility. Lastly, I would like to thank Dr. Melissa Gutschall for the mentorship and guidance that she has provided to me throughout my two years at Appalachian State University.

Dedication

I dedicate my thesis work to my parents, Sue and Jeff Garrity, my grandmother, Shirley Garrity, and my brother, Nick Garrity. These four individuals have shown me the importance of being an active member in the community and working tirelessly to make it a better place. I also would like to dedicate this thesis to my friends, both near and far, for supporting me and making me believe that I can do anything I set my mind to.

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Foreword

Chapter 2 of this thesis will be submitted to a special issue of *The Journal of Translational Behavioral Medicine* focusing on food access among low-income populations. *The Journal of Translational Behavioral Medicine* is one of two journals of the Society of Behavioral Medicine. This thesis has been formatted according to the style guide for that journal.

Chapter 1: Literature Review

Food insecurity, which is defined as not having the resources to obtain enough safe, nutritionally adequate food to support an active, healthy life, is a significant public health issue in the United States that affects the physical and mental health of individuals at all ages (Martin, Colantonio, Picho, & Boyle, 2016; Chilton & Rose, 2009). In past analyses, any level of food insecurity is associated with chronic diseases and a less nutritious diet compared to those with full food security (Laraia, 2013; Nguyen, Shuval, Bertmann, & Yaroch, 2015; Seligman, Laraia, & Kushel, 2009). Causes of food insecurity include unemployment, low levels of income and education, high housing and heating costs, lack of access to transportation, and low social capital (Martin et al., 2016).

According to the Social Cognitive Theory (SCT), self-efficacy and capability (e.g., health literacy) may interact to predict preventative health behaviors (Glanz, Rimer, Viswanath, & Orleans, 2008). The SCT is the view that an individual's knowledge acquisition can be directly related to observing others within the context of social interactions, experiences, and media influences – e.g., one's social environment. Self-efficacy is known as one's judgment of his or her abilities to perform a certain action. A study that examined the relationship between self-efficacy, health literacy, and nutrition and exercise behaviors in a low-income, Hispanic population found that individuals with lower health literacy – the extent to which individuals can obtain, process, and comprehend basic health information and services to make informed health decisions – were found to be less likely to engage in preventative behaviors and more likely to avoid health situations and health information, and report greater barriers to health care (Guntzviller, King, Jenson, & Davis, 2016). Increasing knowledge about self-efficacy and food insecurity among low-

income individuals who may experience food insecurity is a critical step in developing effective health promotion programs in communities and at local resource centers (Kamimura et al., 2017).

A number of studies have found that high self-efficacy is associated with increased food security (Martin et al., 2016; Kamimura et al., 2017; Neter, Dijkstra, Visser, & Brouwer, 2014; Salarkia, Omidvar, Zaeri, Zeinab, & Neyestani, 2015; Becerra, Allen, & Becerra, 2016). Another study sought to find out if mothers' self-efficacy mediated the association between food insecurity and maternal infant feeding styles. The results showed that household food insecurity was associated with a reduction in mothers' self-efficacy (Salarkia et al., 2015). Put more simply, the more self-efficient a mother felt, the less likely her family was to be food insecure. Another study examined food insecurity associated with self-efficacy and acculturation among low-income primary care patients and reported that higher levels of self-efficacy were associated with lower levels of food insecurity. The investigators concluded that self-efficacy should be included in nutrition education programs in order to reduce levels of food insecurity (Kamimura et al., 2017). The inclusion of self-efficacy in nutrition-related programs is in fact a focus area of USDA initiatives to come (Bailey, 2017). Similarly to the studies discussed above, results from a study performed in the Netherlands concluded that food bank recipients who report high self-efficacy for eating healthy are less likely to experience food insecurity compared to those with low self-efficacy in regard to eating healthy (Neter, 2014).

A randomized, controlled trial investigated a novel food pantry intervention including client-choice and motivational interviewing and measured the effect it had on the clients' self-efficacy level. Participants were randomized into one of two groups: Freshplace or

traditional food pantries (control). Freshplace was defined as a model with client-choice, motivational interviewing and targeted referral services. The results of this study, similar to ones discussed above, showed that self-efficacy was significantly inversely associated with very low food security ($p < 0.05$). Participating in the Freshplace intervention and having higher self-efficacy were independently associated with a decrease in very low food insecurity. This study concludes that traditional food pantry models fail to recognize the influence of self-efficacy on a person's food security (Martin et al., 2016). Incorporating programs and tools aimed to improve self-efficacy (i.e., nutrition education, motivational interviewing, one-on-one time, recipe and produce fact sheets, etc.) within food pantries seems to be an imperative step in improving the food security among disadvantaged populations.

There is literature that supports the idea that nutrition education is needed to boost self-efficacy and food security for low-income populations. One study assessed the impact of a short-term nutrition intervention that provided education on a comprehensive array of nutrition and health topics for low-income women. The results of this study indicated that nutrition education focused on the following subjects can impact favorable dietary and health behavioral changes: health benefits of all food groups; identification of healthful foods; shopping, cooking and gardening; and energy balance (Rustad & Smith, 2013). A similar study found that children, the majority of whom resided in low-income households, who participated in a school-based nutrition education intervention program could successfully improve knowledge of healthy nutritional practices and self-efficacy which led them to consume more fruits and vegetables (Tuuri et al., 2009). Another study measured the change in knowledge, attitude, and behaviors (including self-efficacy) among low-income parents

who participated in a five-week nutrition education program. The results showed significant positive increases in their knowledge, behaviors and home environment related to nutrition and healthy eating (Prelip, Slusser, Thai, Kinsler, & Erausquin, 2011). The studies described suggest that an increase in nutrition-related knowledge and self-efficacy can help individuals and families move towards a healthier, more food secure future.

Thus, this study explored a growing community-academic partnership and the feasibility of designing and implementing nutrition-related initiatives aimed to increase self-efficacy to improve dietary behaviors and food security among clients. Improvements in self-efficacy were targeted by increasing exposure and marketing of fresh foods, improving health literacy through nutrition education, and providing access to a nutrition intern acting as a “personal shopper.” This research project has the potential to increase food security by improving the self-efficacy through implementation of initiatives at a local food bank.

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Chapter 2: Article

Introduction

Food insecurity plagues roughly 48.1 million, or one in six Americans, with more than half of all very food insecure counties categorized as rural (Gunderson, Engelhard, Dewey, Crumbaugh, Kato, 2016). This presents an ironic paradox as it is the rural farm communities whose productivity feeds the world and provides low-cost food for consumers (Feeding America, 2017). There are challenges specific to rural counties that contribute to this paradox: unemployment and underemployment are higher, education levels are lower, work support services are less available (public transportation and affordable child care), and companies in rural areas are offered less access to activities that foster administration, research, and development (Feeding America, 2017).

While hunger is a major concern in food insecure areas, so is overall nutrition status because of the direct impact it has on preventing and managing chronic health problems such as hypertension, diabetes, and obesity. The Economic Research Service (ERS) reported that there is a strong correlation between food insecurity and chronic health conditions among working age adults living at or below 200 percent of the Federal poverty line (Gregory & Coleman-Jenson, 2017). Additionally, the Centers for Disease and Control and Prevention (CDC) reported that more than 29 million United States (US) adults have diabetes, more than one in three adults have at least one type of cardiovascular disease (CVD), and seven out of ten leading causes of death in the US are due to chronic diseases (National Center for Chronic Disease Prevention and Health Promotion, 2017). It comes as no surprise that diets low in fruits and vegetables and high in sodium and saturated fats are a key risk factor in

developing a chronic disease (National Center for Chronic Disease Prevention and Health Promotion, 2015).

Lack of access to a nutritious and adequate food supply has implications not only for the development of physical disease, but also mental disease, behaviors and social skills (Gundersen et al., 2016). The consequences of food insecurity for all ages make addressing the issue an economic and social imperative (Gundersen et al., 2016). Families and individuals facing these issues are likely to have low confidence in their ability to become self-sufficient, leading to a perceived low self-efficacy. Self-efficacy is known as one's judgment of his or her abilities to perform a certain action. Without a sense of self-efficacy, individuals will not have motivation to change their behavior, believe in themselves, or persevere through challenges presented throughout life (Martin, Colantonio, Picho, & Boyle, 2016).

A combination of federal nutrition programs and charitable food systems, such as local food banks, help to create a safety net for vulnerable populations and individuals dealing with food insecurity (Gundersen et al., 2016). This research explored self-assessed food security and self-efficacy among food-pantry clients in rural Appalachia. The study also examines the clients' participation in newly implemented initiatives through a community-academic partnership aimed to increase food security and self-efficacy.

Methods

Design

This study utilized a three-step, mixed-methods design for the purpose of identifying the client's self-assessed level of self-efficacy and food security, as well as to measure their involvement in a local food bank's nutrition-related programs. Qualitative data were

collected through open-ended survey questions and observations by the investigator.

Quantitative data were collected using numeric and scaled answers on a survey. The three-step approach to data collection is explored more in *Procedures*.

Population/Sample

The target population was the adult (18 years and older) client base served by the Hunger and Health Coalition (HHC), a local food and resource center in Boone, NC. HHC has been addressing the needs of vulnerable populations in rural Watauga County since 1982 where more than 19% of residents are living in food insecure households, and an estimated 27% of children in the county are food insecure (Green et al., 2015). Eligibility criteria for services include residence of Watauga County, NC with an income at or below 200% of the Federal Poverty Level.

Procedures

As mentioned previously, the study used a three-step approach to data collection. These three steps were (1) observation and feedback, (2) design and implementation, and (3) evaluation. Each step is explained below.

Observation and Feedback

The investigator spent time at the food bank directly observing the organization and their policies surrounding food distribution. While volunteering, the investigator was also able to talk with clients and gain a better understanding of the population's knowledge relating to nutrition and determine what additional services they desired. The investigator spent time in

the Fresh Market prior to renovation observing the client's actions and taking field notes. Discussion and decisions about the Fresh Market renovation included the input of the local food bank's facility staff.

Design and Implementation

A before and after layout of the market was created to display the suggested changes included in the renovation and was approved by the food bank's staff in April 2017, see *Figure 1 & 2*. The Foods to Encourage Framework (F2E) was used to nudge clients to select more nutrient dense foods, such as fresh produce and whole grains (Gunderson et al., 2016). An undergraduate nutrition intern served as a "personal shopper" within the Fresh Market on a weekly basis to assist families in making improved food selections and maintain continuous merchandising and inventory tasks. Mini nutrition education classes were also available to the clients during this time. The nutrition education classes ran for a total of 12-weeks throughout Summer 2017. A different lesson was offered each week, and each weekly lesson was offered twice – on Tuesdays and Thursdays from 10am – 12pm, during high traffic pharmacy hours. Each lesson included at least one handout and a food sample used as an incentive for client participation in the lesson. Lesson topics are presented in *Table 5*.

Evaluation

The client survey was composed of three parts, each consisting of six questions: 1) a validated self-efficacy for food security scale (Martin et al., 2016), 2) the six-item short form food security survey validated by the USDA (Blumberg, Bialostosky, Hamilton, & Briefel, 1999), and 3) questions regarding the level of involvement in the aforementioned nutrition-

related programs offered by the food bank. The self-efficacy scale consisted of six questions and used the following response categories: 1=not at all confident, 2=not very confident, 3=somewhat confident, 4=very confident. The six questions asked, “How confident are you that you can”: 1) Plan meals ahead of time, 2) Make your food money last all month, 3) Make a shopping list before going to the grocery store, 4) Compare prices before you buy food to get the best deal, 5) Make low-cost meals, 6) Buy foods that you think are healthy for you and your family. Clients’ average responses of above 3 (3.1 – 4.0) were classified as high self-efficacy, and 3 or below (1.0 – 3.0) were classified as low self-efficacy.

Food security questions instructed the clients to select the answer that best described their situation based on the statement given:

1) “The food that (I/we) bought just didn’t last, and (I/we) didn’t have money to get more.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?

2) “(I/we) couldn’t afford to eat balanced meals.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?

3) In the last 12 months, since last (name of current month), did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food? [IF YES, ANSWER 4. IF NO, SKIP.]

4) [IF YES ABOVE] How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

5) In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?

6) In the last 12 months, were you every hungry but didn't eat because there wasn't enough money for food.

Responses of “often” or “sometimes” on questions 1 and 2, and “yes” on 3, 5, and 6 were coded as affirmative (yes). Responses of “almost every month” and “some months but not every month” on 4 were coded as affirmative (yes). The sum of affirmative responses to the

six questions in the module was the household's raw score on the scale. Scores of 0 to 1 classified the individual as having high or normal food security, scores of 2 to 4 classified the individual as having low food security, and scores of 5 to 6 classified the individual as having very low food security.

The final six questions were designed to assess use of food bank services. These questions were both multiple choice and short answer. The first question asked the client how long they had been receiving food resources from the food bank. The second question asked the client what programs offered by the food bank they had participated in and how often. The third question asked the client to mark any of the following that they thought they had improved on since participating in the services offered by the food bank: food choices (choosing healthier options), food preparation, improved health, eating more fruits and vegetables. The fourth question required a written short answer and asked the client which service offered by the food bank they thought had helped them/their family the most and why. The fifth question asked the client to check off cooking/food preparation items that they had available to them at their home: stove-top burners, oven, microwave oven, running water, electricity, pots and pans for cooking, baking sheets, cooking and baking utensils (mixing spoons, spatula, colander, knives, etc.). The sixth and final question asked the client to write down any other food storage or food preparation tools that would help them use the food items they receive from the food bank.

Data Analysis

Descriptive statistics were used to analyze demographic and client surveys using SPSS (IBM, Version 24, 2016). Survey data was coded where necessary so that questions

had numeric responses. Short answer responses were recorded and reviewed by researchers for agreement of common themes. Pearson correlation was used to measure the strength of the association between food security and self-efficacy, self-efficacy and client participation in nutrition services, food security and client participation in nutrition services, self-efficacy and length of time receiving resources from the local food bank, and food security and length of time receiving resources from the local food bank.

Results

A total of 54 individuals completed the survey. Four surveys were excluded due to volunteers, rather than clients, filling out surveys ($n=4$). Fifty usable surveys remained for analysis.

Observation and Feedback

The investigator utilized observation field notes to enhance the clients' experience while shopping at the Fresh Market with the end goal of shifting the clients' perceived experience to a more positive, welcoming and empowering one. It was noted that the Fresh Market was in need of fresh paint and that the addition of signs may make it look and feel more like a market. The investigator noted that it was not uncommon for a client to be unfamiliar with some of the fruits and vegetables offered as options in the Fresh Market (e.g., eggplant, Bok Choy, avocado, kohlrabi, and fennel). The investigator also noted that there was a fruit fly issue due to an open cardboard box being used for the compost bucket. Observation of clients' behaviors in the Fresh Market reinforced the idea that Foods to Encourage Framework (F2E) be used to nudge clients to healthier behaviors (Gunderson et al., 2016). The investigator noted that it was common for the clients to walk in the market

and head straight for the desserts which were unintentionally positioned to be seen first. Lastly, the investigator noted that there was a lack of nutrition information available to clients.

Design and Implementation

The shelves in the market were re-painted and decorative signs were made to label each section of the market. To combat the clients feeling unfamiliar with some of the produce options in the Fresh Market, bilingual clip-on labels were created for the produce bins and a handout tower was utilized to provide produce fact sheets that included recipes, storage and preparation information for a wide range of fruits and vegetables. To deal with the fruit fly issue in the Fresh Market, a large trash bin with a lid was purchased to be used for compost, thus improving the experience for clients. The need for this compost bin was also suggested by a staff member. As part of the redesign, produce and whole grains were moved so they would be seen first by clients walking into the Fresh Market. The lack of nutrition education materials was approached in multiple ways. There was a 6-week expansion of nutrition classes, on top of the 6-week course created previously, to make it possible to offer 12 weeks of nutrition education to the food bank's clients, as previously discussed in *Methods*. All of the handouts from these lessons were made available to the clients by adding them to the handout tower in the Fresh Market. An undergraduate nutrition student was recruited to act as a "personal-shopper" to be available in the market during busy times to answer client's nutrition-related questions, suggest ideas on how to use available produce, and to distribute appropriate handouts. The before and after layouts and a detailed list of Fresh Market changes can be found in *Table 4* and *Figure 1 & 2*.

Evaluation

Results from the self-efficacy for food security scale were analyzed and are shown in *Table 1* and *Table 2* below. *Table 1* displays the average self-efficacy score among the clients. The first three questions averaged a low self-efficacy score whereas the last three questions averaged a high self-efficacy score.

Table 1 – Average Self-Efficacy Score (n=50)

Question:	Averaged self-efficacy score among client:
Plan meals ahead of time?	2.90 (±1.04) – low self-efficacy
Make your food money last all month?	2.76 (±1.10) – low self-efficacy
Make a shopping list before going to the grocery store?	3.02 (±0.96) – low self-efficacy
Compare prices before you buy food to get the best deal?	3.26 (±0.99) – high self-efficacy
Make low-cost meals?	3.4 (±0.64) – high self-efficacy
Buy foods that you think are healthy for your family?	3.4 (±0.67) – high self-efficacy

The frequency distribution of client’s average self-efficacy score are provided in *Table 2*. Half (n=25) of the clients scored low self-efficacy while the other half (n=25) scored high self-efficacy. The overall mean from the six questions was 3.12 (±0.52), just barely being classified as high self-efficacy.

Table 2 – Frequency Distribution of Client’s Average Self-Efficacy Score (n=50)

Self-Efficacy Average		
	Score	Frequency (Percentage)
Low self-efficacy	1.67	1 (2%)
	1.83	1 (2%)
	2.17	1 (2%)
	2.50	2 (4%)
	2.67	5 (10%)
	2.83	7 (14%)
	3.00	8 (16%)
High self-efficacy	3.17	5 (10%)
	3.33	6 (12%)
	3.50	4 (8%)

	3.67	4 (8%)
	3.83	3 (6%)
	4	3 (6%)
	Mean:	3.12 (± 0.52)

The results from the USDA food security short form survey are presented in *Table 3* below, listing the possible food security scores and the frequency of clients at each score. About one quarter (22%) of clients were classified in the normal to high food security category, 36% of clients scored in the low food security category, and 42% scored in the very low food security category.

Table 3 – Food Security Score Distribution Among Food Bank Clients (n=50)

Score Classification	Food Security Score	Frequency (Percent)
High or normal food security	0	7 (14%)
	1	4 (8%)
Low food security	2	7 (14%)
	3	4 (8%)
	4	7 (14%)
Very low food security	5	8 (16%)
	6	13 (26%)
	Mean	3.52 (± 2.16)

Pearson correlation was used to measure the strength of association between the client’s food security score and their measured self-efficacy. No significant association was found between the client’s food security score and their average self-efficacy score; however, some significant associations were found between the client’s food security score and individual self-efficacy questions. Self-efficacy question #2, “How confident are you that you can plan meals ahead of time?”, had a significant negative correlation with food security scores ($r=-0.43, p \leq 0.01$); question #3, “How confident are you that you can make a shopping list before going to the grocery store?”, had a significant negative correlation with food security scores ($r=-0.32, p \leq 0.05$); and question #6, “How confident are you that you

can buy foods that you think are healthy for your family?”, had a significant negative correlation with food security scores ($r=-0.29, p\leq 0.05$). Question #4, “How confident are you that you can compare prices before you buy food to get the best deal?”, had a significant positive correlation with food security scores ($r=0.33, p\leq 0.05$).

Nineteen (38%) participants in this study had been receiving food resources from the food bank for more than two years. Fourteen (28%) had been receiving food resources for less than 6 months. Out of the 50 participants, 16% of them had participated in nutrition education programs, 66% of them had regularly shopped in the Fresh Market, 60% of them had participated in food pantry and to-go meals, and 54% of them have used the pharmacy services. No significant association was found between clients’ food security or self-efficacy scores and the length of time they had been receiving food resources from the food bank. When queried about dietary improvements since participating in the services offered by HHC, 54% of clients reported having improved food choices (choosing healthier options), 24% reported having improved food preparation skills, 22% reported having improved health and 56% reported eating more fruits and vegetables. With regard to which services offered by the local food bank had helped families the most, there were 23 mentions of the food pantry boxes, 22 mentions of the Fresh Market/healthy options, 16 mentions of to-go meals and 13 mentions of the pharmacy.

A significant inverse correlation ($r=-0.29, p \leq 0.05$) was found between clients’ self-efficacy score and the total number of services they participated in at the food bank. An inverse correlation was found again ($r=-0.38, p \leq 0.05$) when specifically comparing clients’ self-efficacy score with Fresh Market participation. A positive correlation ($r=0.31, p \leq 0.05$) was found between clients’ food security score and Fresh Market participation.

Most participants (72-80%) had access to stove-top burners, an oven, a microwave oven, running water, electricity, pots and pans for cooking, and cooking and baking utensils (mixing spoons, spatula, colander, knives, etc.).

Discussion

This research explored a growing community-academic partnership and the feasibility of designing and implementing initiatives aimed to increase nutrition-related self-efficacy to improve food selection behaviors, and ultimately food security among food pantry clients in rural Appalachia. The study provides baseline information regarding clients' perceived level of self-efficacy and food security, as well as their involvement in a local food bank's nutrition-related programs, particularly the new program initiatives in the community-academic partnership. When comparing the levels of food insecurity at the local food bank with state and national levels it is apparent that the food bank is providing the appropriate services to the population in most need. According to USDA's most recent data, 13.7% of United States' households are food insecure and 15.9% of North Carolina's households are food insecure (United States Department of Agriculture, 2017). Among the population surveyed at the local food bank, 78% were food insecure.

Evaluation of the six self-efficacy questions presents a logical idea that seems to be consistent with previous research. The first three questions, which averaged a low self-efficacy score, can be considered "planning related" questions whereas the last three questions, which averaged a high self-efficacy score, can be considered "decision making" questions. Therefore, it can be concluded that the clients are not confident in their abilities to plan meals ahead of time, make their food money last, or prepare and plan a grocery

shopping list – i.e., plan for the future. However, clients do feel confident in their ability to compare prices at the grocery store to get the best deal, prepare low-cost meals, and buy foods they think are healthy for their family – i.e., make decisions in the moment. A study performed in 2014 by Epstein et al. looked at the relationship between individuals' food insecurity and their ability to plan for the future. Their research showed that the highest food insecurity was for lower-income families with low levels of financial planning or high levels of financial planning who discounted the future. Low income, food insecure individuals are likely to allocate their attention to immediate challenges presented in their day-to-day lives costing them their ability for future planning. Thus, the authors concluded that having a future orientation represents important psychological processes that are related to food insecurity (Epstein et al., 2014). With these findings, it is apparent that there is a need for future nutrition-related interventions to focus on the importance of planning for both the near and long-term future.

The significant inverse correlations found between the client's food security score and self-efficacy questions #2, #3, and #6 are meaningful because, as explored in *Methods*, the higher the clients' food security score, the more food insecure the client is, whereas the higher their self-efficacy score is, the more self-efficient they are. Therefore, the inverse correlations are showing that clients that rated themselves as being more food secure also rated themselves as being more self-efficient within the themes that these three questions explored. The significant positive correlation found between the client's food security score and self-efficacy question #4 suggests that clients who are more food insecure actually scored themselves as more self-efficient when comparing food prices. Perhaps more food

insecure clients have had more practice and experience at comparing prices as a coping strategy.

From the significant inverse correlation found between clients' self-efficacy score and the total number of services they participated in at the food bank, we can conclude that the more services they participated in the lower they rated their self-efficacy. Another significant inverse correlation was found when comparing clients' self-efficacy score with Fresh Market participation specifically. The clients participating in Fresh Market shopping classified themselves as having lower self-efficacy than the clients not participating in Fresh Market shopping. Interestingly, a significant positive correlation was found between clients' food security score and their Fresh Market participation suggesting that clients participating in Fresh Market shopping are more food insecure than those clients not participating in Fresh Market shopping.

The strengths of this study are the community-academic partnership which has led to continued nutrition service initiatives to build on and create more lasting impacts for the food insecure population in a local community. This partnership can also serve as a model for other food bank programs in the region. This study empowered clients by improving the feel and layout of the food bank and by providing them with nutrition and cooking-related education materials that they can incorporate into their daily lives. The data collection was cost-efficient and can easily be repeated.

An important limitation of this and any study with a small sample size is decreased statistical power. Also, the transient population limited the ability to measure repeatedly or long-term amongst the same sample. The method used to collect data (self-reported surveys) can lead to social desirability response bias – the systematic error in self-report measures that

results from the desire of respondents to project a favorable image to the researcher and to avoid feelings of criticism or shame (Fisher & Tellis, 1998). Therefore, participants may have scored themselves erroneously high on the self-efficacy scale and erroneously low on the food security scale. Research suggests that in order to avoid these erroneously low or high responses, questionnaires and surveys need to utilize indirect questions and avoid the use of direct questions (Fisher & Tellis, 1998). It was also considered that training food bank staff, volunteers, or peers of the clients to administer the surveys could potentially lead to more truthful and vulnerable answers, due to the clients feeling more comfortable when surrounded by familiar faces and individuals better able to relate to their situations. Days and times when survey data was collected were planned for what was reported as the food bank's "busiest times" because the pharmacy was open. Data collection time was short (twice a week for two hours each time) and may have been skewed by clients who filled out a survey but only utilized the food bank for its pharmacy. Lastly, due to the short nature of this study, it was not able to assess lasting future change. The research conducted did not measure before and after changes, nor was it a long-term measure after implementation of a program. Therefore, these findings call for future research to continue to measure changes in self-efficacy after longer participation in nutrition services at local food banks and resource centers.

Conclusions

In conclusion, the results show that clients at a local food bank scored themselves as having low self-efficacy in regard to planning for the future, and high self-efficacy in regard to making decisions in the moment. The clients participating in the most nutrition-related

programs offered at the local food bank had lower self-efficacy, and even more specifically, the clients participating in the newly redesigned Fresh Market had lower self-efficacy and were more food insecure than the clients who reportedly did not shop in the Fresh Market. Therefore, these findings call for future investigations to conduct longer-term measurements of changes in client's self-efficacy and food security after participating in nutrition-related programs at food bank and resource centers. It also encourages nutrition-related programs and initiatives to include education regarding the importance of planning for the future.

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Table 4: Suggested Changes to the Fresh Market

Changes to the Market (see corresponding number on layouts in Figure 1 & 2 on the following pages)	
1	Following the Foods to Encourage Framework, fruits and vegetables were moved to the shelves that the clients see directly when they walk in.
2	A compost bin with a lid was purchased. This minimized problems with fruit flies and smell.
3	Also following the Foods to Encourage Framework, the 100% whole grain breads were separated from the other bread items and displayed on separate shelves. This was done to nudge clients with limited nutrition knowledge to make healthier choices.
4	Bilingual clip on signs were made for the produce bins.
5	“Just Food” handouts were made easily accessible to the clients. These are educational handouts that provide helpful tips on storage and preparation for vegetables. They also include two recipes for each vegetable. These are stored in the handout tower by the Fresh Market’s desk.
Changes to the Market Not Displayed on Layout	
6	The Fresh Market was repainted to give it a fresh, new look.
7	New signs with pictures of fresh produce were created and nutritional education information was painted above and along the edges of the shelves.

Table 5: Twelve-Week Nutrition Education Topics

Week	Lesson Topic
1	What is MyPlate?
2	Grains: Make half of them whole!
3	Fruits & Vegetables: Half your plate!
4	Protein: The building blocks
5	Discover Dairy
6	Stretching your food dollars: Spend smart. Eat smart.
7	Cardiovascular Disease
8	Diabetes
9	Hypertension
10	Food Prep/Meal Planning
11	Food Safety
12	Nutrition Q & A

Figure 1: Before Market Renovations

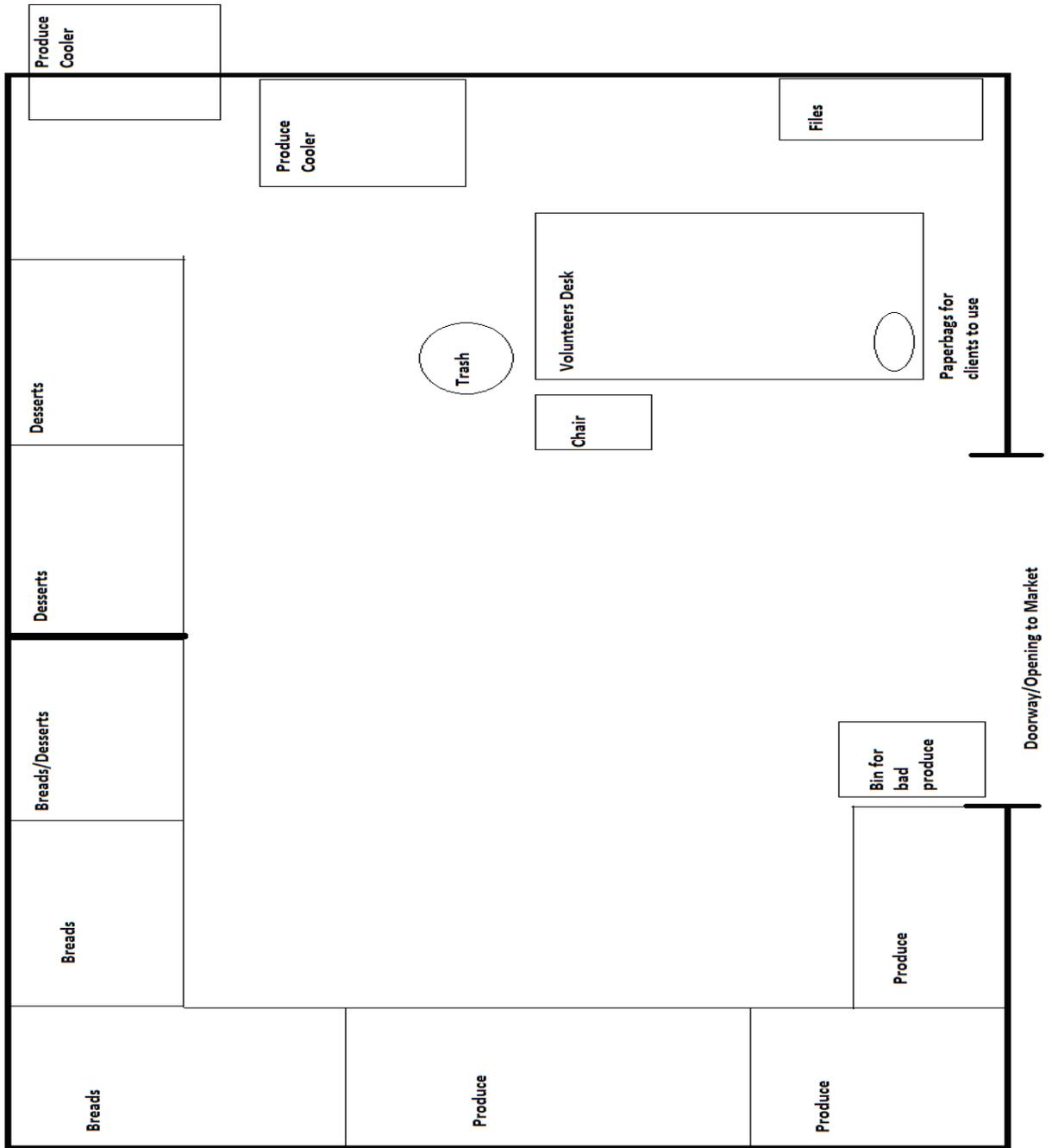
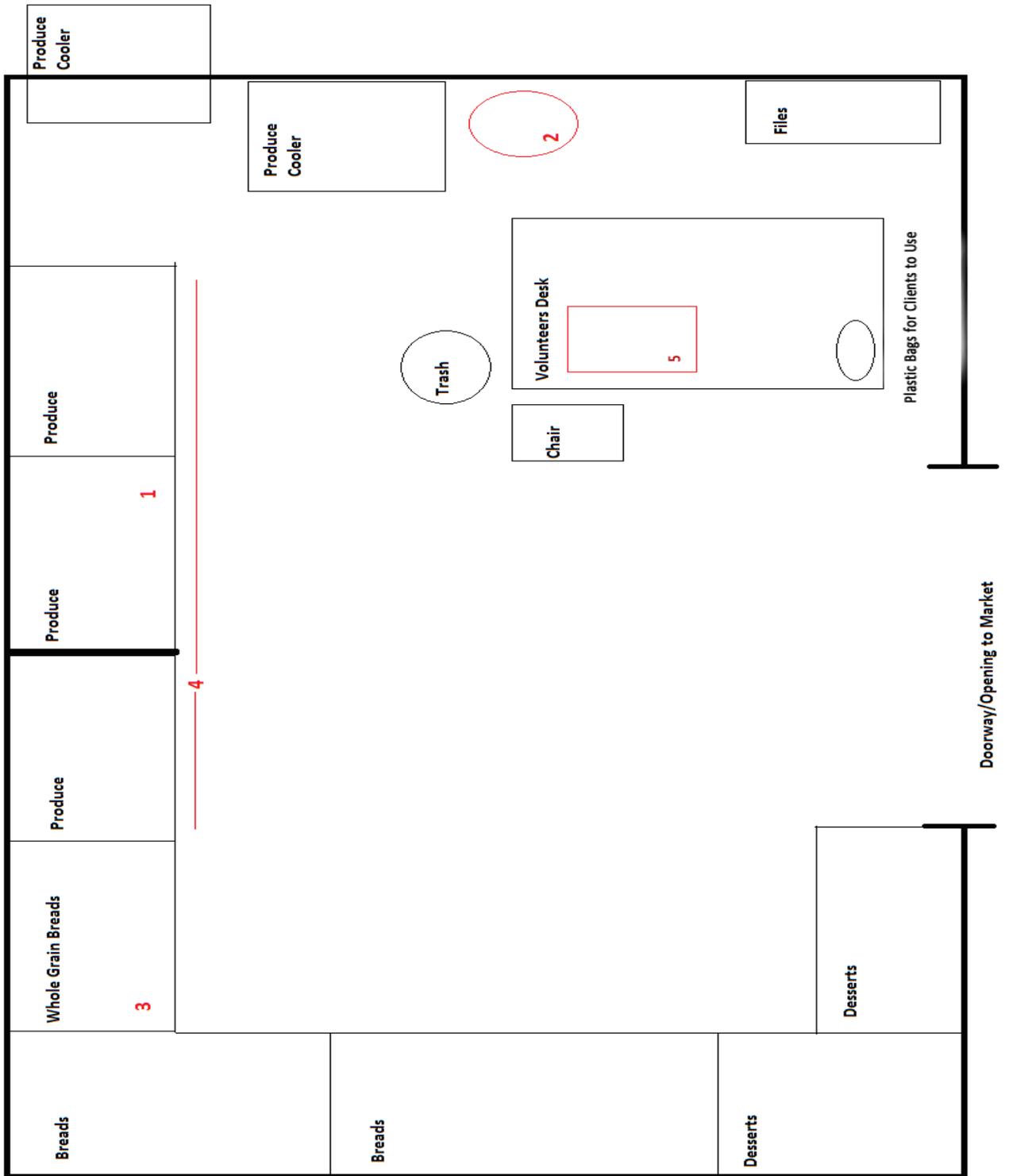


Figure 2: After Market Renovations



Vita

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