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Exploring the Role of Social Capital in the Implementation of Fruit and Vegetable Incentive Programs: A Case Study of the Appalachian Farmacy Program

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by

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ABSTRACT

Exploring the Role of Social Capital in the Implementation of Fruit and Vegetable Incentive Programs: A Case Study of the Appalachian Farmacy Program

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The study was conducted to explore the role of social capital in the implementation of Fruit and Vegetable Incentive Programs (FVIP) through a case study of the Appalachian Farmacy (AF) program and to fill a gap in literature on social capital utility in the implementation and evaluation of FVIPs. The study was guided by a conceptual model adopted from Berkman et al. (2000) to identify the mechanisms through which social networks can impact health. A qualitative content analysis was conducted retrospectively on secondary data from the evaluation of AF program to identify social capital attributes. In addition, the study conducted two focus groups with AF participants and four interviews with AF program administrators to explore their perceptions on the role of social capital in the implementation of FVIPs using a phenomenological approach.

The study utilized both inductive and deductive analysis techniques with the conceptual model as the guide for analysis. The Bengtsson's four steps for conducting content analysis were used for AF content analysis and Tracy's (2013) two-level coding was used to analyze the focus groups and interviews. All the findings were triangulated and mapped on the study's framework to identify the main and emergent themes.

The findings revealed the main avenues for social networks were: cooking classes, farmers markets, recruitment sites, and a low-income housing complex. The main social capital mechanisms were: instrumental and informational social support; social participation and engagement; and social influence. The main actors in the networks were the program administrators, market vendors, and other participants. Lastly, the health pathways identified were the changes in perceptions towards diet and health. The emergent themes revealed that barriers to access and individual characteristics were potential moderating themes, and case management by the program administrators was a potential mediating theme to program implementation.

The study showed that the model was effective in exploring social capital in FVIPs. It highlighted the role that social networks, program actors and social capital play in implementation of public health interventions. Social capital may play an important role in health promotion and more research is needed to identify the mediating influences of the model.

DEDICATION

To my parents, for their unwavering support and love. To my wife, for her patience, love, and care.

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CHAPTER 1

INTRODUCTION

This study sought to explore the role of social capital in the implementation of Fruit and Vegetable Incentive Programs (FVIP). The study examined the Appalachian Farmacy (AF) program – a FVIP implemented in Washington County, Tennessee. The program provided vouchers to Supplementary Nutrition Assistance Program (SNAP) participants to purchase fruits and vegetables at local farmers markets. In addition to existing literature on the impact of social capital on health, the study revealed the importance of social capital in the implementation of FVIPs. Future programs should evaluate and integrate social capital into their program implementation and evaluation processes.

Background of the Problem

Food insecurity remains a challenge in the U.S. In the last 20 years, the national prevalence has ranged between 10% to 15% (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2017). In 2016, 12% of households were food insecure, five percent of whom had very low food security (Coleman-Jensen et al., 2017). Food insecurity is more prevalent among low-income households, with households earning below 100% of the federal poverty line being three times more likely to be food insecure (Coleman-Jensen et al., 2017). Tennessee has a high food insecurity rate of 14.5%, making it one of 12 states with food insecurity rates higher than the national average in 2015 (Gundersen et al., 2017). County level prevalence rates within Tennessee range from 23% to seven percent with Washington County at 13 % (Gundersen et al., 2017).

Food security is defined as access by all members of a household at all times to enough food for an active, healthy life (Beaulieu, 2014, p.12). It is often measured by the United States

Department of Agriculture (USDA) Household Food Security Scale that defines two levels of food insecurity: low food security and very low food security (Coleman-Jensen et al., 2017). Households with low food security are those that report reduced quality, desirability, or variety of their diet. Those with very low food security have reduced intake and disrupted eating patterns in addition to reduced quality, variety or desirability of their diet (Coleman-Jensen et al., 2017).

Food insecurity is associated with poor self-assessed health (Gregory & Coleman-Jensen, 2017). In a USDA study, food insecurity was associated with higher probability of having a chronic illness. Being food insecure was associated with all 10 chronic illnesses studied while income was associated with only three of the chronic illnesses: hepatitis, arthritis, and COPD (Gregory & Coleman-Jensen, 2017). The ten chronic illnesses studied were: asthma, diabetes, hypertension, arthritis, coronary heart disease (CHD), hepatitis, chronic obstructive pulmonary disease (COPD), stroke, cancer, and kidney disease (Gregory & Coleman-Jensen, 2017). This association between food insecurity and health is consistent with the rates of disease in Tennessee. Tennessee has the top ten highest rate of mortality from stroke cancer, chronic lower respiratory disease, heart disease, and diabetes (at 11th place) in the country (Centers for Disease Control and Prevention, 2018).

Food insecurity directly affects health through consumption of low-quality diets which are characterized by nutrient deficiency. Nutrient deficiencies can result in negative physical, physiological and mental outcomes (Holben & Marshall, 2017). Unfortunately, food insecurity disproportionally affects low-income people. In Tennessee, 56% of those who are food insecure earn below 130% Federal Poverty Level (FPL) which is about $26,000 a year for a family of four (Gundersen et al., 2017). The challenge of food insecurity in the United States led to the development of food assistance programs to assist low-income families. The Supplemental

Nutrition Assistance Program (SNAP) is the largest and longest running food assistance program in the United States. SNAP provides financial benefits to low-income people (130% below FPL) to supplement their food expenditures (Center on Budget and Policy Priorities, 2018).

SNAP has been credited for reducing food insecurity among low-income people by as much as 30% (Council of Economic Advisers, 2015). The program increases food expenditures in addition to reducing food insecurity, but it has not been shown to improve diet quality (Nguyen, Shuval, Njike, & Katz, 2014). The minimal impact on diet quality can be attributed to the insufficiency of SNAP funds and the lack of restriction on which food items can be bought using the funds (Barnard & Katz, 2017) among other factors. Programs have been developed to support SNAP in reducing food insecurity and improving diet quality by targeting at-risk populations such as children, seniors, pregnant women and infants. Other programs have been developed to improve food quality among SNAP participants such as FVIPs that increase access and consumption of fruits and vegetables by providing incentives to buy fresh produce.

FVIPs provide incentives in the form of vouchers to SNAP participants to be redeemed at local farmers markets (Melissa, Dixit-Joshi, MacAllum, Steketee, & Leard, 2014). In the past, these programs were implemented on a small scale until recently when the Food Insecurity Nutrition Incentive (FINI) grant program was established under the 2014 Farm Bill (USDA, 2018). These programs have increased access to and consumption of fruits and vegetables and impacted the social determinants of health (SDOH) of the participants and their communities (Olsho et al., 2015; Olsho, Klerman, Wilde, & Bartlett, 2016; Steele-Adjognon & Weatherspoon, 2017). The programs have impacted the economic status of participants by freeing up household's income to buy other necessities (Bartlett et al., 2014). They have also impacted the neighborhood food environment and the local economy by increased sales at farmers markets

(Freedman, Bell, & Collins, 2011; Freedman, Mattison-Faye, Alia, Guest, & Hébert, 2014). Some programs have incorporated educational components that have increased health literacy among the participants (Wetherill & Gray, 2015).

Problem Statement

To date, little research has been done on the role of social capital in the implementation of FVIPs and its impact on the health of program participants. A study by King (2017) looking at mothers and the association between food insecurity and poverty found that social capital was associated with a lower risk of food insecurity. In addition, SNAP participation had no association to food insecurity among mothers with minimal social capital (King, 2017). Social capital is defined as the aggregate of resources linked to being part of a network of relationships, which provide its members with a collectively owned value (Bourdieu, 1986). Social capital is positively associated with self-reported health and health outcomes (Islam, Merlo, Kawachi, Lindström, & Gerdtham, 2006; Poortinga, 2012; Yu, Sessions, Fu, & Wall, 2015). Similar to food insecurity, lower income levels are associated with lower social capital (Kaasa & Parts, 2008). Understanding the social capital of people and their community is important in the successful implementation and sustainability of food assistance programs.

Identifying and utilizing the social capital of participants may increase the impact of FVIPs on food insecurity and the quality of food consumed. Social capital introduces important pathways to behavior change that lead to better health (Berkman, Glass, Brissette, & Seeman, 2000).

Purpose of the Study

The purpose of this study was to identify potential mechanisms through which FVIPs impact social capital by influencing existing social network structures and characteristics. FVIPs

provide SNAP participants with incentives to purchase fresh fruits and vegetables at local farmers markets and stores. In addition, these programs may provide nutrition education and referral services to health care providers and other health programs. This study assessed how participation in a FVIP may affect participants' social capital by evaluating the AF program, a FVIP implemented in Washington County, Tennessee.

The AF program was implemented for one year starting in June 2017. The program recruited SNAP participants from three community sites and provided them with vouchers to purchase produce at three local farmers markets. The program also offered nutrition education classes to participants. The study utilized a qualitative design to identify the potential mechanisms through which AF program created and utilized social capital. These proposed mechanisms provide new ways to improve the success of future FVIPs. The utilization of social capital mechanisms in program planning, implementation and evaluation of such programs will ensure that program and community resources are maximized.

Conceptual Framework

There are multiple pathways through which social capital impacts health. The pathways are developed from the complex social networks of which individuals are members. A conceptual framework is an ideal tool for representing social capital concepts and their theoretical linkages that together describe the pathways to health. Figure 1 presents a theoretical conceptual framework of how social capital impacts health. The framework was adopted from Berkman et al. (2000) conceptual model of how social networks impact health. The model was developed from existing theoretical orientations of social capital from diverse disciplines coupled with findings from social capital research studies (Berkman et al., 2000).

The framework shows that social-structural factors condition the nature, extent, and shape of social networks which create opportunities for psychosocial mechanisms that impact health through several pathways. The framework has two main sections identified as upstream and downstream factors and is further divided into four subsections. Figure 1 shows the framework with FVIPs such as the AF program intervening between the upstream and downstream factors.

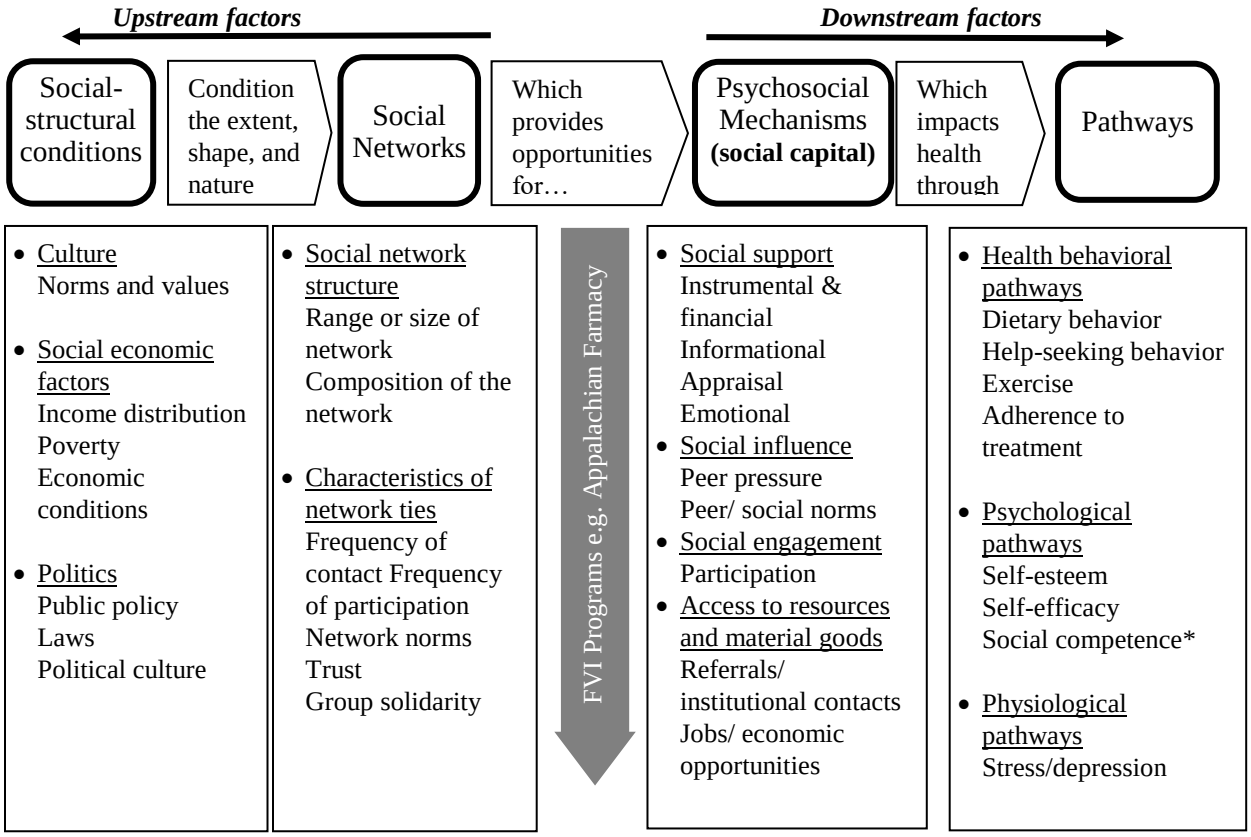

Figure 1. A conceptual framework on the impact of social capital on health adopted from Berkman et al., (2000).

The discussion of social capital cannot be understood in isolation since social networks exist in a larger social and structural context in which they are formed, conditioned and sustained (Berkman et al., 2000, p. 846). The social and structural context includes the culture of the community; the policies and laws of the region; and the economic conditions of the community

and its members (Berkman et al., 2000; Eriksson, 2011). These conditions influence the structure and the characteristics of the social networks formed. The network structure includes the size of the network; the cohesiveness of the members; and the homogeneity or heterogeneity of the members. The network characteristics includes how frequent group members meet or contact each other. It also includes other group characteristics such as norms, levels of trust and solidarity among the members (Eriksson, 2011).

The second section of the framework moves downstream to mediating pathways through which networks might influence health (Berkman et al., 2000). The structure and the characteristics of networks influence social and interpersonal behaviors in four main mechanisms: social support, access to resources and materials, social influence, and social engagement (Berkman et al., 2000). These mechanisms represent the ways through which participation and membership to a network influence one's health.

Social support relates to the perceived and actual support that someone receives from others in the network and from being part of a network. Social support can be divided into four subtypes: instrumental, informational, appraisal and emotional support. Instrumental support is receiving tangible help or assistance in the form of items, finances or services (Berkman et al., 2000, p. 848). Informational support relates to receiving information or advice in relation to a need, for example how to prepare a healthy snack. Appraisal support is receiving appropriate feedback that helps with decision making or self-evaluation (Berkman et al., 2000, p. 848). Lastly, emotional support relates to reassurance and encouragement in times of stress and uncertainty.

Social influence occurs when one's behavior changes or is affirmed by the behaviors of others in the network by virtue of proximity to others. Unlike social support, influence doesn't

require direct contact between members nor deliberate and conscious attempts to modify behavior (Berkman et al., 2000). Social engagement results from participating in the network activities, for example, attending a community meeting. Lastly, involvement in a social network can provide access to resources and material goods through referrals and providing access to contacts and economic opportunities.

The above mechanisms can impact health by enabling behavioral, psychological, and physiological changes in individuals (Berkman et al., 2000). Behavior changes can either be health-promoting or health-damaging. For example, dietary behavior changes can encourage healthy or unhealthy eating. Psychological changes relate to internalized feelings of self-worth and self-efficacy that enable an individual to act. Lastly, physiological changes relate to stress and depression.

FVIPs, such as the AF, provide incentives to purchase fruits and vegetables and give access to nutrition classes. The program impacts existing social networks and may influence the psychosocial mechanisms which impact health. FVIPs create opportunities for participation in community activities such as visiting farmers markets, community centers, and nutrition classes. Participation in these activities provides opportunities for utilization of social capital. The introduction of a FVIP in a community is likely to affect the social environment of the participants in multiple ways.

Research Aims

The overall purpose of the study was to explore the role of social capital in the implementation of FVIPs using the AF as a case study

Aim 1:

To identify attributes of social capital from evaluation data retrieved from the Appalachian Farmacy program by conducting a content analysis.

Aim 2:

To explore participants' perceptions of the role of social capital in the implementation of AF program by conducting focus groups

Aim 3:

To evaluate the perceptions of FVIP program administrators on the role of social capital in the implementation of FVIPs by conducting interviews.

CHAPTER 2

LITERATURE REVIEW

Food assistance programs have a long history in the U.S. They have supported low-income families with benefits to access food and avert hunger and food insecurity. These programs have also impacted health outcomes by influencing the determinants of health. These determinants include the social environment, socioeconomic status, political environment, and built environment of the participants and their community. This chapter reviews food assistance programs in the United States and how they impact food security and health. It reviews the shortcomings of existing programs in improving health and identifies social capital utilization as an important gap. The chapter reviews the role of social capital as a health determinant and how it can be integrated into future food assistance programs.

Food Insecurity

Food security is defined as access by all members of a household at all times to enough food for an active, healthy life (Beaulieu, 2014, p. 12). It is often measured by the USDA Household Food Security Scale that categorizes food security into three main levels; food secure, low food security and very low food security (Coleman-Jensen et al., 2017). Households with low food security are those that report reduced variety, desirability, or quality of diet at a time in the past month or year. Households with very low food security are those that report having disrupted eating patterns and reduced intake at a time in the past month or year (Coleman-Jensen et al., 2017). Food insecurity is also distinct from hunger, which is a physiological response that leads to a physical discomfort often associated with lack of food (Coleman-Jensen et al., 2017).

Food insecurity is still a challenge in the United States with rates ranging between 10 to 15 percent over the past 20 years (Coleman-Jensen et al., 2017). In 2016, 12.3% of households

were food insecure at some time in the year with 5% of households experiencing very low food security (Coleman-Jensen et al., 2017). In 2015, Tennessee ranked 41st most food insecure state with 15.4% of the population being food insecure (Gundersen et al., 2017). The prevalence rates in the state range from as high as 23% in Haywood County and as low as 7% in Williamson County (Gundersen et al., 2017). All west Tennessee counties except Tipton, Chester, and Crockett counties have food insecurity rates above 15% (Gundersen et al., 2017). The rate of food insecurity in Washington County, where the AF program was based, stands at 14.3% of the population (Gundersen et al., 2017). Tennessee was ranked 41st in poverty with 15% of the population earning below the poverty line and ranked 32nd in income inequality in 2017 ("American Health Rankings," 2013). Washington County poverty rates and income inequality rates were fairly similar to the state average ("County Health Rankings and Roadmaps," 2016).

Food insecurity is more prevalent among low-income households. For example in 2016, households below 100% of the federal poverty line were three times more likely to be food insecure at 38% compared to the national average of 12% (Coleman-Jensen et al., 2017). Food insecurity is also higher in households with children (17%), those with children and headed by a single parent (32% female, 22% for male), or those headed by a black (23%) or Hispanic individual (19%) (Holben & Marshall, 2017). Food insecurity among seniors is low at about 8% nationally, but seniors have unique health and social needs (Ziliak & Gundersen, 2017). Although the rates of food insecurity have been gradually decreasing since the 2008 recession, the cost of food and inflation have gradually increased (Holben & Marshall, 2017). The food budget shortfall among food insecure individuals increased by 2% each year between 2006 and 2015 (Gundersen et al., 2017).

Food insecurity is an important factor in public health due to the impact on nutrition status and health outcomes. Food insecurity often stems from having limited resources to acquire food, possibly due to; unemployment, increase in cost of living, loss of earnings or a specific event that stresses the household such as sickness or a natural disaster (Holben & Marshall, 2017). Food insecurity is associated with consumption of low-quality diets, which are characterized by nutrient deficiency. Nutrient deficiencies can result in negative physical, physiological and mental health outcomes (Holben & Marshall, 2017).

A study by Gregory and Coleman-Jensen (2017) based on National Health Interview Surveys (NHIS) from 2011 to 2015 found that food insecurity was a better predictor of chronic illnesses than income. Food insecurity was associated with all ten chronic illnesses studied while income was only associated with three: hepatitis, arthritis, and COPD. The ten chronic illnesses examined were: hepatitis, asthma, hypertension, kidney disease, coronary heart disease, diabetes, arthritis, chronic obstructive pulmonary disease, stroke, and cancer (Gregory & Coleman-Jensen, 2017). Adults in households with very low food insecurity were 15% more likely to have a chronic illness compared to those with high food security. Food insecurity was strongly related to self-assessed health and the likelihood of chronic disease in general and the number of chronic conditions reported (Gregory & Coleman-Jensen, 2017).

Food insecurity also affects chronic illness management due to patients having to choose between buying food or medication (Berkowitz, Seligman, & Choudhry, 2014). A study using 2011 NHIS data, about one in three chronically ill participants were unable to afford food, medication or both (Berkowitz et al., 2014). Tennessee has high rates of chronic illnesses and food insecurity, which is consistent with the above studies. Tennessee ranks in the top 10 for mortality from chronic lower respiratory disease, cancer, stroke, heart disease, and diabetes (at

11th place) in the country (Centers for Disease Control and Prevention, 2018). The state is ranked 46th for cancer mortality and 45th for cardiovascular disease mortality ("American Health Rankings," 2013). It is also ranked 45th nationally for the number of adults with diabetes; which represents about 13% of the state's population ("American Health Rankings," 2013).

Food Assistance Programs

There are many food assistance programs targeting various population groups with the aim of reducing food insecurity and hunger. The programs include food distribution programs, which strengthen the country's nutrition safety net by distributing American-grown foods. Examples include the Commodity Supplemental Food Program (CSFP), the Food Distribution Program on Indian Reservations (FDPIR), and the Emergency Food Assistance Program (TEFAP). There are also programs that provide healthy food to children, such as the Summer Food Service Program (SFSP), Fresh Fruit and Vegetable Program (FFVP), School Breakfast Program (SBP), Special Milk Program (SMP), National School Lunch Program (NSLP), and Child and Adult Care Food Program (CACFP) ("USDA Nutrition Assistance Programs," 2018).

The largest food assistance program in the United States is the Supplemental Nutrition Assistance Program (SNAP), which offers nutrition assistance to low-income individuals and families. The SNAP program is a federal entitlement program in that anyone who is eligible for the program receives benefits. SNAP benefits are also supplemented by additional programs that provide additional benefits to certain at-risk populations. The Supplemental Nutrition Assistance Program for Women, Infants, and Children (WIC) supports pregnant women and women with infants and children. Other supplementary programs like FVIPs encourage healthy eating by providing incentives while others provide nutrition education, for example, the Supplemental Nutrition Assistance Program Education (SNAP-Ed) and the Expanded Food and Nutrition

Education Program (EFNEP) (Food and Nutrition Information Center, 2018). Although most of the SNAP participants may qualify for these supplemental programs, the programs have limited coverage and funding.

History of Supplemental Nutrition Assistance Program (SNAP)

SNAP is the longest running food assistance program in the United States starting in 1939. Today, the program has grown into the largest domestic hunger safety net program reaching over 40 million Americans in 2018 (Food and Nutrition Information Center, 2018). In 2015, it accounted for 71% of all federal food and nutrition programs. In the same year, over 45 million people (15% of the population) were enrolled at a cost of approximately $74 billion (Oliveira, 2016). SNAP, previously known as the Food Stamp Program (FSP), was founded in 1939 as part of the Agricultural Adjustment Act to support poor Americans who were hungry and food insecure as well as farmers who had surplus produce during the Great Depression. In 1939, the FSP was implemented to provide food assistance to low-income households and increase domestic food consumption ("SNAP to Health," 2014). Participants would purchase orange stamps for a dollar each up to the equivalent of their monthly food expenditures, and for each orange stamp, they received free blue stamps each worth 50 cents. The orange stamps could be used to buy food and household items while the blue stamps could only be used to buy food items on the monthly list of surplus foods developed by the Secretary of Agriculture (MacDonald, 1977). Requiring participants to purchase orange stamps ensured that the blue stamps given would equal what the family spent on food hence ensuring money allocated for food purchases by a household would not be spent on non-food items ("SNAP to Health," 2014). Over the next four years, the FSP peak participation was 4 million people at a cost of $262

million. The program ended in 1943 after economic conditions improved and the problem of surplus foods and widespread unemployment reduced (A short history of SNAP, 2018).

In 1961 as part of an election promise, President John F. Kennedy initiated pilot Food Stamps programs. The success of the pilot programs as efficient mechanisms to distribute funds to low-income households led to the enactment of the Food Stamp Act of 1964. The purpose of the act was to strengthen the agricultural economy and improve levels of nutrition among low-income households ("SNAP to Health," 2014). The original stamps were replaced by coupons and like stamps, participants were required to purchase the coupons at levels determined by the USDA to be the household food expenditures for a healthy diet. Additional bonus/benefit coupons were assessed based on participants' income level for the purchase of food ("SNAP to Health," 2014). The Act dropped the requirement of limiting the use of the bonus coupons for food items on the surplus list which was previously developed by the Secretary of Agriculture. Participants could use their coupons to purchase any food for home consumption except for alcohol, tobacco, and imported foods with the exception of coffee, tea, and bananas (Institute of Medicine & National Research Council, 2013). Although the focus was to enable the purchase of nutritionally adequate food, the provision to limit the purchase of soft drinks and "luxury" foods did not make it to the final version of the bill ("SNAP to Health," 2014)

Participation grew exponentially from half a million in 1965 to about 18.5 million by the end of 1976 (figure 2) ("USDA Nutrition Assistance Programs," 2018). This raised concerns about the rising cost of the program which had now topped $6 billion (figure 2) hence the political environment was dominated by questions about the program's administration and accountability. Finally, in 1977, a bipartisan bill to reform the FSP was tabled and the Food and Agriculture Act of 1977 was passed. The Act expanded access to the FSP to all political

jurisdictions including Guam, Puerto Rico, and the Virgin Islands. It also streamlined the program by standardizing state-by-state rules with nationwide eligibility standards and replacing commodity distribution programs with the FSP. The Act improved accountability of the program by streamlining eligibility and work registration requirements and increasing funding to states for program administration (MacDonald, 1977). This was followed by a slight deep in the number of FSP participants in the following two years (figure 2). The Act also eliminated the unpopular requirement to purchase coupons worth the household food expenditure before receiving the bonus coupons. Enrolled participants would receive the bonus portion of the benefit as coupons and were expected to use it to supplement their food expenditure (Institute of Medicine & National Research Council, 2013). Several attempts to limit or exclude foods of low nutrient value did not make it to the final version of the Act due to political pressure and lobbying by the affected industries. Instead, the Act required some food stamp funds be given to EFNEP to

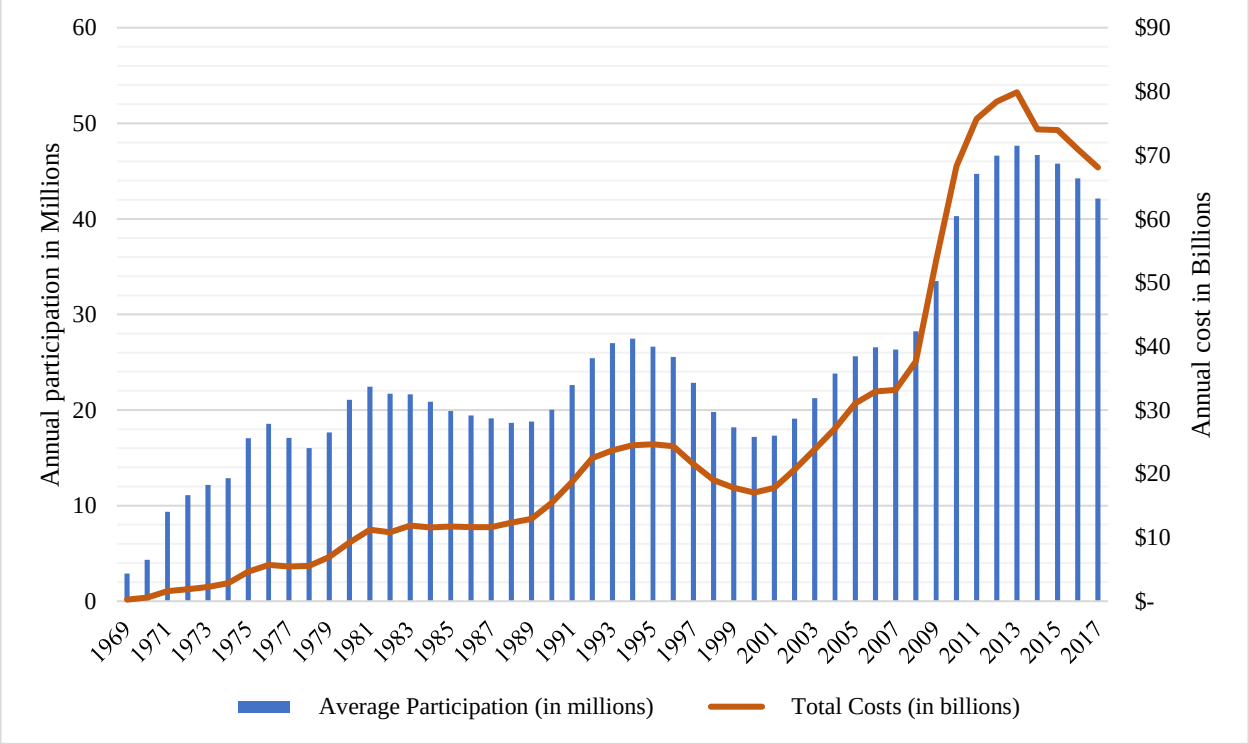

Figure 2. SNAP average participation and total cost of the program from 1969 to 2017

promote nutrition education for participants (Institute of Medicine & National Research Council, 2013).

In 1980, legislators were concerned about the size and cost of the FSP therefore legislation to limit participation and cost of benefits was enacted (figure 2). They limited participation in the program by requiring households of potential participants to meet a gross income test in addition to a net income test and started counting retirement accounts as resources ("USDA Nutrition Assistance Programs," 2018). In 1981, a nutrition education program (later called SNAP-Ed) was established in the FSP as an optional program for states. Nutrition education was aimed at tackling food insecurity and improving health by educating low income (FSP eligible) persons on healthy food choices on a budget and an active lifestyle that promotes health (United States Department of Agriculture, 2018). By 1992, seven states had established nutrition education programs, and in 12 years, all 50 states had established the program ("SNAP to Health," 2014). SNAP-Ed direct education programs reached over 6 million people at over 60,000 sites in 2014. The most common sites for the programs were public schools, public housing, and Head Start programs. In addition, about 24 SNAP-Ed Implementing Agencies used social marketing campaigns in 2014 through pamphlets, websites and outdoor signage. The most frequent messaging (67% of the messaging) related to encouraging fruits and vegetables consumption (Stacy Gleason et al., 2018).

The major changes that took place in the 1990s and early 2000s included the shift from paper coupons to Electronic Benefits Transfer cards (EBT) to increase the efficiency of distributing benefits and to reduce fraud. Since the inception of the EBT card in 1993, SNAP fraud fell from 4 cents to about 1 cent per dollar of SNAP expenditures in 2006 (United States Department of Agriculture, 2018). In 2008, the 2008 Farm Bill made numerous improvements on

the FSP injecting an additional $7.8 billion in resources for the program. The bill increased the purchasing power of participants by indexing benefits to inflation rates annually instead of providing benefits at a fixed rate. For example, in 2009, the change provided four to five extra dollars a month for a family of three. The provision was projected to cost over $5.4 billion in additional benefits from 2009 to 2017 (figure 2) (Rosenbaum, 2008). The bill also marked a new phase in the FSP by renaming it the Supplemental Nutrition Assistance Program (SNAP) to align with the focus on nutrition. The 2008 Farm Bill increased funding for TEFAP from $140 million to $250 million to help emergency feeding organizations such as food banks and pantries to meet the increasing demand for food (Rosenbaum, 2008). The 2008 Farm Bill made important strides in increasing access to fruits and vegetables in low-income schools by mandating the Fresh Fruit and Vegetable Program (FFVP) under the National School Lunch Program (NSLP). The Bill provided significant funding to FFVP, beginning with $40 million in 2009 and increasing to about $150 million by 2012 (USDA Food and Nutrition Services, 2010).

The FFVP started as a pilot initiative in 2002 to determine the best practices for increasing fruit and vegetable consumption in schools. Under the NSLP, FFVP was made available in all 50 states to provide fresh produce as snacks to all school children in participating schools at no cost. The program currently provides $50 to $75 per student over the school year (Bartlett et al., 2013). An evaluation of FFVP in 2013 showed that, on average, participating schools had 85% of their students eligible for free and reduced-price lunches (under the NSLP), and the majority of the schools were in urban areas (45%) and had the highest percentage of non-white students (77%). Most schools offered snacks three to five days a week (82%) serving an average of six different fruits or vegetables each week. Students in FFVP schools consumed a

third of a cup more fruits and vegetables on days that FFVP was available than students in non-participating schools (Bartlett et al., 2013).

Lastly, the 2008 Farm Bill also created the National Institute of Food and Agriculture (NIFA), which is part of the USDA's research division aimed at solving national challenges in agriculture, food, and the environment in communities. NIFA received $20 million mandatory funding for pilot testing the use of financial incentives at the point of sale to encourage SNAP participants to increase their consumption of fruits and vegetables (also called Healthy Incentives Pilot (HIP) (Johnson, 2008). HIP was the first program to test the efficacy of financial incentives in increasing consumption of fruits and vegetables among low income individuals. The findings from one of the pilot sites in Massachusetts showed that over a period of a year HIP participants increased consumption of the targeted fruits and vegetables by a quarter cup a day compared to non-HIP SNAP participants. HIP households also spent $6.15 more on fruits and vegetables than non-HIP SNAP households. This was higher than the average incentives received of $3.65 each month (Bartlett et al., 2014).

In 2014, President Obama enacted the 2014 Farm Bill which introduced significant changes to SNAP. The bill increased SNAP funding to $756 billion for the next 10 years which constituted about 80% of the 2014 Farm Bill budget. The bill introduced changes that would impact the availability of healthy food for SNAP participants. For example, the bill required retailers licensed to accept EBT cards to carry diverse stocks. The retailers were required to offer at least seven items in each of the four categories - dairy, fruits and vegetables, meat, and grains - and offer perishable items in at least three categories (Bolen, Rosenbaum, & Dean, 2014). The 2014 Farm Bill also authorized $125 million for USDA to provide grants and tax incentives to food retailers who operate in underserved communities. The 2014 Farm Bill created the Food

Insecurity and Nutrition Incentives program (FINI) which was an extension of the Healthy Incentives Pilots (HIP) (Chite, 2014). The bill provided $100 million annually from 2014 to 2018 in mandatory funding for grants to non-profit organizations and government agencies to incentivize SNAP recipients to purchase and consume more fresh fruits and vegetables (United States Department of Agriculture, 2018).

Impact of SNAP on Health and Potential Gaps

SNAP has been credited with reducing food insecurity among low-income individuals and households. Households that receive SNAP have food insecurity rates that are up to 30% lower than they would otherwise be without SNAP (Council of Economic Advisers, 2015). Also, a study on SNAP participation and food insecurity found that participating in SNAP for 6 months was associated with a 5 to 10% reduction in food insecurity (Mabli, Ohls, Dragoset, Castner, & Santos, 2013). Counting SNAP benefits as income, SNAP kept 8.4 million people out of poverty in 2015 (above100% FPL), including 3.8 million children (Center on Budget and Policy Priorities, 2018). SNAP also benefits the local economy and is an effective form of economic stimulus. For example, in 2014, SNAP redemption accounted for 10% of the expenditures on foods that families bought for their homes in the U.S (Wolkomir, 2018).

Although SNAP has been beneficial in reducing food insecurity in the country, it has not sufficiently improved diet quality. A study using data from 2003 to 2010 National Health and Nutrition Examination Surveys (NHANES) compared participants with a gross household income equal to or below 130% of the FPL who participated in SNAP in the past year and those who did not participate (130% FPL is the gross income eligibility for SNAP). The study showed that SNAP participants had a higher intake of added sugar and consumed more empty calories than SNAP-eligible non-participants. They also had a lower Healthy Eating Index (HEI)-2010

score which indicates a lower diet quality than non-participants. They specifically had lower scores for seafood, plant protein, fruits and vegetables (Nguyen et al., 2014). Diet quality is important in ensuring the consumption of adequate nutrients that contribute to better health outcomes (Holben & Marshall, 2017).

The inability of SNAP to improve diet quality could be attributed to SNAP funds not being sufficient to cover the total food expenditure of a household (Barnard & Katz, 2017). For example, in the above study by Nguyen et al. (2004) food quality among low-income food insecure adults with SNAP was not statistically different from those without. Another reason why SNAP may have minimal impact on diet quality is the lack of restrictions on what the funds can be used to purchase using scientific-based nutrition guidelines such as the Dietary Guideline for Americans (DGA) (Barnard & Katz, 2017). Programs such as WIC have restrictions on what can be purchased based on food packaging developed by USDA based on the Dietary Guidelines for Americans. A review of research on WIC by the USDA Food Nutrition Service found that participation in WIC was associated with improved diets among children (Colman et al., 2012).

In the past, attempts have been made to restrict what SNAP funds can purchase, for example, restricting empty calorie foods such as sodas, but proposals to impose restrictions on certain foods based on their nutritional quality have been rejected by legislators over the years. A report by the USDA on the implications of restricting the use of SNAP states that it is administratively and logistically difficult to impose restrictions (United States Department of Agriculture, 2007). First, there are no clear standards that exist for defining foods as good or bad, healthy or not healthy. Secondly, the implementation of the food restrictions would increase program complexity and cost in the evaluation and implementation of the restrictions. The USDA estimates that there are more than 300,000 food products on the market with an average

of more than 10,000 new products each year. Thirdly, restrictions may be ineffective in changing purchase practices since 70% of SNAP participants are expected to purchase a portion of their food with other sources of income. Lastly, the report cited the lack of sufficient evidence that SNAP participation contributes to poor diet quality or obesity (United States Department of Agriculture, 2007).

Several programs have been developed and funded that focus on reducing food insecurity and improving diet quality among SNAP participants by providing additional incentives to access healthy foods. These programs target existing SNAP participants by providing nutrition education, support, and incentives to purchase nutritious foods. Unlike SNAP which is an entitlement program, these programs have limited coverage and budgets hence not all SNAP participants participate.

WIC is a good example of such programs. It safeguards the health of low-income women and their children up to 5 years of age by providing vouchers to purchase only prequalified nutritious food, nutrition education, and health care referrals. WIC monthly participation in 2015 was about 8 million people (Oliveira, 2016). Another program is the Senior Farmers Market Nutrition Program (SFMNP) that provides low-income seniors with coupons to buy eligible foods at farmers markets. In 2017, over 800,000 seniors received benefits ranging from $20 to $60 a year (USDA Nutrition Assistance Programs, 2018).

Additionally, there are nutrition education and research programs whose aim is to improve food quality and food security among low-income adults. They include SNAP-Ed that teaches low income people how to eat healthy on a budget; EFNEP that utilizes peer educators to educate the community on nutrition, food security and physical activity; and FINI which

supports programs whose aim is to increase the purchase of fruits and vegetables consumption among SNAP recipients (United States Department of Agriculture, 2018).

To increase access to fresh fruits and vegetables, interventions have been developed that support farmers markets. Promotion of farmers markets addresses the structural barriers to access to healthy food options in the community (Freedman et al., 2017). Farmers markets may increase access to fresh produce especially in poor urban or rural areas that are mostly considered food deserts (Bryce et al., 2017). Although the markets increase access to fresh produce, individuals must still choose between the more expensive fresh produce or the inexpensive processed food available in the store (Bryce et al., 2017).

Fruit and Vegetable Incentive Programs (FVIPs)

FVIPs are funded and managed by local governments, non-profit organizations, private foundations or a multisector collaboration. Examples include programs funded by the USDA FINI grant and the Double Up Food Bucks (DUFB) program. These programs provide incentives in the form of matching funds against SNAP benefits spent at the markets or as a voucher benefit to spend on fresh produce only at the farmers market or a designated store. Some FVIPs also provide nutrition and financial education to participants (Melissa et al., 2014).

Impact of FVIPs on the Social Determinants of Health

The social determinants of health are the conditions in the economic, social, and physical environment surrounding people in which they grow, live, work, and age ("Social Determinants of Health," 2010; Solar & Irwin, 2010). These conditions affect people's health, functioning, and quality of life outcomes ("Social Determinants of Health," 2010). The physical environment consists of the natural (climate and geography) and the built environment (infrastructure and neighborhoods) in which people live, work, and congregate. The social environments consist of

interactions with family, friends, the community and institutions and cultural attitudes, norms, and expectations. (U.S. Department of Health & Human Services, 2010).

The five main areas of the social determinants of health according to the Healthy People 2020 approach are health and health care, education, neighborhood and built environment, economic stability, and social and community context ("Social Determinants of Health," 2010). (1) Economic stability relates to the ability to secure adequate income, employment, housing and food to alleviate poverty. (2) Education includes education achievement such as early childhood education and development and literacy. (3) Health and health care focuses on access to health care and health literacy. (4) Built and neighborhood environment centers around the characteristics of an individual's physical surrounding; the level of safety; quality of housing; the environmental conditions; and access to healthy food ("Social Determinants of Health," 2010). Lastly, (5) the social and community context focuses on the social settings in which people exist. It includes social relationships and the cultural, social, occupational, and religious institutions with which they interact (Barnett & Casper, 2001). An important aspect is a sense of interpersonal trust between community members and the social cohesion among the community members ("Social Determinants of Health," 2010).

Research has shown that FVIPs impact the five SDOH domains, but the research on the impact on social and community context is inadequate. FVIPs provide incentives to acquire fresh produce which impacts a household's economic status by freeing up the household income to buy other necessities (Bartlett et al., 2014). These programs also promote the creation and utilization of farmers markets which improves the food environment of local communities (Freedman et al., 2011; Payne et al., 2013). Some FVIPs also provide nutrition education which improves the nutrition and health knowledge of the participants (Melissa et al., 2014).

The social environment of individuals encompasses the social relationships, cultural milieus, and the immediate physical surroundings, within which groups of people function and interact (Barnett & Casper, 2001, p. 465). Therefore, the social and communal contexts encompass social networks, social support, and social cohesion, which can be summed up as social capital (Eriksson, 2011; Yu et al., 2015).

Social Capital

Social capital, according to Bourdieu (1986), is the aggregate of resources, both actual and potential, linked to being part of a network of relationships, both formal and informal, which provides its members a collectively owned value (capital). Social capital broadly consists of resources accessible through two main routes; social networks and social cohesion. Social networks are resources available directly - individual connections, information channels, and social credentials. Social cohesion is the result of individuals securing benefits available to all members of a given network by virtue of being within the network (Alvarez, Kawachi, & Romani, 2017). These resources (social cohesion) are only available in the presence of networks and do not reside within the individual but in the structure of their social networks (Eriksson, 2011, p. 2). Social capital consists of resources that individuals and groups can access through social connections (Kawachi & Subramanian, 2018)

History of Social Capital

The concept of social capital grew out of the field of sociology and became an accepted school of thought among other fields, such as economics, political science, social sciences and health (Elgar et al., 2011). Social cohesion and its application to health began from the works of Emile Durkheim, a European sociologist, in the early 1950s. He studied how social disintegration was related to suicide, and he argued that societal characteristics can explain

societal patterns related to suicide (Carrasco & Bilal, 2016). The term social capital was first used by Bourdieu in 1983 (Carrasco & Bilal, 2016). He identified social capital as the "aggregate of the actual or potential resources linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance" (pg. 246). He viewed the type and amount of social capital as a product of one's level of influence, power and volume of other capital forms (economic, symbolic or cultural) (Bourdieu, 1986). He considered social capital to be another form of capital similar to cultural and economic capital which were necessary for the distribution of goods and services in the society (Bourdieu, 1986)

However, it is the work of Robert Putnam, an American political scientist, in the early 1990s that was most utilized in health research (Eriksson, 2011). He viewed social capital as a community level resource, " having features of social organization… that facilitate coordination and trust for a mutual benefit" (Baum & Ziersch, 2003, pg. 320). Putman argued that despite social capital as a private good, it is a collective non-exclusive good. For example, living in an area with high social capital is beneficial to everyone including individuals with poor social connections (Eriksson, 2011). The use of the term social capital has since been refined to incorporate both individual (social network) and collective (social cohesion) approaches.

The association between social capital and health gained traction in the late 1990s (Eriksson, 2011). In public health literature, social capital is defined as the "resources available to individuals through their affiliate behaviors and membership in community networks" (Carrasco & Bilal, 2016, pg. 129).

Conceptualization of Social Capital

In the theoretical development of social capital, it has been conceptualized in three main ways. First, social capital as a social-ecological approach whereby social capital is defined as an

individual level attribute and a collective/ community level attribute. Second, social capital as having two main dimensions, structural social capital and cognitive social capital. Lastly, social capital as a construct divided into three types: bonding, bridging and linking social capital. The above conceptualizations are connected and frequently overlap (figure 3).

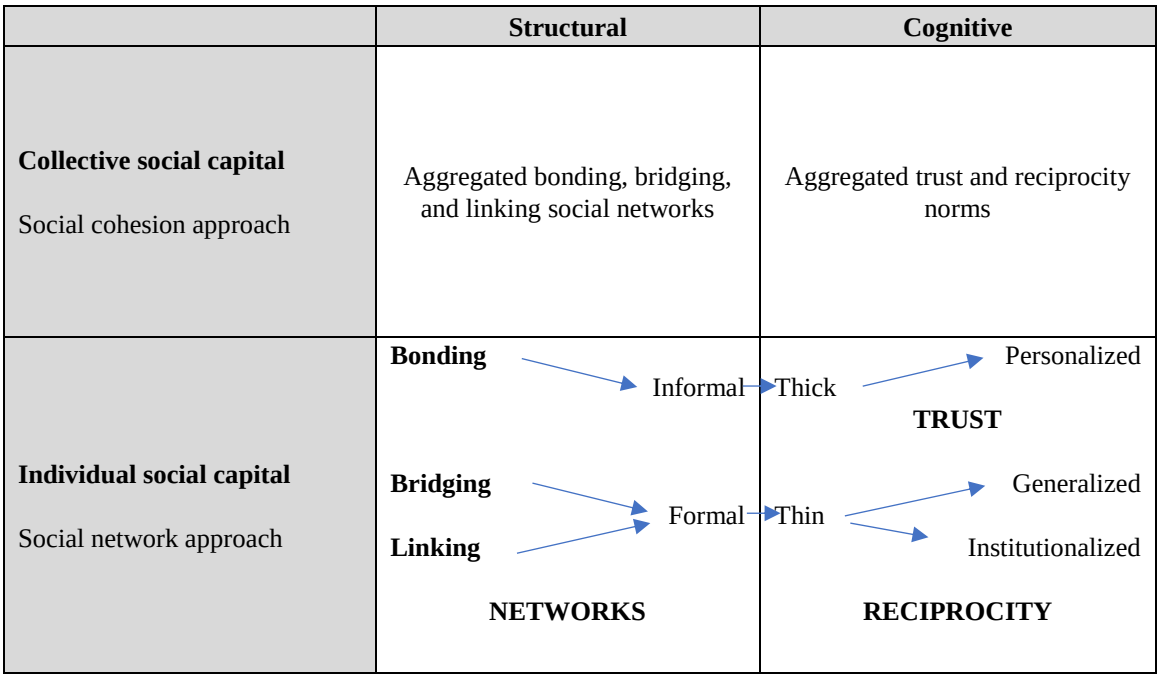

Figure 3. Summary of social capital conceptualization. Source (Eriksson, 2011)

Social-Ecological Approach

Social capital as a social-ecological approach looks at the multifaceted and interactive effects of environmental factors and personal factors that determine behaviors at different levels starting from the individual level, interpersonal level, organizational level, community level to the policy level (National Research Council & Institute of Medicine, 2013). In this approach, there are two schools of thought: social capital as an individual asset and as a collective attribute (Eriksson, 2011).

Social capital as an individual asset looks at the individual's ability to secure benefits by virtue of membership in social networks and other social structures (Eriksson, 2011, p. 2). In this

approach, social capital is a product of the social networks an individual can possess or have access to such as participation in social and civic activities in the community (Carrasco & Bilal, 2016) (Yu et al., 2015). The collective approach, also called social cohesion, views social capital as a characteristic of the whole community, in that social capital is a collective and non-exclusive good that is beneficial to all individuals within an area irrespective of their individual level social connectedness (Eriksson, 2011). Communities with high social capital benefit all the members of the community irrespective of their individual level of social capital (Eriksson, 2011).

Structural versus Cognitive Dimensions

Social capital is also conceptualized as a structural (quantity of social capital) or a cognitive dimension (quality of social capital). Structural social capital encompasses the composition and activities of networks and local level institutions (Eriksson, 2011). It relates to observable behaviors and actions of individuals in the network which can be seen and quantified, for example, the number of civic and social groups with which a person is affiliated (Villalonga-Olives & Kawachi, 2015). Cognitive social capital, unlike structural, refers to the perceived quality of the social relations by looking at an individual's perceptions of their network (Villalonga-Olives & Kawachi, 2015; Yu et al., 2015). Examples of individual perceptions are: individual level of trust towards their neighbors or trust towards their neighborhood in general; individual perceptions of group solidarity among members of the network; and individual's expectation of a reciprocal relationship whereby one expects to be repaid when they make resources available to others in the network (Eriksson, 2011).

Social Capital as a Construct

Lastly, social capital has also been conceptualized into three constructs: linking, bridging, bonding social capital. Bonding social capital is the homogenous aspect of social networks that

reinforce exclusive identities, for example, a network of people from the same family, religious affiliation, or political interests (Lee, 2017; Poortinga, 2012). Bonding reinforces exclusive social identities and encourages reciprocity, solidarity, and social support among groups (Elgar et al., 2011).

Bridging social capital, unlike bonding social capital, relates to heterogeneous social networks of individuals from varying social, cultural, and ethnic groups. This type of networking is common in schools, workplaces and other settings that bring diverse individuals together for a purpose outside their personal sphere (Poortinga, 2012). Bridging is important for building solidarity, respect, and understanding with the wider society (Poortinga, 2012). Bridging social capital is important in mobilization of the community to take an action that serves everyone and is also important in spreading information between groups (Elgar et al., 2011).

The third form of social capital, linking social capital, relates to vertical networks that can be formed between groups that differ in status, power, or influence. These linkages cut across institutions and political power hierarchies in society (Poortinga, 2012). Linking social capital refers to trusting that authorities and the government will promote health and wellbeing in the community. Individuals or communities with strong linking social capital are active participants in civic and political activities in their community in the hope of influencing legislation, policies and laws at an institutional or governmental level (Sundquist et al., 2014).

Social Capital and Health

Studies on the impact of social capital on health have yielded mixed findings due in part to the differences in the measures used for social capital and health and the use of different study designs (Lee, 2017).

A systematic review by Islam et al. (2006) looking at the association between social capital and health in different countries found that social capital had significant association with health at both the individual and the ecological level. Studies in the U.S. found an association between various indicators of social capital, namely trust, reciprocity, and group membership and health outcomes (all-cause mortality and self-rated health) (Gilbert, Quinn, Goodman, Butler, & Wallace, 2013; Islam et al., 2006; Kawachi, Kennedy, Lochner, Sm, & Prothrow-Stith, 1997; Lochner, Kawachi, Brennan, & Buka, 2003).

Ecological studies in the U.S. carried out at the state level found an association between social capital and income inequality and mortality (Kawachi et al., 1997). A similar study by Islam et al. (2006) looked at egalitarianism, which is the degree of income equality and equal access to health across a population, influences the association between social capital and health. The study found that social capital among developed countries with minimal egalitarianism, for example the United States, showed a greater relationship between social capital and health as compared to those with higher levels of egalitarianism, such as Canada (Islam et al., 2006). These findings suggest that the effect of social capital on individual's health is dependent on the degree of community/ regional level social capital. The impact of social capital on health is more pronounced in communities with little or no community level social capital.

Individual-level social capital attributes linked to health include social support, social influence, social engagement, group membership, and individual characteristics. Social support experienced from being part of a social network may influence health by functioning as a buffer to stress and loneliness (Kawachi, Kennedy, & Glass, 1999). Social support fosters an environment that builds mutual trust and promotes social interaction (Liu, Xue, Yu, & Wang, 2016). Social support can be in the form of emotional support, being loved and cared for by

others including family members and friends. It can be in the form of instrumental support which is receiving tangible assistance and aid with needs. Social support can also be appraisal support which relates to getting help with decision making and receiving affirmation for decisions made. Lastly, it can be informational support which is receiving helpful advice or information towards meeting a need (Berkman et al., 2000, p.848).

Social influence is characterized by the normative guidance experienced when comparing one's attitudes with those of the group to which one identifies. Individual attitudes towards norms and behaviors are confirmed or reinforced when they are shared with the group as a whole but altered when there is a discrepancy (Berkman et al., 2000). According to (Kawachi et al. (1999), local communities with high levels of social capital can influence the health of individuals through the spread of healthy norms

Social engagement and participation in community activities can provide opportunities to learn new skills and knowledge useful in facilitating health promotion. Social engagement can stimulate cognitive systems and reinforce meaningful social roles which have been linked to long life (Berkman et al., 2000) and health (Yu et al., 2015). Social participation provides opportunities for companionship and sociability which indirectly creates a sense of meaningfulness and belonging (Eriksson, 2011).

Group membership can provide access to services and resources that directly or indirectly impact health (Eriksson, 2011). For example, seniors who are members of local senior centers, gyms, and/or social clubs have access to the resources provided in those institutions. Group membership may impact health by influencing individual's bonding and bridging social capital. In a study by (Oshio, 2015) bonding and bridging social capital, were inversely associated with poor self-rated health and psychological distress. Lastly, individual status or position in the

network hierarchy or community created by having access to more resources or information can influence health by internalized positive feelings about one's self. This can, in turn, reduce stress and improve self-reported health (Eriksson, 2011). Examples include being a leader in a community association or being a representative or key informant in a community due to the length of membership.

Collective social capital, also called social cohesion, is also associated with health at the individual level. Collective social capital has been conceptualized as either an aggregate measure of individual social capital or as a place-related measure of social capital, for example, neighborhoods or workplaces (Eriksson, Ng, Weinehall, & Emmelin, 2011). In Lochner et al., (2003), neighborhood social capital was associated with all-cause mortality as well as heart disease mortality in Chicago. A study in Sweden found that collective social capital using aggregate measures of individual social capital was strongly associated with self-rated health (Eriksson, Dahlgren, Janlert, Weinehall, & Emmelin, 2010). The association with self-rated health was weak when neighborhood-related measures of social capital were used (Eriksson et al., 2011).

Cohesive communities and neighborhoods are also more successful in uniting for the best interests of the community. For example, such communities are more successful in influencing political decisions that affect the community or community members (Kawachi et al., 1999). Another important link to health is that diffusion of information and knowledge is faster and wider in more cohesive communities due to the dense and strong associations in the community (Eriksson, 2011).

Determinants of Social Capital

The findings on the impact of social capital on health are highly dependent on the context being studied (Shiell, Hawe, & Kavanagh, 2018). The determinants of social capital can be divided into individual and community-level characteristics. Individual-level determinants are the socio-economic and psychological characteristics of individuals that influence their social capital. They include income and education level, family and social status, and values and personal experiences (Kaasa & Parts, 2008).

Income and education level have the greatest effect on all aspects of social capital. Individuals with higher income and education have higher interpersonal trust and group membership (Campos-Matos, Subramanian, & Kawachi, 2016; Eriksson et al., 2010). These individuals tend to participate more in the community and in voluntary activities (Kaasa & Parts, 2008). Religiosity, in general, has been found to have a positive impact on social capital (Mcpherson et al., 2013), but the extent of the impact varies with the denomination and the religion. For examples, countries dominated by Protestant denominations were associated with higher trust than those with hierarchical denominations like Catholicism (Kaasa & Parts, 2008).

Demographic characteristics also impact social capital. Social capital tends to increase with age, although after sixty years of age, social capital tends to decline with age (Bernstein & Munoz, 2012; Sirven & Debrand, 2012). This finding may be due to comorbidity, disability, changes in work status and changes in living arrangements that make it difficult for older adults to be engaged in networks (Bernstein & Munoz, 2012; Liu et al., 2016). Gender has also been shown to influence social capital with women being more active in informal networks than men. Women also have more family-based social networks and are more trustworthy (Kaasa & Parts, 2008). The gender differences in social capital could be due to gender constructions, gender

culture, and norms (Eriksson et al., 2010). Marriage has been shown to reduce risk-taking behavior and stress possibly through the emotional and financial support it provides to the partners (Giordano & Lindström, 2011). Having children also has a positive effect on social capital since those with children are more likely to participate in civic activities (Kaasa & Parts, 2008).

Social Capital and Food Insecurity

The role of social capital on FVIPs has not been established in existing literature. King (2017) conducted a longitudinal study using the data from the Fragile Families and Child Wellbeing Study (FFCWS) to examine the role of social capital on food insecurity. The sample included urban mothers with children under five years who were at risk of living in poverty, and looked at the association between their social capital and food insecurity. The study found that SNAP participation had no association with food insecurity among mothers with minimal social support. Social cohesion was associated with a lower risk of experiencing food insecurity (King, 2017). These findings suggest that although SNAP participation may reduce food insecurity among some participants, social capital provides additional mechanisms for improving food security especially among households with low social capital.

Summary

Food insecurity is an important health concern especially among vulnerable groups such as low-income individuals, seniors, and households with children (Bernstein & Munoz, 2012; Holben & Marshall, 2017). Food insecurity is an important public health problem because it affects food intake, the quality of foods consumed and the health of the individual. National efforts to address food insecurity have concentrated on the development of programs that provide incentives or benefits to supplement household food expenditures (USDA, 2018).

Additional supplementary programs, such as FVIPs, have been developed to improve food security among SNAP participants. While there is sufficient evidence on different mechanisms through which healthy incentives programs impact the health of participants and their communities, few researchers have investigated social capital as a mechanism through which FVIPs impact health. Social capital represents an important mechanism for improving health through existing networks and institutions in the community (Eriksson, 2011).

A study by King (2017) found that greater levels of social capital reduce the risk of food insecurity among SNAP participants. Social capital distribution differs between different societal groups, and this affects the success of interventions. It is important to acknowledge this variation in social capital when developing and evaluating interventions. In addition, strengthening individual level social capital can be an important addition to health interventions since access to social capital is associated with health, (Eriksson, 2011). To improve the health of low-income families, programs need to not only provide the essential services – food access, health care, and education - but also promote social cohesion and networking (King, 2017). The aim of this research was to explore the role of social capital in the implementation of FVIPs.

CHAPTER 3

DESIGN AND METHODOLOGY

Introduction

The purpose of the study was to explore the role of social capital in the implementation of FVIPs. The study was exploratory in nature and utilized a qualitative study design to explore how a FVIP impacted the various aspects of social capital as represented in the conceptual framework (Figure 1). In this chapter, the study design and the methodology used to collect and analyze the data will be described.

Design

The study used a qualitative study design to explore the role of social capital in the implementation of a FVIP. This design was chosen because there was minimal research available on the role of social capital in FVIPs. The study followed three aims. In the first aim the study analyzed existing evaluation data from the AF program through qualitative content analysis. Content analysis is a systematic and objective technique of making valid inferences from written, visual, or verbal data in order to describe a phenomena (Bengtsson, 2016, p. 9). The second aim, the researcher analyzed the findings from two focus groups he conducted with AF participants. Thirdly, the researcher analyzed four interviews he conducted with AF program administrators. The analysis of each objective was guided by the conceptual framework (Figure 1) and all three objectives were triangulated to identify the divergent and convergent themes. Finally, the themes were mapped on the model to identify possible mediating and moderating variables. Lastly, recommendations for future programs and policy recommendations were made.

The Appalachian Farmacy Program

The AF program was a FVIP that was implemented in Washington County, Tennessee from June 2017 to May 2018. The program was a pilot study funded by a 1:1 match grant of $100,000 by FINI to provide incentives for acquiring free fruits and vegetables at the local farmers markets after a successful proposal submitted by the Appalachian Resource Conservation & Development Council (ARC&D). The program was developed and implemented by a coalition of partners from: two local non-profit organizations, the East Tennessee State University (ETSU) College of Nursing, a local grocery store, and government agencies such as community centers and the county extension office.

The objective of the pilot was to increase the purchase and consumption of locally produced, fresh fruits and vegetables at three farmers markets in the county that accept SNAP EBT cards by providing fruit and vegetable prescriptions to participants. The program targeted only SNAP participants living in Washington County, TN and recruitment occurred at the community health center and two community sites. Recruitment at the health center was conducted through referrals by the center's physicians of SNAP participants with nutrition-related health conditions such as obesity and high blood glucose to the AF program administrator for enrollment into the program. Recruitment at the community centers was open to all adults who were SNAP recipients that lived in the county.

Participants were provided with a packet with all program related information and a fruit and vegetable monthly voucher to be used at any of the three farmers markets in the county. The value of the voucher corresponded to the household size of the participant ranging from $28 for those living alone to $112 for households with four people and above each month. Participants would then present the voucher to the market coordinators and they would receive a unique token of the same value as their vouchers. These tokens could only be used to buy from prequalified vendors (those

selling fresh fruits and vegetables). Participants were also required to attend at least two nutrition classes offered by the extension office. Finally, participants were required to go back to their recruitment site every month for evaluation and collection of vouchers. Vouchers were redeemed at the farmers markets until end of October when the markets closed. The funds left over after the markets were closed were redeemed at a local grocery store fresh produce section through March 2018. By the end of the program 171 participants were recruited.

The AF program was evaluated by researchers in the ETSU College of Public Health using a mixed methods approach. This evaluation data was the data used in Aim 1 for content analysis. Quantitative data was collected using a baseline and post survey with closed-ended questions. Qualitative data was collected from two open-ended questions on the post survey (Table 2) that asked participants their thoughts about the program. Additional qualitative data were collected through interviews and focus groups with the participants and interviews with program administrators. The interviews were conducted at the farmers market by intercepting participants as they came to shop at the market. The participants were interviewed in a private space for approximately 15 minutes a participant and 21 interviews were conducted. Two focus groups were conducted at the community centers in which participants collected their monthly vouchers. All the interviews and focus groups were moderated by semi-structured guides and the study staff took notes of the sessions. The interviews and focus groups asked participants about their perceptions of the program, their fruits and vegetables intake, and the impact the program had on their health. Lastly interviews were conducted with the administrators as part of the process evaluation of the program. The interviewers asked the administrators about the program implementation process and any challenges and feedback from participants. In total the program had seven administrators; one at each recruitment site, one at each of the two main farmers markets, an administrator in charge of the nutrition classes, and an overall program manager.

Research Aims

The study was guided by the conceptual framework (Figure 1) adopted for the study. The variables from the conceptual framework are shown in Table 1.

Table 1

Summary of Social Capital Conceptual Framework Variables

Social- structural conditions	Social networks	Psychosocial mechanisms	Health pathways
Culture Socio-economic factors Politics	Network structure Network characteristics	Social support Social influence Social engagement Access to resources	Behavior changes Psychological changes Physiological changes

The research aims were:

Aim 1: To identify attributes of social capital from evaluation data retrieved from the Appalachian Farmacy program by conducting a content analysis.

Aim 2: To explore participants' perceptions of the role of social capital in the implementation of AF program by conducting focus groups

Aim 3: To evaluate the perceptions of FVIP program administrators on the role of social capital in the implementation of FVIPs by conducting interviews.

Aim One: To Identify Attributes of Social Capital from Evaluation Data Retrieved from the Appalachian Farmacy Program by Conducting a Content Analysis

A content analysis was conducted on the evaluation data gathered from the AF program to identify social capital attributes in the data.

Study Setting

The study was based on the AF program, a successful FVIP implemented in Washington County, Tennessee. In this aim, the secondary data collected from the evaluation of the AF

program was used. The data from the program evaluation included: results from the baseline and post surveys; transcripts of two focus groups and 21 interviews conducted on the AF participants; and six transcripts of interviews conducted on AF program administrators.

Table 2

Summary of Data Retrieved from The Appalachian Farmacy Evaluation

Baseline survey
• Demographic information of the participants
Post- survey open-ended questions
• Do you have any feedback regarding the program, vouchers, cooking classes, farmers market? • Do you have any feedback on how the program has affected your health?
Quantitative outcomes data
• Fruit and vegetable intake outcomes
Participant focus groups
• Participant's experience with the program and the program components • Participant's knowledge and perceptions about diet and health • Participant's recommendations for improving the program • Participant's sustainability plans after program ends
Participant intercept interview
• Participant's experience with the program at the farmers markets • Participant's perceptions of purchase, preparation and consumption of fresh produce • Participant's perceptions of importance of fruits and vegetables to health
Program administrator interviews
• Program implementation process • Program implementation gaps and challenges • Participant feedback

Data Collection and Analysis

The researcher gathered all the evaluation data from the AF program evaluation team. The AF program was deemed "not human subjects research" by the ETSU Institutional Review Board (IRB) and the data received was de-identified. Relevant quantitative demographic data from the baseline survey were extracted. This included a summary of participants' gender, age, food insecurity status, and BMI. The qualitative data were then compiled and analyzed through a

content analysis process guided by Bengtsson (2016) using four steps for conducting a qualitative content analysis.

Stage 1. De-contextualization - The step involved thoroughly reading the transcripts to become familiar with the data and to obtain a general sense of the AF program. The researcher inductively identified insights and ideas including key phrases, words, places, and people were underlined and noted on the margins. The researcher also developed broad codes that facilitated organizing the information in the transcripts.

Stage 2: Re-contextualization - The step involved identifying the codes and sections of transcripts that related to the research aim and the conceptual framework of the study (Figure 1). The researcher then uploaded the transcripts into NVivo®12 qualitative data analysis software (QSR International Pty Ltd, 2018).

Stage 3: Categorization - The researcher created a codebook based on the conceptual framework and additional codes generated from stage 1 and 2 (Appendix A). The codes were defined, and sub-codes developed to improve the organization of the data. The transcripts were then read and coded into the relevant categories. The codes were re-arranged and redefined where necessary based on the findings from the data.

Stage 4: Compilation - The researcher reviewed the transcripts alongside his coding location and the highlights and notes from stage 1 and made additional changes where necessary. This process ensured that the researcher stayed close to the original meanings and context of the participants (Bengtsson, 2016). Lastly, the researcher developed a table summary of themes and categories identified from the AF program data.

The findings from this aim informed the development of the interview and focus group guides for research aims two and three (Appendix E & H). These findings were also triangulated

with the findings from research aims two and three to develop a comprehensive picture of how the program impacted social capital.

Aim Two: To Explore Participants' Perceptions of the Role of Social Capital in the Implementation of AF Program by Conducting Focus Groups

The study used a phenomenological approach for research aims two and three which is a branch of qualitative design that focuses on people's lived experiences of a particular situation or phenomenon (Morrissey & Higgs, 2006). Phenomenology is a valuable qualitative approach for learning and understanding people's subjective experiences (Morrissey & Higgs, 2006) and provides a rich and holistic perspective (Tracy, 2013).

Study Setting and Participants

The study was approved by the ETSU IRB. The researcher followed the approved research protocol and used approved documents only. The study recruited two types of participants for the second and third aim: the AF program participants and the AF program administrators, respectively. The AF program participants were recruited from the two community centers that were used as recruitment centers. The researcher contacted the administrators at the two community sites that recruited participants and asked whether they had a record of the AF program participants and their contact information. The researcher numbered the list of participants and used a random number generator on Excel to rearrange the list of participants. The researcher then called participants until 10 participants were recruited for each of the focus groups (Appendix B).

To be eligible the participants must have participated in the AF program. The participants were invited to participate in a 90-minute focus group at the site. Reminder phone calls were made to participants the day before the focus group. A total of seven participants attended the

focus group at community site A and eight participants attended the second focus group at site B. The sample size for the focus group was ideal to ensure adequate participation from all participants (Bengtsson, 2016). Upon arrival, participants received the Informed Consent Document (ICD) and all consented to participate in the focus group.

Data Collection

A short survey was distributed at the beginning of the focus group assessing participants' individual social capital. The questions were adopted from the Integrated Questionnaire for the Measurement of Social Capital (SC-IQ) by Grootaert, Narayan, Jones, and Woolcock (2004) (Appendix D). The survey contained two demographic questions and eight social capital questions. Four of the social capita questions required a numerical response, one had binomial answer choices and three questions had a 5-point Likert scale. The focus group was guided by a semi-structured discussion guide (Appendix F). The discussion guide was developed from the conceptual framework of the study and was also based on the feedback from the content analysis. The guide asked participants about their experience with the program and how participation impacted their social networks, psychosocial attributes and their health.

The focus group session was held in a quiet and private room inside the community site. The researcher reviewed the purpose of the study and the ICD and once the participants were ready the session began. The session was audio recorded, and the researcher also took notes. The focus groups lasted for one and a half hours. Once the focus group was complete, the researcher thanked the participants and provided them with $20 compensation for their time and contribution. The researcher also provided $50 to each community site for their involvement in hosting the focus groups in their sites.

Aim three: To Evaluate the Perceptions of FVIP Program Administrators on the Role of Social Capital in the Implementation of FVIPs by Conducting Interviews

The researcher used a phenomenological approach, similar to research aim two, to gather information from the program administrators on their perception of the program's impact on participants' social capital. The program administrators oversaw program implementation and directly interacted with participants throughout the AF program period. Interviewing the administrators provided a different perspective of the impact that the program had on the participants. In addition, the administrators had a collective view of the participants' behaviors, concerns and challenges throughout the program period.

Study Setting and Participants

The researcher contacted the AF overall program administrator and requested the contact information of the program administrators. Upon receiving the contact information, the researcher recruited four program administrators who were the most involved in the program and had the most contact with the participants. The administrators recruited were: the program manager for the AF program, the program administrator from community site A, the program administrator from community site B, and the program administrator for the cooking classes. The administrators were recruited via a phone call using a calling script (Appendix F) for a one-hour interview and a follow-up email was sent with the time and location of the interview. All interviews were conducted face-to-face at the administrators' workplaces. The sessions were audio-recorded.

The interview sessions were guided using a semi-structured interview guide that was developed based on the conceptual framework, research aim, and findings from aims one and

two. The administrators were asked about their perceptions of the participants, the program, and their role in the program as it relates to social capital (Appendix H).

Data Analysis

The data from the short survey given to participants before the focus group was compiled and tabulated. The 5-point Likert responses were converted into a binomial response by combining the two positive responses together and the two negative responses together and eliminating the central response value. The findings were then aggregated into a table and percentages for each question were provided.

The recordings collected from research aims two and three were transcribed by professional external transcribers. Names and identifying information were removed, and the transcripts were reviewed for errors and gaps. The transcripts were analyzed using both inductive and deductive analysis techniques. This approach increased the rigor of the process and allowed for emergent themes to be integrated into the deductive design of the study (Fereday, Adelaide, Australia, & Eimear Muir-Cochrane, 2006). The data analysis was performed in two main phases based on Tracy's two-level coding: primary-cycle and secondary-cycle coding (Tracy, 2013). In primary-cycle coding, the researcher focuses on words that capture the essence of the data, essentially answering the what, the how and the who of the data (Tracy, 2013). In secondary-cycle coding, the researcher goes beyond descriptive coding into analytical and interpretive coding. It includes interpretation of patterns, rules, or cause-effect progressions identified in the data (Tracy, 2013).

Primary-cycle Coding

The researcher printed and reviewed the transcripts to familiarize himself with the data. Using an open-coding approach, the researcher inductively read the transcripts and identified key

words and phrases, key players and key places mentioned by the participants and administrators. This information was highlighted and noted on the margins of the transcripts. The transcripts were reviewed again, and similar words and phrases identified were coded and themes were identified.

Secondary-cycle Coding

This stage was deductively coded by developing codes based on the study's conceptual framework (Figure 1) and the relevant codes from the primary-cycle coding. The researcher used NVivo®12 (QSR International Pty Ltd, 2018) to conduct the coding process. The transcripts were reviewed, and data were coded into the relevant categories (codes). All the coded information was reviewed again by the researcher and aligned to the code definitions to ensure each section was coded accurately. Summary coding reports were then generated from NVivo®.

The findings from the three aims were triangulated. Triangulation is the process of combining multiple research techniques, researchers, data sources, and/or theories to overcome the intrinsic barriers that come from using a single technique, single-observer and single-theories (Patton & Patton, 2002). In this study, using different data sources, participants, and methods created a better understanding of how the program impacted the participants' social capital. The findings of the analysis are shown in the next Chapter.

CHAPTER 4

RESULTS

This section presents the findings of the study. The results are guided by the conceptual framework of the study (Figure 1) and the variables are summarized in table 1.

Aim one: To Identify Attributes of Social Capital from the Evaluation Data Retrieved from the Appalachian Farmacy Program Evaluation Through Content Analysis

The findings for this aim were entirely from content analysis conducted by reviewing secondary data from the AF program evaluation data. Demographic information was extracted from the baseline survey completed by all the participants from the start of the program. Qualitative data were sourced from the open-ended questions on the post surveys completed by the participants, transcripts from focus groups conducted with participants and interviews conducted on participants and program administrators of the AF program.

Characteristics of AF Participants

Findings in table 3 were gathered from the baseline survey of participants conducted at the start of the AF program in July 2017. The secondary data findings revealed that a majority of the program participants were female and adults between 45 and 64 years. A majority of the participants were also overweight or obese (82%) and food insecure (85%). The total sample size of the program was 171 participants with the majority recruited from the health center.

Table 3

Appalachian Farmacy Participant Characteristics

Characteristics		N (%) *
Gender	Male	37 (23)
	Female	126 (77)
Age range	Adults below 45 years	45 (29)
	Adults between 45 and 64 years	78 (49)
	Adults 65 years and older	35 (22)
BMI	Underweight <18.5	3 (2)
	Normal weight 18.5 to 24.9	22 (16)
	Overweight 25 to 29.9	41 (28)
	Obese >30	76 (54)
Food security status	High or Marginal Food Security	25 (15)
	Low Food Security	81 (50)
	Very Low Food Security	56 (35)
Recruitment site	Community site A	41 (24)
	Community site B	13 (8)
	Community health center	117 (68)

*The totals of each category are not the same due to missing data on some questions. Percentages are category specific. The total sample size was 171 participants.

Social Networks

Social networks are hosted in formal institutions such as schools, hospitals and churches, and in informal settings such as in households, restaurants, and parks. In the AF program, there were three main settings in which the social networks were hosted; the three recruitment sites- community site B, community site A, and a community health center, the three farmers market locations- farmers market A, farmers market B, farmers market C, and at the cooking classes. The three recruitment sites served as centers for participant interaction with the program administrators and in some cases other participants. They also exposed participants to other services and people that were part of the networks present at these centers.

The qualitative content analysis identified three main social networks that were utilized by the AF program: the recruitment sites, the farmers markets and the cooking classes. These sites were central to the AF program implementation process

Recruitment Sites Characteristics

According to the program administrator interviews from the secondary analysis, participants were recruited from the site's existing members with some additional participants joining the sites to be part of the AF program. The community health center required participants to be patients at the health center, community site B required the participants to be members of the center, but community site A did not require membership to the center. Hence, most of the participants were already members of the recruitment sites.

The program administrator at community site B discussing the recruitment process:

> Some participants were not members at the center and were unable to pay for membership… The center decided to pay for these memberships for the participants. (Program administrator interviews)

The program administrator at the health center discussing the recruitment process:

> Participants who were interested but not current patients of the clinic were turned down and advised to go to other sites. (Program administrator interviews)

Farmers Market Characteristics

According to transcripts from interviews of the farmers market administrators, farmers market A was open on Wednesdays and Saturdays and had the highest attendance of program participants, averaging about 35 people on Wednesdays and 55 people on Saturdays. Farmers market B and farmers market C each averaged about 10 participants a week. Findings from the transcripts from participant interviews and focus groups showed that participants liked going to the farmers markets largely because they had vouchers to spend at the market. "Things we wouldn't buy otherwise - love the program and I have enjoyed the opportunity to go to the FM."

Participants also preferred the farmers market A since it had a greater variety of fruits and vegetables than farmers market B and farmers market C. “[Farmers market A] had a better variety. [Farmers market B] - not much at all.” But farmers market B unlike farmers market A sold only local produce.

The main challenges sited by participants from the secondary analysis was parking at farmers market A especially among those with disability. Farmers market A was more accessible on Wednesday than Saturday due to parking:

> Parking is my biggest pet peeve…Every time I see someone with a walker, a wheel chair, or a cane and I know they had to walk at least a block. (Focus group participant)

Cooking Classes Characteristics

Overall participants enjoyed socializing with other participants in the cooking classes. Most of the participants said they learned new skills despite having cooked most of their lives. This was also evidenced by the majority of the participants interviewed mentioning they cook their own meals. Participants also liked that they received a bag of produce after each cooking class:

> The cooking classes were fun and I learned some things I didn't know and I cooked all my life. (Participant interview)

The turnout in the cooking class was low, averaging about seven people a session. The barriers cited by participants were the timing of the classes was not conducive for some participants and transportation to cooking classes was also a challenge. Some program administrators identified additional barriers such as lack of childcare services and translation services for Spanish-speaking participants which affected the turnout for some classes.

Psychosocial Mechanisms

The psychosocial mechanisms, also called social capital, are the social mechanisms by which social networks might influence health status (Berkman et al., 2000). They include social influence, social support, social participation, and access to resources. The main social capital mechanisms that were identified from the content analysis were social engagement and social support. Social engagement is the physical participation and involvement in the activities of a social network. Social support is perceived and actual support that someone receives from others in the network and from being part of a network (Eriksson, 2011).

Social Engagement

Participants visited the farmers markets more often than before because the program provided vouchers redeemable at the markets. One participant's response when asked about the program was "…I was able to buy more often than usual." Although all participants visited the markets, only a few attended the cooking classes: "It surprises me how many people are in this program, when I show up, there is only 7 or 8 people at the classes." They were happy that they could afford extra produce from the market. The main barrier to social engagement for most participants was transportation and individual limitations due to disability, age or sickness: "I cannot go out to a lot of these places due to health." Another quote by a community site administrator during the interview shows how transportation and health are barriers to engagement: "Although transportation to cooking classes is a challenge for some participants. People with health issues also come to the market less consistently."

Social Support

The main themes under social support were informational and instrumental support. Informational support is providing others with information or advice towards meeting a

particular need, while instrumental support is aid, help, or assistance, with tangible needs (Berkman et al., 2000). These two types of social support were mostly received from the vendors at the farmers market and from the cooking classes. At the farmers market, the vendors provided the participant with useful information on how to prepare and store the vegetables and provided recipes to the participants. In addition, some vendors would give participants extra produce to round up their voucher amount:

> Some I wasn't sure what they were, so I asked the farmers, 'what is this and what would one do with it?' … they were good at telling me what to do, they taught me how to prepare. (Participant focus group)

> Some vendors will throw in some extra things if they have 50 cents left. (Participant focus group)

The cooking classes provided the participants with information and skills on how to prepare fruits and vegetables. In addition, participants mentioned that they received recipes, some of which they shared with their friends and family: "Has shown us ways to use vegetables that we haven't used before... Have used recipes given out." Other instances of social support were from family members and caregivers of the participants. For example, one of the participants struggled with cutting vegetables, so she relied on her siblings to cut vegetables while she cooked.

Health Pathways

Health pathways are behavioral, psychological, and physiological mechanisms through which health is impacted. The behavioral changes identified from the quantitative outcomes obtained from the AF secondary data showed that participants' consumption of fruits and vegetables increased significantly during the 20 weeks. The mean consumption of fruits increased from 4 to 6 times a week to 2 times a day and vegetables from 4 to 6 times a week to once daily. The mean increase in consumption of fruits and vegetables, and consumption of dark

green vegetables was statistically significant (α= .05). In addition, there was a significant mean increase in the types of fruits and vegetables consumed in the past week from 5 to 8 and 6 to 11 respectively (α= .05).

The above quantitative findings were reiterated by participants as evidenced by the interviews and focus groups transcripts obtained. A caregiver with the Power of Attorney (POA) to represent his brother said "[my] Brother typically does not eat fruits and vegetables but now does more." Another participant during an interview added that "I eat more produce now than I used to. I try different produce than before." In addition, some participants mentioned the impact the program had on their health, such as losing weight, decreases in blood sugar, and stabilization of blood pressure. Other participants also stated that they felt healthier and more energetic during the program. Below are some of the quotes from participants during the focus groups and interviews when asked about their perceived impact of the program on their health:

> The fresh fruits and vegetables have benefitted me by losing 15lbs and I have maintained that for the last 3 months. I feel better and have more energy and my digestion has improved. I also crave less carbohydrates.
>
> My weight has varied 3 pounds since the program started. I used to have 10-pound swings.
>
> Blood pressure is more stable.
>
> Blood sugar has decreased.

Aim two: To Explore the Impact of Participation in A FVIP on Participants' Perceptions of Personal and Community Social Capital through Focus Groups

The findings for this aim came from two focus groups conducted at community site A and B. The focus group in community site A was made up of seven participants, two men and five women between the ages 45 to 80 years, while the focus group at site B was made up of

eight participants, seven women and one man ranging between 28 and 74 years. The focus groups were preceded by a short social capital survey assessing the participants structural and cognitive social capital (Appendix D). Table 4 shows the findings from the survey.

Table 4

Focus Group Participants' Social Capital Characteristics

Characteristics		N (%)
Age (years)	Mean	63
	Adults below 45 years	1 (7)
	Adults between 45 and 64 years	6 (40)
	Adults 65 years and older	8 (53)
Gender	Male	3 (20)
	Female	12 (80)
Household size (N)	1	9 (60)
	2	4 (27)
	>2	2 (13)
Size of Inner circle (Family and close friends)	Mean	11
Social participation in the last two weeks (structural social capital)	Mean participation	4
	No participation	5 (33)
Social networks characteristics* (participation in the last two weeks)	Religious groups**	7
	Formal group[1]	3
	Informal groups[2]	16
Trust and solidarity (Cognitive social capital)	Generalized trust	7 (50)
	Trust towards neighbors	10 (67)
	Trust neighborhood	3 (20)
Reciprocity	Extent of willingness	13 (87)

* Participants could choose all choices that applied hence percentages are not applicable

**Religious groups although classified separately, can be grouped under informal groups

[1] Includes professional associations and educational groups

[2] Includes neighborhood meetings, community clubs, get- together party, and community centers

The survey depicts the social capital characteristics of the participants who participated in the focus group. Structural social capital was measured by asking participants about the number and types of social circles they participated in the last two weeks. All responses to the structural social capital questions were open ended numerical responses. Cognitive social capital attributes

of trust, solidarity and reciprocity were measured by questions asking about the participants' levels of trust in general, towards their neighbors, and their neighborhood in general. Reciprocity was measured by asking the participants the likelihood of their community to cooperate to solve a community problem. One of the questions had a binary response will the other three questions had a 5-point Likert scale response ranging from strongly agree to strongly disagree. The 5-point Likert scale responses were collapsed into two categories, agree and disagree, and the central category was eliminated. In this study, none of the participant's responses fell on the middle category.

The majority of the participants in the focus group were adults above 45 years who lived alone. Participants were mostly involved in informal networks, a sign that they had more bonding social capital than bridging social capital. Bonding social capital is characterized by strong ties with a network of people of similar identities and is the main source of social support. On the other hand, bridging social capital is characterized by weak ties but is an important sources of information and resources through linking people from different networks together (Eriksson, 2011).

The majority of the participants also trusted their neighbors but were split evenly when asked about their level of generalized trust, and all but three of the participants did not trust their neighborhood. Trust is a good cognitive measure of what people feel with regard to social relations in their surroundings. When people in a community trust their neighbors but are less likely to trust their neighborhood or people in general, it shows that they have higher individual social capital but there is lower perceived community social capital. Most participants (13) believed that people in the community are willing to cooperate to help each other. This

perception of reciprocity aligns with the perception of trusting people you know (neighbors) and not the community in general.

Social Networks

Similar to research aim one, participants identified the cooking classes and the farmers markets as the main points of connection with other participants. Participants met new people at the cooking classes and at the farmers market, but most relationships formed did not last beyond the cooking class session. When asked how the program influenced their relationships, a participant responded by saying "…it (the program) didn't do anything for relationships for me..."

Some participants also met other participants that they knew from other social circles at the cooking classes and at the market. The program strengthened their relationships: "I think I got to know [participant name] very well. I met [participant name] from [name of church], but we became closer through this program.

Psychosocial Mechanisms

The two main psychosocial mechanisms that the participants addressed in the focus groups were social support and social influence. While social support is actual or perceived support received from others, social influence is interpersonal influence between people due to their proximity to each other in the network (Berkman et al., 2000)

Social Support

The main types of social support identified by the participants were informational and instrumental social support. Informational support is provision of advice or information useful to meet a certain need while instrumental support is aid in kind, money or labor (Berkman et al.,

2000). Similar to research aim one, social support was received from other participants and family members, at the cooking classes and from vendors at the farmers markets.

Informational support. Participants provided informational support to other participants, their family, and community. For example, they exchanged recipes with other participants, family members and neighbors. The quotes below are from participants talking about how they have shared information they have learned from the program:

> I have done that many times (sharing recipes) ‘cause am big on cooking… especially vegetable and beans.
>
> I've given recipes to my sister and she's in Washington State. We talk on the phone.
>
> We have people at the farmers market would say "What are you going to do with that?" And we'll sit there and say "Oh, I'm doing this, this and this."
>
> And I've shared recipes and stuff on Facebook.

At the farmers market, vendors were instrumental in providing social support to the participants. The vendors answered participant questions about how to prepare, store and cook vegetables. Below are examples of participants examples of how vendors were helpful.

> It looked like cucumbers but there’s real little. I can’t peel a big cucumber cause there’s nothing left… so what I did, I asked him, "Sir, are these like cucumbers?" “They got more pulp, more potency and more fiber. Well you can eat the whole thing like you eat it." He told me.
>
> There is one vendor…gave us a chart of things that come in at different times (produce season chart). And I have it right where I can see it. And when broccoli comes in, I may go to the market.

The cooking classes also provided the participants with information on how to prepare fruits and vegetables and enhance cooking skills. A participant sharing what they learned from the cooking class said “Mine was the cooking class. And like he said there was some techniques and they gave us recipes to take home to try.”

Instrumental support. Participants received help from other participants, in the cooking class and from vendors at the farmers market. Some participants rode together with other participants or with family members to the farmers market and to the cooking classes. Below are quotes of participants sharing about how they go to the market:

> My best friend lives right around the corner…we go together. Either she drives, or I drive…

> My mom took me. She brought me to the cooking classes…

Vendors also provided the participants with instrumental support to participants. In one example, the vendor helped the participant carry her purchase to the car:

> Sometimes the vendor would actually help me. He'd say, "Where are you parked?" And I'd just show him, and he'd say, "Well okay. I'll carry it 'cause I'll be right back," even though he sometimes have to leave his space vacant, but most of the vendors have at least two people there at their section so.

In other cases, similar to the findings in research aim one, vendors would provide participants with extra produce:

> We were very well received by the farmers (vendors). They even give us extras sometimes because they knew that we were on the program.

> But like at [name of farmers market A], say they wanted a $1.25 for a cucumber? "Here, take it for a dollar.

The cooking classes also provided participants with a bag of produce after they attended the cooking class. The bag of produce contained most of the ingredients and items used to make what they learned from the class:

> I always go (to the cooking class) to get their goodies. Not only do they have the little food goodies but you get the measuring spoons there, or things to open up can lids...

Social Influence

The participants mentioned how they influenced other participants, their families and their community to eat healthy. For example, a woman who became a program participant

towards the end of the program was influenced by another program participant to visit the farmers market. When she went to the market she would also buy some produce while utilizing other SNAP programs offered at the market:

> I didn't receive any vouchers but when she would go (participant name), I would go with her and I get food stamps (SNAP), and so they do the... at the [farmers market A], they do double food stamps as well, so it was a good thing. She would say "You want to go today?", and I'd be like "Yeah." Because we both benefited.

Some participants influenced their family members and their neighbors because of their participation in the program. The quotes below are responses from participants about the people they have influenced around them:

> My one neighbor girl, she'd see us come in on Saturday's and she'd say "All right, we're having [participant name]'s salad tonight."

> My mom would be calling me while I was at the farmers market and she'd say "What's going on at the farmers market." And I'd say "Well, I'm getting all this stuff" and I said, "I'm bringing you some fresh corn and green beans to your house so we can fix it and have lunch together.

> In the cooking classes that we took from Extension, we learned how to disguise some of the vegetables to look like something else. Like cauliflower… you can make it looked like mashed potatoes. Actually, I started doing that. I started boiling them in with my potatoes and then mashing them together, and my family does not know that mom has substituted some of them potatoes. Because we won't eat cooked cauliflower. It's out.

Health Pathways

The health pathways are pathways through which social capital mediates health outcomes: the pathways include behavioral, psychological, and physiological pathways. The main health pathway identified by the participants is the health behavioral pathway. The main behavior change was in dietary habits relating to food preparation, food storage, and variety consumed. Participants shared how the information learned from the cooking classes influenced their eating habits:

> We went home and made the salsa and a couple of the dressings, as well, to put in the fridge so it was nice.
>
> [Participant's spouse] and I also made the sweet potato pancakes more than once at home. We've kept that recipe and shared it with family, too.
>
> I would always buy extra fruit and then freeze it because in the summer I make fruit smoothies.

In addition, some participants identified how their participation in the program impacted their health. Their perceptions are similar to those identified in the content analysis (research aim one). They include loss or regulation of body weight, reduced blood glucose, and reduced or regulated blood pressure:

> And it (the program) did help me with my diabetes... I was up above eight and now my A-1 is below a six…They say that I may not have to take Metformin (Diabetes medication) much longer.
>
> My blood pressure went down. you know, not greasy food and spicy food… after eating fruit like all summer. When I went there (farmers market) all I got is fruit fruit fruit, instead of eating canned food all the time or going to McDonald's all the time.

Aim Three: To Evaluate the Perceptions of FVIP Program Administrators on the Impact of Participation in a FVIP on the Social Capital of Participants though Interviews

The findings for this aim came from four interviews of the AF program administrators. The administrators included the overall program administrator, Community site A, community site B, and the cooking class administrators. The questions asked in the interview were based on the conceptual model of the study and additional questions were asked about the gaps they identified during the implementation of the AF program and recommendations for how social capital could be improved for similar programs.

The findings from the interviews reveal the administrator's perception of the program and its participants as it relates to social capital and the role they played in the success of the program. The main findings related to social networks and social support. An important

emergent theme from the interviews was case management, which can be understood as social support received from a professional over a period of time to facilitate the meeting of goal or need.

Social Networks

The program administrators identified social networks that facilitated the success of the program and also recommended future partnerships that could improve the program's success. These recommendations could be applied to future FVIP programs.

The new social network identified by program administrators was a low-income housing complex. The housing complex was home to some AF participants and the program administrators identified it as an important social network for the participants that lived there. Having many participants living within a single complex created strong ties between the participants that enhanced their participation in the program. For example, the cooking class administrator when talking about socialization in the cooking class mentioned that "The socialization came with them having friends who were participating in the program. And then you had the socialization at [name of low-income complex] … it was because those folks were living together in the same complex." Another example of how their participation was enhanced by living in the complex was that the participants at the complex took advantage of transportation services offered by site A to some cooking classes and the farmers market than other participants:

> Even though we provided transportation to farmers market, we didn't really have anybody that picked it up from here (the recruitment site). It was more from [name of low-income complex]."
>
> …we also provided transportation to the [cooking classes] at the clinic. We had quite a few people who took advantage of that, especially from [name of low-income complex].

The administrators also shared examples of partnerships that they formed that facilitated the success of the AF program. Although the list doesn't show all partnerships that AF program had, it highlights those that were mentioned in the interviews.

- The extension office partnered with the AF program to organize and manage the cooking classes. (Overall program administrator interview).
- The extension office partnered with a nearby university to provide internship hours to students who facilitated the cooking classes (Cooking class administrator interview).
- The program partnered with a local grocery store to sell fresh produce to the participants once the farmers market season ended (overall program administrator interview). The same grocery store had a nutritionist on staff who also partnered with the extension office to provide support for the cooking classes (Cooking class administrator interview).

Partnership Recommendations

The program administrators suggested recommendations for how future programs can utilize community social networks to improve success. Each of the following areas of partnership were mentioned by at least three of the four administrators interviewed.

- Partnering with the housing authority and the school systems to identify and target low income housing complexes as proxies for recruitment and retention.
- Partnering with health resource centers, the health department and physician offices
- Partnering with community centers such as churches, food banks, and senior centers

Psychosocial Mechanisms

The main psychosocial mechanism identified was social support and mainly informational and instrumental social support.

Social Support

Informational support. The main sources of informational support identified were the cooking classes and from the site administrators. The cooking classes were instrumental in providing participants with health information on nutrition, food safety, meal planning and budgeting from the cooking classes:

> They got the recipes. There were some handouts … on fiber or the benefits of eating more fruits and vegetables. Food safety was a big one… hand washing … We had a dietician, a registered dietician there at times… if they had specific diet questions, she was able to answer those for them…

The participants would also come to the cooking class with questions on how to prepare the produce they had bought from the farmers market:

> What also helped with the cooking classes is that people... You might have a squash, but some people don't know what to do with it… they ask me something like, "How do you prepare this?"… I would be like, "This is how you might be able to prepare this item."

Participants enjoyed being part of the cooking classes mainly because they were hands-on and flexible. The administrator of the cooking classes explained that she designed the classes to promote learning through interaction between participants. Her quote below shows how participants enjoyed the socialization and information sharing in the cooking classes:

> They wanted to socialize. They wanted to... They kind of like taught each other some tips and things like that, so they were able to talk to each other. We would all finish and eat as a group. We had to wait until everybody was finished with their recipe before we could try all of them together. So that helped, and people would be like, "I think I would add this to this recipe." It kind of got them talking to each other and talking to other people that may have not had known before.

The structure of the cooking classes also encouraged other participants who weren't willing to socialize to get involved. Participants found an opportunity not only to learn but to teach others which also built their self-esteem. The quote bellow gives an example of a disgruntled participant finally getting involved:

> There were some that were…disgruntled about having to be there (cooking class). They were just like, "Why do I need to be here? I know this stuff". I think even though he was disgruntled about it, when we actually got them to where they needed to actually participate, people were interested and learning from them because they were a former chef. (cooking class administrator interview)

At the recruitment sites, administrators would provide the participant with information on the program, nutrition and health information, and information on available services and activities at the site:

> We shared the dates that they could use their vouchers, and the times when they could go to the farmers market. And then at first we had some things where you had handout information on fruits and vegetables... we shared what we had here, and they would pick up maybe the newsletter or some other things…We would let them know when the educational classes were for here. (site A administrator interview)

Triangulation of Research Aims and Themes

The analysis of the AF evaluation data, participant focus groups and program administrator interviews for impact of AF program on the social capital of the participants shows several overlapping themes. Table 5 below shows how the findings from each research aim contributed to the social capital framework. The second column shows the main social networks utilized by the program were the cooking classes, the recruitment sites, the farmers markets and a low-income housing complex. The main psychosocial mechanisms utilized in the program were social support, particularly instrumental and informational support, social engagement and social influence. Lastly, the main health pathway identified was behavior change through the changes in dietary practices such as increased fruit and vegetable intake. Participants also attributed some of the changes in their health to the program.

Table 5

Summary of the Social Capital Conceptual Framework Attributes Identified from the Research Aims

Social- structural conditions	Social networks	Psychosocial mechanisms	Health pathways
Socio-economic factors[1 2 3] • Participants are low income [1 2 3]	Network structure and characteristics [1 2 3] • Cooking classes [1 2 3] • Farmers markets [1 2 3] • Recruitment sites [1 2] • Housing complex [3]	Social support [1 2 3] • Instrumental support [1 2] o Participants [2] o Administrators [1 2 3] o Vendors [1 2] • Informational support [1 2 3] o Participants [2 3] o Administrators [1 2 3] o Vendors [1 2] Social influence [2] • Participants [2] Social engagement [1 2] • Cooking class [1 2] • Farmers market [1 2] Access to resources[3]	Behavior changes [1 2 3] • Diet changes [1 2] • Perceptions of health [1 2]

[1] Research aim one
[2] Research aim two
[3] Research aim three

Emergent Themes

There were emergent themes identified during the open coding stage that were consistent in all three aims. These themes were connected to attributes in the social capital framework (Table 5) but did not fall perfectly into any of the categories. The themes were: Individual characteristics such as frailty, living alone or having inadequate resources; various aspects of access; and case management. Individual characteristics and access themes were gathered from participants' responses on the challenges and barriers they experienced in the program. These themes influenced how often participants would access the program sites hence may have impacted the amount of produce acquired and consumed. The theme of case management was identified mainly from the responses of the program administrators when discussing about their contributions to the program implementation. The program administrators played a central role

in the implementation of the program since they connected the participants to the program and facilitated their retention throughout the program period.

These themes could be considered possible moderators or mediators to participants' participation in the program. Moderators are variables that influence the relationship between two variables hence influencing the strength of the relationship (figure 4). For example, individual characteristics such as being frail influenced the participants frequency of visiting the farmers markets, the quantity of produce they could carry to their homes and also the types of produce they could prepare and consume. Hence individual characteristics moderated the strength of the impact the program had on the participant's fruits and vegetable. This moderation was evident from the participants' feedback on the factors that affected their consumption of fruits and vegetables.

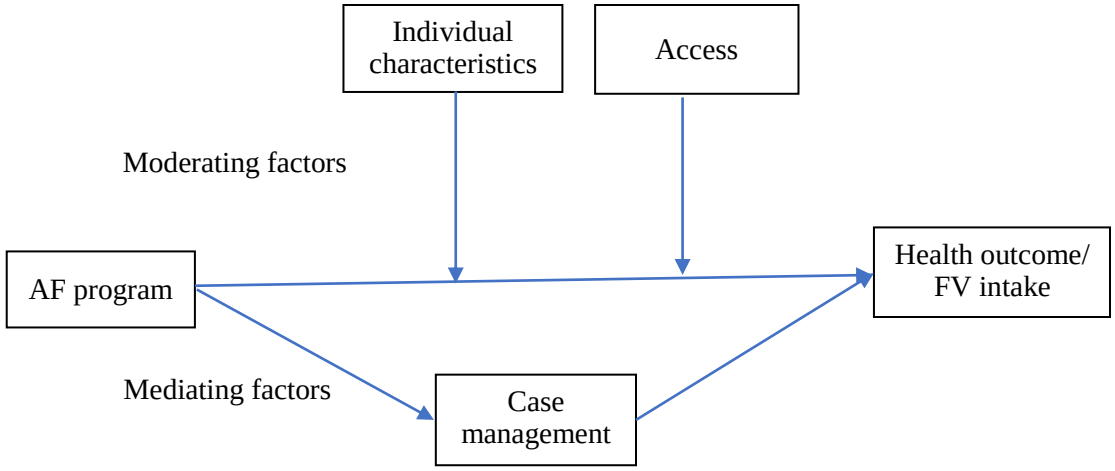

Figure 4. Illustration of the plausible mediating and moderating factors

Mediators, on the other hand, are variables that intervene the relationship between two variables and act as an intermediary step to the relationship. A good example from this study was case management which linked the participants to the AF program without which participants could not access the program figure 4). In addition, the level of case management provided by the administrators may have promoted participation and retention of participants. Mediation was

evidenced by the feedback from program administrators on their roles in the implementation of the program.

Mediation and moderation relationships are important in research and can only be ascertained through ordinary least squares regression and analysis of variance procedures in statistical analysis (Judd, Kenny, & McClelland, 2001). In addition, for mediation and moderation to be accurately assessed, the suspected mediating or moderating variable should be controlled to test the change in the relationship between the independent and dependent variable. For example, in this study, to test the impact of case management will require a control group of participants that did not experience any case management to compare with those that did. This level of analysis was beyond the scope of this study hence the researcher relied on his understanding of moderating and mediating relationships from existing studies to identify these plausible relationships (Baron & Kenny, 1986; Lee, Herbert, & McAuley, 2019; Yang, Buys, Judd, Gower, & Locher, 2013).

Potential Moderating Themes

There were two main themes that showed a potential moderating effect on the participants level of participation in the program. They were individual characteristics of the participants and challenges with access to various aspects of the program.

Individual Characteristics. Some participants expressed individual barriers such as being sickly, disabled, frail, living alone and having inadequate resources as limitations to what they can buy at the farmers markets. The participant's ability to shop at the farmers markets, buy and transport produce to their homes, store the produce correctly, and prepare the produce was influenced in part by their physical health, physical abilities, and resources available to store the produce. The quotes below from participants show this moderation:

> I have enjoyed the opportunity to go to the FM but I can only walk so far because of my walker. (content analysis participant focus group)
>
> Everything I buy I have to carry up my stairs to my house. (Content analysis participant interview)
>
> I don't have a freezer at home and I live alone. (Content analysis participant interview)
>
> I'm single, don't feel like cooking – need something to sustain me. (Content analysis participant focus group)
>
> I cannot go out to a lot of these places due to health. (Content analysis participant interview)
>
> A Farmers market administrator observed that "People with health issues also come to the market less consistently. (Content analysis administrator interview)

Access. There were various aspects of access that participants had to navigate in the program; access to produce, the farmers markets, cooking classes, and transportation.

Access to the farmers markets was affected by the market operation hours and days unlike grocery stores that are open every day, the markets were only open on Saturdays and farmers market A was also open on Wednesdays. Participants also mentioned that the farmers market B and the farmers market C did not have a variety of produce hence had to come to farmers market A. The comments below are by participants talking about their experience at the farmers markets:

> I like the fact that they're able to go to the farmers market, but I like the fact that the [grocery store name] got involved with us, too. For those that can't get to the farmers market… because the [grocery store name] is accessible all the time. (Participant focus group)
>
> The [farmers market C], right here. It was expensive to go there…They didn't have a choice… big variety. (Participant focus group)

In addition, many participants cited parking at the farmers market A being a problem especially on Saturdays which was the main market day. Some participants opted to come on Wednesdays

or very early in the morning on market days. Below the participant was expressing their frustration with accessing the farmers market:

> I mean you know, I can't walk very far to get to the farmers market. Latecomers…You gotta park two blocks away. (Content analysis participant interviews)

Access to a reliable means of transportation affected participants' access to the farmers markets and cooking classes. Below are the participant's comments about their challenges with transportation:

> I couldn't have gone to the farmers market anyway. I have no transportation. The transportation I have here is [transportation service name], and they don't run on Saturday." (Participant focus groups)

> Some of them (participants) were from Johnson City too so they weren't able to come here to our cooking classes, and then we were able to go there if I could drive there… I didn't have a car for a while. (Participant focus groups)

Other participants lived close to the market and were able to walk or use the bus to go to the market. For example, a participant reacting to other participants' challenges with transportation said "You know how lucky I am? I live on the [name of street] and I can walk to the market." The means of transport available to the participant influenced how much produce they could buy. For example, a participant expressed the difficulty of carry some produce by bus said, "I couldn't get the watermelon or anything 'cause well, watermelons was huge. Yeah I couldn't carry that on the bus so yeah."

Potential Mediating Themes

The main theme with a probable mediating effect was case management. This theme emerged from support provided to the participants by the program administrators that enabled them to succeed in the program. Participants recruited through the community health center recruitment site experienced minimal case management since the program was administered over-the-counter, similar to a pharmacy. The participants' approached the health center's front

desk staff and the staff would administer the monthly vouchers and record on their records. Alternatively, participants recruited from the community site A and the community site B were managed by one program administrator in a social setting. The program administrators served as the liaison between the program and the participants. They mediated the access of participants to the program and participants' access to vouchers.

Case Management

Case management began as early as recruitment. When eligible participants were identified, program administrators at community site A and B would schedule an appointment with the participant at a time and day that worked for the participant. During the appointment the administrator conducted a brief health screening and assisted the participant with the study survey by reading out the questions. Appointments would last up to 30 minutes and similar appointments were scheduled monthly. The administrators also called the participants to remind them of their appointments. In community site A, the administrator would conduct the monthly appointment off-site at the participant's neighborhood in case they were not able to come to the center. In some instances, the administrators would urge low income individuals to enroll into SNAP to be eligible for the program. One participant when talking about how they heard about the program said "[name of administrator] encouraged me to apply to get the food stamps (SNAP). She said that (once I apply) she would tell me what the program was."

At the community health center, participants would be enrolled immediately after their doctor's visit. The participants would then be expected to come back each month and collect a monthly voucher from the front desk. There was minimal follow up conducted to remind participants of their appointments. The community centers had a near perfect retention rate as compared to the health center at about 60% retention rate. Nearly all the participants recruited

from the community sites consistently went to the center for their monthly vouchers until the end of the program, while about 40% of the participants at the health center dropped out of the program before it ended. The overall program administrator attributed the low retention rates to lack of case management.

> The lack of case management and the lack of a cohesive community (at the community health center). I wouldn't say that the lack of community is necessarily not a killer for the program, but I just think it made the [community sites] better. Because they were going to the [community sites] for community.

The administrator at the community centers urged and encouraged participants to participate. For example, the community site B administrator's mentioned that,

> We called them (participants) and we stood on top of them and reminded them to come in and to get it (vouchers). They got used to the routine, so they knew every month they were coming in, and this is what was going to happen.

During the program, community site A also provided transportation to the farmers market and to some cooking classes on some days. The program administrators also encouraged the participants to participate in the cooking classes and take advantage of the resources available to them through the program:

> I think by us promoting it here (the AF program) and then for us providing transportation and going to ... we actually took the testing and went to [low-income complex] to test at [low-income complex], and … to hand out vouchers. So they didn't have to come here. (Program administrator interview)

> Just by giving them encouragement, basically, is all I would say we're able to really do…That was probably the biggest problem was trying to encourage them to find one (a cooking class), at least, that they could come in to. (Program administrator interview)

In addition, the community centers also provided additional educational materials and sessions:

> We took them (participants) one time over to [grocery store name] and we walked them around the store, so they could actually see the bargain prices. (Program administrator interview)

Lastly, the community site B paid membership to the site for the participants who could not afford to join the center. This provided the participants access to the services offered at the center. Similarly, at community site A, participants were welcomed to participate in all the activities offered at the center. The center provided subsidies to participants for activities that had a fee:

> Yeah, there are some fees to certain things. There are other things that aren't fees, but then we also have a fellowship program if you're low income, if you're below the poverty level, then our foundation will supplement some of the fees for programs that have a fee. (Program administrator interview)

Case management seemed to work better with the community centers since they are more accessible to the community than the health center. Secondly, the centers were social centers that fostered formal and informal networks through their daily scheduled activities. Unlike the health center where participants only went for medical reasons, the centers provided activities for every day:

> We were a little bit more accessible and that you didn't have to have an appointment with a physician. (Program administrator interview)

Conclusion

The purpose of the study was to explore the ways in which the AF program, an FVIP, impacted the social capital of the participants. Thematic analysis revealed that the findings from the content analysis, focus groups with the participants and the interviews with administrators were consistent (Table 5). The study showed that the AF program did impact the social capital of participants by giving them access to resources, information and other services offered in social networks in the community.

CHAPTER 5

DISCUSSION

The purpose of the study was to explore the role of social capital in the implementation of a FVIP using a social capital conceptual framework. The study used the framework to investigate the role that social capital played in the implementation of the AF program. In this section, the researcher will summarize the findings and discuss their implications in relation to the literature. The researcher will also explore possible recommendations for policy and future research work.

Summary of Findings

The findings revealed that the AF program impacted the social capital of participants and the model was a useful tool to investigate this impact. The study utilized the model for the three research aims and the findings were triangulated. The conceptual model was adopted from Berkman et al. (2000) and was developed to consolidate the existing theoretical and research knowledge of how social networks through social capital mechanisms impact health (figure 5). The model is divided into downstream and upstream factors that link social networks to health. The upstream factors are social networks and the larger social-structural context in which they exist (figure 5). The downstream factors are the mechanisms through which involvement in social networks influences social and interpersonal behavior (Berkman et al., 2000).

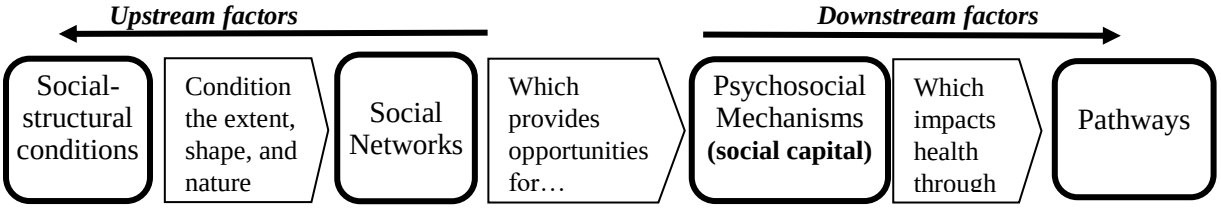

Figure 5. Social capital conceptual framework summary adopted from Berkman et al., (2000)

Upstream Factors

Social Structural Conditions. The social structural conditions are the characteristics of the environments that the participants and the social networks exist. The information on these conditions was derived from findings from the content analysis in research aim one and review of relevant literature. The program participants were all SNAP recipients living in Washington County, Tennessee which is within the Appalachian region. Findings from the literature showed that Tennessee has high poverty rates of 16.5% compared to the national average of 13.4% ("County Health Rankings and Roadmaps," 2016). In Washington County, 57% of the people earning below the SNAP threshold of 130% FPL were food insecure in 2017 (Gundersen et al., 2017) compared to about 85 % of the AF participants. This finding is consistent with studies that show food insecurity disproportionally affects low income individuals (Holben & Marshall, 2017)

The social-structural context of the participants was consistent with the literature showing that food insecurity remains a challenge particularly among the low-income populations (Gregory & Coleman-Jensen, 2017) and those living in the Appalachian regions ("American Health Rankings," 2013). Food insecure individuals consume low-quality diets that are nutrient deficient which results in poor health outcomes such as diabetes and obesity (Bryce et al., 2017; Holben & Marshall, 2017). Several participants also mentioned that they were suffering from a chronic illness which is also consistent with findings that associate food insecurity with poor self-assessed health and probability of having a chronic illness (Gregory & Coleman-Jensen, 2017).

Social Networks. Social networks in the model are central to the development and utilization of social capital (Berkman et al., 2000). They are the myriad of social relationships

that surround individuals and the characteristics of those connections and networks (Berkman et al., 2000). The AF program created and utilized social networks that exposed participants to each other and to other actors in those networks. Social networks utilized by the program include cooking classes, farmers markets, community sites, and a housing complex. The farmers market vendors were important actors in providing social support, particularly information support, to participants which is consistent with findings from studies by Hunt and Murphy (Hunt, 2007; Murphy, 2011). Study findings about participants enjoying coming to the market sometimes with their family and friends was consistent with Hunt's (2007) study on consumer interactions at the farmers markets.

Cooking classes were social networks organized for the program participants only and provided hands-on food preparation and cooking skills. Attending cooking classes may have improved participants' intake of a variety of fruits and vegetables. This observation is supported by a study by Bowling, Moretti, Ringelheim, Tran, and Davison (2016) in which participants reported that exposure to the cooking and tasting interventions and the program financial incentives were equal drivers of their retention in the program.

The community sites, similar to the farmers markets, served more than just the program participants. The community centers were open to the public but were mainly utilized by adults over 50 years. Unlike the health center, the community sites were social centers for with various daily activities. Community sites can be useful for spreading health information and information about resources available in the community (Freedman et al., 2017)

The housing complex utilized by the program housed several program participants which made it easy for the community site administrator to provide social support. Targeting of low-income housing is good strategy for increasing participation and overcoming transportation and

other access barriers experienced by participants. A similar strategy was employed by Freedman et al., (2011) to increase farmers market access to low income individuals.

Downstream Factors

They represent the mediating pathways by which networks might influence social and interpersonal behavior thus health (Berkman et al., 2000).

Psychosocial Mechanisms. The model was useful in identifying the psychosocial mechanisms utilized by the AF program. The triangulation of findings from the three research aims identified social support, particularly informational and instrumental, social influence, social participation, and social engagement as the main psychosocial mechanisms used in the program. In our study, access to these mechanisms may have improved the participants' participation in the program, therefore increased fruit and vegetable consumption. Participants received informational social support from other participants, vendors and program administrators on information about fruit and vegetable purchases and preparation and health and nutrition information. This is similar to findings from Lee (2017) who found that informational social support fostered faster diffusion of health-promoting information that improved health-related decisions.

Instrumental social support in our study was shown by vendors and program administrators to participants in the form of additional produce, kitchen appliances, or informational materials. These items were useful to the participants in supporting their intake of fruits and vegetables. Similarly instrumental social capital was linked to moderation of food insecurity among low income mothers (King, 2017). AF participant's social participation and social engagement increased their access to social support. This finding is consistent with findings from King (2017) and Yu et al., (2015).

The farmers market and the nutrition classes provided participants with informational and instrumental social support that exemplified the effectiveness of the program (Bowling, Moretti, Ringelheim, Tran, & Davison, 2016; Bryce et al., 2017). Similar to Bowling et al. (2016) the social networks may have helped participants gain knowledge and skills necessary to access and prepare fruits and vegetables thus increasing consumption. Participants also generally enjoyed visiting the farmers markets for social reasons such as: supporting local farmers who some knew; shopping with family and friends; and as a leisure activity. These findings were consistent with Freedman et al. (2016) systematic review on the factors that influence the use of farmers markets among low income populations.

The community centers and the health center used for recruitment for the AF program were also important networks for providing information to participants about the program. This addressed a gap identified in many studies that SNAP participants are usually not aware of existing health programs in the community (Freedman et al., 2017b; L. E. Olsho et al., 2015).

Health Pathways. Although the purpose of the study was to explore social capital in the AF program, participants identified perceived health changes they experienced through their participation in the program. The current study did not determine correlation or causality between social capital attributes and health outcomes. It is evident that participation in social networks empowered participants with information and skills which some shared with other participants, family members, and friends. In addition, this knowledge gain and information sharing could have had a positive psychological impact by improving self-efficacy, self-esteem and a sense of meaningfulness and belonging in the society (Eriksson, 2011).

Emergent Fndings

The study also found three emergent themes that played an important role in possibly moderating or mediating participant's utilization of social capital. Potential moderating themes identified were individual characteristics of the participants and barriers to access. These themes did not clearly fit into the model but can fall under social structural factors that conditioned the extent to which participants could participate in the social networks. Individual characteristics such as having a chronic illness, frailty, living alone or lack of household resources (for example owning a refrigerator) affected the participant's ability to access the market and the cooking classes and also affected how much produce they could acquire and consume. This is consistent with findings from Kawachi et al., (1999) that social isolation increased risk of poor health outcomes because of limited access to emotional, informational, and instrumental support.

Accessibility challenges such as transportation may have influenced the participant's frequency of visiting the social network sites. These challenges were also consistent with those identified by Freedman et al., (2016) systematic review of barriers to farmers market utilization. Participants navigated their shortcomings by relying on their social networks, for example, carpooling to the market and cooking classes, shopping together with family and friends, and seeking assistance from market vendors and program administrators. Additionally, program administrators also intervened by providing transportation to the social network sites and in another case, the administrator visited the participants at their housing complex to provide services. These strategies employed in the program to overcome the challenges represent important considerations when planning public health interventions.

Case management was a potential mediating theme identified in the study. In the conceptual model, case management closely fit under social support but presented a much

broader concept. It consisted of one-on-one participant support by the program administrators at the community site to promote and support their participation in the program. The support included encouraging and motivating participants to participate, providing health screening and education services to the participants, and assisting participants with problem-solving to navigate the challenges they were experiencing in connection to participation.

Case management is not a new concept but is usually associated with social work and health care systems where it has been shown to decrease health service use, improve care for patients, improve health outcomes, and ease the process of navigating programs (Davis, Tamayo, & Fernandez, 2012). Other FVIPs are similar to the AF program but no study to the researcher's knowledge has evaluated the case management role played by the administrators and other actors in supporting participants' success in the program.

Similar programs have employed educational interventions in addition to the incentives program at the farmers market similar to the cooking classes in the AF program. The interventions are in the form of: food tastings (Bowling et al., 2016); nutrition education only (Anderson et al., 2001); nutrition education and hands-on experience (Freedman et al., 2011); and nutrition education intervention via an online portal (Bensley, Anderson, Brusk, Mercer, & Rivas, 2011). In the above studies, the education component increased the participants' use of farmers markets and increased the consumption of fruits and vegetables.

The utility of the social capital conceptual model

The model presented a comprehensive conceptualization of mechanisms through which social networks impact health. In this study, the model was effective in identifying the social networks utilized by the program and the various mechanisms through which participant's social capital was impacted by the program. The study also shows that the model can be effectively

used for programs in where social capital is not the primary intervention. The model in this study was used to evaluate the AF program after implementation but program planners can use it in the planning and process evaluation stages. The model is also versatile for use with different research methodologies and designs. For example, in our study, we used the model for a qualitative study design using content analysis and phenomenological approaches. It sufficiently addressed the research aims of the study.

The emergent themes identified are important considerations for future uses of the model for FVIPs since they represent mechanisms that moderate and mediate social capital. In this study, the emergent themes helped explain the variation in participation between participants recruited from the health center and those from the community centers. Though the study did not set out to prove any statistical relationships or causality, these themes provide a starting point for future studies. For example, the model could be modified to include individual level characteristics and access as a new category for factors that moderate the frequency and extent of utilization of social networks. In addition, case management could be added as a unique category under psychosocial mechanisms as social support received from a professional over a period to facilitate meeting of a goal or need.

Strengths and Limitations

It is important in qualitative studies to demonstrate the quality of the study since quantitative quality measures - validity, reliability, and generalizability- do not necessarily apply. This is especially true for phenomenological studies. Hence quality in qualitative studies is assessed by looking at credibility, transferability, dependability, and confirmability (Shenton, 2004) and ethical conduct (Morrissey & Higgs, 2006). The study was approved by the ETSU IRB to ensure it was ethically conducted. The researcher diligently followed the approved

research protocol and used only the approved procedures and study materials. The participants were adequately informed about the study procedures and that their participation was voluntary.

To demonstrate credibility and dependability, the researcher used established research designs and criteria that have been extensively used in similar studies. The researcher also used different data sources and different data collection techniques to improve the study quality. The study was also guided by the same conceptual framework which was also used in the development of the research aims, development of data collection tools and in data analysis. The study utilized triangulation for analysis of findings which was essential for demonstration of all four aspects of quality. To demonstrate transferability, the researcher provided thick descriptions of the methodology, the study participants and the background of the study. And lastly, confirmability was demonstrated by triangulation of the findings from the three levels of data collection and analysis.

The study had several limitations including the study sample, the method of data collection, and having a single researcher. The study being qualitative in nature means that the findings cannot be generalizable to wider populations with the same degree of certainty as quantitative studies. The study improved the transferability of the study by providing thick descriptions of the methodology and analysis and using a model to guide the data collection and analysis. Nonetheless, the findings may be instrumental in informing the development and evaluation of future programs and theories.

The study sample contained participants from the community sites only since the researcher was not able to access participants from the health center. This selection bias may have biased the findings to only represent the experience of participants at the community sites and not all the participants of the study. Although, the findings can be generalized to similar

studies utilizing community centers as the primary recruitment and retention sites for the participants.

The use of interviews and focus groups for data collection meant that the researcher relied on self-reported information for the study. There may have been a testing bias due to participants answering questions in a socially desirable manner especially in the presence of other participants and the researcher. This may have influenced the accuracy of the information gathered, but the use of different information sources helped validate the information collected.

Lastly, having a single researcher collect, analyze and present the data may have introduced researcher bias and created room for measurement bias in the research process. The researcher relied on his extensive training in research methodology and the use of validated research methods and tools to mitigate this limitation.

Implications for Practice, Policy, and Research

The study identified the utility of social capital in the successful implementation of FVIPs using a social capital conceptual framework. The framework provided an elaborate guide for analyzing the study findings to identify social capital attributes in the program. It is important to identify and utilize social networks that exist in the community and the key actors in those networks when developing FVIPs. Individual characteristics and barriers to access such as transportation challenges moderate the participants' ability to utilize social capital. Case management mitigates the individual and community level barriers to participation.

Implications for Practice

Future FVIPs should evaluate the community for social networks and the individual's social capital and integrate the findings into the development of programs. The programs should focus on utilizing existing social networks in the community and mitigating the individual

challenges to participation. Future programs should also incorporate case management and provide adequate staffing to ensure success. Successful case management requires person-to-person encounters and low caseloads (Davis, Tamayo, & Fernandez, 2012) to foster relationships between participants and program administrators.

Policy Implications

Possible policy recommendations should focus on developing and nurturing community-level social capital. Community-level social capital has been associated with lower odds of food insecurity, regardless of employment status, education, or household income (Martin, Rogers, Cook, & Joseph, 2004). Efficient ways to increase community-level social capital include implementing policies that: (1) improve the built environment of the community to ease access to community centers such as senior centers and health centers; (2) improve the food environment, for example, by opening farmers markets in food deserts and improving transportation services in the community to ease the individual barriers to access; and (3) provide adequate funding to community centers for outreach and case management services to at-risk populations in the community.

Implications for Future Research

Future research should address the existing shortcomings in social capital research methodology, measurement.

Study 1: Developing Social Capital Measures for use in Public Health Interventions

The lack of consensus on how to measure social capital at the individual or community level makes it difficult to consistently evaluate social capital. Many social capital attributes are measured with an array of indicators that may be associated with social capital but are not direct measures, for example, using crime rates as an indicator of low community level social capital

(Shiell et al., 2018). This makes it difficult to ascertain the actual connection between social capital and health.

Future studies should look into developing specific measures for each of the social capital attributes and additional measures for community level social capital. The studies can start with an extensive systematic review of social capital measures and identifying the most effective measures. These measures can then be tested and validated independently and together to identify any interaction and confounding effects. Finally, the measures can be tested on different public health interventions and improved to adequately and specifically measure social capital.

Study 2: Longitudinal Study to Access the Impact of Social Capital on Health

There is a need for longitudinal studies such as prospective studies to determine the causal relationship between social capital and health, particularly in public health research. This is necessary since it is not clear whether social capital is a determinant of health or a product of health or whether they are correlated with each other (Shiell et al., 2018). Studies should be built around specific components of social capital to allow for more detailed analysis of the impact of social capital and social networks on health. The study will entail a thorough evaluation of the socio-structural conditions and the existing social networks to determine the context and baseline of the sample population and community. The study can use specific social capital attributes as a primary or secondary intervention and closely monitor and evaluate its impact on behavior and health. They can use the measures identified and developed in study one to measure the impact of social capital on health. These studies will provide clear understanding on how social capital impacts health and ways to foster social capital in interventions to increase the impact on health.

Study 3: To Develop a Social Capital Conceptual Framework for Public Health Interventions

Additional studies should test the efficacy of the social capital conceptual framework used in this study and further explore the possible moderation and mediation relationships identified. The findings from study 1 and 2 will be useful in testing and modifying the model to include the variables and attributes that are relevant to public health interventions. For example, the findings from this study showed that there were some possible mediating and moderating themes that were not captured in the model.

This study will develop a comprehensive survey that includes all the validated measures identified in study 1 and 2. Additional measures will be developed based on the emergent themes found in this study and other similar studies that have utilized this model. The survey will be used to evaluate participants of various public health interventions based on a specified criterion. The findings will then be analyzed against the model to test the various mechanisms in the model including the emergent themes. The analysis will also test for mediation, moderation, confounding and interaction between the variables. The significant variables will be included in the revised model and the model will be ready for further study.

Conclusion

The research explored the impact of FVIPs on the social capital of participants using a social capital conceptual model. The model was useful in exploring the role that social capital played in the implementation of the AF program. The study findings can be instrumental in the development and evaluation of FVIPs and shed light on the utility of social capital as a health determinant. Social capital presents a promising mechanism to improve the success of food assistance programs in reducing food insecurity and improving the nutrient quality of food consumed.

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APPENDICES

Appendix A: Study Codebook

Name	Description
Access types	Includes codes exploring how participants navigated access and the barriers they experienced
cooking class	Access and barriers to the cooking class location, the actual room, and the class times (scheduled times)
F & V	Access and barriers to acquiring and consuming fruits and vegetables
Farmer's market	Access and barriers to the farmer's market location, time, actual room
Transportation	Access and barriers to means of transport to any program commitment
Case management	Aspects of the program in which participants received one on one
Cooking class	Characteristics of the cooking classes
Farmers market-characteristics, issues	Farmers market characteristics (schedules), preferences, challenges and barriers.
Health pathways	Perceptions of health
Behavior change	Ways in which participants said they changed their behavior during and beyond the program period
Existing health knowledge	Participants statements about health, there personal health, what is healthy, what are healthy behaviors and effects of diet on health
Perceptions of health	Participants statements about the health changes experienced due to the program
Psychological changes	Participant's statements on self-esteem, efficacy, coping mechanisms, depression, sense of well being
Individual	Factors affecting individual participation in the program
Barriers	Barriers to participation that relate to the participant's physical body and resources
Individual traits	Characteristics of individual participants including personality attributes, actions taken, lifestyle choices etc.
*Needs	
Perceptions of the program	Participant's perceptions of the program as a whole
Self esteem	Statements by participants suggesting change in confidence in their worth or abilities
Stigma	Statements by participant's insinuating stigma associated with being on SNAP/program participant
Recommendations & Feedback	Suggestions by participants on how to improve the program
existing partnerships	Program improvement through existing partnerships

Name	Description
Financial sources	Available financial sources in the community
Methodologies	Program improvement through changes or improvements to the implementation process
Opportunities for partnership & resources	Program improvement through available resources and partnerships in the community
Social capital	
Access to resources & materials	
Social engagement	
Social influence	``people obtain normative guidance by comparing their attitudes with those of a reference group of similar others. Attitudes are confirmed and reinforced when they are shared with the comparison group but altered when they are discrepant"
*ref^ Social support	Perception and actuality that one is cared for, has assistance available from other people, and that one is part of a supportive social network
Appraisal SS	Appraisal support, often defined as the third type of support, relates to help in decision-making, giving appropriate feedback, or help deciding which course of action to take.
Case management	Statements about Administrator's
Emotional SS	Emotional support is related to the amount of ``love and caring, sympathy and under- standing and/or esteem or value available from others" (Thoits, 1995). Emotional support is most often provided by a confidant or intimate other, although less intimate ties can provide such support under circum- scribed conditions.
Informational SS	Informational support is related to the provision of advice or information in the service of particular needs.
Instrumental SS	Instrumental support refers to help, aid or assistance with tangible needs such as getting groceries, getting to appointments, phoning, cooking, cleaning or paying bills. House (1981) refers to instrumental support as aid in kind, money or labor.
Social networks	The networks the participants are involved -formal and informal
Network characteristics	Range and size of network, density of the network, and homogeneity
Network structure	Frequency of contact, length of time members have known each other, reciprocity
Socio-structural conditions	Characteristics of the environment in which the participants live
Culture	Norms and values
Politics	Laws; public policy; political culture
socio-economic	Income status, poverty,
Vendors	Interactions with farmer's market vendors. Positive and negative

Appendix B: Focus Group Recruitment Phone Script

FVIP Social Capital

Phone call script for participant recruitment into focus group

Hello, this is [study PI] a student from [East Tennessee State University], am I speaking to [participant name]?

If no: Is this [participant name] number?

If no: Sorry for the inconvenience, bye

If yes: Please ask [participant name] to call me back on [PI phone number]

If yes: I am doing a research study on the participant's experiences with the Appalachian Farmacy program in which you were a participant. I am calling you to invite you to participate in a 90-minute group discussion on your experience in the program. The group discussion will be conducted by a team from ETSU and for your participation you will receive $20. Would you be interested in participating?

If no: Thank you for your time.

If Yes: Thank you for your willingness. The group discussion will meet at [site names]. Would you be available for the meeting on [days and times]? Which times and location works best for you?

Thank you once again for agreeing to participate. I will call you again as the day of the focus group approaches. [Participant's name], is this the best number to reach you? Could you provide me an alternative number of a family member or friend that I could reach you on incase this number doesn't go through?

Have a blessed day.

Appendix C: Focus Group Informed Consent Document

[Date]

Dear Participant:

My name is Kiriinya Munene Mwirigi and I am a graduate student at East Tennessee State University. I am working on my doctoral degree in Public Health. To finish my studies, I need to complete a research study. The name of my research study is the Impact of Fruits and Vegetables Incentives Programs (FVIP) on the Social Capital of SNAP participants.

The purpose of this study is to learn about the impact of the Appalachian Farmacy program on your social capital of those that participated and their community. The study will involve interviewing you on your views of the impact the Appalachian Farmacy program on the social capital of participants and their communities. The session will last about 1 hour. Since this study deals with discussing personal experiences and opinions, it might cause some minor stress. However, you may also feel better after you have had the opportunity to express your views on the Farmacy program. This study may provide benefit by providing more information about social capital and its impact on the health of the community.

Although there is a minimal risk of potential loss of confidentiality since the sessions will be audio recorded, we will make every effort to keep the study records completely confidential. In other words, there will be no way to connect your name with your responses. All information that can identify you will be removed from the data. This data will then be stored for possible use in future research studies. We will not ask for additional consent for those studies. Although your rights and privacy will be maintained, the Secretary of the Department of Health and Human Services, the ETSU and Kiriinya Munene Mwirigi have access to the study records.

If you do not want to participate in the study, it will not affect you in any way. There are no alternative procedures except to choose not to participate in the study.

Participation in this research study is voluntary. You may refuse to participate. You can quit at any time. If you quit or refuse to participate, the benefits or treatment to which you are otherwise entitled will not be affected.

If you have any research-related questions or problems, you may contact me at (859) 200-5194. I am working on this project together under the supervision of Dr. Debbi Slawson. You may reach her at (423) 439-4592. Also, the chairperson of the Institutional Review Board at East Tennessee State University is available at (423) 439-6054 if you have questions about your rights as a research subject. If you have any questions or concerns about the research and want to talk to someone independent of the research team or you can't reach the study staff, you may call an IRB Coordinator at 423/439-6055 or 423/439/6002.

Sincerely,

Kiriinya Munene Mwirigi

Appendix D: Focus Group Pre-Session Survey

(Adopted from Grootaert, Narayan, Jones, & Woolcock, 2004)

COLLEGE *of* PUBLIC HEALTH
EAST TENNESSEE STATE UNIVERSITY

Focus Group Survey

Thank you for participating in the focus group. We would like for you to answer a few questions about yourself and your community. Do your best to give us your honest thoughts and views. Remember, your answers will be confidential (private) and your name will not appear on the survey. You can choose to not answer any questions you don't want to. Your answers will be put together with those from the entire group as a summary.

What is your age? _____Years
What is your gender? _____
How many people are in your household? _____

The following three questions will ask about your social circles

1. Thinking about your social life/ circles
   How many close family members do you have? _____
   How many close friends do you have? _____

2. In the past TWO WEEKS, how many formal or informal groups/meetings have you attended in your community? *[examples include religious groups, educational groups, neighborhood meetings, party etc]* _____

3. Tick the type of group or meeting you attended

	Mark (**X**) all that apply
Religious or spiritual group	
Professional association	
Neighborhood meeting	
Educational group	
Community club or center	
Get-together/ party	

   Other _____

The next four questions will ask about your thoughts about your community

4. Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?
   1. People can be trusted

2. You can't be too careful

5. Generally speaking, are most people in your neighborhood willing to help if you need it.
    1. Agree strongly
    2. Agree somewhat
    3. Neither agree or disagree
    4. Disagree somewhat
    5. Disagree strongly
6. In general, do you agree or disagree that in this neighborhood, one has to be alert or someone is likely to take advantage of you.
    1. Agree strongly
    2. Agree somewhat
    3. Neither agree or disagree
    4. Disagree somewhat
    5. Disagree strongly
7. If there was a flood problem in this community, how likely is it that people will cooperate to try to solve the problem?
    1. Very likely
    2. Somewhat likely
    3. Neither likely or unlikely
    4. Somewhat unlikely
    5. Very unlikely

Thank you for your time

Appendix E: Focus Group Guide

FVIP Social Capital

Focus group Guide

Introduction 10 mins

Thanks for taking the time to meet with us. My name is Munene and I am a Public Health Doctoral student at ETSU. I understand that your time is valuable and I appreciate your participation. We'll be here for about an hour and a half so that we can talk about your experience with the Farmacy program. This session is not associated with the program's administrators and your responses will not be used for or against the Farmacy program. Instead your input will be valuable in the development and evaluation of future programs.

Our discussion will revolve around our social lives and our relationships with people in our communities during the period you were involved in the program; as early as July 2017 to February 2018.

In this group setting, I would like to ask questions to find out about your experiences with the program and your thoughts about how it has impacted you and your family.

Before we get started, I'd like to go over some ground rules so that our discussion runs smoothly.

1. I would like to hear from everyone during the discussion even though each person does not have to answer every question.
2. This session is being audio recorded. Please speak
3. Feel free to respond directly to me or to anyone else in the room. Please avoid side conversations so that people don't get distracted.
4. There are no wrong answers, just different opinions. So just say what is on your mind because are the experts.
5. There are several questions that we want to go through, so I may have to move to another question before the discussion of a previous question has ended.
6. Everything we talk about is between us. You must agree not to reveal anything you learn about other participants or share statements made during this discussion outside of this focus group. Having said that, don't feel pressure to reveal anything about yourself that you are not comfortable with others in this group knowing.

Does each of you agree to these ground rules?

Any more questions before we begin?

Let's begin

How did you learn about the program?

1) **NETWORK EFFECTS 20 mins**

When you think of the period you participated in the program, how did it influence or affect your relationships? Impact on network

[Did it make them stronger/weaker?]

Let's begin with

Your family/ those that live in your household e.g. children, relatives
Close friends and extended family members
Community members/ neighbors/ workplace/ community centers
leaders/ program administrators for example physicians, clinic staff, community center staff

Did you meet new people/ form new relationships when… ? New networks

Visiting the Farmers Market
Attending nutrition/cooking classes
Collecting vouchers at the senior centers or clinics

2) **SOCIAL INFLUENCE 8 mins**

Looking at the people you met or interacted with during this program.

Where were they from?

[Were they from your neighborhood/ different neighborhood?]

What were the things you had in common with them?

3) **INFORMATION EXCHANGE and ACCESS 17 min**

What kind of information did you exchange with the people you met in the program?

[Examples of information include; Did you exchange…
information on the program
health information
information on opportunities- for work
information on finances
personal information]

Did you find that information useful?

Did that information influence a decision you made?

Did any of the people you met influence a decision you made?

Did any of the people you met motivate/influence you to change a behavior/action related to your health?

4) **SOCIAL SUPPORT 15 mins**

What kind of challenges did you experience during the program?

[Is there a time you were unable to
get vouchers,

go to the farmers market,
go to the cooking classes,
prepare/ cook a vegetable you had purchased
store the produce you had acquired?]

How did you overcome the challenges? [Who may have helped you overcome these challenges?]
Family and friends
Neighbors and community
New friends
Program administrators

What kind of help did you receive? –
[Financial, advice, transportation, emotional support]

Where you able to help other participants in the program? How/ in what ways?

In general, how important were relationships to your successful participation in the program?

[relationships with other participants
, your friends,
with program administrators]

5) **IMPACT ON HEALTH 10 mins**

How did the program impact your health and life?

In what ways did relationships influence your health?

[Your relationships with your…
Family
Close friends
Community members/ neighbors
Program participants
program administrators]

In what ways have you influenced the health of someone else?

[In your family, among your friends or in your community?]

Finally, do you have any additional thoughts or comments about our discussion today?

Appendix F: Interview Recruitment Phone Script

FVIP Social Capital

Phone call script for program administrator recruitment for interview

Hello, this is [Study PI] from East Tennessee State University, am I speaking to [Administrator's name]?

If no: Is this [administrator name] number?

If no: Sorry for the inconvenience, bye

If yes: Please ask [administrator's name] to call me back on [PI's phone number]

If yes: I am doing a research study on the experience of the Appalachian Farmacy program participants. I am calling you to invite you to participate in an interview on the experience of the Appalachian Farmacy program participants. The interview will be an hour long and will be conducted at a time and place convenient to you. Would you be interested in participating?

If no: Thank you for your time.

If Yes: Thank you for your willingness. Which times and location works best for you?

Thank you once again for agreeing to participate. I will call you again as the day of the interview approaches. [Participant's name], is this the best number to reach you?

Thank you. Have a good day

Appendix G: Interview Informed Consent Document

[Date]

Dear Participant:

My name is Kiriinya Munene Mwirigi and I am a graduate student at East Tennessee State University. I am working on my doctoral degree in Public Health. To finish my studies, I need to complete a research study. The name of my research study is the Impact of Appalachian Farmacy program on the Social Capital of SNAP participants.

The purpose of this study is to learn about the impact the Appalachian Farmacy program had on your social capital. The study will involve a brief survey followed by a group discussion with other participants on your experience. The session should only take about 90 minutes. Since this study deals with talking about your experiences with others, it might cause some minor stress. However, you may also feel better after you have had a chance to express yourself. This study may benefit you by informing you about your social capital and its impact on the community. You will receive a meal during the session and $20 cash at the end of the focus group for your participation in the study. "You will be asked to sign a form confirming that you received the cash. This form will be released to the University for the purpose of payment recordkeeping."

The sessions will be audio recorded hence there is a minimal risk of potential loss of confidentiality. We will make every effort to keep the study records completely confidential. In other words, there will be no way to connect your name with your responses. All information that can identify you will be removed from the data. This data will then be stored for possible use in future research studies. We will not ask for additional consent for those studies. Although your rights and privacy will be maintained, the Secretary of the Department of Health and Human Services, the ETSU and Kiriinya Munene Mwirigi have access to the study records.

If you do not want to participate in the study, it will not affect you in any way. There are no alternative procedures except to choose not to participate in the study.

Participation in this research study is voluntary. You may refuse to participate. You can quit at any time. If you quit or refuse to participate, the benefits or treatment to which you are otherwise entitled will not be affected.

If you have any research-related questions or problems, you may contact me at (859) 200-5194. I am working on this project together under the supervision of Dr. Debbi Slawson. You may reach her at (423) 439-4592. Also, the chairperson of the Institutional Review Board at East Tennessee State University is available at (423) 439-6054 if you have questions about your rights as a research subject. If you have any questions or concerns about the research and want to talk to someone independent of the research team or you can't reach the study staff, you may call an IRB Coordinator at 423/439-6055 or 423/439/6002.

Sincerely,

Kiriinya Munene Mwirigi

Approved by ETSU Campus IRB / Approval Date: March 6, 2019

Appendix H: Interview guide

FVIP Social Capital
Program Administrators Interview

Introduction

Thanks for taking the time to meet. I am [*name of facilitator*]. I understand that your time is valuable, and I appreciate your participation. I'll be here for about 1 hour to talk to you about the Farmacy program.

In this interview, we will discuss about the Appalachian Farmacy and how it affected the social lives of the participants and the community. I would like you to share your experiences and thoughts on how it impacted the participants and their communities.

Please be as honest as possible but remember you are free to not answer any question.

Do you have any questions before we begin?

Let's begin…

How important do you think the program was to the participants?

NETWORK EFFECTS

Thinking of the Farmacy program how do you think it influenced the participant's relationships?

[With their Family
With their friends
With their community
With authorities such as clinic staff, community center staff, community leaders]

SOCIAL SUPPORT AND INFLUENCE

How did the following aspects of the program influence the participant's social life/ behavior?

Farmers markets
Cooking classes
Monthly voucher redemption
Access to produce
Any other aspect that comes to mind?

MECHANISMS TO HEALTH

Other than the promotion of health through consumption of fruits and vegetables, in what other ways did the program impact the health of participants?

[Think of health as physical, mental, psychologically or emotionally]

Based on your interactions with the participants; which aspects of their social lives improved/promoted their participation in the program?

[Household dynamics/loneliness
Relationships
Economic status
Self-motivation]

What kinds of social needs did participants express to you during your interactions with them?

[social needs are any needs relating to their relationships with others and the community]

How did your interactions with the participants improve their success in the program?

[Recruitment
Retention
Motivation
Information sharing
Other social needs?]

GAPS AND RECOMMENDATIONS

The program utilized your site and your expertise for a successful implementation. When you look at this community, its resources and other institutions in it. How could future programs like Farmacy be improved…

[In other words, what are the opportunities for growth?]

To utilize other existing institutions/ organizations in this community

[giving examples]

[how can other can other organizations participate in program implementation/success]

To utilize available resources (local government and organizations) in the community

[giving examples]

[Are there resources available in the community that Farmacy or similar programs can utilize?]

How could future programs be improved to…

Improve retention of participants

Improve participants health outcomes

Maximizing the participant's social networks and ties in the community [giving examples]

Lastly, do you have any closing comments or suggestions in relation to what we have discussed today?

VITA

KIRIINYA MUNENE MWIRIGI

Education:

DrPH. Community Health, East Tennessee State University, Johnson City, Tennessee 2019

M.S. Community Nutrition, Eastern Kentucky University, Richmond, Kentucky 2015

M.P.A. Community Development, Eastern Kentucky University, Richmond, Kentucky 2014

BSc. Food, Nutrition, & Dietetics, Kenyatta University, Nairobi, Kenya 2011

Professional Experience:

Adjunct Faculty, East Tennessee State University, Johnson City, Tennessee, 2019 - Present

Graduate Assistant, East Tennessee State University, Johnson City, Tennessee, 2016 – 2019

Doctoral Intern, Appalachian Farmacy Program, Johnson City, Tennessee, 2017- 2018

External Site Reviewer for the Summer Food Service Program (SFSP), Child Nutrition Resource, Kentucky, 2016

Nutrition Intern, Iona Senior Services, Washington, D.C., 2015

Nutrition Intern, USDA Summer Food Service Program (SFSP), The Upward Bound Program, Eastern Kentucky University, 2015

Intern, White House Clinics, Richmond, Kentucky, 2013

Graduate Assistant, Eastern Kentucky University, Richmond, Kentucky, 2012 - 2015

Community and clinical nutritionist, Food for the Hungry, Marsabit, Kenya, 2011 – 2012

Nutrition Intern, World Vision International, Naivasha, Kenya, 2011

Presentations:

Mwirigi, K. M. “Mum’s Kitchen: Nutrition in the Diaspora” The annual Kenyans in Kentucky seminar, Richmond, KY, December, 2018

Mwirigi, K. M., Kamran, B., & Slawson, D. L. “Increasing farmers market utilization by SNAP recipients through an innovative program at senior centers: Appalachian Farmacy” Abstract accepted for session presentation at the American Public Health Association, San Diego, CA, November, 2018

Mwirigi, K. M. “The Appalachian (F)armacy: An initiative to improve health outcomes of low-income families.” Rural Health Association of Tennessee 24th Annual Conference, Pigeon Forge, TN, October, 2018

Mwirigi, K. M. “A review of the Appalachian Farmacy Program” Ballard Health, Johnson City, TN, August, 2018

Mwirigi, K. M., & Kamran, B. “Appalachian Farmacy: An Evaluation of A fruits and vegetables prescription pilot program” The Appalachian RC&D Council, Johnson City, TN, May, 2018

Mwirigi, K. M. “An Evaluation of Appalachian (F)armacy” The Appalachian Student Research Forum- ETSU, Johnson City, TN, April, 2018

Honors and awards:

Pi Alpha Alpha award for outstanding scholarship and accomplishment in public affairs and administration, 2014

ETSU College of Public Health Graduate Student Research Grant, 2019