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Investigating the barriers of a healthy diet among low-income individuals who suffer from diet-related illnesses living in Atlanta, GA

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Investigating the barriers of a healthy diet among low-income individuals who suffer from diet-related illnesses living in Atlanta, GA

By

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An abstract of
A thesis submitted to the Faculty of the
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Abstract

Investigating the barriers of a healthy diet among low-income individuals who suffer from diet-related illnesses living in Atlanta, GA

By: Erin Cahill

Introduction: In Atlanta Georgia, the ninth-largest metropolis of the world's richest country, thousands of people have limited or no access to fresh food and many are suffering from nutrition-related illnesses like diabetes and heart disease. Within Grady Memorial Hospital, a large, urban safety net hospital providing care to low-income, uninsured and vulnerable populations, food insecurity appears to be more prevalent than in the general metro-Atlanta area. To better understand, and address the barriers that low-income individuals face towards adopting healthier nutrition habits, Grady Hospital implemented a Fruit and Vegetable Prescription Program (FVRx) within their primary care center. During the 6-month program, participants met with a clinician as part of the Healthy Living Group Class, received a prescription to eat more fruits and vegetables, and attended monthly cooking classes offered by a local non-profit organization.

Objective: The purpose of this thesis project was to conduct a post-intervention qualitative evaluation among participants of the FVRx implemented at Grady Hospital from July 2016-December 2016.

Methods: FVRx participants were contacted by phone in June 2017, approximately six months after completing the program. Phone interviews were conducted that focused on program evaluation and capacity to sustain behavior change after completion of the program. Interviews were recorded, transcribed, and a constant comparative analysis was used to compare experiences and perspectives among participants.

Results: Of the original 32 program enrollees, 18 were able to be contacted and agreed to participate in this qualitative evaluation. Overall, participants expressed positive sentiments about their experience, and reported continued use of lessons learned. Those who did not finish the program cited reasons for not continuing as their own or a family member's poor health, out of pocket costs i.e. co-pays, and lack of affordable transportation or parking. When asked what they believed to be the biggest barrier to healthy eating, the most commonly reported answer was cost of healthier options, including fresh produce.

Conclusions: The skills and knowledge gained through the FVRX program seemed to sustain positive behavior change in many of the participants; however, socioeconomic factors remain as continual barriers to sustaining healthy eating over the long term.

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Problem Statement: There is a need to improve diets among low-income individuals with chronic disease in Atlanta, Georgia.

Purpose: The purpose of this thesis project is to investigate the barriers to sustaining a healthy diet among low-income individuals with diet-related illnesses who participated in a Fruit and Vegetable Prescription program implemented by Wholesome Wave Georgia and Grady Memorial Hospital in Atlanta, Georgia.

Introduction

Effective public health, health promotion, and chronic disease management programs help people maintain and improve health, reduce disease risks, and manage chronic illness. They can improve the well-being and self-sufficiency of individuals, families, organizations, and communities. Usually, such successes require behavior change at many levels, e.g., individual, organizational, and community (Rimer et al., 2005). Yet, these types of health promotion programs are often not available or not easily accessible to all Americans. For many low-income households, economic barriers limit capacity of individuals or families to achieve recommended practices, including consuming a healthy diet.

Addressing social determinants of health by creating environments that promote good health for all should be a priority, providing everyone equal access to social and economic opportunities to make the choices that lead to good health (ODPHP, 2014). Lack of access to healthy food is a social determinant of health in diet-related illness prevention, treatment, and management (Clark & Utz, 2014). To address this issue, Grady Memorial Hospital, and Wholesome Wave Georgia (WWG) developed and implemented a Fruit and Vegetable Prescription Program (FVRx). The FVRx program is a unique clinic based approach that seeks to tear down access related barriers to healthier diets among low income individuals with chronic diseases.

Food insecurity and diet-related illnesses

Most U.S. households have reliable access to enough food for active, healthy living, meaning they are food secure. But some households experience food insecurity at times, meaning their access to adequate food is limited by a lack of money and other resources. In

2016, an estimated 1 in 8 Americans were food insecure, equating to 42 million people (Coleman-Jensen et al., 2017).

The prevalence of food insecurity varies across subgroups of the U.S. population; some groups are more likely to be food insecure than others. The distribution of food insecurity across residence areas shows that the majority of food-insecure households are in metropolitan areas, with income as one of the primary characteristics associated with food insecurity. Low-income households have a much higher prevalence of food insecurity than their nonpoor counterparts (Rabbitt et al., 2017). In 2016, 31.6 percent of households with incomes below 185 percent of the Federal poverty line were food insecure. These low-income households constituted the majority of food-insecure households (58.9 percent) (Coleman-Jensen et al., 2017). The prevalence of food insecurity varies considerably by state. In Georgia, 16.2 percent of people are food insecure (Feeding America, 2015). When controlled for income, food insecurity is associated with poor nutrition and diet, poor health, and higher rates of obesity (Mook et. al., 2016).

Low-income households are, unsurprisingly, less likely to buy fruits and vegetables due to cost and availability and more likely to buy affordable, energy-dense, nutrient-poor foods, which contain refined carbohydrates, added fats, and added sugars (Grutzmacher, Gross & Munger, 2012). This type of poor diet is a leading risk factor for diabetes, heart disease, and cancer, while a diet rich in high-nutrient foods, such as fruits and vegetables, can promote health and prevent these types of diet-related illnesses (Mook et. al., 2016).

Food insecurity is a complex problem that does not exist in isolation. Many low-income households are affected by multiple, overlapping issues: affordable housing, social isolation, health problems, medical costs, and low wages. Altogether, these issues are important social determinants of health, effecting individual and population health outcomes (Coleman-Jensen et al., 2017).

Description of the Grady FVRx program

In Atlanta Georgia, the ninth-largest metropolis of the world's richest country, thousands of people have limited or no access to fresh food and many are suffering from nutrition-related illnesses like diabetes and heart disease. For patients within Grady Memorial Hospital, a large, urban safety net hospital providing care to low-income, uninsured and vulnerable populations, food insecurity appears to be more prevalent than in the general metro-Atlanta area. In a 2015

study researching the association between food insecurity and diabetes in Grady's primary care center (PCC), low-income patients receiving outpatient care noted high overall prevalence of food insecurity (54.5%) and diabetes (50.3%). This high prevalence of food insecurity was consistent with the prevalence found in other studies with low-income Americans (Girovich, 2015).

To better understand and address the barriers that low-income individuals face towards adopting healthier nutrition habits, Grady Memorial Hospital implemented the FVRx program within their PCC. Clinicians within the PCC provide care to more than 50,000 patients per year, including many individuals suffering from diet-related illnesses like diabetes, hypertension, congestive heart failure and limited mobility due to arthritic disease exacerbated by excess weight. Referred PCC patients enrolled in the program, and each month for a 6-month period, FVRx participants met with a clinician as part of the Healthy Living Group Class, received a prescription to eat more fruits and vegetables, and attended monthly cooking classes offered by a local non-profit organization that provides evidence-based nutrition and cooking skills education. FVRx prescriptions could be redeemed once a week for a pre-prepared box of fruits and vegetables provided by a local, mission-driven distributor of regional farm products. Of note, the monthly cooking classes and weekly food redemption occurred at a partnering local church, located two blocks away from our primary care center and hospital. Thirty-two participants enrolled in the initial FVRx program and sixteen graduated (completing more than two classes).

Bringing about Behavior Change-What works?

While the FVRx program focuses primarily on individual behavior change, it also provides support to overcome environmental barriers related to low food access. In this way, the FVRx program attempts to better support low income patients to make healthier choices when it comes to their own nutrition. One cannot underestimate the important role environment plays in an individual's capacity to initiate and sustain behavior change. The social ecological model, a commonly applied theory in social determinants of health, recognizes individuals as embedded within larger social systems and describes the interactive characteristics of individuals and environments that underlie health outcomes (Golden & Earp, 2012). The FVRx program, grounded in the social-ecological model, recognizes that low-income patients suffering from

diet-related illnesses face factors outside of their individual control that affect their food choices: fast food restaurants or convenience stores are plentiful in low income neighborhoods; high fat and sugar foods are often the cheapest option; lack of transportation to grocery stores limits access; and competing financial priorities on fixed income limit food budgets. While the FVRx is attempting to influence positive behavior change in individual patients, the provision of vouchers for free fruits and vegetables recognizes these types of outside forces and barriers to healthy eating.

There was no specific behavior change framework used in the development of the FVRx program; instead, it contains familiar constructs that are common in many behavior change theories. Generally, there is no one theory or framework that is suitable for all cases, and some constructs, such as self-efficacy, which is a person's belief in his or her ability to succeed in a particular situation, are central to multiple theories (Rimer et al., 2005). One method that is used to bring together the multiple models and theories of behavioral change is the Theoretical Domains Framework (TDF). Within the original TDF, constructs from 33 behavior change theories were grouped into 12 domains of behavioral determinants covering the full range of current scientific explanations for human behavior (i.e., 'Knowledge,' 'Skills,' 'Social/professional role and identity,' 'Beliefs about capabilities,' 'Beliefs about consequences,' 'Memory, attention and decision processes,' 'Environmental context and resources,' 'Social influences,' 'Emotion,' 'Behavioral regulation,' and 'Nature of the behaviors'). As a consequence, researchers can use this integrative framework instead of having to choose between different theories (Huijg et al., 2014). The TDF was recently revised to include 14 domains total. Main differences between the original and the revised framework include the separation of the domain 'Optimism' from the domain 'Beliefs about capabilities' and the domain 'Reinforcement' from the domain 'Beliefs about consequences.' Additionally, the domain 'Motivation and goals' was divided into two separate domains, 'Intentions' and 'Goals,' and the domain 'Nature of the behaviors' was omitted in the revised framework (Huijg et al., 2014).

Utilizing the TDF when evaluating the FVRx program is beneficial because it allows us to use the various domains to analyze the program activities that are working to address the barriers patients face to better nutrition (See examples in Table 1 below).

Table 1. TDF Domains and Nutrition Barriers

TDF Domain	Example of healthy nutrition barriers
Knowledge/Skills	Not knowing what to eat to lose weight, or how to read nutrition labels
Beliefs about capabilities	Lack of self-efficacy; does not feel that they have the ability to improve their nutrition, weight or health status on their own. Does not feel confident when shopping for or cooking healthy foods.
Social Influences	Lacks support or feels alone in journey to get healthy Family, friends, coworkers, etc. do not take part in healthy nutrition
Environmental Context/Resources	Having access to a food retailer that sells healthy options, and being able to afford that type of food

Using the theoretical constructs within TDF, we can compare the different parts of the FVRx program to the behavior change that it hopes to achieve. For example, sessions in the monthly Healthy Lifestyle Class focused on topics such as “*Identifying and Overcoming Behavioral Barriers to Weight Loss*,” as well as “*Cheap but Healthy Foods to Eat*.” This curriculum is targeting the ‘Knowledge’ and ‘Skill’ domains, while the fruit and vegetable vouchers given out to participants to redeem at a local market focuses on improving the ‘Environmental Context/Resources’ domain by improving their access to healthy food choices.

The domains within the TDF also feed into the COM-B model, which is an individual’s capability, opportunity and motivation (COM) for behavior (B) change. This model recognizes that these three components interact to generate certain behaviors; opportunity can influence

motivation as can capability; enacting a behavior can alter capability, motivation, and opportunity (Michie et al., 2011). Someone's capability to make good food choices is tied to their skills and knowledge about what is healthy, while the opportunity for them to eat more fruits and vegetables is affected by their food-shopping environment or monetary resources. Lastly, their motivation could be influenced by many of the domains; their beliefs about capabilities to lead a healthier lifestyle, their beliefs about the effect more fruits and vegetables will have on their diet-related illness, or their goals or intentions for enrolling in the program. FVRx targets all three constructs with their program, with a heavy focus on capability and motivation through its healthy living class curriculum.

While many of the TDF domains and COM-B components are addressed through the FVRx program, there are also constructs that I would like to know more about to better understand the nature of the participant's behavior in context. 'Intentions' and 'Goals' for instance are two domains that I believe heavily influence behavior change, specifically long-term behavior change. Having a clear understanding of what those are in FVRx patients would be very beneficial. Patients were referred to the program by their clinicians, however participation was voluntary. Patients who enrolled clearly had a motivation to take part in the program, whether it was a desire to learn how to get healthier, or simply to receive free food through the vouchers, and having a better understanding of that motivation could be useful for evaluation purposes. It is also unknown why some patients chose to stay in the program and complete the entire curriculum, while others dropped out. Assessing these behaviors in the patients could help guide future programs focused on nutrition behavior change.

'Environmental Context and Resources' is another domain that plays a major role in an individual's fruit and vegetable consumption, but, beyond the produce vouchers, it is not easily addressed with the FVRx program. Patient's demographic information and income range was collected during the beginning of program, yet that data does not provide detailed information about the barriers patients face to a healthy diet: environmental stressors, priorities when spending on a limited budget, access to grocery stores, etc. Finally, with no real follow-up with patients after the program, the 'behavioral regulation' domain is difficult to address, and is important when targeting behavior change. It is about participants not only meeting their 'intentions' and 'goals' during the program, but also maintaining those new healthy habits. What

happened when the program ended? Are the skills and knowledge gained enough to sustain continued healthy choices? Using a qualitative research design, this project is focusing on these TDF domains in an attempt to gain a better understanding of the factors that influence food choices and healthy eating, the opportunities that would most benefit patients suffering from diet-related illnesses, as well as the motivations that drive them to improve their nutrition habits.

Literature Review

Fruits and vegetables are important components of a healthy diet; sufficient daily consumption reduces the risks of major chronic diseases such as heart disease, cancer, diabetes and obesity (Pomerleau et al., 2005). In the case of cancer, the evidence indicates that increasing fruit and vegetable intake to five portions daily is the second most effective prevention strategy after smoking cessation (Kearney et al., 2005). However, most persons in the United States do not consume the recommended amounts of fruits and vegetables and other healthier food groups (e.g., whole grains, fat-free foods or low-fat dairy foods) (Grimm et al., 2013). Unfortunately, millions of people in the United States do not have adequate access to a plentiful, healthy, food supply. These individuals are often limited by a lack of money and other resources, and thus, are considered to be food insecure (Coleman-Jensen et al., 2015). The United States Department of Agriculture (USDA) measures food insecurity in the United States annually, and 12.7 percent of U.S. households (15.8 million households) were food insecure at some time during 2015 (Coleman-Jensen et al., 2015). Food insecurity has been associated with a lower nutrient intake as well as a lower intake of fruits and vegetables (Mello et al., 2010).

Food access is a critical component of food insecurity, and it is often considered a function of a variety of factors, including the spatial proximity to food resources, as well as the affordability and the nutritional adequacy of available resources (Evans et al., 2015). Limited food access has been found to disproportionately affect low-income individuals who are more likely to live in communities with limited availability of healthful foods, specifically fresh fruits and vegetables (Larson et al., 2009). These communities have a lower concentration of sources of healthy food such as supermarkets and a higher concentration of fast-food restaurants and other sources of food that are not consistent with healthy eating (Kirkpatrick, 2012). Low-income individuals living in these communities tend to have less healthy diets and run a higher risk for chronic disease, such as various cancers, cardiovascular disease, and Type 2 diabetes, compared to individuals living in higher income communities (Morland & Evenson, 2009).

As a result of the relatively high prevalence of U.S. households living in communities with limited healthy food access and the noted health disparities, federal and local initiatives are being implemented to increase both geographic and economic access to more healthful foods (Evans et al., 2015). Geographic strategies include placing more chain supermarkets in food

deserts, increasing the number of farmers markets or farm stands, and establishing community gardens (Keener et al., 2009). Strategies to increase economic access include pricing schemes that look to decrease the cost of healthy food options, as well as incentives at local grocery stores or farmers' markets that match the value of federal nutrition benefits when benefits are used to purchase fresh, local produce at participating farm-to-retail venues (Flournoy, 2010).

Research has shown that both financial access and geographic access to healthy foods are important determinants of fruit and vegetable (FV) consumption. More specifically, FV consumption in low-income populations may be greater when fresh produce is more accessible (Pitts et al., 2015). To better understand the effect of accessibility on FV consumption, researchers in a 2015 study looked at farmers' market shopping and dietary behaviors among Supplemental Nutrition Assistance Program (SNAP) participants in Pitt County, North Carolina. SNAP participants were recruited from the Pitt County Department of Social Services waiting room and were asked to complete a survey that assessed farmers' market shopping frequency, awareness of markets, access to markets, and barriers to and facilitators of use of farmers' markets. The survey also assessed dietary behaviors such as FV consumption, sugar sweetened beverage (SSB) consumption and fast-food consumption. 43 percent of participants had been to a farmers' market or produce stand in the past 12 months, and 37 percent were aware of the market closest to their home. SNAP participants who reported previous use of farmers' markets reported consuming 4-7 servings of FV per day versus 3-6 servings for SNAP participants who has never shopped at farmers' markets. Although not statistically significant, SNAP participants who reported never shopping at farmers' markets consumed more SSB and fast food than those who reported shopping at farmers' markets. The top barrier to farmers' market shopping among SNAP participants was the fact that currently, Pitt County does not have any farmers' markets that accept SNAP/EBT or food stamps. One way to improve financial and social access as well as healthy dietary behaviors among participants is to expand SNAP/EBT access and promotion at farmers' markets in the area (Pitts et. al., 2015).

The immediate food environment has been widely hypothesized to influence diet; those who live closer to stores with healthy food options may buy and eat healthier food (Vaughan et. al, 2017). Some research has documented an association between shopping at corner stores with purchasing and consuming foods high in fat and/or sugar versus shopping supermarkets or

specialty grocery store and FV intake (D'Angelo et al., 2011). While many studies have emphasized the influence of the physical environment on someone's diet habits, highlighting dietary issues that arise when local food environments are not conducive to healthy eating, it is important to also consider individual characteristics. Research that has simultaneously examined the effects of shopping at different store types and shoppers' sociodemographic characteristics on diet has produced mixed findings (Vaughan et. al, 2017). Some research suggests that shopping at supermarkets and specialty stores is associated with higher FV intake after controlling for age, income and education (Zenk et al., 2005). Other research has shown that the poorer dietary quality of residents of low-income, low-access (to food) areas relative to their socioeconomically advantaged peers has not been adequately explained by differences in the food retail channels where they shop. Instead, demographic characteristics such as race, education, and income have demonstrated a much stronger effect on diet (Rahkovsky & Snyder, 2015). Disentangling our food environment, and understanding all the various factors that may influence someone's dietary habits and in turn their health status, is complex. Both environmental and individual influences may make significant, unique contributions to diet. This more complex scenario would suggest the importance of an ecological approach in which dietary interventions must address both individual and environmental influences to exert maximal impact (Vaughan et. al, 2017). To strengthen this evidence base, researchers examined environmental as well as individual influences on diet to understand the role of both. Household interviews were conducted with 1,372 individuals randomly selected from two low-income, predominantly African American neighborhoods in Pittsburgh, PA. Participants reported their sociodemographic characteristics, food shopping behavior, and dietary intake. The study's findings demonstrated the roles of both food retail environment and individual characteristics in diet (Vaughan et. al, 2017). While the study adds to the growing body of evidence suggesting that shopping at convenience stores is associated with an unhealthy diet, it also augments an accumulating body of evidence that highlights the role of sociodemographic characteristics in diet, particularly the consumption of unhealthy beverages and foods such as SSB, added sugars and discretionary fats. Additionally, their findings that educational attainment and receipt of SNAP benefits strongly predict diet converge with recent findings showing that sociodemographic characteristics, namely socioeconomic status indicators (education, income), better explain variation in diet than where people buy food (Vaughan et. al, 2017). These

findings suggest a need for alternative methods to improve the diet of individuals with specific sociodemographic characteristics. For example, certain individuals may benefit from targeted interventions designed to modify dietary choices. Such interventions may be particularly critical for curbing unhealthy diets given the findings that sociodemographic characteristics accounted for more variance and more unique variance in unhealthy diet than food shopping behavior (Vaughan et. al, 2017).

In another study done in 2015, researchers were interested in understanding the barriers to access of healthful foods (defined in this paper as fruits and vegetables, (F&V)), among residents in low-income communities in Central Texas. Focus groups were used to ask participants about their knowledge of healthful eating, factors influencing their food purchasing decisions, and their perceptions regarding solutions to increase access to more healthful foods. The goal of the research was to provide important input to help inform lay communities as well provide direction for future intervention efforts. 148 participants were recruited from 11 geographically proximate zip codes in central Texas. All of the participating areas had high concentrations of individuals living in households below the poverty threshold and with limited access to healthy food (defined by the lack of a chain supermarket in the community within one mile from the majority of residents). Researchers found that focus group participants were very knowledgeable of what it means to eat healthy, and the majority of the participants used consumption of F&V as a proxy when answering questions about healthy foods in general. Participants unanimously agreed that a variety of F&V is an essential part of a more healthful diet, suggesting that lack of knowledge is not the driving factor influencing food purchasing and dietary behaviors among this population. Results from the focus groups confirmed that both economic and geographic access are major factors influencing how low-income individuals shop for their food. The four specific factors that influence how and where food purchases are made include: price of food, geographic access, quality of food for sale, and quality of store. Other studies have found similar results and underscore the importance of the affordability, variety, and quality of food as well as proximity to grocery stores as main influences on where to shop (Evans et. al, 2015). These findings go along with other literature that suggests that increasing geographic access by simply placing supermarkets in low-income, food desert areas may not increase the purchase and consumption of healthy food. However, lowering the cost of certain

foods, and increasing availability of healthy foods in already-existing stores does seem to positively impact consumers' purchasing and consumption behaviors (Evans et. al, 2015).

To highlight the importance of not only having healthy food available in low-income neighborhoods, but also having it be affordable, researchers Betsy Breyer and Adriana Voss-Andreae investigated the role of grocery store prices in structuring food access for low-income households in Portland, Oregon. Much of the recent discussion around equitable food access in North American cities has centered on food deserts, or areas lacking physical access to full-service grocery stores. This study argued that the food environment in Portland, Oregon is marked not only by food deserts but also by food mirages. In a food mirage, full service grocery stores appear plentiful but, because food prices are high, healthful foods are economically inaccessible for low-income households. Food mirages are invisible using conventional approaches to food desert identification, but affect food access for low-income households similarly—a long journey to obtain affordable, nutritious food is required either way (Breyer & Voss-Andreae, 2013). The conventional food desert approach presumes that grocery store prices are reasonably equivalent, such that any full-service grocery store provides access to affordable food. Findings from this study demonstrated that grocery stores in the same city offered drastically different price points, such that many stores are not affordable for low-income households. Food access depends on store affordability, which must be understood as a function of income. Conventionally defined food deserts do not sufficiently describe the barriers to healthful food access faced by Portland's low-income households. Price-based barriers were shown to exist in areas that would not appear problematic from a conventional food desert standpoint. On average, the nearest grocery store is 0.7 mile (about a 30-min round-trip walk for the average person), but the nearest low-cost grocery store is 1.9 miles farther away (nearly a 2-h round-trip walk). Food access is primarily an issue of income and class. As such, food prices matter. They cannot be overlooked in a food environment assessment because members of low-income households are likely price-sensitive shoppers (Breyer & Voss-Andreae, 2013).

As is highlighted in the study above, framing the issue of healthy food access as a class issue is another viewpoint researchers take. There are countless factors that affect an individual's eating habits, yet we cannot ignore the large disparities that exist between socioeconomic classes when it comes to access to healthy foods. Low-income households often have to choose among

competing needs before purchasing food, thus leading to 47 million people receiving SNAP benefits in an average month in 2012 (Shannon et al., 2015). The intense political debate about SNAP during discussions about the 2014 Farm Bill, which resulted in an \$8.6 billion cut to the program over 10 years, reflects the deep divide between those who believe that access to food is a right that the state should guarantee and those who disagree and emphasize individual responsibility instead (Shannon et al., 2015). In a 2013 article, researchers Azetsop and Joy discuss their views that access to healthy food is a right, not a privilege to be enjoyed by few. This right is usually inherent in the right to an adequate standard of living for health and wellbeing, where food adequacy refers to both food quality and food quantity. It is one of those rights that provides an individual with the ability to function properly in order to participate in society's affairs. Poor diet and ill health are causally connected due to constraints imposed by structural inequality rather than individual failure—that is, a social justice versus a victim-blaming explanation (Azetsop & Joy, 2013). So while we can see these inequalities exist within our country, what can we do to address them? According to Azetsop and Joy, the promotion of equity in access to quality food demands a shift from a food system which is exclusively market-based to one which is justice-based. In this country, food is categorized as a commodity available to consumers with purchasing power rather than as a universal human right. However, food is different from other commodities in the market as it is explicitly and intrinsically linked to our human existence. While many other commodities confer social benefits, food ensures survival (Azetsop & Joy, 2013). Cost and availability are cited as two important barriers to healthy eating, meaning that lifestyle change initiatives and health education may not be completely effective in increasing healthy food consumption if it does not take into consideration neighborhood segregation, market strategies, retailer competition, poverty, and major forms of social discrimination as important modifiers of accessibility. There is a need for partnership and advocacy on several fronts—government, food manufacturers, retailers, marketing boards, media, health professionals, and local communities. Policies need to be developed that focus on favoring the social inclusion of low-income population groups, challenging neighborhood segregation and addressing other forms of social inequities (Azetsop & Joy, 2013).

One approach that has been developed in recent years for increasing the consumption of fruit and vegetables among those living in disadvantaged circumstances is the use of financial incentives; e.g. providing vouchers that give access to free or discounted fruit and vegetables

(Buyuktuncer et. al, 2014). In a 2005 study based in the UK, a brief preventive intervention was deployed in primary care consultations to address fruit and vegetable intake as a major risk factor for cancer and cardiovascular disease. A prescription containing four vouchers offering monetary discounts on fruit and vegetables were issued to patients by general practitioners and nurses on an opportunistic basis. In this project, clinicians were encouraged to take a population approach, not targeting particular patients or disease groups. No more than one voucher could be used per transaction and the vouchers could be exchanged at a local food cooperative (a non-profit community enterprise) and at a local retail superstore. As the health professionals issued the prescription to the patient, they also linked it explicitly to key messages regarding benefits of fruit and vegetable consumption. In addition to the brief consultation and vouchers, posters and leaflets were placed throughout the health center to advertise the five-a-day theme, as well as local resources such as the food cooperative and healthy cooking sessions in the community. Evaluation was conducted using telephone questionnaires and in-depth interviews to assess impact of the intervention on changes in consumption and purchasing behavior, food knowledge and skills, and experience of the health professionals in the use of the prescription as a brief intervention. At the time of publication, the evaluation of the project was still ongoing. However, early feedback suggested that the intervention of prescription plus key messages has a significant impact on patients in highlighting the connection between food and health (Kearney et al., 2005).

In a later evaluation of the study, it was found that while there was no statistically significant difference in the amount or pattern of consumption, a number of the participants stated that their fruit and vegetable consumption had increased compared to their consumption before receiving the vouchers (Buyuktuncer et. al, 2014). A number of the participants suggested some ideas for improving the program included increasing the value and time validity of vouchers, as well as extend the number of outlets where they can be used. Similar to other literature on food access, the primary barriers to fruit and vegetable consumption were stated as ‘the quality of fresh fruits and vegetables’ and ‘the money available to spend on food’ (Buyuktuncer et. al, 2014).

Many interventions that are looking to improve nutrition habits of populations in low-income areas focus on individual-level mediators of behavior change, such as increasing knowledge, self-efficacy, and self-regulatory skills. While these strategies have demonstrated

effectiveness, maintenance of the new health behaviors have been difficult to achieve (Lee et al., 2011). Often, some behavior change happens, but it does not maintain over time (Wood & Neal, 2016). In an intervention that looked to increase physical activity and improve dietary habits in African American and Hispanic or Latina women in Houston and Austin, Texas, researchers focused on the importance of social and physical environmental factors (e.g., lacking access to clean and safe physical activity resources, lacking access to fresh and affordable food or historical social injustices) that are present before, during, and after individual-level intervention strategies are implemented (Lee et al., 2011). These environmental factors contribute to the baseline behavior of participants, and, because the environment typically persists after the intervention is completed, facilitate return to baseline behavior (Egger & Swinburn, 1997).

Summary of Aims

Looking at the literature on this topic, we can see that there are a number of different theories on what has the strongest effect on an individual's eating habits, and the main themes that emerge as barriers to healthy nutrition in low-income communities are cost and accessibility. There is with a noticeable gap in information regarding long-term behavior change following implemented interventions, and also, what specifically the individuals in these communities are looking for when it comes to improving their health through nutrition. Further complicating the issue is that every community is different. Where one type of program or intervention might be effective in a specific region in the northeast, might not work as well for low-income communities in the south. It is important to understand the big picture of what communities face when it comes to accessing healthy food, and the impact that has on their health status.

Methods

The purpose of this thesis project was to conduct a post-intervention qualitative evaluation among participants of a Fruit and Vegetable Prescription Program (FVRx) implemented at Grady Memorial Hospital from July 2016- December 2016. At the Grady program site, eligible participants were patients aged 18+ who were diagnosed with at least one diet-related illness. In a baseline survey administered at the beginning of the program, many of the participants reported receiving public assistance through the Supplemental Nutrition Assistance Program (SNAP) program, and most reported low or very low food security. Each month, participants met with a clinician at Grady, received a prescription for fruits and vegetables, attended a Healthy Living Nutrition Class offered by Grady, and a cooking class offered by Open Hand Atlanta. Prescriptions could be redeemed each week for a pre-prepared box of local fruits and vegetables that was provided by the Common Market. The FVRx prescription was equal to \$1/day for each participant and household member; e.g., a family of 4 would receive \$28 per week. Detailed information about the specific program model used can be obtained from Wholesome Wave Georgia upon request.

This evaluation aimed to follow up participants six months post program and investigate constraints on program participation, barriers to maintaining a healthy diet among participants post-intervention and strategies to improve participant retention, satisfaction and capacity to sustain behavior change.

Study Design

A qualitative research design was chosen to investigate complex questions about food-related behavior (Swift & Tischler, 2010) in a manner that participants could express themselves in their own words. I used a telephone interview script with questions evaluating the FVRx program, as well general questions about grocery shopping habits and the patient's current fruit and vegetable consumption.

Data Collection

I contacted the original 32 FVRx patients by phone in June 2017, approximately six months after completing the program. For those participants who did not answer but had voicemail, a maximum of two messages were left. I encountered the wrong number three times,

full mailboxes for two numbers, two went unanswered (no voicemail) and one number was disconnected. Of the 32 participants, 18 were contacted and consented to participate in follow-up evaluation. The final sample comprised those who “graduated” the program (n= 7), defined as completing at least three clinic visits and were included in the follow-up analysis through a post-program survey, and those who only attended a few classes but dropped out (n=11). None of the FVRx participants contacted refused to be interviewed.

Interviews were recorded using the TapeACall app and transcribed verbatim. Four interviews were not recorded due to technical difficulties with the app. In these instances, detailed notes were taken and were used in analyses in lieu of verbatim transcripts. A codebook was developed consisting of deductive and inductive codes. Deductive codes were developed based on the key topics addressed in the interviews; inductive codes were identified from analytically reading the transcripts. Transcripts were uploaded to and coded in MAXQDA v12 (Release 12.3.2). Constant comparative analysis was used to compare experiences and perspectives between those who graduated and those who dropped out. This comparison was undertaken to understand how capabilities, motivations and opportunities changed over the course of their participation, and how this ultimately influenced program retention.

Ethics and Informed Consent

All study protocols, informed consent documents and tools were reviewed and approved by Grady Hospital review board and deemed exempt from review by Emory University IRB. All participants gave verbal informed consent to participate and provided permission to record the call.

Results

Of the original 32 FVRx participants, 72% were women (71.9%) who reported their race as Black/African or Caribbean American (90.6%). Most (68.8%), were either currently unemployed, homemakers, or on disability and reported their annual household income as less than \$25,000 (81.3%). Participants were either uninsured (28.1%) or were insured through Medicaid or some other form of public insurance (53.1%). Many of the participants reported receiving public assistance through the SNAP program (43.8%), and most reported low or very low food security at baseline (56.3%).

Of the original 32 program enrollees, I was able to contact 18 total. Of those 18, seven attended most of the classes and “graduated” from the program, and the other 11 were individuals who were not able to finish or dropped out at some point. The average number of nutrition classes attended by non-completers was one class.

Participants expressed very positive sentiments over all about their program participation. When asked about their main motivation for enrolling in the program, most participants mentioned wanting to learn how to eat healthier, with many also wanting to lose weight. And while most said they did not reach their goal of losing weight, they reported learning more about nutrition and developing a better understanding of what was healthy to eat. When asked about the most useful thing they learned in the program, nearly all the respondents mentioned an increase in nutritional knowledge, whether it was correct portion sizes, taking the skin off their chicken, or how to read nutrition labels. Other positive takeaways mentioned included the social aspect of the classes; getting to meet new people and having a sense of camaraderie and support from the group, “Going to meet everybody from my class, and we would talk and share and encourage each other.” Additionally, over half of the participants, including those that graduated, and those that did not finish the classes, said they would like to enroll in the program again if given the opportunity; “Yes, I would be very interested in that (enrolling again), especially now that I am more mobile, and able to get to places and can drive on my own and stuff.”

When asked about eating habits since the program ended, most of the respondents reported they continue to eat a “good amount” of fruits and vegetables; “I’m beginning to start to like broccoli and been doing some kale. Those different kinds of things, corn, and other things like that that I’m trying to bring into my diet.” This positively relates back to many of the participants initial motivation to enroll, which was to eat healthier.

The majority of participants (both those that completed the program and those that dropped out) reported that they continue to use the lessons they learned in the healthy living and cooking classes when making food choices; some favorite recipes that participants continue to recreate include a vegetable stir-fry as well as oven “fried” chicken. Many also report they still try and eat fruits and vegetables daily; “Yes, I do a lot of salads and fruits; fresh fruits especially this time of year [summer]. I am loving the fresh fruits.”

The small amount of negative feedback was from those who were unable to finish the program. Two participants mentioned having to pay a co-pay for the classes, and they said that even though they were getting free food with the vouchers, it was still too expensive. “I had to pay a co-pay each time, and just got too expensive. The co-pay, plus the five dollars for parking at each clinic visit was not financially possible to sustain.” Additionally, participants with inconsistent or unreliable transportation found it difficult to attend the Healthy Living Classes; “I wasn’t able at that time to have the transportation to go to all of them,” and another participant with mobility issues had a hard time walking to the local church to pick up their boxes of fruits and vegetables.

In general, those who did not graduate cited as reasons for not continuing as their own or a family’s member’s poor health (n=7); out of pocket costs (n=3 ie. co-pays); lack of affordable transportation or parking (n=4); inconvenient scheduling of the sessions (n=1).

In addition to feedback from the FVRx program, participants were also asked about their food shopping habits, as well as their opinions on barriers to healthy eating. When asked where they do most of their grocery shopping, the majority of people mentioned a large grocery store chain. Over half of the respondents mentioned shopping at multiple stores so they could obtain the lowest prices: “Umm I shop at the cheapest store I can get it [fruits and vegetables] at.” Seven of the 18 respondents mentioned shopping at a local farmers market, and three said they go to DeKalb Farmers Market or Little Giant; both sell low-cost fruits and vegetables, but are traditional grocery stores. Most participants reported that they drove to the store, with only three mentioning riding a bike or getting a ride from a friend, neighbor or relative. One participant mentioned occasionally using Marta Mobility (local public transportation) and none of the participants mentioned walking to a grocery store.

When asked what they believed to be the biggest barrier to healthy eating, the most commonly reported answer was cost. As one participant noted,

“You can get unhealthy foods a lot cheaper. It’s easier, especially for people like me, that have so many medical bills, or other bills, so what little money you have left, it’s easier to get the cheaper, unhealthy things, than fresh fruits and vegetables.”

Also related to cost, one participant explained that her family often has to get groceries from the food pantry. While she emphasized that she is very much grateful for these foods, she noted the foods do not align with those recommended by the program, “they give you a lot of bread, and they give you a lot of potatoes, and rice, and canned goods, and stuff like that; it’s not a lot of fruits and vegetables.”

Having time to cook healthy meals, especially when working or caring for children, was also brought up as a barrier. As one participant stated,

“If I am working a lot, I am not going to do it (cook). Something has to balance out. I am working a lot, so usually it is the cooking that doesn’t get done. So I end up having to feed us, which means eating out somewhere. Because it is quite convenient. I work outside the home, I work inside my home, and I am only one person.”

Physical access to healthy foods was only mentioned by one participant as a barrier to eating more fruits and vegetables.

When analyzing responses across graduation status, the number of responses per code were evenly split between the completers and non-completers. Respondents, regardless of graduation status shared similar motivations to enroll and a desire to enroll again. A similar number in each group also reported shopping at a variety of stores for lower prices. Encouragingly, each group similarly reported still using the nutrition knowledge they learned in the classes. Differences between the completers and non-completers were in the “continued behavior” category, where all four respondents who mentioned continuing to use the recipes they learned in the program had completed the program. In the “positive takeaways” category, all four of the respondents who mentioned camaraderie as something they enjoyed in the program were graduates. Additionally, when looking at the biggest barriers to health, of the six respondents who mentioned cost as the biggest barrier, five of those were individuals who did not finish the program.

In August 2017, the FVRx program held an alumni event for graduates of the pilot group that took place at Grady and the Sweet Auburn Market. Five of the original 32 FVRx participants attended the alumni event, and the session began with a physician facilitator asking the patients how they have been doing with their healthy eating since the program has ended. Patient’s

responses included: “I usually only shop about once a month, so sometimes I forget to get fruits and vegetables, but still working on it.” One patient stated she would grade herself with a C+ as it related to healthy eating, but she felt like she learned a lot in the program, which improved her portion control (she now only has one little scoop of ice cream instead of a giant bowl). Another patient stated she definitely is eating more fruits and vegetables now, and eats out less. A canning workshop was also held as part of the alumni event, giving patients an opportunity to learn a new skill, socialize with their peers, and reinforce the importance and ease of utilizing fresh, healthy foods in their cooking.

Discussion

The information collected in these qualitative interviews highlights the many factors that affect dietary habits, including the environmental and individual influences that play a role in food choices people make. While it was initially hypothesized that those who live closer to stores with healthy food options may buy and eat healthier food, my impression after speaking with these participants is that food choices are more influenced by financial constraints. The majority of participants could easily get to a full service grocery store, with only one of the respondents mentioning the lack of a “good neighborhood market that has fruits and vegetables,” as a major barrier to healthy eating. However, financial constraints limited what they were able to spend on fresh fruits and vegetables once getting to the grocery store. A number of participants mentioned shopping at a few different grocery stores to get better deals. Food insecurity among the participants in this program is not a function of spatial proximity to nutritional food, but instead the ability to afford fresh fruits and vegetables.

The findings from my interviews align with previous research, namely on the role sociodemographic characteristics play in influencing an individual’s diet, as well as the idea that food access is not always directly related to geographic, physical access. For example, Vaughan et. al, highlights how the interplay of environmental and individual influences makes significant, unique contributions to diet. Similar to this project, the findings of that study showed that sociodemographic characteristics, namely socioeconomic status indicators, specifically income, better explain variation in diet than *where* people buy food (Vaughan et. al, 2017). This more complex scenario suggests the importance of an ecological approach in which dietary interventions must address both individual and environmental influences to exert maximal impact, which is what the FVRx program ultimately aims to do.

Recent research has begun to debunk the idea that simply placing supermarkets in low-income areas, where many suffer from food insecurity, may not increase the purchase and consumption of healthy food (Evan et. al, 2015). However, lowering the cost of certain foods, and increasing availability of healthy foods in already-existing stores may work to positively impact consumers’ purchasing and consumption behaviors (Breyer and Voss-Andreae, 2013). Breyer and Voss-Andreae introduced the idea of “food mirages” as an alternate food environment designation. In food mirages, full service grocery stores appear plentiful but

because food prices are high, healthful foods are economically inaccessible for low-income households. They demonstrated that grocery stores in the same city offered drastically different price points, such that many stores are not affordable for low-income households (Breyer & Voss-Andreae, 2013). Food access depends on store affordability, which must be understood as a function of income (Breyer & Voss-Andreae, 2013). This directly ties into the results from my interviews, where participants had access to many grocery stores, however they are limited on what they can afford when they shop. As FVRx participants' mention, low-income households are often on a fixed budget, having to choose among competing needs before purchasing food, especially pricey fruits and vegetables.

The complex relationship between an individual and their environment can complicate dietary behavior change interventions. While interventions appear to be more successful at positively changing dietary behavior among populations at risk of (or diagnosed with) disease than among general, healthy populations (Asserman et al., 2002), drawing conclusions about the most effective dietary intervention is difficult. Because of the diversity of targeted populations and often-limited resources available to public health professionals, intervention elements are extremely varied. Lifestyle change interventions have been shown to be effective in the treatment and prevention of diet-related illnesses such as diabetes. In a study done in 2002, the Diabetes Prevention Program (DPP) enrolled overweight participants in an intervention that provided intensive individual counseling and motivational support on effective diet, exercise, and behavior modification. Researchers found that participants reduced their risk of developing diabetes by 58 percent (Knowler et al., 2002). Similarly, other research has shown the use of goal setting, as well as small groups to be promising tools in dietary behavior modification (Asserman et al., 2002), both of which are used in FVRx.

Of note, cost and availability are cited as two important barriers to healthy eating, meaning that lifestyle change initiatives and health education may not be completely effective in increasing healthy food consumption if it does not take into consideration neighborhood segregation, market strategies, retailer competition, poverty, and major forms of social discrimination as important modifiers of accessibility (Azetsop & Joy, 2013). While previous studies have focused on these intervention elements separately, either providing health education, or monetary incentives (matching of federal nutrition benefits, pricing schemes, vouchers, etc.), FVRx works to integrate both. This unique approach of improving not only the

participant's knowledge surrounding healthy eating, but also addressing their environmental opportunities and barriers to fruits and vegetables is key.

Using the COM-B model as a reference when analyzing data from the interviews, participants came into the program with “motivation” for behavior change, and their “capability” to make that change was targeted with the healthy living class curriculum and local cooking skills sessions. However, it is the “opportunity” component that often creates the roadblock for long lasting behavior change. These participants now have the knowledge they need to make healthy food choices; during the interviews, many of them mentioned learning new things such as the importance of fiber and proteins, and correct portion sizes. Nevertheless, it is often their various life situations, whether it is limited income due to unemployment, or disability, or needing to take care of sick parents, that may have a negative impact on being able to follow a healthy diet. This further highlights the importance of the socioecological model in obesity prevention programs, as there are so many complicated and multidimensional factors that affect an individual's eating habits.

While the developers and implementers of the FVRx program did not use a specific theory or logic model when designing the program, the healthy living class curriculum is based on a national curriculum that uses evidence based content from the Academy Nutrition and Dietetics, Institute of Medicine, USDA, ADA, and AHA. The curriculum was also supplemented with topics that the clinicians felt were important to cover with this population. This concept of addressing both the individual aspect of behavior change by providing knowledge and skills in the healthy living classes, as well as environmental factors by giving away fresh fruits and vegetables weekly, was successful in helping these patients make positive changes. Additionally, the majority of the people who were not able to finish the program, due to their various circumstances, had interest in enrolling again, showing their continued motivation to get healthy. They just need a little help in the capability and opportunity categories, which is where the program comes in, helping to make a difference in these participants health.

Limitations and Recommendations

While the information collected in my interviews does in fact highlight the difficulty low-income individual's face in affording healthy foods, these findings are from a small pool of people in a segmented population; low-income adults enrolled in the FVRx pilot program at

Grady Hospital. The 18 participants I spoke with are not reflective of all low-income patients suffering from diet-related illnesses, meaning that we cannot generalize these findings. However, because the purpose of this study was to specifically obtain more in-depth information from this particular population, we can use these snapshots of information to map out common themes and barriers related to healthy eating.

One limitation of the FVRx program is that once the six months are over, participants no longer receive the vouchers, and are on their own to obtain fresh, healthy food. This is a common problem in behavior change interventions, where adherence to a new behavior will often decline as the intervention is reduced or withdrawn (Artinian et al, 2010). Often times, follow-up with participants is simply not possible, or just not part of the program. Further complicating this issue is that fact that certain environmental factors contribute to the baseline behavior of participants, and, because the environment typically persists after the intervention is completed, facilitate return to baseline behavior (Lee et al, 2013). For the participants in the FVRx program, these behaviors would be returning to a diet full of highly processed, unhealthy foods. This highlights the importance of incorporating strategies that equip participants with enough knowledge and self-efficacy to empower them to continue their healthy behaviors. Additionally, conducting follow-up with participants at various intervals, whether with phone calls, or hosting meet-ups like the FVRx alumni events, could be a useful strategy to increase likelihood of continued behavior.

As far as research-related next steps for the FVRx program, I think it will be beneficial to continue to collect qualitative information from the participants to help strengthen the evidence base of the program. This is a 6-month program, which is relatively short. Therefore, while the post-program health data may show some positive changes in the patients' health, whether that is a slight decrease in weight or blood pressure, I think the real benefits of the program are highlighted through the participant's personal, first-hand feedback. Talking to the participants and getting not only their opinions on the program and what they gained from it, but also getting a better idea of the barriers they face to healthy eating in general is hugely beneficial to future program planning and human nutrition research. This type of information can extend past the participants of the FVRx program, and be looked at from a broader, community perspective. Continuing this type of research on how the environment and socioeconomic

characteristics play into an individual's eating habits can help public health professionals better address nutrition barriers. Additionally, one of the focuses of this project was to better understand why some people only attended a few of the sessions, and dropped out of the program, while others were able to "graduate." I was able to do this through my phone interviews; however, it is not part of the general FVRx program. In future cohorts of this program, it would be important to do this follow-up, designating someone to attempt to contact those who dropped out and see how the program could better fit their needs. These individuals were not included in the post-program survey, yet they had important insight and feedback, which is research data that I would hate to miss.

Overall, the skills and knowledge gained throughout this local program seem to sustain positive behavior change in many of the participants. However, the ability to buy and subsequently prepare healthy fruits and vegetables in the home is often controlled by life circumstances. For our specific population of low income patients suffering from diet-related illnesses, The FVRx program appears to have helped participants set realistic goals, introduced or reintroduced them to various fruits and vegetables using vouchers, and equipped them with the tools they need to make healthy choices, thereby fostering patient self-efficacy and feelings of empowerment to take charge of their health.

Developing interventions that target diet-related illnesses, food insecurity and address social determinants of health among low-income populations is extremely complex. Given the challenges of effecting meaningful dietary change among a significant number of individuals who face a multitude of environmental barriers to change, public health professionals will need to continue to take a broad approach to dietary behavioral interventions. FVRx is adding to the field by taking innovative approaches that address the variety of barriers and motivators to change.

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Appendices

Appendix A: Telephone Interview Script

Hi! My name is Erin Cahill, and I am working with Emory University and Grady Memorial Hospital on a research study. The purpose of this study is to learn about the difficulties patients have in eating healthy.

Today, I would like to ask you questions about your experience with the Fruit and Vegetable prescription program classes that you took at Grady hospital and Big Bethel last year. I would also like to ask some questions about your eating habits and ability to buy healthy foods.

This information will be used to help myself and others identify ways to help patients eat healthier foods.

I will be taking notes, but I would also like to record this discussion so I don't miss anything. All the information you give will be kept confidential. Neither your name, nor any of the things you tell me, will be shared with anyone in a way that can identify who you are. Your participation is completely your choice, and you do not have to participate if you do not want to. Also, you are free to not answer questions you do not wish to answer, and you may stop at any time.

If you decide to participate I would expect this interview to take about 30 minutes.

Would you agree to participate in this study? Yes/No

Do you agree to this interview being recorded? Yes/No

(These are the main set of questions I will ask those patients who attended most of the classes, and “graduated” from the program)

So I want to start with some questions about your experience with the program:

1. What were your main reasons for joining the Fruit and Vegetable program?
 - a. Probe – What made you enroll to being with; was it to lose weight, learn more about healthy foods, etc?
2. What was the most useful thing(s) you learned in the healthy living classes?
3. What did you enjoy most about the classes? And the least?
4. What was the goal you set for yourself at the beginning of the program, and did you reach it?
5. I know there were also prescriptions for free foods given, so that you could get weekly fruits and veggies from Big Bethel. Were you able to use all of those prescriptions?
 - a. If no, why? If yes, what were you favorite fruits and vegetables you tried?
6. Did you attend any of the cooking classes that also took place at the church?
 - a. If yes, how many? If no, what were the main reasons for not attending?
 - b. Have you made any of the things they made at home?
7. Since the program ended, have you continued to eat a good amount of fruits and vegetables?
 - a. If not, why not? What are your biggest barriers to healthy eating?
 - b. If yes, that's awesome! Do you still use the lessons from the healthy living class?
8. Do you have any advice for people who are looking to eat healthier?

9. What is your favorite place to purchase healthy foods?
10. What would it take for you to enroll in this program again?
11. What would it take for one of your family members/friends to want to enroll?

For those on the list that enrolled, but did not complete the program, I will first ask about the number of classes they attended, and then:

1. What were some of the main reasons you did not continue coming to the classes or participate in the prescription program?
2. Was there anything in particular that would have made it easier for you to attend the sessions?

So in addition to the program, I also wanted to ask some general questions, just about your ability to buy fresh fruits and vegetables, and your grocery shopping habits.

1. What neighborhood in Atlanta do you live in?
2. What is the grocery store you go to most often, and how far is it from your house?
3. Do you drive or walk to the grocery store?
4. How many people are in your home?
5. Do you know about the Fresh Marta Market, or ever shop there?
6. Do you receive SNAP benefits?
 - a. If yes, have you ever used them at local farmers markets?
7. When was your last general check up at the doctor? If given access, would it be ok if I looked at your health numbers, like BMI and cholesterol since the program has ended?

Thanks so much for chatting with me today, I really appreciate it!

Appendix B: Codebook

<i>Main code</i>	<i>sub-code</i>	<i>simple description (one line)</i>	<i>Full definition/description</i>	<i>detailed inclusion criteria (when to use)</i>	<i>detailed exclusion criteria (when not to use)</i>	<i>example text</i>
Motivation to enroll	Eat healthy	mention wanting to learn to eat healthy	This code describes repondants who decide to enroll in program because they want to learn how to eat healthy	Use when participants mention eating healthy as their motivation to enroll in FVRx	Do not use if this reason is not mentioned regarding enrollment motivation	"My main reason for joining the program was to learn how to eat healthier, especially after my cancer diagnosis."
	Lose weight	mention wanting to lose weight	This code describes repondants who decide to enroll in program because they want to lose weight	Use when participants mention losing weight as their motivation to enroll in FVRx	Do not use if this reason is not mentioned regarding enrollment motivation	"I need to eat healthy and try and lose some pounds."
	Doctor recommended	mention their doctor recommending the program	This code describes repondants who decide to enroll in program because their doctor recommended it to them	Use when participants mention their doctor recommending the program to them as their motivation to enroll in FVRx	Do not use if this reason is not mentioned regarding enrollment motivation	"Well my doctor has been working on me to try and lose some weight, and she was the one that referred me to the program."

Positive takeaways	nutrition knowledge	mention enjoying learning about different vegetables and healthy ingredients	This code describes respondents who, when asked what they enjoyed most about the program, or found most useful, mention learning how to prepare different fruits and vegetables, and eat healthier	When participants mention trying new fruits and vegetables, learning how to prepare them, or basic nutrition knowledge	Do not use when nutrition knowledge is not mentioned	"One of the most useful things was how to prepare certain meals with the different vegetables they gave you. Sometimes you have the basics, but you might want something a little different, other ideas and suggestions so its not the same old."
	Desire to enroll again	mention wanting to enroll again	This code describes respondents who mentioned a desire to enroll in the program again if given the opportunity	When participants mention a desire to enroll again	Do not use if participants do not mention wanting to enroll again	"I would love to see if I am eligible again this year to attend. I would definitely consider it again."
	Camaraderie	mention enjoying the social/group aspect of the program	This code describes respondents who, when asked what they enjoyed most about the program, or found most useful, mention the camaraderie or social aspect of the group	When participants mention camaraderie, or social aspect of program	Do not use when camaraderie, or social aspect of program is not mentioned	"I enjoyed just coming every week to pick up the fruits and vegetables; you know the group I was in, we kind of mingled with each other,

						looked out for each other.
Dropout/missed sessions reasons	personal health	mention not completing program because of personal health reasons	This code describes respondents who dropped out of the program because of health issues they were having	When respondents mention not feeling well, or having health issues going on	Do not use when personal health is not mentioned	"I didn't feel good some days."
	Dislike group setting	Mention not completing program due to group setting	This code describes respondents who mention disliking group setting as reason for not finishing program	When respondents mention not liking group setting of classes	Do not use when group setting is not mentioned	"I get stressed when I go there, because it's crowded."
	co-pay/cost	mention not completing program because of having to pay a co-pay	This code describes respondents who dropped out of the program because of having to pay a co-pay when they attended classes	When respondents mention a co-pay	Do not use when co-pay is not mentioned	"I stopped going every time I go, I had to pay a co-pay. So that started to add up. That can be expensive."
	transportation/mobility	mention not completing program because of difficulty getting to Grady/Big Bethel	This code describes respondents who mention lack of transportation or mobility issues getting to church as reasons for dropping out	When lack of transportation of problems with mobility are mentioned	Do not use when transportation or mobility is not mentioned	"I went to one to two classes, but wasn't able to use the voucher I received, since I didn't have a ride."
	Schedule/timing	mention not completing program	This code describes respondents who mention the timing of	When timing, or a busy	Do not use when timing or scheduling	"I work a lot, so it was mostly about the

		because of timing or busy schedule	the classes, or having a busy schedule as reasons they were not able to complete the program	schedule is mentioned	is not mentioned	scheduling of the classes."
Food Shopping	More than one store	Mention grocery shopping at multiple stores	This code describes respondants who mentioned going to multiple grocery stores when asked about food shopping	When more than one grocery store or market is mentioned	Do not use when only one grovery store is mentioned	"I usually go to Publix, or Kroger, or Walmart; just depends on who is having a sale."
	Cheap options or sales	Mention shopping wherever has cheapest options	This code describes respondants who mention shopping based on wherever has cheapest options or best sales	When cheap food or sales is mentioned	Do not use when cheap food or sales is not mentioned	"Umm I shop at the cheapest store I can get it at."
	Farmers Markets	Mention shopping at local farmers markets	This code describes respondants who say yes when asked if they ever shop at farmers markets	When visiting farmers markets is mentioned	Do not use when farmers markets are not mentioned	"Yep farmers markets and I catch the sale downtown at 5 points. At the Marta Train Station."
	Transportation to store_drive	Mention driving to the grocery store	This code describes respondants who say they drive to the grovery store when asked how they get there	When driving to grovery store is mentioned	Do not use when driving is not mentioned	"Yes ma'am, I drive there."
	transportation to store_Doesnt drive	Mention another means of trasnportatio	This code describes respondants who mention other transportation (not driving) when asked	When another form of transportation , besides	Do not use when how they get to store is not mentioned, or	"No, I don't have a vehicle at the time, I get a ride."

		n for getting to the store	how they get to the grocery store	driving is mentioned	driving is mentioned	
Barriers to health	Cost	Mention cost of healthy foods	This code describes respondents who mention cost when asked what they see as biggest barriers to healthy eating	Use when cost is mentioned in reference to healthy eating	Do not use when cost is not mentioned	"I don't have a lot of money, and I don't receive any assistance, so its kind of hard to buy healthy."
	Time to Cook	Mention time to cook as reason for unhealthy eating	This code describes respondents who mention having time to cook at home as a barrier to healthy eating	Use when having time to cook is mentioned as barrier to healthy eating	Do not use when time to cook is not mentioned	"If my schedule is really busy, and I am not cooking. So I don't cook"
	Support	Mention support, guidance, motivation or commitment in reference to leading a healthy lifestyle	This code describes respondents who mention support guidance, motivation or commitment in reference to what they believe is needed to address barriers to healthy eating	When support guidance, motivation or commitment is mentioned	Do not use when support guidance, motivation or commitment is not mentioned	"You gotta have motivation and support; the right kind of support."
	Access	Mention access to fruits and vegetables	This code describes respondents who mention having access to fresh fruits and vegetables as a barrier to healthy eating	Use when physical access to fruits and vegetables is mentioned	Do not use when access is not mentioned	"I think the biggest barrier for people eating more fruits and vegetables is if they lack a good market in their neighborhood that has fruits."

Continued behav.	FruitVeg consumption	Mention continuing to eat fruits and vegetables, post program	This code describes respondants who report continuing to eat a good amount of fruits and vegetables since the program has ended	When eating fruits and vegetables is mentioned	Do not use when comsuming fruits and vegetables are not mentioned	"I still use the tools I learned in class, and eat lots of fruits and vegetables."
	Recipes from class	Mention continuing to use receipes from classes	This code describes respondants who report continuing to use the recipes from healthy living and cooking classes	When recipes from classes is mentioned	Do not use when recipes are not mentioned	"I make a dish with zucchini that they demonstrated in one of the cooking classes."

Appendix C: MaxQDA Code System

The screenshot shows the MAXQDA12 interface with a 'Code System' window. The window displays a hierarchical tree of codes and their associated counts. The total count for the entire code system is 140.

Code System Category	Count
Code System	140
Continued Behavior	0
Recipes from class	4
Fruit and Veg Consumption	15
Barriers to health	0
Time to cook	2
Access	2
Support	2
Cost	8
Food Shopping	0
more than one store	10
Farmers Markets	10
cheap options or sales	5
Transpor. to store_doesnt drive	2
Transpor. to store_drive	7
Dropout / missed sessions reasons	0
other issues	1
dislike group setting	1
Schedule/timing	1
transportation/mobility	4
co-pay/cost	3
personal health	7
Positive takeaways	0
Desire to enroll again	11
Camaraderie	5
Nutrition knowledge	15
Motivation to enroll	0
Doctor recommended	6
lose weight	8
eat healthy	11