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I, Surbhi Chhabra , hereby submit this original work as part of the requirements for the degree of Master of Science in Nutrition.

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Social Capital, Social Support and Food Insecurity in Food Pantry Users

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Social Capital, Social Support, and Food Insecurity in Food Pantry Users

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Abstract

The purpose of this study was to examine the relationship between food security, social capital and social support in urban food pantry users in Cincinnati, OH. Fifty three in-person interviews were completed with food pantry users using the 18-item US Household Food Security Survey Module, a 36-item social capital questionnaire, and a 23-item social support questionnaire. Most participants (81%) were food insecure and 68.5% reported that the Supplemental Nutrition Assistance Program (SNAP) was their primary source to buy food. The participants were asked to list up to 10 significant people who provided personal support. The average number of people listed was 4.9 ± 2.4 and included immediate family members (49.0%), friends (24.3%), and relatives (10.8%). Social capital was assessed at sub constructs of trust, networks, cooperation, community involvement, and self-perception using a response range from 1 to 4. The score was highest for self-perception (3.2 ± 0.64) and lowest for community involvement (2.2 ± 0.61). There was no significant association of food security to social capital or social support. The finding may be due to a small sample size. It will be important to examine the relationship with a larger sample.

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1. Introduction

Household food security is defined as “*access at all times by all people to an adequate amount of safe, nutritious, and culturally appropriate foods for active and healthy lives.*”¹ It ranges from high, marginal, low, to very low food security. During 2010, **14.5%** of U.S. households were food insecure, of which 9.1% had low food security and 5.4% had very low food security². This prevalence increased from **11.1%** (13 million households) in 2007; of which 7.0% were low food secure and 4.1% were very low food secure¹. Ohio has moved from 12th in the nation for food insecurity to 9th in 2010. On average, between 2008 and 2010, **16.4% of households in Ohio were food insecure**, with 9.8% having low food security and 6.6% having very low food security³. In Hamilton country 84.4% of food pantry users are food insecure and 49.3% are food insecure with hunger².

Food insecurity is associated with various factors, such as poverty, low education, minority status, and food assistance program use, social isolation, lack of transportation, limited access to grocery shops, and decreased physical and mental health are significantly associated with food insecurity². There is a wide range of negative consequences of food insecurity in adults.

Research suggests that adults in food insecure households were more likely to rate their health as poor/fair and scored significantly lower on physical and mental health as compared to food secure⁴. Individuals in food insufficient households have higher odds of having disability, suffering from multiple chronic diseases, or having major depression compared to those living in food sufficient households⁵. Food insecurity is more likely to place adults at increased risk of being overweight or obese and at higher risk for diet-related chronic diseases, such as heart disease, diabetes, hypertension, and even food allergies⁶.

Besides using federal food and nutrition assistance programs, cooking meals with non-family members, eating less preferred foods, limiting portion size, skipping meals, borrowing food or money have been used as coping strategies for food insecurity ⁷. Most of these coping strategies dealt with the economic determinants of food insecurity and those strategies have been well studied. Less well studied are the non-economic or social determinants of food insecurity, such as social support and social capital.

Availability and accessibility of foods can be increased through *social capital and social support*. Research points to the impact of collective social functioning on an individual's ability to access food. With growing recognition of the social determinants of health, *social capital and social support* are increasingly important concepts in international health research to avoid undesirable conditions such as food insecurity ⁸. Social capital, particularly in terms of reciprocity among neighbors and community, has been shown to contribute to higher food security and is positively associated with it ⁹. There are a number of indicators of social support that may be associated with food insecurity. Lack of social support, having a limited social network, being socially isolated, particularly living alone or being divorced, separated, or widowed, especially for men, are risk factors for poor nutritional intake or status and food insecurity ⁸. The coping strategies used currently have not been able to eliminate food insecurity; hence, other alternatives need exploration such as social capital and social support. Social capital and support have shown to be positively related to better health status but its association to food security requires more exploration. This research attempts to examine the relationship between food security status and the use of social capital and social support as coping strategies to overcome food insecurity in the food pantry users.

2. Research Objective

The purpose of this study was to examine the association of food insecurity to social capital and social support in food pantry users in urban area.

Research Question

1. Is social capital associated with food security status in food pantry users?
2. Is social support associated with food security status in food pantry users?

3. Literature Review

3.1 The Definition of Food Security

The broad conceptual definitions of food security and insecurity developed by the expert panel convened in 1989 by the Life Sciences Research Office (LSRO) have served as the basis for the standardized operational definitions used for estimating food security in the United States.

According to LSRO definition, *food security* is defined as access to enough food for an active, healthy life. The concept includes at a minimum (a) the ready availability of nutritionally adequate and safe foods and (b) an assured ability to acquire acceptable foods in socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing, or other coping strategies). *Food insecurity* exists whenever the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain ¹.

The food security status of each household lies somewhere along a scale extending from high food security to very low food security. This continuum by USDA is divided into four categories as shown below ¹⁰:

High food security	Households have no problems, or anxiety about, consistently accessing adequate food.
Marginal food security	Households have problems at times, or anxiety about, accessing adequate food, but the quality, variety, and quantity of their food intake are not substantially reduced.
Low food security	Households reduce the quality, variety, and desirability of their diets, but the quantity of food intake and normal eating patterns are not substantially disrupted.
Very low food security	At times during the year, eating patterns of one or more household members is disrupted and the food intake reduced because the household lacks money and other resources for food.

3.2 Prevalence of Food Insecurity and Its Measurement

In 2010, the prevalence of food insecurity in the United States was 14.5% (17.2 million households). On the whole 9.1% households had low food security and 5.4% had very low food security. Households in some states prone to food insecurity, such as Ohio, had average rates of household food insecurity and very low food security in 2008-2010 at 16.4% and 6.6 % respectively ².

This prevalence is estimated based on the Current Population Survey Food Security Supplement (CPS-FSS) which is conducted to monitor the food security of major demographic groups in the United States. The 18-item food security scale has been used to estimate the prevalence since 1995 ¹¹. The scale includes items which ask situations and behaviors that serve as indicators of the food security condition. The Food Security questionnaire includes questions that ask about

four kinds of household conditions, events, and behaviors ¹², such as 1) anxiety that the household food budget or food supply may be insufficient to meet basic needs; 2) perceptions by the respondent that the food eaten by household members was inadequate in quality or quantity; 3) instances of reduced food intake by adults in the household, or consequences of reduced intake such as the physical sensation of hunger or loss of weight; and 4) instances of reduced food intake or consequences of reduced intake, by children in the household.

All of the food security questions have two characteristics in common. Each question makes sure that the reported behavior or condition occurred because of household financial limitations by including phrases such as “because we couldn't afford enough food” or “because there wasn't enough money to buy food.” Also, each question asks explicitly about circumstances that occurred within the past 12 months (The CPS also included questions asking about the past 30 days, but the primary scale is based exclusively on 12-month questions). The food security scale used is a three stage design with screeners used to assess food security at household level, adult stage and child stage.

This measure expresses the household's level of food security or insecurity in terms of a numeric value that ranges between 0 and 10 and divides the household into one of four categories (High, marginal low and very food security). The scale thus represents the *severity* of household food insecurity. It is important to remember, however, that the scale measures only the *sufficiency*, not the nutritional adequacy, of the household food supply and food budget ¹¹. There are clearly some strengths and limitations of this measure compared with others.

Some of the *advantages* include: The United States Food Security Module, is based on solid science, with input from a wide range of knowledgeable people, and has been refined and updated over the past few years to become even more rigorous than originally designed. A major

strength of the instrument is that it is easy to administer and analyze, and provides a dimension of food security that is well understood by policy-makers. The module can also be easily incorporated into other survey with low respondent burden. This offers a major advantage in terms of costs and logistics. There are several limitations. It is not clear that this scale can measure the complexity of hunger in any given locale ². Also the scale measures only sufficiency, not nutritional adequacy which is an important consideration to understand the wellbeing.

3.3 Risk factors of Food Insecurity

Food insecurity was strongly related to income; with 40.2% households with incomes below the official poverty line were food insecure, compared with 7.4% of those with incomes above 185% of the poverty line. Even so, almost two-thirds of households with incomes below the poverty line managed to remain food secure throughout the year, while some households with annual incomes well above the poverty line were food insecure at times. This reflects, in part, the influence of other factors on food security: the stability of income and employment; local costs of food, housing, and other basic needs; use of food assistance and other noncash assistance; health of household members; ownership of assets; family stability; and household management skills ¹³.

Food security also depends considerably on household structure and composition. Food insecurity in 2010 was least common among households consisting of multiple-adults households with no child/children present (4.0%) and households that included an elderly person (2.6 %). Single mothers with children registered the highest rate of food insecurity (35.1 %), while married couples with children (13.8 %) showed the lowest rate. These differences result in part from income differences associated with household composition, but even when the effects

of income are accounted for, single mothers with children are more likely to be food insecure than married couples or single fathers with children (25.4%), and households with elderly members are less likely to be food insecure than those without elderly. Rates of food insecurity were higher among Black and Hispanic households (25.1 % and 26.2 %) than among White non-Hispanic households (10.8 %), reflecting primarily the lower incomes and higher poverty rates of these groups ².

Michael Schiferl and Sheila Zedlewski reported about the characteristics of children in families that use emergency food assistance, focusing especially on Hispanic children compared with other race and ethnic groups. It was seen that the vast majority (82%) of children in families that received emergency food assistance in 2009 lived in poverty, including nearly one-half that lived in deep poverty (below 50 % of the federal poverty level). Children in Hispanic and white families were less likely to live in deep poverty than black children (48 and 43 %, respectively, compared with 52 %). Family composition was another predictor for their use of these programs. Family composition differed by race and ethnicity for families receiving food assistance program. Among all children in families with assistance, 29 % lived with only one adult present, 46 % with two adults, and 25 % with three or more adults. Hispanic children lived with more adults than either black or white children. The number of working adults also determined their food security status. Almost 48 % of these families turned to these assistance programs having no working adult in 2009. Hispanic families more often had working adults than other race groups (63 % compared with 40 % for blacks and 51 % for whites) ¹⁴.

Therefore, in the *United States*, the primary causes of food insecurity have been low and unstable income, unemployment and unstable employment, disability, family disruption, and lack of community and extended family support—but much also remains unknown.

3.4 Consequences of Food Insecurity

Food insecurity can affect food intakes, nutrient intakes, health status and further quality of life

¹⁵. Kendall et al examined the association of hunger and food insecurity to food consumption with a random sample of women in New York. They found that the frequency of fruit and vegetable consumption was significantly lower in food insecure group (3.6 and 2.3 times/week) than those who are food secure (6.0 and 2.9 times/week). In addition, potassium and fiber intake was significantly lower in the food insecure as compared to the food secure group ($p < 0.002$ and $p < 0.03$ respectively).

Secondary data analysis with the third National Health and Nutrition Examination Survey (1988–1994) and the Nutrition Survey of the Elderly in New York State (1994) also found that food insecure older adults had significantly lower intakes of energy, protein, carbohydrate, saturated fat, niacin, riboflavin, vitamins B-6 and B-12, magnesium, iron and zinc than food secure adults. Additionally, food-insecure older adults were 2.33 (95% CI: 1.73–3.14) times more likely to report fair/poor health status than the food secure and had higher nutritional risk for deficiencies or malnourishment ¹⁵.

Based on the 1994–1996 Continuing survey of food intakes by individuals, overweight (defined as BMI $> 27.3 \text{ kg/m}^2$ for women and $> 27.8 \text{ kg/m}^2$ for men) was associated with food insecurity in women ($p < 0.0001$), but not for men ($p < 0.44$). With the exception of 11 severely food insecure women, the prevalence of overweight among women was higher for moderately food insecure (52%, $n=86$) than the mildly food insecure (41%, $n=3447$) and was 34% for those who were food secure ($n=3447$). Food insecurity remained a significant predictor of overweight status, after adjustment for potentially confounding demographic and lifestyle variables ($p < 0.01$) for this population ¹⁶.

An extensive literature review has shown that women who experience food insecurity are more likely to be overweight or obese as compared food secure women; however there is little evidence that food insecurity promotes increased weight gain over time. Among children and men, association between food insecurity and weight status has been mixed ¹⁷. The following paragraph provides the evidence from previous studies.

Compared with fully food-secure men, marginally food-secure men had a higher mean BMI (+1.2 kg/m², p< 0.05), and a tendency to be overweight (+6.4 percentage points, p= 0.06) and obese (+6.5 percentage points, p = 0.08). In contrast, compared with fully food-secure men, low food security was associated with lower BMI (-0.9 kg/m², p < 0.05) and a lesser likelihood of being overweight (-8.3 percentage points, p < 0.05). In another study with the 1999-2002 NHANES data, divorced men were significantly more likely than never-married men to report very low food security (OR= 2.8, p< 0.05). Also, divorced men (7.2%) were more likely than never-married (4.1%) men to live in a household with very low food security. Compared with fully food secure men, marginally food-secure men were heavier, whereas men with low food security were lighter. Compared with fully food-secure women, marginally food-secure women tend to have a higher BMI (+ 0.8 kg/m², p =0.10) and are overweight (+6.5 percentage points, p=0.05), whereas women with low food security were significantly more likely to be obese (+10.8 percentage points, p < 0.01) also showed a tendency to be overweight (p < 0.05), whereas women with low food security were more likely to be obese. When considering the interaction between food insecurity and marital status, food insecurity was related to a greater likelihood of obesity among married women, those living with partners, and widows, when compared with never-married women ¹⁸.

3.5 Coping Strategies to Overcome Food Insecurity

Households with limited food resources employ a variety of strategies to overcome lack of foods, such as using federal and/or community food assistance programs, cooking with other people, and obtaining foods from worksite ¹⁹. In addition, some people identified selling blood and participating in multiple research studies to earn money for food as coping strategies ⁷.

SNAP, National School Meal program, and WIC are the three largest Federal food and nutrition assistance programs. Fifty nine percent of food-insecure households reported receiving assistance from one or more of the three largest Federal food and nutrition assistance programs during the month prior to the December 2010 food security survey. As community food assistance program, food pantries were recognized as one of the prime contributors to relieve food insecurity. In 2010, approximately 18% of food pantry users were low food secure and 32.1% were very low food secure households ².

3.6 Social Capital

Concept and Definition:

Besides tangible assistance to eliminate food insecurity, the recognition on the impact of collective social functioning on an individual's ability to access food has been increased ²⁰. With growing recognition of the social determinants of health, social capital and social support are increasingly important concepts in international health research ²⁰. Strong and compelling evidence covering extended time span links social support and networks with positive health outcomes ^{21, 22}.

Social capital is about the value of social networks, bonding similar people and bridging between diverse people, with norms of reciprocity ²³. Like other forms of capital, social capital is based upon the idea that an investment (in social relations) will result in a return (some benefit or

profit) to the individual or social unit²⁴ . The idea of social capital originated in the fields of sociology and political science to explain how citizens within certain communities cooperate with each other to overcome the dilemmas of collective action, but recently public health researchers have turned to the tool of social capital to explain heterogeneities and disparities in population health status across geographic areas ²⁵ .

The first systematic contemporary analysis of social capital was conducted by Pierre Bourdieu, who defined the concept of social capital as “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition” ²⁶ . The modern development of the concept came from three key authors, Bourdieu, Coleman and Putnam with many other authors contributing to the current multidisciplinary theory. In simple words, social capital refers to resources accessed by individuals and groups within a social structure that facilitate co-operation, collective action and maintenance of norms ²⁷ . Social capital includes a structural and a cognitive aspect. The first implies taking part in social networks and associations and other forms of civic engagement, and the second refers to the perception of level of trust and reciprocity, through norms, values and attitudes ²⁸ . In simplest terms, the two components can be characterized as what people ‘do’ and what people ‘feel’ in terms of social relations.

Association of Social Capital to Food Insecurity, Nutrition and Health

Social capital, particularly in terms of reciprocity among neighbors and community, contributes to higher food security and is positively associated with it. Walker et.al conducted a cross-sectional, self-administered mailed survey in Athens County, Ohio, to examine the household food security status, social capital, and self-rated health status of women from households receiving WIC benefits alone (n=170) and those from households receiving both WIC and

Farmers' Market Nutrition Program benefits (n=65), as well as the relationship of food security, social capital, and self-rated health status. Perceived health status were not significantly different between the food secure and food insecure groups; however, high social capital was observed greater ($\chi^2=8.156$, $p=0.004$) for WIC participants, compared to WIC/Farmers' Market Nutrition Program group respondents. Overall, household food insecurity was inversely associated with perceived health status ($r=0.229$, $p=0.001$) and social capital ($r=0.337$, $p<0.001$)^{29, 30}. In an urban sample from Hartford, Connecticut, social capital at the household and community levels was significantly associated with household food security. Community level social capital was significantly associated with decreased odds of experiencing hunger. (Adjusted odds ratio (AOR) = 0.47, $p < 0.01$)³¹. In addition to food insecurity a study showed the association between social capital and food consumption. Higher levels of social capital was positively associated with fruit and vegetable intake among a rural group (n=1220) in Central Texas ($r=0.410$, $p<0.010$)³².

Measurement of Social Capital

Social capital is relatively a new concept and hence no consensus has yet been reached to measure social capital, resulting in several tools available³³. All the instruments found are summarized in Table 1. The instruments address the structural and cognitive component to measure social capital. Most of them also measure social capital at household, community and organizational levels.

The questionnaire developed by Jenny Onyx and Paul Bullen (2000) includes 36 items. Eight distinct elements of the questionnaire include participation in local community, neighborhood connections, family and friend connections, work connections, proactivity in social context, feeling of trust and safety, tolerance of diversity and value of life. The response scale of the

items is 4-point Likert scale ranging from 1 (strongly/somewhat disagree or never/rarely) to 4 (strongly/somewhat agree or often/sometimes).

Another instrument by Krishna and Shrader (1999) called as the Social Capital Assessment tool (SCAT) has three key components. A *community profile* which incorporates hands-on qualitative methods with a community survey instrument to assess various dimensions of community-level social capital, including community assets identification, collective action, solidarity, conflict resolution, community governance and decision making, institutional networks, and organizational density; a *household survey* which includes a 39 -close-ended items that relate to structural social capital and a 21- close ended items that relate to cognitive social capital; an *organizational profile* designed to define the relationships and networks that exist among formal and informal institutions, integrating semi-structured interview data with a scoring system for assessing organizational capacity and sustainability. It has the unique advantage of clearly distinguishing between cognitive and structural components of social capital but is time-consuming (over 60-items) ³⁴.

Harpham et al. (2002) designed and used an adapted version of SCAT (A-SCAT) which items on structural (connectedness) social capital and cognitive (reciprocity, sharing and trust) social capital. It has been designed for application in low-income developing country settings with low literacy levels (i.e. it is interviewer administered compared to self-administered). The typical interview duration of A-SCAT is 15-minutes. The instrument has been used in Durban (South-Africa), Lusaka (Zambia) and Cali (Colombia). The data collected using A-SCAT can be analyzed using factor analysis as has been successfully by other (Onyx and Bullen 2001, Krishna and Shrader 1999) and has the potential to yield a single summary number, or at most two numbers, one for structural and one for cognitive social capital ³⁵.

Grootaert, Narayan Jones and Woolcock (2003) provided with an Integrated Questionnaire for the Measurement of Social Capital (SC-IQ) for those interested in generating quantitative data on various dimensions of social capital as part of larger household survey. They have arranged their instrument into six broad sections. The SC-IQ focuses on measurement at the micro level, i.e. level of households and individuals. It does not collect data at the level of community unlike other instruments. All questions are addressed to individuals, in the context of a household survey, and the objective is to obtain information about the participation of household members in groups and associations, perceptions of trust and empowerment, household participation in collective action, etc. ³⁶.

Table 1 Summary of Instruments to Assess Social Capital

Measure	Description	Reliability & Validity
Measuring Social Capital in Five Communities -Jenny Onyx and Paul Bullen (2000)	36 items on trust, networks, reciprocity and social norms at individual, household and community level. Response on a scale of 1 to 4.	The Cronbach's alpha for 36 items was 0.84; in general, the item total correlations are in the range of 0.25-0.45.
Social Capital Assessment Tool (SCAT) -Krishna and Shrader (1999)	Extensive questionnaire with three key components: community profiles, household survey and organizational profile and over 60 items (open and closed ended response required)	The data regarding the reliability and validity is not available.
Adapted Social Capital Assessment Tool (A-SCAT) -Harpham (2002)	Adapted version of original SCAT, with only 7-items on structural social capital and 11-items on cognitive component.	Has been shown to be reliable for application in low-income developing country settings with low literacy levels.
Integrate Questionnaire for the Measurement of Social Capital (SC-IQ) -Grootaert et.al (2003)	Has six broad sections :groups and networks (33-items), trust and solidarity (6-items), collective action and co-operation (7-items),	The data regarding the reliability and validity is not available.

	information and communication (11-items), cohesion (23-items), and empowerment (15-items)	
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3.7 Social Support

Social support is an exchange of resources between two individuals perceived by the provider or the recipient to be intended to enhance the well-being of the recipient. It may also involve the consideration about the costs and benefits of supportive exchanges for both participants, and the importance of non-network sources of support ³⁷.

Concept and Definition:

Social support is usually defined as the existence or availability of people on whom we can rely, people who let us know that they care about, value, and love us ³⁸. *It refers more specifically to assistance provided to individuals (including emotional and tangible), the frequency of contact with others, and perceived adequacy of that support* ³⁹. Social support theorists categorize support into four qualitatively different types: emotional, companionship, informational, and instrumental. Emotional support generally comes from family and close friends and is the most commonly recognized form of social support. It includes empathy, concern, care, love, and trust. Companionship is the type of support that gives someone a sense of social belonging (and is also called belonging). This can be seen as the presence of companions to engage in shared social activities with. Informational support includes advice, suggestions, or directives that assist the person to respond to personal or situational demands. Instrumental support is the most concrete, direct form of social support, encompassing help in the form of money, time, in-kind assistance, and other explicit involvements on the person's behalf ⁴⁰.

Association of Social Support to Food Insecurity, Nutrition and Health

There are a number of indicators of social support that may be associated with health. A large body of research consistently shows that older adults with more social support experience better health. However, the mechanism by which social support affects health is varied. Individuals may be encouraged to participate in healthy lifestyles and discouraged to participate in unhealthy lifestyles or vice versa depending upon their social support system. Additionally, receipt of social support may directly or indirectly enhance one's capacity to enhance personal competence and enable one to access needed resources or services ⁸.

Based on one meta-analysis on the relationship between social support and physiological processes with 81 studies, social support was consistently related to health status such as cardiovascular, endocrine, and immune systems. The most important potential mechanism underlying these associations seems support from family ⁴¹. A study with women who were at food insecure household in Toronto that two-thirds of them (64%) reported feeling isolated and alone some or most of the time. Women who were food insecure with moderate or severe hunger over the past 12 months were almost 6 times more likely to perceive themselves as socially isolated (O.R: 5.81, 95% CI: 2.71-12.47) ⁴². In another study, individuals from food-insufficient households had significantly higher odds of reporting poor/fair health (O.R:2.9), and having poor social support (O.R: 1.7) ⁵.

An array of social support factors also correlate with poor nutrition in older adults. The positive benefits are conferred to those who are married, especially men, has been repeatedly demonstrated in regard to nutritional health in older adults. Persons who are married are less likely to skip meals and better able to afford them. Older men who are not married, particularly those who are widowed, are vulnerable to experiencing poor nutritional health because they have

not been socialized to be feeders and often do not know how to shop or cook for themselves, hence may not eat for 1 day or more and experience hunger (O.R=0.73, CI: 0.59-.089) ⁴³.

Women, especially those who are widowed, are also vulnerable to poor nutritional health because they may not be able to afford an adequate diet. Additionally, women traditionally cook for others; and it is one of the primary ways they express their care for others ⁴⁴. When older women no longer have anyone to cook for, they may be less inclined to cook only for themselves ⁴⁵. Lack of social support, having a limited social network, being socially isolated, particularly living alone or being divorced, separated, or widowed, especially for men, are risk factors for poor nutritional intake or status ^{43, 46}.

Measurement of Social Support

The definition of social support varies but mostly includes both tangible (e.g., financial assistance and physical aid) and intangible components (e.g., encouragement and guidance). It is difficult to resolve discrepancies in the measures as they vary widely from study to study as there are many inconsistent findings on the measurement of social support in the literature. In order to guide selection of measurement strategy for use in our research setting, a review of current journals and instruments was undertaken to best fit our study and the summary of the instruments is shown in Table 2.

The Norbeck Social Support Questionnaire ⁴⁷ is a self-administered measure that asks respondents to list 20 social network members; giving a rating to each member on a scale from 0 to 4. Test- retest reliabilities were 0.85 and 0.92, concurrent validity for this measure was based on poor to modest positive correlation (-0.3 to 0.56). In conclusion, this scale seems to be reliable, although the validity data are weak and the number of items employed may be few to adequately cover the content (content validity) of social support ⁴⁸.

Another instrument developed by Sarason et al conceptualizes social support in functional terms (e.g., listing people who provide certain services) was not found to be as useful as viewing support as the respondents' perceptions that they are valued and loved and have available to them persons who will provide assistance if necessary. Each one asks a question for which a two-part answer is requested just as NSSQ. The items ask that subjects (a) list the people to whom they can turn and whom they can rely in given situations (b) indicate how satisfied they are with these social supports ³⁸.

Broadhead et al described the measurement for social support in family medicine patients. This was a 14-item self-administered, multidimensional and functional social support questionnaire. The questionnaire is brief and has been tested-retested for reliability and validity. It addresses more relevantly to the patients in clinic and recovering from any kind of major illness and the support accessible to them ⁴⁹.

The Medical Outcome Study (MOS) social support survey developed by Cathy and Anita (1991) is a brief, multidimensional self-administered social support survey for patients in medical outcome study (MOS). Multitrait scaling analyses supported the dimensionality of four functional support scales and the construction of an overall functional social support index. These support measures are distinct from structural measures of social support and from related health measures. They are reliable ($\alpha > 0.91$), and are fairly stable over time. Selected construct validity hypotheses were supported ⁵⁰.

Table 2 Summary of Instruments to Assess Social Support

Measure	Description	Reliability & Validity
Norbeck Social Support Questionnaire (NSSQ) -Norbeck et.al (1981)	Self-administered, respondents list 20 network members and answer 9 questions each which include 6 items on functional properties of	Test-retest=0.85 to 0.92, concurrent validity =0.03 to 0.56

	social support, 1 each on duration of relationships, frequency and recent losses	
Social Support Questionnaire (SSQ) -Sarason et. al (1983)	2 separate parts -List of individuals in network -Overall level of satisfaction with support received for each item (27 items)	Test-retest=0.90 for SSQ –Number (N) and 0.83 for SSQ-Satisfaction (S)
Duke-UNC Functional Social Support Questionnaire -Broadhead et.al (1988)	Self-administered 14 five- category Likert format items. Contained questions in four content areas: quantity of support, confidant support, affirmative support and instrumental support	Test-retest correlation=0.66.
The Medical Outcome Study (MOS) Social Support Survey -Cathy and Anita (1991)	19 -functional support items to measure five dimensions of social support :emotional, informational, tangible, positive social interaction and affectionate support	Reliability co-efficient =0.92.

4. Methods

This is a cross-sectional pilot study using in-person interview survey.

4.1 Participants

Fifty three participants were recruited using a convenience sampling at a food pantry at the Society of St. Vincent De Paul (SVdP) in downtown Cincinnati. SVdP in Cincinnati is a non-profit organization providing personal assistance with food, clothing, medicine, rent, utilities, transportation and companionship to people facing economic, emotional or spiritual crises. SVdP food pantry serves the community of West End where there is high prevalence of low social economic status (SES) population and it is a food desert. After they completed the survey, they received \$ 15 gift certificate as an incentive.

4.2 Procedure

On the days of food pantry service, flyers were posted in order to recruit participants. The food pantry users who were interested in the study signed up for the study at the front-desk.

Approximately 50 – 60 minute in-person interviews were conducted in reserved rooms and most of the interviews were conducted by two graduate students (The interview also include additional surveys as a part of another research project).

4.3 Instruments

Demographics: Questions on age, gender, educational level, ethnicity/race, living arrangement, income, and use of food assistance and other assistance programs were included.

Food Security: The 18-item U.S. Household Food Security Survey Module, an 18-item was used to assess food security. The module was developed and validated by the USDA based on two decades of research identifying the particular set of conditions, experience and behavior patterns that consistently characterize the phenomenon of food insecurity and hunger ¹¹.

Social support: A 23-items questionnaire was developed to assess social support. The nine-item questionnaire developed by Norbeck was used as a basis for the development ⁴⁷. The fact that a person does not receive support during a given time period does not mean that the person is unsupported. Received support is confounded with need and may not accurately reflect the amount of support that is available to a person. We generated a pool of 23 items based on support items and dimensions identified in the literature review. The questionnaire includes sub-constructs: instrumental (8-item), emotional (7-item), informational (3-item), and companionship (2-item), and a general category (3-item). Each question was answered on a Likert scale of 0 (no not at all) to 4 (a great deal), except the last three questions which were open-ended. A maximum score of 80 points could be achieved if each question was given the highest score of 4 points.

The internal reliability of social capital was tested by calculating Cronbach's α was 0.819 ($\alpha > 0.70$ considered reliable).

Social capital: A 42 item instrument includes modified 36- items of the social capital questionnaire⁵¹ and newly developed 6 items on social capital related to food insecurity. The questionnaire is composed of six sub-constructs: trust (5-item), networks (6-item), and cooperation (8-item) community-level (10-item), household level (4-item), and self-perception (9-item). Each of the question was answered on a Likert scale of **1** (strongly disagree or never) to **4** (Strongly agree/often/always). A maximum score of 168 points could be obtained if the response for each question was given the highest score of 4. (Internal reliability: Cronbach's $\alpha = 0.857$).

P.S. The instruments can be obtained on request to the author.

4.4 Data Analysis

The data were entered into SPSS (Statistical Package for the Social Sciences version 19). For social support, the total score was calculated by adding the rating for each question (which includes all the ratings listed for each member as a support within that question) and then dividing it by the number of people listed. Total scores for social support section were calculated by adding the individuals' scores for each sub-construct. Scores were calculated for each sub-construct by adding the ratings for each question within the sub-construct. The mean total score was obtained by dividing the total score by the number of questions in that sub-construct. Overall total scores for social capital calculated by adding the individuals' scores for each sub-construct. The overall mean total score was obtained by dividing it by the number of questions in the questionnaire. Also the mean total score for each sub-construct was calculated by dividing it by the number of questions in each sub construct. Descriptive statistics (mean, SD, and frequency)

of demographics, food insecurity, social capital, and social support was run. The relationships among food security, social capital, and social support examine were examined using Pearson's correlation coefficient. A p-value <0.05 was considered statistically significant ⁵².

5. Results

5.1 Characteristics of Participants

Fifty-three food pantry users participated in the study. As shown in the Table 1, more than half of the participants were male and were mainly non-Hispanic Black American. Approximately 35% had less than high school education and 42% had completed high school or GED. More than half was single and more than two thirds are unemployed. The average poverty level was 30% (range: 0 - 111.29%). Most of the participants used several federal assistance programs, such as SNAP (98.1%), Social Security Income (75%), and Social Security Disability (83%).

Table 3 Demographics of Participants (n=53)

Variables	
Age (year)	50.5 ± 9.05
Gender (%)	
Male	54.7
Female	45.3
Race (%)	
Black American	88.7
White American	9.4
Other	1.9
Marital Status (%)	
Married	1.9
Single	59.6
Divorced/Separated/ Widowed/Widower	26.9
Co-habitant	11.6
Household Size (%)	
Single	60.4
Two	17.0
Three-Six	22.6
No. of children (%)	
None	81.1
1-5	18.9

Education (%)	
Less than high school	34.6
High School or GED	42.3
Some College/College	23.1
Household Income \$ (Annual)	6,216.7 $\pm$ 4,813.4
Poverty (%)	30.7 $\pm$ 35.0
Employment (%)	
Employed	20.8
Unemployed	79.2

5.2 Food Security Status

As shown in the figure 1, most of them were food insecure (96%) and among those 59% had very low food security.

Figure 1 Food Security of Food Pantry Users

5.3 Social Capital

The overall mean total score for social capital was **2.76 $\pm$ 0.41** (Range: 1.57 - 3.52). As shown Figure 2, among the sub-constructs the mean score was highest for ‘Self-perception’ (3.2 $\pm$ 0.64) which may indicate that people in this sample had a higher self-value when compared to their peers in their community. It was the lowest for ‘Community involvement’ (2.2 $\pm$ 0.61) which may demonstrate lack of social networking and communication between people. There was no significant correlation between the overall social capital scores and food security status, though

there was negative correlation between a sub-construct ‘trust’ and the food security status ($r=0.324$, $p=0.018$).

Figure 2 Average Social Capital Scores for each sub-construct

5.4 Social Support

The average number of people listed for immediate help or support was 4.9 ± 2.4 and they included immediate family members (49%), friends (24.3%) and relatives (10.8%) indicating that family was the first one to turn to help when in need. The overall mean total score for social support was 2.69 ± 0.49 (Range: 1.18 -3.73). Among the sub-constructs the mean score was highest for ‘Emotional’ (3.1 ± 0.42) and lowest for ‘Companionship’ (2.19 ± 0.72) as shown in figure 3. Participants scored the lowest for ‘Companionship’ sub-construct which may be due the fact that majority of the sample was single or staying alone (60.4%) hence didn’t have anybody to share their feelings or concerns.

Figure 3 Average Social Support Scores for each sub-construct

5.5 Relationship among Food Security, Social Capital, and Social Support

There was no significant correlation between food security and total social capital score as well as food security and total social support score as shown in Table 4. However, there was a significant correlation between social capital and social support scores. Among sub-constructs in social capital, ‘Trust’ is negatively related to food security ($r=-0.324$, $p=0.018$) (Data not shown in the table).

Table 4 Pearson correlation co-efficient among Food Insecurity, Social Capital, and Social Support Scores

	Food Insecurity	Social Capital
Social Capital	-0.118	
Social Support	-0.198	0.348*

* $p < 0.05$

6. Discussion

Based on my knowledge and the literature review, this is the first study to examine the relationship among food insecurity, social capital, and social support in food pantry users. The idea of social capital and social support has been in prominence mainly in theoretical and social science over the last decade ³⁶. Our study has tried to extend this idea to food security status in the food pantry users. Though we did not find a significant correlation between food security to social capital and social support, there was a significant positive correlation between one of the sub-construct of social capital ‘trust’ and food security status.

Most of the previous studies on social capital examined the relationship of social capital to economic growth, income inequality, hunger, and health. ^{5, 8, 9, 27}. Martin et al examined whether food security was associated with social capital at household and community level in 330 low-income households in Hartford, Connecticut. They found that food security was significantly associated with social capital at both household and community level and high social capital was significantly associated with decreased odds of experiencing hunger (adjusted odds ratio = 0.47, 95% CI: 0.28, 0.81) ³¹. On the other hand, social support related studies have been linked to nutritional risk, health, income, and usage of food assistance programs; however, there have been very few studies on the food security status. A study reported that Black Americans were at a greater risk of poor nutritional health, social isolation, and less social support and social capital as compared to White Americans ⁸. Black women were most likely to have high nutritional risk (30.9%) compared to white women (21.6%), black men (25.5%) and white men (7.2%). Also, lack of social support was significantly higher ($p < 0.001$) in black women as compared to white women, and in black men as compared to white men. The above data analysis was controlled for age, education, income, and marital status ⁸.

Even though this present study did not find any significant association of food insecurity to social support and social capital, several previous studies showed a negative association between them. One of the earlier studies with data from the 1996/1997 National Population Health Survey consisting of ~3200 households in Canada has reported that food insufficient households had significantly higher odds of having poor social support (OR=1.7) ⁸. Although it might appear that household food insufficiency predisposes individuals to poor health and social support but the reverse can also be true. Craig et al. found seasonal food insecurity was positively associated with social support in a sample of ~200 mothers from two ethnic groups living in rural Tanzania ($p<0.01$) ⁴⁰.

Most of previous research studies on social capital and social support have dealt with populations such as households, low-income groups, WIC participants, older men and women, families seeking food assistance programs, however studies involving food pantry users have mainly been examined their participation in food assistance programs, nutrient intake and coping strategies to overcome food insecurity ^{53, 54, 55}. Majority of the participants in this present study used SNAP to obtain food, but some didn't use it. Some of the previous studies have identified the barriers to participation in SNAP. In one of the study, it was reported most of the food pantry clients who are eligible for food stamps did not receive them. Even though almost 90% of the clients were living below poverty line, only 15% of them received food stamps because of homelessness (due to inability to provide residential proof) and limited English language skills ⁵³.

The present study examined a new dimension of the food pantry users, such as their social networks and support so that it can be prospectively used as coping strategy to overcome food insecurity. Studies in the past have examined different coping strategies and nutrition education needs to overcome food insecurity among the food pantry users. Some of them included finding

means of stretching food supplies by freezing them, making food in bulk and using left over were few that were mentioned. Also they used a combination of stores, discount coupons, and sales to obtain food and ingredients. Stretching food dollars was the most requested topic for nutrition education ⁵⁵.

There are a couple of strengths of this study. This is the one of the first studies to explore social capital and social support together in food pantry users. In addition, the instruments were modified specifically to cater the food insecure population by adding questions related to food status, finances regarding food management, hunger etc. Some of the limitations were that the sample size was small. Also, it took almost an hour to complete the whole survey. Hence people may tend to be less attentive towards the end.

7. Conclusion

There was no significant association of social capital and social support to food security status. A study with a larger sample size may be needed to examine the association. A mixed method involving both qualitative and quantitative approach may be useful to understand how social support and social capital are associated with food security and how they are used as coping strategies to overcome food insecurity. A mixed method approach may use in- depth assessment of severity of food deprivation, qualitative compromises in food selection, and acceptability of foods consumed may help to evaluate the effect of social capital and social support, related to food security in the food pantry users more efficiently.

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