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Social Capital and Food Insecurity in Two Counties in Wisconsin

Yvonne Denise Greer
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Walden University

College of Health Sciences and Public Policy

This is to certify that the doctoral study by

Yvonne Greer

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
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Walden University

2022

Abstract

Social Capital and Food Insecurity in Two Counties in Wisconsin

By

Yvonne D. Greer

MPH, University of Minnesota, 2000

BS, University of Wisconsin – Stevens Point, 1976

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Public Health

Walden University

November 2022

Abstract

Hunger and food insecurity are public health issues, with 38 million people in the US struggling with food hardship. This study examined if there was a relationship between four types of social capital (SC) (bonding, bridging, community structural-formal, and community structural-informal), income, and food insecurity risk (FIR), in two counties in Wisconsin. A quantitative descriptive correlational study design involving multiple linear regression analysis, and the integral model framework was conducted with cross-sectional secondary data from the 2014-2016 Survey of the Health of Wisconsin. Participants were from Milwaukee ($n = 335$) and Dane County ($n = 235$). Results revealed that in Milwaukee County, community structural formal SC (e.g., WIC, SHARE) was positively associated ($\beta = .135$, $p = .015$) with FIS risk, while community structural informal SC (e.g., farmers market, supermarkets) was inversely associated ($\beta = -.190$, $p = .028$) with FIS risk. In Dane County, only bonding SC was inversely associated ($\beta = -.283$, $p < .001$) with FIS risk. When examining income, social capital, and food insecurity risk, for both Milwaukee (MIL) and Dane (DA) County, significant inverse correlations were found for bonding SC (MIL, $\beta = -.152$, $p = .025$), (DA, $\beta = -.178$, $p = .024$); 200% of federal poverty level & below (MIL, $\beta = -.346$, $p < .001$), (DA, $\beta = -.418$, $p < .001$); and education attained, (MIL, $\beta = -.187$, $p = .013$), (DA, $\beta = -.157$, $p = .021$). By adopting targeted actions into nutrition and health practice that enhance the food insecure's bonding relationships, sense of belonging, awareness/access to community food resources, and self-efficacy, while promoting public policy reforms for greater education attained and a living wage, positive social change can be achieved.

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Dedication

This research is dedicated to my Mom and Dad for helping me to dream of the possibilities of what I could accomplish from a very young age.

My mother, Louise McKinnie, my first health and nutrition teacher, helped me to explore the health professions that I could pursue after I told her that I wanted to reach as many people as possible to help them to live long and healthy lives.

My dad, Henry X (aka, Abdul Wali Suluki) always spoke of the importance of getting a college education and encouraged me to dream big. He proclaimed that by dreaming big you can accomplish great things, versus dreaming small, you will never accomplish anything.

These two individuals provided me with the strong foundation needed to excel and to always believe that I could accomplish whatever my mind could envision despite any obstacles that may arise.

Thank you both for your direction, support, and unconditional love!

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Section 1: Foundation of the Study and Literature Review

Addressing hunger and food insecurity has been recognized as a global public health issue for decades, with reports of starving children in drought and war-torn countries such as Bangladesh or Somalia (Biswas et al., 2017; World Food Programme, 2017). Worldwide, approximately 795 million individuals were classified as undernourished in 2015 (Biswas et al., 2017; Food and Agriculture Organization [FAO] et al., 2015). This translated to about one in every nine individuals across the globe who were food insecure and not able to eat the food needed for optimal health and longevity (FAO et al., 2015).

By 2017, 815 million undernourished people were reported, indicating an upward trend (FAO et al., 2017). This was attributed to factors including food insecurity, climate change resulting in higher food costs, conflicts due to war, and more recently, severe effects due to the COVID-19 pandemic (FAO et al., 2017; US Department of Agriculture Economic Research Service [USDA ERS], 2022; World Food Programme, 2017; World Food Programme et al., 2011). Currently within the United States, 38.3 million people continue to struggle with food insecurity, which includes 6.1 million children who live in households where both the children and adults are food insecure (USDA ERS, 2022). Although rates were beginning to trend downward, this was still significantly higher than in 2006 (i.e., 35 million) prior to the recent 2007 recession period (USDA ERS, 2018b).

The emergence of hunger as a critical public health issue in the United States can be traced back to the Great Depression that occurred between 1929-1935, during which

widespread hunger, severe undernutrition, and starvation were issues which required the government to intervene (Hoefler & Curry, 2012; O'Brien et al., 2004). As companies failed, unemployment rose to 24.86%, with hundreds standing in bread lines due to lack of work (O'Brien et al., 2004). Farmers, having no markets for their crops, had to leave crops in the fields to be plowed over (O'Brien et al., 2004).

Problems experienced during this time along with ineffective policies that were implemented contributed to the election of Franklin D. Roosevelt with his New Deal reforms. He enacted the Federal Emergency Relief Administration (FERA) and Federal Surplus Relief Corporation (FSRC), which involved obtaining excess agricultural commodities and redistributing them to states and local cities in order to be given to the poor and less fortunate (Hoefler & Curry, 2012; O'Brien et al., 2004). Its concept formed the foundation for the Commodity Supplemental Food Program (CSFP), implemented in 1973, and the Temporary Emergency Food Assistance Program (TEFAP), reestablished in 1981.

Inadequacies with commodity distribution programs during the Depression era led to the creation of the food stamp program (FSP) in 1939. However, early FSP required payment for food vouchers, with additional vouchers given out to obtain commodities surpluses as a supplement (O'Brien et al., 2004). The early FSP pay system and CSFP stayed in place until 1943, when the programs ended during the war years. Although the programs were no longer in force, hunger was still an issue, and people turned to charity handouts to help feed their families (O'Brien et al., 2004). Policy officials were aware of ongoing hunger issues, as 40% of war draftees were turned away due to poor physical

condition (Hoefer & Curry, 2012; O'Brien et al., 2004). Hunger was now viewed as a problem affecting national security. Therefore, due to concern for poor and starving children, the federal government, with strong support by both parties enacted the National School Lunch Act of 1946, establishing school lunch programs (SLP) throughout the nation.

During the post-war period, as the economy recovered, all food assistance programs but the National School Lunch Act were abandoned (O'Brien et al., 2004). It was not until the 1960s, when presidential candidate Senator John F. Kennedy brought attention to the hidden hunger seen in many communities, particularly in the mountains of West Virginia, that the government's focus turned back to the plight of poor families in America. Therefore, to address the hunger issue, his first action as president was to expand the commodities program and establish a new food stamp pilot program that was no longer tied only to commodities, allowing for expanded food choices (Hoefer & Curry, 2012; O'Brien et al., 2004). During the Johnson presidency that followed, the Food Stamp Act of 1964 was established as part of a larger farm support bill.

Over the course of the next 15 years, various food assistance programs would be enacted based on the goal of eradicating hunger in the US. In 1966, the School Breakfast Program (SBP) was created and became permanent in 1975. In 1968, after a citizens' board of inquiry documented widespread starvation and hunger throughout US counties, and a TV documentary entitled *Hunger in American* reported on malnutrition in the southwest and south, the government enacted the Summer Food Service Program (SFSP) and Child and Adult Care Food Program (CACFP). These programs were geared to poor

children to ensure healthy meals over the summer months when school was not in session (Hoefler & Curry, 2012; O'Brien et al., 2004).

In 1969, the first White House conference on food and hunger was held. From that conference, it was established that malnutrition and hunger were critical problems in the United States, and not rare. Because of the hearing, two new programs were established. The Food Stamp Reform Act of 1970, the entitlement framework used today, with reforms seen in 1977 removing the pay requirement and expanding eligibility (Hoefler & Curry, 2012; O'Brien et al., 2004). In 1975, the advocacy group Food Research and Action Center (FRAC) was activated and provided advocacy support for expansion of food stamp allotments.

The second food assistance program established because of the White House conference was the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). WIC provides healthy food allocations, medical assessments, and instructions for low to moderate income (up to 185% of the federal poverty level) pregnant and breastfeeding women, infants, and children under 5. Currently, WIC is fully funded and viewed as one of the most successful health promotion programs; for every \$1 spent in WIC, there can be as much as a \$3.00 savings in terms of diverted healthcare costs (O'Brien et al., 2004; USDA Food and Nutrition Service [FNS], 2013).

In 1979, the FRAC conducted the landmark Childhood Hunger Identification Project (CCHIP) to document the extent of childhood hunger in the US. The CCHIP concluded that approximately four million youth under 12 were going hungry, and almost

10 million youth were at risk for hunger (O'Brien et al., 2004). Poor children who experienced hunger had higher rates of school absenteeism due to illness, more school nurse visits due to headaches, anger and behavioral issues, and poor school achievement due to lack of concentration as compared to poor children who were well nourished (Hoefer & Curry, 2012; O'Brien et al., 2004). This led to reforms of the school meals program to include free and reduced meals for low-income families. Over time, it expanded to include the Fresh Fruit and Vegetable Program (FFVP) and Farm to School program.

Also in 1979, with the financial backing of the federal Department of Housing and Urban Development (HUD), Second Harvest was formulated as a nationwide collaboration of food banks. It functioned as the largest clearing house of surplus food for use by food pantries and other food relief organizations. Over the years, Second Harvest would go through various name changes to become Feeding American. In addition to providing wholesale food resources, it serves as a food information hub to connect farmers to consumers and hunger advocates in order to address food policy issues, demographic and food access data, and anti-hunger promotional tools (Feeding America, 2018; Weinfield et al., 2014).

During all of the 1980's and early years of the 1990's food assistance expanded with enhanced services and food options. Then, in 1996, Bill Clinton was elected president on a platform to end welfare as it was currently structured. Through a series of reforms, funding for many food safety net programs were reduced, such as the FSP, WIC, SLP, and SBP (O'Brien et al., 2004). Due to the robust economy in 1998, there was not

the political will to address the issue of food insecurity. Although the unemployment rate was low and poverty rates were reducing, the rate of decline in food stamp rolls was nearly threefold more (O'Brien et al., 2004). The reduction in food stamp rolls did not indicate lower food insecurity, but rather suggested that private sector food relief charities saw increased families requesting help (Friedens Community Ministries, 2017; Hoefler & Curry, 2012; O'Brien et al., 2004).

At the start of the Obama presidency, a call to end childhood hunger by 2015 was met with an expansion of the food safety net system. In 2010, the Healthy, Hunger-Free Kids (HHFK) Act was enacted, which reauthorized funding for federal childhood nutrition programs run by the USDA, including the SLP, SBP, WIC, SFSP, and CACFP. The Act allowed the USDA to make program innovations, which included the allocation of funding for research to address the gaps in access and coverage. The goals of reforms were to improve the nutritional profile of meals and expand the hunger safety net for youth (National Research Council [NRC] and Institute of Medicine [IOM], 2013; FNS, 2013).

Currently, there are 15 food assistance programs in the US food safety net system (Hoefler & Curry, 2012; O'Brien et al., 2004). However, this is still not sufficient to address the needs of very low food insecure households. Moreover, state reforms, such as the work requirement for single adult SNAP recipients enacted in 2015 by the state of Wisconsin, have led to thousands being deemed ineligible for assistance (Beck, 2015). This resulted in capacity concerns for charitable food pantries as participation counts rose (Beck, 2015; Friedens Community Ministries, 2017; Weinfield et al., 2014). Hunger

assistance agencies, nutritionists, and public health practitioners concluded that social and environmental conditions need to be addressed in order to achieve food security for all (Anderson et al., 2016; Coleman-Jensen et al., 2017).

Introduction to Social Capital and Society

In looking to understand the range of thought related to the concept of social capital's influence on society, I reviewed three pioneer sociologists, James Coleman (1926-1995), Pierre Bourdieu (1930 – 2002), and Robert Putnam (1941-) (Claridge, 2004). Coleman, an American sociologist, was interested in different types of capital and their interaction, such as human, physical, economic, and social capital (Claridge, 2004); Coleman, 1986). He utilized the concepts of rational action from the economist to examine social capital and the actions of individuals (Claridge, 2004; Coleman,1986). Coleman believed that social capital resided in the social construct of relationships among people. He saw it mostly as a public good where the actions of individuals connecting benefited society as a whole (Claridge, 2004; Coleman, 1986). He conceptualized social capital as a collective asset of the group, exerting a positive impact on not only the individuals who were actively engaged, but also those that were not (Claridge, 2004; Coleman, 1986). Strong families and communities occurred as a consequence of strong social bonds among trusted members. Coleman made little provisions for the inequality that could result or that causes differential power and status within society, such as economic or racial inequality (Claridge, 2004; Coleman, 1986).

Pierre Bourdieu was a French sociologist and public scholar. He, in contrast to Coleman, was primarily concerned with the dynamics of power in society and the uneven distribution of social capital between individuals (Bourdieu, 1986; Claridge, 2004). Bourdieu viewed social capital as reproducing social inequity and stressed that there was structural limits and unequal access to systemwide resources based on social class, sex, and racial affiliation (Bourdieu, 1986; Claridge, 2004). Social capital was seen as personal property rather than a group collective (Bourdieu, 1986; Claridge, 2004). The individual may exert power on the group, who in turn utilizes the resources.

Opposite of Coleman, Bourdieu believed that social capital was not evenly distributed, but provided to those who expended the effort in gaining it by advancing to higher levels of power and status or by promoting good will (Bourdieu, 1986; Claridge, 2004). Thus, social capital was tied to class and other forms of division. His work on the sociology of culture is still recognized, particularly his concepts on social stratification that relate to status (Claridge, 2004). A key contribution was the relationship between types of capital, including economic, cultural, social, and symbolic status (Claridge, 2004). Bourdieu viewed social capital as having both positive and negative aspects which could lead to greater disparities in society (Bourdieu, 1986; Claridge, 2004).

Robert Putnam, a professor of public health at Harvard, is known for his work in the social sciences, authoring several best-selling books and reports related to social capital (Putnam, 2000; Putnam, 2001). He contended that as a result of advances in technology, coupled with the social and financial changes that has occurred in the 1960s,

there was an extreme decline in Americans' supply of social capital (Claridge, 2004; Putnam, 2000, Putnam 2001). This decline in social interaction was seen in many forms, including lower civic engagement, lower voting rates, less membership in social clubs, people were disconnected from their families, and there was less eating out together or with friends (Claridge, 2004; Putnam, 2000; Putnam, 2001). Although people were bowling more than ever, they were found to be *bowling alone* and not on bowling leagues. These changes seem to usher in an era where neighbors were disconnected, and the moral fabric of American society was fading (Claridge, 2004; Putnam, 2000).

However, Putnam, like Coleman, ultimately believed in social capital as a public good, which encompassed the level of participation, civic engagement, and trusting relationships within local communities, states, and countries (Claridge, 2004; Putnam, 2001). He traveled around the country and noted the innovative ways that people were beginning to reinvent community through new connections that brought hope to society (Putnam, 2001). For example, in Philadelphia, seniors and youth were united in a mentoring and reading project yielding mutual benefit – youth got assistance in reading while the seniors achieved more fulfilled, purposeful lives (Putnam, 2001).

Putnam convened a Harvard working group of 30 scholars from across the US and compiled a report which called for a nationwide campaign to redirect the downward spiral of civic apathy (Claridge, 2004; Putnam, 2001). New ways for rebuilding community ties and restoring civic engagement for the future well-being of society were

offered (Putnam, 2001). Putnam was given credit for popularizing the concept of social capital as used today (Claridge, 2004; Putnam, 2001).

From the social theories of these and other researchers, the concept of addressing the social determinants of health and disparities was advanced (Claridge, 2004; Putnam, 2001). Examining and building social capital is being employed as a strategy for solving complex societal issues (Claridge, 2004; Givens et al., 2018). Today, assessing social connectedness and building social networks can be found in guidance documents as best practice strategies to be incorporated into individual and community health promotion plans (Academy of Nutrition and Dietetics, 2017; Claridge, 2004; Givens et al., 2018; MCOPP, 2022).

Background of the Problem

In health promotion guidance documents developed by the World Health Organization (e.g., 2000-2015 Millennium Development Goals [MDGs]; 2016-2030 Sustainable Development Goals [SDGs]), priorities for addressing both hunger and poverty were outlined (FAO et al., 2015; United Nations; World Health Organization [WHO], 2015). The SDGs have placed emphasis on broad global, comprehensive interventions to promote change in the social, economic, and environmental elements that impact health which are integrated in all phases of human development (United Nations; WHO, 2015). Addressing food insecurity is grounded in the values of food as a human right and health equity for all people. WHO advocates for the creation of policies and practices by all countries that enable optimal population health through an adequate food

safety net system (FAO et al., 2015; WHO, 2015). Additionally, in several guidance documents that addressed hunger in the US (e.g., 2020-2025 Dietary Guidelines for Americans; Healthy People [HP] 2020; Hunger in America 2014; National Prevention Strategy [NPS]; Plan to End Hunger in America), focusing on the social determinants that contribute to food insecurity were highlighted as key public health strategies (Academy of Nutrition and Dietetics, 2017). This included creating targeted supports to vulnerable groups and making access to healthy and affordable food convenient to all households (Healthy People, 2018; National Prevention Council, 2011; Office of Disease Prevention and Health Promotion [ODPHP], 2021; Weinfield et al., 2014). Examining the relationship of social capital to food insecurity in Milwaukee and Dane Counties assisted in the development of targeted interventions and advocacy strategies to impact hunger and risk of food insecurity in Wisconsin (HP, 2018; National Prevention Council [NPC], 2011).

Food Insecurity, Health Promotion, and the Social Determinants of Health

It has been discovered that there is a need for more research to better understand the social determinants of health present within a community for the creation of effective strategies and actions to overcome the obstacles to achieving optimal health and well-being (American Diabetes Association, 2017; Brennan Ramirez et al., 2008; ODPHP, 2021). Health promotion professionals have concluded that it is not enough to just provide food and economic support (Anderson et al., 2016; Pellmar et al., 2002). Examining a complex health problem from all spheres of influences, such as those

outlined in the socio-ecological model (SEM) or the newer integral model (IM) used in this proposal, was recommended.

Uncovering the specific issues impacting the rates of health disparities and chronic diseases within a community, such as the factors related to risk of diabetes, heart disease, or cancer would help in creating positive health outcomes (American Diabetes Association, 2017; Best & Holmes, 2010; Lundy, 2010; ODPHP, 2021; Pellmar et al., 2002). When applied to the food insecurity issue, the expanded knowledge would in turn lead to enhanced nutrition and health coaching practices and tailored interventions that empower the food insecure household (Lundy, 2010; ODPHP, 2021; Pellmar et al., 2002). Moreover, building community capacity for addressing food insecurity would create a collective impact for positive social change (Anderson et al., 2016; Johnson et al., 2015; Jordan, 2013; ODPHP, 2021).

Fundamental to health and well-being is having access to an adequate and appropriate food supply (Brown et al., 2015; ODPHP, 2021). Yet, significant disparities have been seen in the ability of households to access healthy food. The quality and types of food that are affordable may be limited, leaving many to suffer food hardships (Hoefler & Curry, 2012). Food hardship is defined as a measure of household food insecurity brought about by not having enough money to purchase sufficient amounts of food or having to go without food due to lack of funds (Curtis et al., 2014).

Undernutrition and hunger can affect both physical and mental health status (Academy of Nutrition and Dietetics, 2017; Hoefler & Curry, 2012; Lende, 2012). These affects have been shown to be long lasting, altering health trajectory and limiting life

achievement (Chilton et al., 2016; Dube et al., 2001; Halfon, 2009; Hoefer & Curry, 2012; Lende, 2012). Even when nutrition education and health counseling are provided, other forces such as social isolation and low social connectedness has been shown to limit the food options or opportunities for meeting the household nutritional and health needs, altering perceptions of well-being (Anderson et al., 2016; Jordan, 2013; Martino et al., 2017; Pellmar et al., 2002). Examining food insecurity and the impact of social capital may assist in developing tailored strategies that promote nutrition and health equity along with improved self-efficacy for healthy practices within at-risk households and communities (Academy of Nutrition and Dietetics, 2017; Johnson et al., 2015; Martino et al., 2017; Pellmar et al., 2002).

Children, Hunger, and Food Insecurity

Addressing the high rates of food insecurity takes on a different connotation when it is discovered that about 6.8 million or one-fourth of the US food insecure individuals are children (Gundersen & Iliac, 2014; Nord et al., 2014; USDA ERS, 2018b & 2022). According to the 2015 Gallup-Healthways Well-Being Index, conducted with 177,281 household units, 1 in 6 US households with children were food insecure (Nord et al., 2014). Among the factors shown to contribute to these elevated levels include low-income status, lower educational levels, high racial and ethnic health disparities, single parent households, homebound elderly status, living with a disabled person in the household, higher prices of food items, and lower wage employment (Chang & Hickman,

2017; Coleman-Jensen et al., 2014; Coleman-Jensen et al., 2017; Dean et al., 2011; Hoefler & Curry, 2012; Nord et al., 2014).

Developing a healthy and nurturing environment for optimal growth and development in childhood includes the provision of an adequate and sufficient food supply within the household. In addition, strong social connections are needed within the home and community networks (Benson et al., 2012; Gundersen & Ziliak, 2014; Martino et al., 2017; ODPHP, 2021; Sheffield & Landrigan, 2011). Establishing a healthy relationship with food is grounded in the cultural norms and food traditions that are passed down through the family, household unit, and affiliated community, which is influenced by several factors (Mill et al., 2020; ODPHP, 2021; Swierad et al., 2017; Whitt-Glover et al., 2017).

Racial inequalities have contributed to the higher hunger rates of 10.4% to 6.7% for African American and Hispanic households in the US, respectively, compared to hunger rates of 4.5% for white households (Chilton & Doar, 2015). Having strong social networks, such as seen in two parent households, has a significant impact on food hardship, even after taking into account various demographic and socio-environmental factors (Claridge, 2020; Willis & Fitzpatrick, 2019). Strong networks may blunt the effects of poverty and limited access to affordable food (Claridge, 2020; Willis & Fitzpatrick, 2019).

Chilton et al. (2017) said food insecurity can be recycled from one generation to the next due to the adverse childhood experiences (ACE) of hunger and malnutrition. Nutritional deprivation can negatively affect the level of school achievement, the ability

to concentrate or to conduct complex tasks, emotional stability, and self-control.

Moreover, it may affect the ability to get along with classmates or coworkers, and limits future income potential (Chilton et al., 2017; Dube et al., 2001; The Nutrition-Cognition National Initiative, 1994; Walsh & Theodorakakis, 2017). Lente (2012) developed the “poverty poisons the brain” model to illustrate how social factors, like the negative effects of low social class and racism, can lead to physical impairment in growth and development of the brain during childhood (Claridge, 2020; Willis & Fitzpatrick, 2019; Pieterse et al., 2011). (Lente, p.185)

Brain changes can evolve from hunger, prolonged poor nutrition, limited bonding with parents, and other ACE issues encountered within the child’s social environment (Academy of Nutrition and Dietetics, 2017; American Academy of Pediatrics [AAP], 2012; Lente, 2012). Mental scars that affect social functioning may develop from the toxic stress that is endured (AAP, 2012; Dube et al., 2001; Lente, 2012; Olf, 2012; Pellmar et al., 2002; Walsh & Theodorakakis, 2017). Moreover, the long-term effects of both the physical and mental trauma may negatively affect the entire life course, altering health trajectory throughout adulthood (AAP, 2012; Chilton et al., 2017; Dube et al., 2001; Halfon, 2009; Association of Maternal and Child Health Programs, 2015; Pellmar et al., 2002; Pinderhughes, 2017; Walsh & Theodorakakis, 2017).

Adverse neighborhood characteristics have been shown to predict an increased risk of food insecurity, which is strongly affected by low social capital and safety concerns (Jackson et al., 2019). The risk of food insufficiency in youth and households living in extremely high-risk environments could be significantly lowered through

engagement in informal and formal food safety net programs and nutritional support services (Jackson et al., 2019; King, 2017). It has been proposed that food insecurity be included in neighborhood renewal planning, with incorporation of community fruit and vegetable gardens (Furness & Gallaher, 2018; Jackson et al., 2019).

In rural communities, those with less social ties experience higher rates of hunger (Dean et al., 2011; Whitley, 2013). Disparities have been seen in participation in food programs based on the level of social connectedness and engagement (Whitley, 2013). Targeted approaches are needed as food insecurity may present differently in rural settings versus urban settings due to high transportation and elevated food expenses (Dean et al., 2011; Whitley, 2013).

The Home Environment: A Child's First Teacher

The home environment is where children receive their first lessons on what foods should make up a healthful meal (Benson et al., 2012). Parents and caregivers play key roles in modeling healthy eating and appropriate food selections, preparation, and food safety practices to the children and teens in their environment (Knoblock-Hahn et al., 2017; Mills et al., 2020; ODPHP, 2021). Establishing healthy family meals has been viewed as a key health promotion strategy for children and teens (ODPHP, 2021). The familial social structure centered around the family meal is acknowledged as the primary influencer for healthy childhood growth and development as well as reduced risk-taking behaviors by teens (Knoblock-Hahn et al., 2017; O'Connor et al., 2009; ODPHP, 2021).

Informed parents can take advantage of teachable moments at the dinner table to educate on the nutritional content of the family meal, where food comes from, and what it does in the body (O'Connor et al., 2009; ODPHP, 2021). However, when there is food insecurity in the household, the variety of healthy foods available may be limited (Hoefler & Curry, 2012; O'Connor et al., 2009). The parental relationship with food when funds are scarce centers primarily around survival or coping practices versus for optimal health and nutritional well-being, limiting dietary biodiversity (Anderson, et al., 2016; Kuzmarski et al., 2017). Stretching the food dollar with low cost, low nutrient, calorie dense foods to feed the family with reduction of protein rich foods, fruits, and vegetables, have led to higher rates of obesity and chronic disease in the food insecurity populations (Anderson, et al., 2016; Burke et al., 2017; Hoefler & Curry, 2012; Kuzmarski et al., 2017; National Minority Consortium of Public Television & Joint Center Health Policy Institute, 2008).

Problem Statement

Hunger and food insecurity are considered modern-day markers for malnutrition and poor diet quality, indicating a need for further health risk evaluation (Academy of Nutrition and Dietetics, 2017; Condon-Paoloni, 2011; Ding et al., 2014; Hoefler & Curry, 2012; Jensen et al., 2018; Lillioja et al., 2013; Salvador Castell et al., 2015). Jensen et al. (2018) reported on the consensus recommendations of the Global Leadership Initiative on Malnutrition (GLIM) for the establishment of a standardized global criterion for defining and characterizing malnutrition. The GLIM convened a consensus conference with

nutrition and health leaders from all over the world to look at the clinical diagnosis of malnutrition in the adult hospitalized patient. Given the broad array of conditions that manifest nutrient deficiencies, both phenotypic criteria (e.g., unintentional weight loss, muscle wasting) used to assess severity of the condition and etiological criteria (e.g., low food intake and food hardship, disease states with inflammation) used to provide context to the malnourished state which can impact intervention strategies and potential outcomes, were proposed (Jensen et al., 2018).

The health of individuals and households reflects on the health of the entire community (Pellmar et al., 2002; Wong et al., 2016). Those experiencing food insecurity have presented with higher self-reported poor health along with higher prevalence rates of prediabetes, diabetes, obesity, cardiovascular, dental caries, and other acute or chronic diseases (Academy of Nutrition and Dietetics, 2017; American Diabetes Association, 2017; Chi et al, 2014; City of Milwaukee Health Department [MHD], 2016; Ding et al., 2014; Hoefler & Curry, 2012; Greer et al., 2013; Kruger et al., 2015; Lo et al., 2012). Food insecurity contributes to higher healthcare expenditures, with higher emergency room visits and hospitalizations, adding to the burden on society (Pabalan et al., 2015; Tarasuk et al., 2015; Wong et al., 2011). In a report by Gregory and Coleman-Jensen (2017) that looked at food insecurity and chronic disease in lower income working adults (i.e., those living at or below 200% of the federal poverty level), it was reported that there was an 18.6% higher number of disease condition in individuals with low food security than individuals reporting high food security. There was also a 10.5% higher hypertension rate in individuals reporting high food insecurity (Gregory & Coleman-

Jensen, 2017). It was concluded that food security status is more strongly predictive of chronic illness than income level. While financial status was positively related to only 3 out of the 10 chronic conditions reviewed (i.e., hepatitis, arthritis, and lung disease), all 10 conditions were related to food insecurity. The chronic diseases of focus included high blood pressure, heart conditions, liver impairment, stroke, cancer, asthma, diabetes, arthritis, lung disease, and kidney disorders (Gregory & Coleman-Jensen, 2017).

Health promotion, engagement, and communication through our social interactions and the power of the word of mouth is grounded in the connectedness that exists within the household, the community, the greater society, and the world (Dean et al., 2014; Martino et al., 2017; Mettler et al., 2014; Pellmar et al., 2002). Beliefs, perceptions, health practices, traditions, and ways of doing are influenced by the social structures in place and how they function to support the behaviors that are seen whether the behaviors promote or hinder achievement of optimal health (Academy of Nutrition and Dietetics, 2017; DeBiase et al., 2017; Greer & Nelson, 2014; Pellmar et al., 2002). The social environment may affect the types of foods that are popular, which new foods are accepted or adopted into the family meals consumed, and how often they are prepared (American Diabetes Association [ADA], 2017; Goldberg et al., 2017; Knoblock-Hahn et al., 2017; Mills et al., 2017; Swierad et al., 2017).

Conversely, social isolation and low social support have been correlated to higher risks of mortality, comparable to that attributed to cigarette smoking or lack of physical activity (Martino et al., 2017; Pellmar et al., 2002). Households with lower incomes, low social ties and networks, and low community connections are at higher risk for food

insecurity and other health risks, both physical and mental (Cattell, 2001; Cruwys et al., 2013; Leung et al., 2015; Luke & Harris, 2007; Mertens et al., 2015). In addition, community forces external to the household can also exert pressure on the food choices and practices that are seen. Examples may include when food prices go up because of crops being wiped out due to severe flooding or droughts, or the limited availability of healthy foods outlets within some neighborhoods, referred to as a food desert (Brown et al., 2015; Darmon & Drewnowski, 2015; Guidry, 2014; Center for Disease Control and Prevention [CDC] et al., 2010; Jerry et al., 2014; Jilcott et al., 2011; Smith et al., 2013-b).

Understanding the social and physical environment that influence the ability to secure the appropriate food needed by the household can help the nutritional or health coach establish tailored strategies and innovative programs to combat the detrimental effects of food insecurity (Darmon et al., 2015; Guidry, 2014; Knoblock-Hahn et al., 2017; Leung et al., 2015; Mettler et al., 2014; ODPHP, 2021; Olsho et al, 2017; Smalls et al., 2015; Wong et al., 2016). To this end, this study sought to examine if there was a relationship between social capital and the risk of food insecurity within two counties in Wisconsin (Milwaukee and Dane County). Additionally, it explored if there was a relationship between income (i.e., federal poverty level) and social capital and risk of food insecurity. A variety of descriptive and confounding variables (e.g., neighborhood characteristics, adverse life events) were used as controls when assessing the extent of these relationships.

Purpose Statement

The findings of this quantitative retrospective descriptive correlational study that examined if there was a relationship between types of social capital and risk of food insecurity within two counties in Wisconsin (Milwaukee and Dane County), was intended to serve two major purposes. First, it aimed to inform nutrition and health coaches about the elements that could be tailored and incorporated into coaching encounters to address food insecurity, build social capital, and support networks (Benson et al., 2012). The goal was to use the results to empower the households experiencing food insecurity through increased awareness, skill-building, motivational and social support, and improved self-efficacy for achieving healthy meal patterns (Ivens & Edge, 2016; Johnson et al., 2015; ODPHP, 2021).

The research also identified areas for enhanced public policy, advocacy, and collective action to create social and environmental change that support equitable access to healthy and affordable food by all citizens, regardless of income level, social status, race/ethnicity, or neighborhood location (Academy of Nutrition and Dietetics, 2017; Amed et al., 2015; ADA, 2017; Best & Holmes, 2010). Given that the African American population has the highest rates of food insecurity in the State of Wisconsin, with the highest population densities located within Milwaukee and Dane Counties, these two counties were selected as a primary focus for analysis to explore the assets or needs in social capital to be addressed (Curtis et al., 2014; Greer et al., 2013; Heckman, 2016).

Nature of the Study

In this study, I used a quantitative retrospective descriptive correlational analysis design. This research was prompted by the significant disparities in food insecurity rates seen within the state of Wisconsin. The overall state of Wisconsin's food insecurity rate was 11.3%, which is lower than the US rate of 14.1% (Heckman, 2016). Yet, when taking a closer view of the food hardship levels in the state by Congressional Districts, it was recorded that District 4, which encompasses Milwaukee's lower SES inner-city zip codes, had the highest levels with a food hardship rate of 22.1%; while Congressional District 5, which encompasses the higher SES zip codes located on the outer edges of Milwaukee County and surrounding counties, had the lowest food hardship levels of 9.9%. Additionally, District 2, which includes Dane County had a food hardship rate of 12.2% (Curtis et al., 2014; Heckman, 2016; Greer et al., 2013; Gundersen et al., 2018).

These disparities seen within this close geographic location justified the need for more in-depth analysis of what could be discovered about the social capital present, both internal and external to the households experiencing food insecurity in Milwaukee and Dane Counties (MHD, 2016; Heckman, 2016; Greer et al., 2013; Gundersen et al., 2018). Results were used to develop tailored strategies to promote improved nutrition and health coaching, healthy food access, social support, and well-being within the at-risk communities (Academy of Nutrition and Dietetics, 2017; Briscoe et al., 2014).

The quantitative, cross-sectional study design was chosen given the availability of a Wisconsin specific health database, the Survey of the Health of Wisconsin (SHOW).

SHOW provides information on household and community connections. It also includes the availability and utilization of health and community resources (School of Medicine and Public Health, 2017). The quantitative analysis provided baseline information needed to target appropriate resources for awareness, outreach, advocacy, and self-empowerment nutritional and health coaching (Frankfort-Nachmias & Nachmias, 2008; Soriano, 2013).

Given the large amount of data and the variety of variables reviewed, conducting a quantitative analysis through this secondary data source led to a timely and comprehensive formative analysis of the types and levels of social capital present and their impact on food insecurity risk (Frankfort-Nachmias & Nachmias, 2008; Soriano, 2013). Future qualitative studies that explore the perceptions of the individuals in the households experiencing food hardship related to social capital such as the quality or effectiveness of their bridging social support relationships (e.g., perceived strength of the relationship with their healthcare provider) would be a logical next step in completion of the IM Map (Lundy, 2010; Soriano, 2013). However, this was not addressed in this study (Frankfort-Nachmias & Nachmias, 2008; Soriano, 2013).

The four variables of social capital that were reviewed in exploring the relationship of social capital to risk of food insecurity included bonding social capital (intimate individual or family connections such as spouse, significant other, children, friends, neighbors); bridging social capital (health and social services connections including physician, nurse practitioner, or registered dietitian; medical care utilization); community structural formal social capital (utilization of governmental food safety net resources such as WIC or SNAP; political engagement; access to employment); and

community structural informal social capital (connections to community food pantry resources and other food resources, including access to healthy food outlets, farmers markets, food co-ops; sense of community/civic engagement) (Greer et al., 2013; Lu et al., 2016; Nord, 2013; Rummo et al., 2015; School of Medicine and Public Health, 2017; Smith et al., 2013-b; USDA Food and Nutrition Service [USDA FNS], 2013; USDA FNS, 2014).

Additionally, the relationship of income and social capital and risk of food insecurity was examined through looking at the percent of federal poverty levels, while controlling for access to various characteristics within the neighborhood, adverse life events within the household, and various demographic variables (School of Medicine and Public Health, 2017). Specific Milwaukee county inquiry variables included in the SHOW that assessed housing status and other social and environmental factors were examined . The demographic variables included marital status, gender, age group, race/ethnicity, household size (i.e., number of persons and number of children in the household 0-17), education attained, transportation, geographic location (urban/rural), and type of residence.

Research Questions and Hypotheses

This study involved using the following research questions:

RQ1: Is there a relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity within Milwaukee County?

H₀₁: There is no significant relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity within Milwaukee County.

H_{a1}: There is a significant relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity in Milwaukee County.

RQ2: Is there a relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity within Dane County?

H₀₂: There is no significant relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity within Dane County.

H_{a2}: There is a significant relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity in Dane County.

RQ3: Is there a relationship between federal poverty level ratio and social capital and risk of food insecurity within Milwaukee County, controlling for neighborhood characteristics, adverse life events, and Milwaukee specific inquiry?

H₀₃: There is no relationship between federal poverty level ratio and social capital and risk of food insecurity in Milwaukee County, controlling for neighborhood characteristics, adverse life events, and Milwaukee specific inquiry.

H_{a3}: There is a relationship between federal poverty level ratio and social capital and risk of food insecurity in Milwaukee County, controlling for neighborhood characteristics, adverse life events, and Milwaukee specific inquiry.

RQ4: Is there a relationship between federal poverty level ratio and social capital and risk of food insecurity within Dane County when controlling for neighborhood characteristics?

H₀₄: There is no relationship between federal poverty level (ratio) and social capital and risk of food insecurity in Dane County when controlling for neighborhood characteristics.

H_{a4}: There is a relationship between federal poverty level ratio and social capital and risk of food insecurity in Dane County when controlling for neighborhood characteristics.

Theoretical or Conceptual Framework

The premise of the IM is that in order for real transformational change to occur, both theory and practice must be integrated into actions that are accountable to each other, creating a new paradigm from which health promotion is forged (Lundy, 2010; Weber, 2000). Integral refers to being a thorough, complete, and inclusive analysis of a

problem, balanced to include all issues that impact human existence in all its complexity (Lundy, 2010). Ken Weber, an integral theorist, developed the IM as a paradigmatic framework that combines various theoretical and practice approaches to health promotion to create a comprehensive analysis map for examining complex societal issues that span across disciplines and thought (Lundy, 2010). The results are intended to lead to effective and sustainable actions for the health improvement of all people. Its adoption aspires to lead to a new era of health promotion grounded on a foundation of patient-centered care, applied research, interdisciplinary collaboration, health equity, evidence-based practice, public policy reform, and advocacy (Lundy, 2010). The IM is being utilized throughout the world in both academic and practice settings as an effective meta-theory given that it blends concepts from multiple theories to achieve a comprehensive whole to enhance human development which can potentially impact the entire lifecycle (Lundy, 2010).

The IM combined with constructs of the theory of planned behavior (TPB), were used in this research study. These models helped to identify targeted strategies to increase awareness, enhance social capital and connectedness, and influence perceived ability to access community food resources by low to moderate-income households experiencing food hardship within Milwaukee and Dane County, Wisconsin (Baranowski et al., 2003; Blue, 2007; Johnson et al., 2010; Lundy, 2010; Martino et al., 2017). The IM is considered a comprehensive logic model that guides purposeful assessment and evidence gathering from multiple perspectives to address the complexity of a health issue (Lundy, 2010). The dimensions of the IM are intended to take a holistic and systematic

examination of the factors that affect a health issue from various domains of influence (Lundy, 2010).

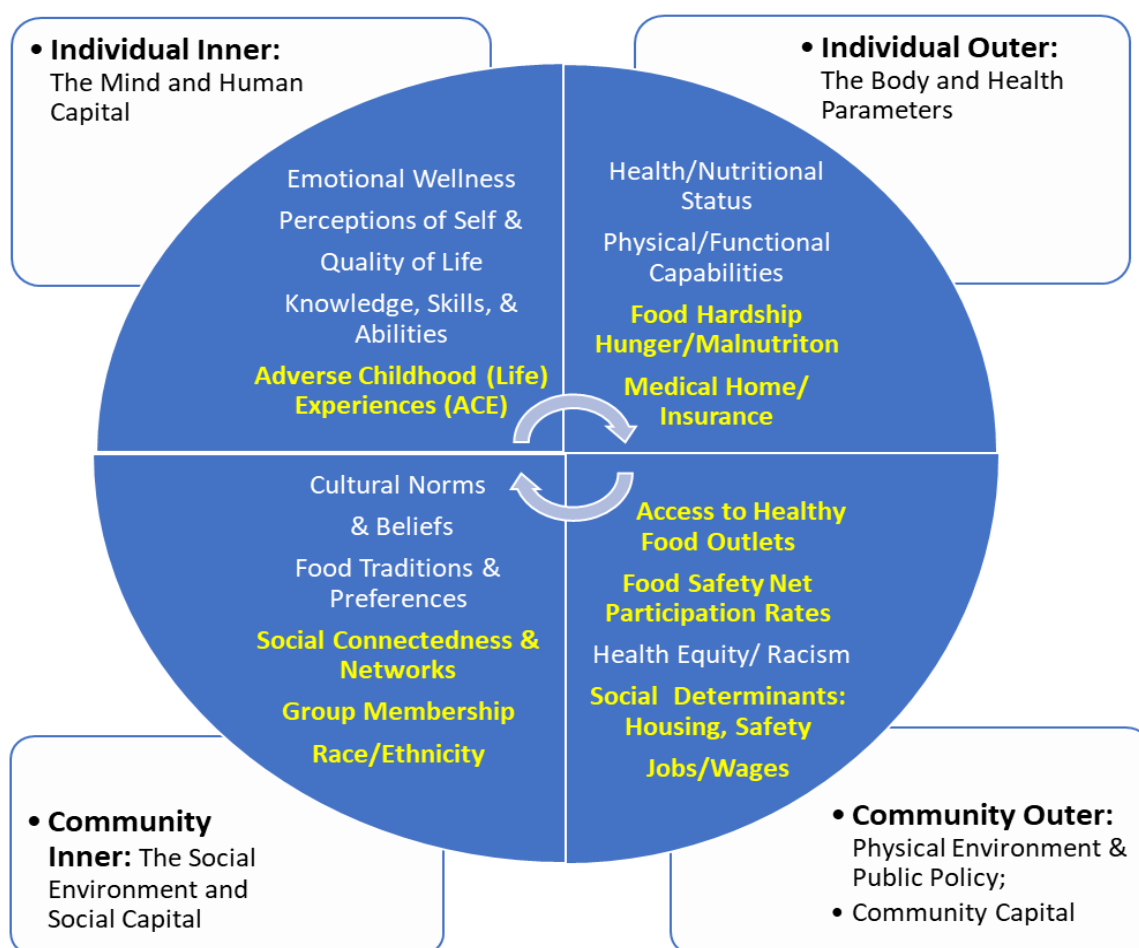
There are four specific domains that make up the IM Map, which includes: a) the intrapersonal, inner self – the mind, how do they feel about their health, which includes their knowledge, skills, perceived abilities, and stressful/adverse life circumstances; b) the intrapersonal, outer self – the body, their physical or mental health status (e.g., hunger, malnutrition) and resources (e.g., medical home); c) the community, inner-cultural groups, norms, social connections and networks (e.g., family bonds; sense of community); and d) the community, outer – environmental, food access, social determinants (e.g., housing, safety), public policy (e.g., rules/regulations, political will), job market, and wages (e.g., low or high income) (Lundy, 2010). Conducting a comprehensive assessment that includes elements from each of these domain areas is recommended to provide a clear picture for the development of appropriate intervention strategies and prioritized actions (Lundy, 2010; Pellmar et al., 2002).

The IM map structure as outlined in Figure 1 promoted a systematic assessment of both the intrapersonal and community context related to social capital and food insecurity in Milwaukee and Dane County, Wisconsin. Essential to the effectiveness of the IM would be to have informed transformational, participative leaders or co-champions from multiple disciplines to facilitate the integration and connections to the various stakeholders involved, including the engaged individuals at risk (Lundy, 2010; The Academy Quality Management Committee, 2018). The goal would be to create a unified conceptual framework to guide the jointly identified priority actions through to

the desired collective impacts and life course transformations (Amed et al., 2015; Chilton et al., 2017; Lundy, 2010; Pellmar et al., 2002). A position paper on food insecurity by the Academy of Nutrition and Dietetics (2017) identified the nutrition professional as having the unique qualities needed to fill this leadership role but concluded they may need additional training, which could include enhanced coaching skills, to assure quality and confidence.

Figure 1

Food Insecurity IM Map



Adapted From: “A Paradigm to Guide Health Promotion into the 21st Century: The Integral Idea Whose Time Has Come. Lundy, T. (2010). *Global Health Promotion*, 17(3), 44–53. <https://doi.org/10.1177/1757975910375169>

In looking at the TPB, increasing perceived ability to access healthy food and to prepare and serve healthy family meals (e.g., increased knowledge, social connections, and awareness of community support services) may require a transformation of the at-risk individual’s thought process from minimal survival mode, towards empowered self-efficacy for health promotion and disease prevention (Baranowski et al., 2003; Leischik et al., 2016). However, before self-empowerments can be achieved, other issues may need to be addressed such as emotional concerns, financial and food resource management abilities, and mental health issues (Cruwys, 2013; Dun et al., 2016; Gundersen & Garasky, 2012; Leischik et al., 2016; Pieterse et al., 2011).

Emotional issues such as post-traumatic stress syndrome and psychosis from years of persistent poverty and income stagnation due in part to perceived racism have been reported in African Americans populations (Pieterse et al., 2011). Financial literacy, which is now viewed as a health promotion strategy given its impact on overall stress levels, may also need to be addressed. This may include the ability to manage the food budget effectively to purchase the healthy food required to meet the nutritional needs of all household members (Gundersen & Garasky, 2012; Leischik et al., 2016). Moreover, food has been used to soothe the feeling of depression and loneliness from not having enough money to participate in leisure activities along with lack of social support from significant others (Cruwys, 2013).

The TPB places emphasis on the attitudes, supportive norms, and perceptions surrounding the intentions and perceived behavioral control for participating in a healthy practice, such as accessing healthy foods outlets and awareness of community food safety net resources (Baranowski et al., 2003; Blue, 2007; Dean et al., 2011; Jordan, 2013). Bridging social relationships, such as nutritional or health coaching relationships, may serve to increase the client's sphere of influence, with increased knowledge, skills, and abilities that feed the inner self while enhancing awareness and connections to the community inner and outer support resources (Jordan, 2013; Lundy, 2010). The coaching relationship can also serve as a bridge to build self-confidence for participating in community outer activities through connections to supportive networks for advocacy and public policy activism (Jordan, 2013; Mettler et al., 2014). These constructs were incorporated into the IM Map to identify specific areas to target for tailored nutritional coaching, community interventions, and advocacy (Blue, 2007; Jordan, 2013; Lundy, 2010).

Strategies to increase both perceived control for securing recommended healthy foods along with connections to informal and formal nutrition safety net and healthy food resources within the community were identified through this research study (Best & Holmes, 2010; Blue, 2007; Dean et al., 2011; Jordan, 2013; Lundy, 2010; Mettler et al., 2014). The new health literacy instructional model developed by Dunn et al. (2016), which provided evidence that supports looking at social capital as a strategy for addressing health literacy and health promotion, was considered along with the IM Map to guide the study's recommendations (Lundy, 2010). It concluded that both emotional

and social support need to be addressed before educational instructions could be internalized (Dunn et al., 2016).

Through the utilization of these frameworks in examining the relationship of the types of social capital to the risk of food insecurity in Milwaukee and Dane County, Wisconsin, specific formative strategies were formulated (Blue, 2007; Dunn et al., 2016; Lundy, 2010). Given the heterogenic nature of the food access and insecurity landscape, the methods used in this research may serve as a model for exploring the specific needs of other racial, ethnic, or high-risk groups (e.g., adults living with a disability) residing within the State of Wisconsin in the future (Best & Holmes, 2010; Greer et al., 2013; Grimm et al., 2013; Heckman, 2016; Lundy, 2010). A further qualitative exploration of the perceptions and emotional state of those experiencing food insecurity would aid in completing the IM map, providing a comprehensive view of additional issues related to food insecurity that could be addressed, but are beyond the scope of this quantitative research study.

Definitions of Terms

Community Capacity

Overall level of human capital, community assets and resources, and social capital that is present in a community which can be mobilized to address common issues and enhance the quality of life of the community (Cattell, 2001; Pellmar et al., 2002). Actions may be taken through formal or informal social interactions, community-based participatory action, and/or advocacy for public policy reforms (Claridge, 2020; Cattell,

2001; Dean et al., 2014; Leischik et al., 2016; Onyx & Leonard, 2010; Pellmar et al., 2002).

Community Food Security

State in which all people within the community have equitable access to appropriate amounts of nutritious, safe, and culturally acceptable food for optimal growth, health, and wellness through a sustainable food system with high levels of community capacity and social supports that enhances community self-efficacy, social justice, and working together for collective impact (Hamm & Bellows, 2003).

Community Social Capital

Diffuse exchanges of trust and reciprocal respect that binds people to their communities (Claridge, 2020; Onyx & Leonard, 2010; Pellmar et al., 2002). These circles of engagement may include various formal and informal governmental or civic agencies such as emergency food programs, neighborhood meal sites, community farmer's markets, faith-based food pantries, social clubs, and other programs as well as neighbor to neighbor interactions that provide food supports to those experiencing food hardship (Claridge, 2020; Cattell, 2001; Dean et al., 2014; Leischik et al., 2016; Onyx & Leonard, 2010).

Core Food Security Module (CFSM)

A series of 18 questions (10 if no children reside in the household) that ask whether the household faces difficulties feeding adults and children over the past year because of a lack of food (Anderson et al., 2016; Gundersen & Ziliak, 2014; US

Department of Agriculture [USDA, 2016). Each question was qualified by the stipulation that the food hardship was caused by the lack of money (USDA, 2016).

CFSM is part of the Current Population Survey (CPS), a nationally representative monthly survey conducted by the US Census Bureau (Anderson et al., 2016; Gundersen & Ziliak, 2014; US Department of Agriculture, 2016). The survey has been consistent since 2001, with some additions beginning with 2016 (USDA, 2016). It is currently a part of the nationally representative 50,000-household December supplement to CPS (Gundersen & Ziliak, 2014; USDA, 2016). Table 1. outlines the food security & insecurity categories used in the CFSM.

Table 1

Descriptions of Food Security & Insecurity Categories

USDA categories	Descriptions of CFSM responses
Fully Food Secure	No positive responses
Marginally Food Secure	1 or 2 positive responses
Food Insecure	3 or more positive responses
Very Low Food Security	6 or more positive responses (households without children)
	8 or more positive responses (households with children)
Food Insecurity among Children	2 or more positive responses to child-referenced questions
Very Low Food Security among Children	5 or more positive responses to child-referenced questions

From: “Childhood Food Insecurity in the U.S.: Trends, Causes, & Policy Options,” by C. Gundersen, and J.P. Ziliak, 2014, *The Future of Children: Princeton-Brookings*, 1-19, p.2. https://futureofchildren.princeton.edu/sites/futureofchildren/files/media/childhood_food_insecurity_researchreport-fall2014.pdf

Food Hardship

A measure of food insecurity obtained through a bi-annual survey of households that assesses if the household has difficulty obtaining the food needed due to not having enough money (Feeding Wisconsin, 2015).

Food Insecurity

Inability to secure adequate and appropriate amounts of healthy food needed for optimal health and wellness through normally acceptable channels (Coleman-Jensen et al., 2014; Gundersen & Ziliak, 2014; Heckman, 2016; Nord et al., 2014). A working definition used by the USDA states that “food insecurity is present when food access is insufficient or uncertain for at least one person in the household at some point in the year.” (Heckman, 2016, p.2)

Food Security

Condition in which there is sufficient food for healthy and active living for all household members at all times (Heckman, 2016, p.2).

Healthy Family Meals

Meals that are planned to meet the nutritional needs of the various family members, which include the appropriate amounts adjusted based on age, growth, health, and wellness needs (ODPHP, 2021). Included in the concept of healthy family meals is the influence of the social structure and support through eating together as a family,

parents' role modeling healthy behaviors, the values placed on healthy eating and active living practices, the meal as a teaching tool, and food traditions (ODPHP, 2021). A sense of belonging and love are reinforced through the sharing of food and the priority of having a set mealtime and place (ODPHP, 2021).

Healthy Nutritional Intake

Ingestion of the macro and micronutrients that the body needs in the right proportions for optimal human development, functioning, and longevity (Buttriss et al., 2014; ODPHP, 2021). Various healthy eating plans have been identified, including the MyPlate Food Guide, The DASH Diet Plan, and the Mediterranean Eating Pattern, which serve as guides to healthy meal planning to meet individual and household nutritional requirements (Buttriss et al., 2014; ODPHP, 2021). Having connections to the food safety net system such as participation in the SNAP and WIC Programs have been correlated to higher nutrient intake by food-insecure households (Kaiser et al., 2015; USDA FNS, 2013; Whitmore Schanzenbach, 2016).

Human Capital

Overall knowledge, skills, and abilities that an individual possesses that aid in navigating through life (Onyx & Leonard, 2010; Pellmar et al., 2002). Individuals with a high level of social connections and support networks have a greater potential to build human capital through our propensity for lifelong learning (Bolin et al., 2003).

Social Capital

Interrelationships and bonds that exist among individuals or groups, both inside and outside the family or household unit (Pellmar et al., 2002). As people in a community connect with one another, they create social capital (Cattell, 2001; Pellmar et al., 2002). Social capital can promote the enhancement of human capital through reciprocal knowledge exchanges, can influence human behavior, perceptions of well-being, links to resources, and enhance community capacity through civic engagement and advocacy (Bolin et al., 2003; Cattell, 2001; Claridge, 2020; Dean et al., 2014; Leischik et al., 2016; Pellmar et al., 2002).

Structural Competency

Having the knowledge, skills, and capabilities necessary to intervene when interacting with individuals or groups with unmet social issues to reduce health inequalities. This may include addressing the social, organizational, and environmental determinants of health that impact well-being and the quality of life (Jordan, 2013; Pellmar et al., 2002).

Assumptions, Limitations, and Delimitations

Assumptions

Given the limited qualitative data available on the strength of the social networks, an underlying assumption is that as social connectedness goes up, so does the level of social support, and the quality of the interactions that evolves (Pellmar et al., 2002).

Another assumption, due to limited data, is that participants had access to nutritional or health coaches.

Limitations

One limitation is that this quantitative research design that utilizes cross-sectional secondary data doesn't include an examination of qualitative interviews of the affected households so that the perceived quality of the social connections and support could be extensively explored. Future follow-up research could focus on perceptions of overall health, fitness practices, discrimination experiences, and extent of PTSD in those at-risk for food insecurity that could yield valuable information. Also, given the highly segregated and diverse racial and ethnic populations seen within the counties in Wisconsin, the results of the examination of social capital, food insecurity, and the influence of income differences within Milwaukee and Dane County, may not be generalizable to other Wisconsin counties (Logan & Stults, 2011).

Delimitations

The scope of the study is bound by data that were collected through secondary data sources, which were primarily quantitative in nature. The dataset includes limited data on access to nutrition professionals, awareness of healthy meal planning skills, and knowledge of nutritional recommendations for the preparation of household meals. The study was not able to fully explore the emotional state of those experiencing food insecurity, nor distinguish the severity of food insecurity by categories (e.g., very low food insecurity) within each county or food hardship districts. Also, although county-

wide level SHOW data was available for Milwaukee and Dane County, they were not available for many surrounding counties, limiting further regional comparisons. Given the vast disparities seen within and between counties (e.g., racial/ethnic, income), results may not be generalizable to the entire State.

Significance of the Study

Reduction of Gaps

The state of Wisconsin boasts a lower overall food insecurity rate (11.6%) compared to the 14.4% rate of the US population (Curtis, Barfeld, & Lessem, 2014; Heckman, 2016). However, this rate doesn't reveal the significant racial and ethnic inequities present within the State, with the white population having a much lower food insecurity rate of 8.7% (Curtis et al., 2014; Heckman, 2016). The African Americans and Hispanic populations have rates as high as 34.6% which is higher than both the State and national food insecurity levels (Heckman, 2016). Heckman (2016) recognized these disparities and offered a list of strategies to address the problem.

Academy of Nutrition and Dietetics (2017) said, in a position paper that addressed food security in the US:

Because of the tremendous dietary and health implications associated with food insecurity, it is paramount that nutrition and dietetics practitioners take a leadership role in identifying, addressing, and preventing food insecurity within their scope of practice. RDNs [Registered Dietitian Nutritionist] and NDTRs

[Dietetic Technician Registered Nutritionist] should also advocate for the inclusion of dietetics practitioners in community-based initiatives and research. RDNs and NDTRs are uniquely positioned to address food loss and waste within the food system. In addition, RDNs and NDTRs can facilitate referrals, provide targeted education, and empower individuals struggling with food insecurity. Specifically, RDNs and NDTRs can help those struggling with food insecurity to access and connect with existing programs and social services aimed at improving food and nutrition security and other areas (e.g., employment, housing, and transportation assistance). (p. 1999)

Although the Academy's position statement provided clear guidance and support for the involvement of the nutrition professional in addressing food insecurity in education and practice, research, advocacy, and policy, there was no direct mention of assessing social capital, social isolation, or social connectedness which has been shown to be key factors to promoting motivation, empowerment, or self-efficacy (Academy of Nutrition and Dietetics, 2017; Leischik et al., 2016; Pellmar et al., 2002; Smith et al., 2013-a). This represented a significant gap in the practice of dietetics that this research study sought to address.

In Milwaukee County, low socio-economic status (SES) issues have contributed to higher levels of food insecurity as well as health disparities in the inner city, low

income, African American neighborhoods, calling for expanded emergency food pantry services (Cunningham et al., 2017; Friedens Community Ministries, 2017; Greer et al., 2013). Milwaukee County has the highest population of African Americans in the State of Wisconsin. Dane County, which includes Madison, WI, the State Capital, has the second-highest African American population with food insecurity rates higher than the state average (MHD, 2016; Heckman, 2016). Milwaukee County also has the congressional districts with both the highest and lowest food hardship rates in the State, District 4, and District 5, respectively (Curtis et al., 2014; Feeding Wisconsin, 2015; Greer et al., 2013; Heckman, 2016). The highest food hardship district encompasses the inner city, low income, African American neighborhoods (Curtis et al., 2014; Greer et al., 2013; Heckman, 2016).

Research was warranted that informs and prioritizes specific issues that could be included in prevention and coaching efforts to impact food insecurity and enhance awareness and access to healthy food resources (Grimm et al., 2013; Kaiser, 2013). Examining if social capital is related to risk of food insecurity seen within Wisconsin, through examination of Milwaukee and Dane County, assisted in developing strategies to empower households experiencing food insecurity in meeting their nutrition and health needs (Curtis et al., 2014; Gregory & Coleman-Jensen, 2013; Jordan, 2013; Lo et al., 2012; Martino et al., 2017; Zhang et al., 2013). This study also led to assess-based community development (ABCD) initiatives, a strength-based approach to building community capacity for achieving food security for all (Ennis & West, 2010).

ABCD entails the practitioner having a constructionist worldview in which all people are believed to have an innate toolkit of strengths, assets, and abilities which can be mobilized to positively impact their lives (Ennis & West, 2010). It is sensitive to the internal psychodynamics of knowledge, understanding, and self-efficacy, as well as the external influences of social, environmental, cultural, traditional, and policy factors that affect actions. Among the key elements identified in ABCD are the importance of relationship-building to inspire and provide choices from which the individual has the freedom and power to select (Ennis & West, 2010; Mettler et al., 2014).

Assessing knowledge, capabilities, and the extent of social connectedness through social networks has helped in setting realistic, achievable goals that are long-lasting and sustainable (Ennis & West, 2010; Mettler et al., 2014; Pellmar et al., 2002). The results of the study were used to tailor nutritional coaching interactions and inform social or environmental change strategies for greater healthy food access, personal empowerment, and building community capacity (Academy of Nutrition and Dietetics, 2017; Brown et al., 2015; Ennis & West, 2010; Leischik et al., 2016; Mettler et al., 2014; Minkler et al., 2003; Pellmar et al., 2002).

As a registered dietitian (RD) and health promotion advocate as well as an active member and nutritional advisor to the Milwaukee County Organizations Promoting Prevention (MCOPP; formerly the Milwaukee Childhood Obesity Prevention Program), I have sought to discover and advance innovative ways to improve the nutrition and fitness practices of the residents of the Milwaukee community (Behlmann & Brennan, 2014; Christens et al., 2016; Greer & Nelson, 2014; Hunter et al., 2014; Nelson et al., 2015;

Young et al., 2014). Furthermore, as a former Board member of the Frieden's Community Ministries, Food Pantry Network, I assisted in running four food pantries located throughout the city of Milwaukee (Frieden's Community Ministries, 2017).

In addition, I remain an active partner in statewide health promotion initiatives, including some that are centered in Dane County (i.e., Madison, WI). Two include the Wisconsin Diabetes Advisory Group of the Wisconsin Department of Health Services Chronic Disease Prevention Program (WDHS CDDP) and healthTIDE Wisconsin, State Obesity Prevention Initiative (Adams et al., 2016). Both are striving to create collective impact initiatives that lower the chronic disease and childhood obesity rates as seen within the state of Wisconsin (Adams et al., 2016). Both are also involved in implementing the state health plan (Wisconsin Department of Health Services [WDHS], 2018).

Nutrition and physical activity promotion are included as one of the five priority areas in the five-year (2015-2020) Wisconsin state health improvement plan. Priority action teams (PATs) have been established for each priority area to lead and coordinate progress. The nutrition and physical activity PAT include members and associates of healthTIDE (myself included) and the Wisconsin Breastfeeding Coalition (WDHS, 2018). These groups lead the statewide efforts to achieve the goal of "all Wisconsin residents eating healthier and moving more through increased intake of healthy foods and drinks, increased breastfeeding initiation and duration, and increased physical activity." (WDHS, 2018, p.26) Another strategy included supporting current community coalitions and organizations in implementing key nutrition strategies as well as helping to establish

new alliances where none are present (WDHS, 2018)

Social change would be forged through the promotion of community engagement and collaborative wavemaker leadership (e.g., healthTIDE members) using a systems mindset (Mui et al., 2019; Nelson et al., 2015). Evidence-informed strategies would be developed and implemented from the grassroots ground up level, as well as at the wider organizational and societal levels through linking the actions of diverse coalitions (e.g., MCOPP) with environmental and policy transformations (Adams et al., 2016; Bolin et al., 2003; Nelson et al., 2015; Pellmar et al., 2002).

This research study was able to fill the gaps in knowledge related to the social influences on food insecurity that exist within Milwaukee and Dane counties, in Wisconsin (Greer et al., 2013; Heckman, 2016). Although general demographic information was available on the rates of food insecurity and food hardship by Congressional district or by racial/ethnic groups, there was a limited analysis of the specific types of social capital networks or connectedness on the risk of food insecurity (Greer et al., 2013; Heckman, 2016). It remained unknown whether there was a relationship between income level and social capital and risk of food insecurity. A greater understanding was gained of the social capital assets and needs of the at-risk community to impact the effectiveness of the future interventions that were proposed (Behlmann & Brennan, 2014; Johnson et al., 2010; Nelson et al., 2015; Pellmar et al., 2002).

Therefore, the specific intent of this research was to promote the incorporation of the results and recommendations formulated into nutritional and health coaching practices as well as in MCOPP and healthTIDE strategic planning. Tailored strategies

related to social capital and food insecurity risk would also be woven into future grant proposals, developed in collaboration with committed partnering agencies and food pantry networks within Milwaukee and Dane County (Adams et al., 2016; Frieden's Community Ministries, 2017). The goal would be to build the capacity of health promotion staff, health and nutritional coaches, policy advocates, and the community at large for addressing food insecurity through enhancing social capital awareness, social connectedness and engagement, and community support networks (Academy of Nutrition and Dietetics, 2017; Adams et al., 2016; Frieden's Community Ministries, 2017; Hunter et al., 2011; Pellmar et al., 2002).

Implications for Social Change

Findings from this research study which promoted an increased awareness of social capital networks and supports, both from the individual and community context, in two counties in Wisconsin (Milwaukee and Dane County), aided in informing strategies for tailoring nutritional or health coaching practices (Curtis et al., 2014; Jordan, 2013; Smith et al., 2013). Understanding the relationship between income level and social capital and risk of food insecurity informed strategies for addressing the high cost of food and managing the household food budget to achieve recommended healthy eating patterns for optimal health and well-being (Gregory et al., 2013). Enhancing social support networks and community capacity for addressing food insecurity may also have an impact on reducing other health risks through enhancement of self-efficacy, such as prediabetes and heart disease, thus reducing the healthcare burden on society (Academy of Nutrition and Dietetics, 2017; Bolin et al., 2003; Jordan, 2013; Wong et al., 2011).

For children, improved health, growth patterns, learning, and school achievement may be seen which could positively influence their entire life course (Martino et al., 2017; USDA Food and Nutrition Service, 2013). Informed nutritional coaches may aid in creating an integrated health promotion and food security system that builds social capital for empowered individuals, households, and communities (Academy of Nutrition and Dietetics, 2017; Behlmann & Brennan, 2014; Bolin et al., 2003; Christens et al., 2016; Leischik et al., 2016). These empowered social networks may forge a collective impact that advocates for access to the healthy food resources and service linkages that are needed for achievement of sustainable community food security (Adams et al., 2013; Adams et al., 2016; Dean et al., 2011; Jordan, 2013; Leischik et al., 2016; Minkler et al., 2003).

A Review of Professional and Academic Literature

In conducting an extensive literature review, I used the following databases: CINAHL, Medline, PubMed, ProQuest Centra, SAGE Journals, Science Direct, Taylor & Francis Online, and Google Scholar. I used the following search terms: *food insecurity*, *food hardship*, *social capital*, *social network*, *nutritional coaching*, *health promotion*, *patient-centered care*, and *health equity*. I also searched for sources published between 2018 and 2022 and foundational articles that were included in the references of key selected publications as well as articles included as similar topics in search engines to thoroughly explore the subject area being reviewed. Given the use of the IM for this

research study, a broad and comprehensive review of factors related to social capital and food insecurity was conducted.

Literature Review

In examining the literature that looked at the issue of social capital and food insecurity several themes emerged.

First, the limitations of food hardship and the household's ability to act on the health promotion and nutrition messages received, brought a consideration of the functional mode of the at-risk household in relationship to Maslow's hierarchy of needs and others foundational theories of human development and health promotion. Particular attention was given to where social interaction and connectedness fit in the needs model, the overall promotion of optimal health, including relational health, and its effect on the growth and development of children and teens.

Next, I looked at the ways nutritional and health coaching was used to address the needs of the at-risk population, including standards of nutrition care and the knowledge to action (KTA) exchange distinctions between nutrition education, counseling, and coaching. Examples of interventions to promote improved nutritional status through building social capital and supportive environments were provided.

Continuing in this review is a look at how culture, racial and ethnic identity, and types of social connections may impact the social determinants of health and health disparities, with an introduction to structural competency skills for working to meet the unmet needs of the low income and food insecure population.

Moreover, I sought to examine the literature related to the use of building social capital as an intervention strategy to promote food security, health equity, and to build community capacity, with a review of high-risk groups included.

Finally, the economic impact of food insecurity as compared to the food secure was explored through a review of the household budget at various income levels related to the cost of raising a child. This also included the influence of the high cost of food to meeting nutritional recommendations and the importance of skill-building initiatives to further reveal the gaps that this research study seeks to bridge.

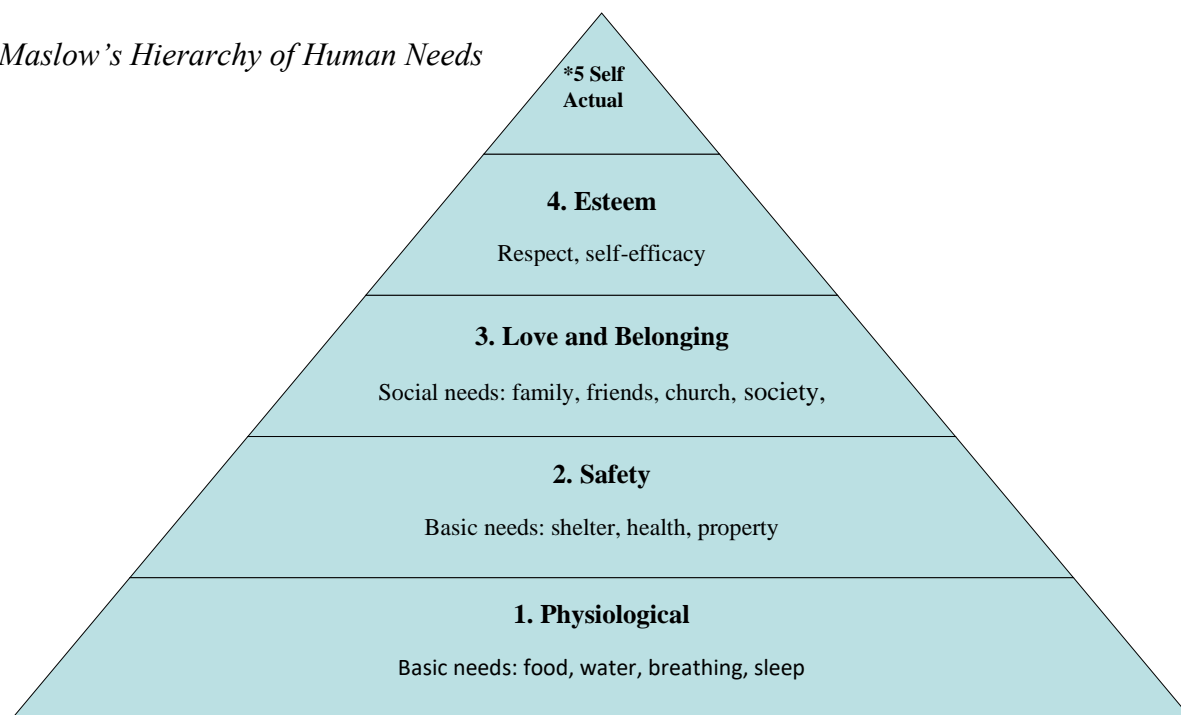
The Importance of Social Capital to Human Development and Health Promotion

Many theorists have provided insight on the human need for social interactions for healthy human development and health promotion (Khan Academy, 2018; Koltko-Rivera, 2006; Winston, 2016; Winston et al., 2017). Among these, Maslow's hierarchy of needs has been viewed as one of the key foundational works that explains human's functioning and motivation in the presence of adversity or abundance, from those that are suffering to excelling (Khan Academy, 2018; Koltko-Rivera, 2006; Winston, 2016; Winston et al., 2017). In the 1940s and '50s, Abraham Maslow, a psychologist, and scholar of humanism studied exceptional individuals such as Albert Einstein to understand their motivation to achieve (Maslow, 1943). He went on to develop the five stages of human needs which are usually depicted in a pyramid diagram (Khan Academy, 2018; Maslow, 1943).

Humanism is a theory of motivation that postulates that humans are inherently good but driven by free will (Khan Academy, 2018; Winston, 2016; Winston et al., 2017). Motivation is spurred on by a conscious decision to meet basic needs along with a drive for the achievement of self-actualization, reaching human's fullest potential (Khan Academy, 2018; Koltko-Rivera, 2006). The Maslow's model premise is that each level builds up to the next such that the lower level one (bottom tier – basic needs) must be achieved to proceed up to level 5 (top tier- self-actualization and transcendent)(Khan Academy, 2018; Koltko-Rivera, 2006; Maslow, 1943). Figure 2 outlines the five stages of Maslow's hierarchy of needs.

Figure 2

Maslow's Hierarchy of Human Needs



Note: The lower-level basic needs must be met before moving to the next level. *Level 5 – Self-actualization, able to meet full potential, morality focused, creative, relaxed, motivated to compete and excel. Adapted from: "Theories of Personality." *Khan Academy (2018)*. <https://www.khanacademy.org/test-prep/mcat/behavior/theories-personality/v/biological-theory>

Food insecure households must meet basic survival and social needs before health promotion actions are feasible which is at a higher functional level (Koltko-Rivera, 2006; Maslow, 1943). The nutritional coach would need to assess the spheres of influence and extent of social connectedness so that effective strategies and actions could be formulated that are tailored to the individual's or household's unique situation (Mettler et al., 2014). Low social capital and limited spheres of influence are predictive of low social support, with lower coping capabilities for life challenges encountered and an inability to reach optimal functioning or potential (Dube et al., 2001).

Another humanistic psychologist, Carl Rogers characterized self-actualization as emanating early in life from a constant growth-promoting environment in which two elements must be in place (Khan Academy, 2018). First, the individual must be free to be their genuine true self without fear. This involves having trusting relationships with others and not being bound by conditions or expectations. A key element of self-conception is an understanding of the question of who am I? Understanding self allows the individual to open-up and learn (Khan Academy, 2018).

The second concept needed for self-actualization is acceptance from others. Growth flourishes through the positive acceptance of others. Thus, essential to the achievement of self-actualization and reaching one's highest potential is an environment that allows exploration of self as well as having genuine social relationships with others (Khan Academy, 2018). Both humanistic theories provide support for the examination of social capital in addressing food insecurity by nutrition and health promotion coaches as strategies for achieving nutrition and wellness goals (Khan Academy, 2018).

The complex issues of social capital and social determinants of health were outlined in a seven-part documentary series (National Minority Consortium of Public Television & Joint Center Health Policy Institute, 2008). The series looked at the root causes of socioeconomic and racial inequities in health. They highlighted the health impacts of the social circumstances that are present at birth as well as related to where individuals live and work. It was illustrated, through looking at the lives of individuals in four districts of Louisville, Kentucky, that there were as much as a ten-year difference in life expectancy between the wealthiest and the lowest income districts (National Minority Consortium of Public Television & Joint Center Health Policy Institute, 2008).

Chronic stress along with economic and racial inequities were cited as contributing to disparities (National Minority Consortium of Public Television & Joint Center Health Policy Institute, 2008). Strategies to address these social determinants of health are being proposed in Louisville and communities throughout the US that focus not on more medical solutions but on transforming social practices and public policies to achieve health equity (National Minority Consortium of Public Television & Joint Center Health Policy Institute, 2008). The following is a summary of the different levels of social functioning of the individuals based on income, social status, and capabilities for meeting individual and household needs for healthful living and well-being:

Very low-income individuals and families (Maslow's Basic Level 1)- may be suffering when basic needs for food, clothing, and shelter are not routinely met. Food hardship with money only for necessities may be seen with low cost, low nutrient, high-calorie foods consumed. These individuals may present with limited transportation, low

leisure activities, higher stress levels, lower educational levels, higher perceived poor health, and high risk for chronic disease, mental health disorders, and premature death.

Lower wage income households (referred to as the working poor) (Maslow's Basic Level 2) - may be viewed as surviving such that some minimum needs and desires are being met such as cell phone, food extras, housing, and transportation may be less of a problem. There may be more disposable money but tight with participation in spectator-sports, but money still limited for recreation and trips. There may be low food insecurity or marginal food security, still having issues of obtaining the healthy food that is needed. Stress levels may be high, with a high risk of chronic disease. May present with low levels of health and financial literacy.

Moderate income households (Maslow's Social Level) - with more household money and community connections, can purchase or obtain a variety of healthy foods to meet the recommended healthy meal patterns for health and longevity. Strong social connections with family, friends, and relatives are key to meeting life's challenges. They are connected to a church and other social outlet. They also have medical insurance and a relationship with their health care provider. Yet, they still may not have enough income to plan for the dream vacation that they desire.

High-income households (Maslow's Esteem Level) - are thriving and may have money that can be used for other wants (e.g., cable TV, electronics) and money that can be used for vacations and weekend getaways. A fitness lifestyle is perceived as feasible, with participation in fun fitness and active leisure activities with family and friends. Can consume a wide variety of foods regardless of price. They are not worried about

necessities. They hold high paying jobs that provide them with respect and responsibility, which is desirable but stressful.

Wealthy households (Maslow's Self-actualization Level) - are said to be excelling when all dimensions of holistic health can be met with high social capital, high social connections and support, high disposable income for leisure activities, vacations, and socializing with family, friends, and colleagues. Morality and social responsibility focused through monetary donations are now feasible. Housing and environmental aspects are conducive to achieving a healthy lifestyle. High educational attainment with higher health and financial literacy is apparent (Koltko-Rivera, 2006; Maslow, 1943; National Minority Consortium of Public Television & Joint Center Health Policy Institute, 2008).

Other behavioral theories used in nutrition, obesity, and physical activity interventions contend that the extent of social relationships and interactions along with environmental factors exert significant impacts on health practices of individuals and groups (Baranowski et al., 2003). In the social cognitive theory (SCT), the reciprocal interplay of personal and environmental influences, with social context as a component of the environment, were viewed as critical constructs in the development of health practices (Bandura, 1995; Baranowski et al., 2003; Nieuwenhuijsen et al., 2006). The individual's attention level, memorization, imitation, expectations, and motivation all combine to affect knowledge, skills, and self-efficacy for health practices (Nieuwenhuijsen et al., 2006).

Byrd-Bredbenner et al. (2011) reported that the SCT constructs of self-efficacy, self-regulation (e.g., goal setting, self-reward, self-monitoring, and environmental structuring), outcome expectations, and coping were used in the examination of 201 mothers related to BMI and diet quality. Using a Likert scale and statistical analysis, all SCT constructs were evaluated to see if there were differences in BMI or diet quality from mothers in the highest, middle, and lowest-ranked groups. Results indicated that the lowest quadrant had an intake of significantly lower fiber, vitamin C, magnesium, potassium, fruit, and vegetables than the highest quadrant as well as significantly more calories, fat, and cholesterol (Byrd-Bredbenner et al., 2011). Environmental findings showed that TV viewers at dinner had significantly lower consumption of fiber, vitamin C, magnesium, potassium, fruits, and vegetables than those that didn't watch television at dinnertime (Byrd-Bredbenner et al., 2011).

Through regression analysis, self-monitoring, environmental structuring, self-reward, and outcome expectations were shown to be significant positive predictors of self-efficacy (Byrd-Bredbenner et al., 2011). And self-monitoring was a positive predictor of outcome expectations (Byrd-Bredbenner et al., 2011). It was concluded that given the significant results between the SCT constructs, differences in nutritional intake, and BMI levels, it suggests a need to include strategies to build self-efficacy, self-regulation, outcome expectations, and coping skills in mothers to enhance health promotion efforts (Byrd-Bredbenner et al., 2011).

Social network theory (SNT) looks at the extent to which an individual, household, or organization are connected to others and their environment, with particular

attention to the levels of social connections observed (Ennis & West, 2010). Social networks form the framework that supports the existence of social capital which can be robust when considering the larger community or minimal when mapping out a smaller household unit (Claridge, 2020; Ennis & West, 2010). A visual matrix can be drawn by using nodes or points to represent the players or network members and attaching lines to show the connections based on a certain type of relationship, resource, or service being reviewed (Ennis & West, 2010). Those with a high number of social connections are assumed to have a high level of social support which has been linked to higher coping skills for handling adverse life consequences, such as food insecurity (Claridge, 2020; Ennis & West, 2010). The SNT analysis process can be used to develop enhanced strategies for asset-based community development through building upon the social networks and potential community connections that are identified (Ennis & West, 2010).

The SEM uses the interpersonal environment that surrounds the individual to understand the health or social determinate issues to be addressed (Baranowski et al., 2003). This includes exploring the social interactions and spheres of influence at various levels from the interpersonal to the societal levels (Baranowski et al., 2003). SEM takes a systems approach to create supportive environments and policies that enhance desired behaviors and establish new cultural norms (Baranowski et al., 2003).

In articles that outlined the social relationship factors that exert influence on food intake and activity practices in obese individuals, social elements included: role modeling (practices acquired through emulating the actions of others); behavioral and cultural norms (health habits routinely conducted by the social groups); facilitating (initiating or

halting an activity according to the coordination with others); and influencing strategies (trying to impact others health thoughts through behavior modification techniques) (Baranowski et al., 2003; Nieuwenhuijsen et al., 2006; Smith et al., 2013-a). Key to the SEM is the involvement of the at-risk population and looking at the issue from all levels of influence so that the most effective strategies can be implemented (Baranowski et al., 2003; Nieuwenhuijsen et al., 2006; Smith et al., 2013-a).

Health coaching is grounded in the ontological, constructionist worldview where learning is generated from the lived experiences of the individual, household, or community (Lundy, 2010; Smith et al., 2013-a). It encompasses a strength-based, patient-centered approach to health promotion such that if given a voice, the individual (or community residents) can tell the health coach (or community-based participatory researcher) what they need, what has worked best, and what they would like to see implemented (Minkler et al., 2003). The role of the health coach, in this case, is more of a content expert, data communicator, facilitator, and support person (Smith et al., 2013-a). There are two-way learning exchanges and power is shared through the mutually respectful, trusting relationship that is formed (Smith et al., 2013-a).

Using a patient-centered approach has been shown to yield positive results by addressing the problem from the ground up, through the lived experience of the individual or group (Minkler et al., 2003; Smith et al., 2013-a). Co-producing knowledge about a complex problem through “engaged scholarship” is consistent with a systems-thinking lens (Minkler et al., 2003; Mui et al., 2019; Nelson et al., 2015). The I that was used in this research study, provided a broader systems approach of viewing complex

health issues, such as food insecurity, which has multiple elements of influence. Through the IM map, a comprehensive assessment of variables from the intrapersonal and community context was considered in determining the most feasible strategies to implement (Lundy, 2010). It is important for the health coach to understand the social and environmental context of the individual or groups to be served so that targeted messages, appropriate guidance, and support can be provided (Minkler et al., 2003; Smith et al., 2013-a).

Social Capital Impacts Child and Adolescent Growth and Development

Social relationships have been shown to play significant roles in childhood impacting overall health and development (Garner & Yogman, 2021; Pellmar et al., 2002). The parent-child interaction can influence the types of foods consumed as well as the child's relationship towards eating through the food environment that is created (Academy of Nutrition and Dietetics, 2017). The home feeding environment may be influenced by several factors including the parent's responsiveness to their child as well as their ability to cope with adverse life events (Garner & Yogman, 2021; Jackson & Vaughn, 2017; O'Connor et al., 2009).

Early feeding interactions between mother and infant may result in more positive feeding experiences and produce greater maternal sensitivity and responsiveness to infant needs (Davies et al., 2006; Satter, 2014). The pioneering work of Ellen Satter (1986-a-b; 2004; 2014) and her work in conjunction with Davies et al. (2006) related to the parent-child feeding relationship and the division of responsibilities in feeding between parent

and child highlighted the importance of setting a positive social environment for feeding. Understanding the child's need for autonomy to develop a healthy relationship with food without forcing or limiting food would be needed (Academy of Nutrition and Dietetics, 2017; Davies et al., 2006; Satter, 2014). O'Connor et al. (2009) looked at parental feeding styles using self-reported data from a cohort of Head Start parent-child dyads. It was documented that higher fruit and vegetable intake was associated with parents in the non-directive food parenting cluster that used practices that increased availability and access of fruits and vegetables as well as those that used teachable moments to engage their children in thinking about the benefits of eating fruits and vegetables. These parents used a lower amount of firm discipline, allowing the child to exercise autonomy (O'Connor et al., 2009). Low intake of fruits and vegetables were associated with authoritarian parents who practice lower engagement during feeding with a high amount of directive eating through firm discipline external to the child, such as treats, rewards, pressure to eat, and restrictions (O'Connor et al., 2009).

Breastfeeding has been associated with improved mother-infant bonding (Anderson et al., 2007; Liu et al., 2014-a). Active bonding (i.e., verbal interactions during feeding) may protect against childhood internalizing disorders (Liu et al., 2014-a; Olf, 2012). Research has shown that childhood internalizing disorders, such as depression and anxiety, can affect up to 20% of children and adolescents and can increase the risk of future psychological problems in adulthood (Liu et al., 2014-a; Olf, 2012). A study by Liu et al. (2014-a) found that breastfed babies with mothers that were highly interactive had the lowest rates of internalizing behaviors (mean = 10.01, SD = 7.21) as compared to

babies that were not completely breastfed or not breastfed (mean = 12.79, SD = 8.14). African American mothers and mothers that are low income have the lowest rates of breastfeeding in the US (CDC, 2013; Hess et al., 2015). In 2013, it was reported that a low of 30.1% of African American infants were still breastfed at 6 months as compared to 46.6% of non-Hispanic white infants and 45.2% of Mexican American infants (CDC, 2013; Hess et al., 2015).

Financial strain in the household and food hardship can affect the child's physiological development which may lead to failure to thrive, impaired brain development, and strained relational health development (American Academy of Pediatrics [AAP], 2012; Lente, 2012; Olf, 2012; Walsh & Theodorakakis, 2017; Wong et al., 2016). Strong relational health in which children establish secure attachments to their caregivers are fostered through exposure to engaged, responsive caregivers in a safe, stable, and nurturing emotional environments (Garner & Yogman, 2021; Liu et al., 2014-a). Formation of relational health is an essential protective factor for the development of emotional regulation, resilience, and the ability to cope with adversity throughout life (AAP, 2012; Dube et al., 2001; Garner & Yogman, 2021; Lente, 2012; Olf, 2012; Pellmar et al., 2002).

Parent's poverty-related stress can lead to depression and marital conflict which can activate the child's stress response system, including the child's immune system (AAP, 2012; Cattell, 2001; Lente, 2012; Olf, 2012; Walsh & Theodorakakis, 2017). Stress-induced changes in the immune response can contribute to inflammatory, infectious, and auto-immune health disorders (Pellmar et al., 2002). Prolonged exposure

to toxic stress due to adverse childhood experiences (ACE), including hunger and food insecurity, can lead to impaired learning, behavioral problems, and the inability to form bonding relationships with others that can last throughout adult life (AAP, 2012; Dube et al., 2001; Garner & Yogman, 2021; Lente, 2012; Olf, 2012; Walsh & Theodorakakis, 2017; Wong et al., 2016). In a study that used data from the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B), Jackson and Vaughn (2017) said that parent’s history of negative life circumstances can increase the likelihood of childhood food insecurity and hunger through its influence on social functioning, such as the parent-child interactions, as well as risks to the household environment. Disruptive life events that posed a significant risk to childhood food security included the experience of parent being suspended or permanently banned from school as a teen, a job loss, maternal depression, parental illness or hospitalization, and parental incarceration, among others (Jackson & Vaughn, 2017).

Children brought up in households that are food insecure have been found to have more emotional issues, such as anxiety, problems handling stress, and a higher suicidal propensity (Dube et al., 2001; Garner & Yogman, 2021; Jackson & Vaughn, 2017). In addition, those that are food insecure have been linked to asthma, recurrent hospital admissions, high weight status, and lower academic achievement (Jackson & Vaughn, 2017). It was concluded that to address food insecurity, health care providers or public health need to not only look at addressing the immediate unmet food needs but should also look deeper into the disruptive life events that can be manifested within the household’s social environment (Garner & Yogman, 2021; Jackson & Vaughn, 2017).

In adolescence, social connections have been shown to influence weight and fitness practices (Anderson Steeves et al., 2016; Garner & Yogman, 2021). This has been associated with a youth's propensity to conform to the social norms, role models, and the trends of their peer groups (Anderson Steeves et al., 2016). Adolescents may also gain greater control over their food choices due to increased amounts of personal funds to buy food which could have both positive and negative consequences on food intake patterns (Anderson Steeves et al., 2016). Anderson Steeves et al. (2016) conducted a convergent parallel, mixed-method design study to examine the social roles that parents, friends, and significant others play on the food consumption and physical activity habits of low income, African American youth, ages 9 to 15 years. The study was a sub-study of the B'more Healthy Communities for Kids (BHCK), an obesity prevention initiative conducted in the food desert neighborhoods of Baltimore, MD, USA. Structural questionnaires (quantitative data) were completed by 297 youth with combined comprehensive interviews (qualitative data) from 38 youth and 10 parents. The results showed that parents and caregivers (e.g., grandparents) play several major roles that impact the food consumption patterns and activity level of youth such as establishing household health promotion parameters, creating a healthy food environment, and being a role model for active living (Anderson Steeves et al., 2016; ODPHP, 2021).

An issue that emerged in managing the home food environment was the parents' will for establishing a healthy food environment (Anderson Steeves et al., 2016; Garner & Yogman, 2021). The types of foods purchased were influenced by the cost of grocery items as well as their knowledge of the nutritional value of foods (Anderson Steeves et

al., 2016). Some parents purchased a sugary juice drink versus 100% juice because of the lower cost without concern for or understanding of the nutritional contribution it provided (Anderson Steeves et al., 2016).

Other significant people such as friends and relatives (e.g., Aunt) may also influence the youth through such things as being partners for active play or providing exposure to new foods, respectively (Anderson Steeves et al., 2016; Garner & Yogman, 2021). Teachers and healthcare providers were shown to mainly provide information to enhance knowledge on eating and fitness with little other strategies used to promote healthy behaviors (Anderson Steeves et al., 2016). It was concluded that more research was needed to identify effective strategies to build on and to impact social support relationships that influence minority youths' health practices (Anderson Steeves et al., 2016; Garner & Yogman, 2021).

Health Promotion and Social Capital

Health is molded by both the extent to which an individual is capable to pursue health through the resources that are available as well as their self-efficacy for making use of the opportunities for health that is available (Martin et al., 2017; Weaver et al., 2013). Some resources may be exchanged for other resources that promote health, such as financial resources for healthy food or exercise equipment (Bolin et al., 2003; Cattell, 2001). Social and cultural connections could be used to gain job positions, housing, or other supports that are needed, including food. It can also be used in shaping the health

beliefs and traditions that are passed down through the generations that influence cultural health and wellness practices (Bolin et al., 2003; Cattell, 2001; Weaver et al., 2013).

In a qualitative study that looked at the influences of economic, social, and cultural resources on the dietary management of diabetes, Weaver et al. (2013) said those with low resources were the least equipped to manage their diabetes with lack of economic, social, and cultural supports having a negative impact compared to those with high resources. Those with high resources were highly motivated to achieve a healthy eating lifestyle with a sufficient quantity of financial, social, and cultural support to empower positive health promotion efforts. Thus, it was concluded that acquiring greater insight on how all three components (i.e., economic, social, cultural) influence the health capabilities of low resource groups were viewed as critical to the development of strategies to improve self-efficacy, disease management, and wellness practices (Weaver et al., 2013).

Several public health recommendations and documents called for more universal and targeted interventions geared to those that are disproportionately burdened by poor health (Givens et al., 2018; Healthy People [HP], 2018; Minkler et al., 2003; National Prevention Council, [NPC] 2011). Health disparities in the US are closely linked to social, economic, and environmental factors (Givens et al., 2018; HP, 2018; Minkler et al., 2003; NPC, 2011; Pellmar et al., 2002). Enhancing social relationships and social connectedness have motivated people to be more proactive in participating in healthy lifestyle practices, including active living, healthful eating, controlling stress, and healthy decision making (Givens et al., 2018; HP, 2018; Mills et al., 2017; NPC, 2011; Onyx &

Leonard, 2010; Pellmar et al., 2002). Various initiatives have shown that through such things as community building, community organizing, and community based participatory action, the communities were empowered to address the social conditions that impacted the achievement of healthy behaviors (Garcia et al., 2013; Hoeft et al., 2014; Minkler et al., 2003; Onyx & Leonard, 2010; Pellmar et al., 2002).

Building social capital was effective through the trust and social cohesiveness that was developed (Hunter et al., 2011; Minkler et al., 2003; Onyx & Leonard, 2010). The collective impact that was generated promotes community ownership of the outcomes achieved (Hunter et al., 2011; Minkler et al., 2003; Onyx & Leonard, 2010). Some elements highlighted to build social capital included: retraining of professional staff to enhance coaching skills; open-ended transformational community building funding (versus traditional narrow targeted funding); involvement of the community in setting the direction of the initiative from the ground up; addressing adverse childhood experiences (ACE) through trauma-informed interventions, and supportive and engaged policymakers and community champions to provide leadership to community-driven public policy reform efforts (Garcia et al., 2013; Givens et al., 2018; Hoeft et al., 2014; Minkler et al., 2003; NPC, 2011; Onyx & Leonard, 2010).

Impacting Social Determinants of Health through Addressing Social Capital

Social capital has been extensively researched over decades in the social and behavioral sciences but has received renewed attention by health promotion and public health researchers looking at ways to combat the social determinants of health, moving

upstream to address root causes of health disparities (Brennan Ramirez et al., 2008; Garcia et al., 2013). Table 2. reveals the complex array of social issues that may need to be addressed to impact an individual's achievement of optimal health and well-being.

Table 2

Social Determinants of Health

Housing	Single Parenting
Employment	Medical and Mental Health Services
Poverty/ Working Poor	Environmental Hazard (e.g., Lead in Water)
Hunger & Malnutrition	Transportation
Healthy Food Access in Community	Walkable Communities
High Food Costs	Quality Schools, Higher Education
Health Disparities	Recreational Facilities
Neighborhood Crime/Safety	Active Faith Community
Drug, Alcohol, Tobacco Abuse	High School Dropouts; School Achievement
Incarceration	A Person with a Disability in the Household

Adapted from: "Promoting Health Equity: A Resource to Help Communities Address Social Determinants of Health," L.K. Brennan Ramirez et al., 2008. *U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.*

<https://www.cdc.gov/nccdphp/dch/programs/healthycommunitiesprogram/tools/pdf/sdoh-workbook.pdf>

Social capital has been viewed as a mediator between the social determinates of health that pose health risks and the extent of positive health outcomes achieved (Hunter et al., 2011). The strengths of social relationships whether within the household or community may impact the ability to navigate through life's hardships (Pellmar et al., 2002; Social Capital Research and Training, 2018). Effectively managing adversity has

been shown to impact health and perception of the quality of life (Pellmar et al., 2002; Social Capital Research and Training, 2018).

Households with high social connections were shown to have greater trusting relationships and more resilience in dealing with adversity (Hunter et al., 2011; Onyx & Leonard, 2010; Pellmar et al., 2002). While, those households that were more socially isolated, having few social networks, had less social support and less ability to cope with the hardships of life leading to higher health impairment, mental health issues, and higher mortality (Hunter, et al., 2011; Leung et al., 2015; Onyx & Leonard, 2010; Pellmar, et al., 2002). Even in poor communities, those with high levels of social connections had the least chronic disease and higher perceived quality of life (Hunter, et al., 2011).

Baiden et al. (2014), conducted a secondary data study using the Statistic Canada's 2012, Canadian Community Health Survey. They examined the association between a sense of community belonging to unmet healthcare needs of Canadian individuals, once adjustments were made for predisposing, enabling, and need factors related to use of health services. The sample included 21, 257 individuals, 12 years and older, using logistic regression statistical analysis (Baiden et al., 2014).

Results indicated that 10% of the individuals reported having unmet health care needs with community belonging having a significant effect (Baiden et al., 2014). Those with lower levels of community belonging were 1.27 times more likely to report unmet needs. Those shown to be more likely to have unmet needs included individuals that were younger, females, had more education, did not have a primary care physician, were in poor physical and mental health, were limited in activities of daily living, and presented

with chronic health conditions (Baiden et al., 2014). Researchers concluded that health programs should be developed to meet both the specific needs of individuals as well as to promote a sense of community belonging (Baiden et al., 2014).

Pantell et al. (2013) examined the effect of social isolation on mortality risk as compared to traditional mortality risk factors (i.e., smoking, hypertension, high weight, and elevated cholesterol) to ascertain its relative predictive value. The study was conducted using an adult cohort from the Third National Health and Nutrition Examination Survey (NHANES III) and the National Death Index. They found that those that were considered socially isolated had higher mortality from all causes as compared with those that were more socially connected (Pantell et al., 2013).

Furthermore, social isolation had a significant predictive value for mortality risk compared to that of smoking and high blood pressure in both men and women. Social isolation factors included being unmarried, limited church participation, low social contacts, and low club or agency memberships (Pantell et al., 2013). It was concluded that findings support the importance of evaluating an individual's level of social isolation (Pantell et al., 2013).

Building up social connections can occur over a shorter timeline than changing the broader social determinants of health such as impacting poverty levels, promoting income equality, or changing educational achievement rates (Hunter et al., 2011). This shorter timeline for realizing social change through the building of social capital lends itself well to local public health initiatives which need to show the effective use of public health funding (Hunter et al., 2011). Sustainability of social change may be positively

impacted when the household and the community are empowered to take a leadership role in shaping their social environment. Through the forging of trusted relationships, new connections for support and resources, and collective civic engagement, the social conditions that affect health can be addressed (Garcia et al., 2013; Hunter et al., 2011; Minkler et al., 2003; Onyx & Leonard, 2010; Pellmar et al., 2002).

Dean et al. (2011) examined the influence of collective social functioning on food insecurity levels in older adults, which encompassed both community and familial social capital as well as perceived social disparity. They concluded that higher levels of food insecurity were associated with women, African Americans, households with low or poverty-level incomes, those that perceived their situation as worse than others, and those with low familial social capital (Dean et al., 2011). Lower risk of food insecurity was related to being older, those with a partner, and those with higher incomes (Dean et al., 2011).

Types of Social Capital

Social capital has been described in several ways based on the types of relationships that it encompasses (Claridge, 2004; Pellmar et al., 2002). Dean et al. (2014) reviewed the various social networks that could be accessed by older adults to deal with food needs. These social relationships included intimate social networks (e.g., familial, friendship, neighbors), community social relationships (e.g., civil groups with food pantries, home or community gardens, faith-based meal programs), and governmental capital which includes the formal food safety net system (e.g., SNAP;

Senior Congregate Meals). They concluded the mix of these social networks, and the strengths of their connections can assist the low-income elderly to remain food secure whether living in urban or rural settings (Dean et al., 2014).

Additional types of social relationships or social connections have also been categorized by Villalonga-Olives et al., (2016) as belonging to two major categories, either bonding or bridging relationships. Bonding social relationships were those which included personal close relationships within an individual's immediate cultural circle, which includes family, friends, and other close individuals. Bridging social relationships includes individuals or groups outside the person's immediate social circle. They serve to educate or connect the individual to support services and affordable community resources, such as a trusted health professional, teacher, or community champion (Claridge, 2004; Onyx & Leonard, 2010; Villalonga-Olives et al., 2016).

A third type of social relationship, known as linking social capital, is viewed as an extension of bridging relationships that encompass the norms of respectful decorum and reciprocal trustful interactions that are formed amongst individuals and groups networking through formal structures or systems of higher power or hierarchy positions in civic society (Claridge, 2004; Villalonga-Olives et al., 2016). This type of linking relationship might be seen between a non-profit agency and grant administrators or elected officials and can be vital in building community capacity (Claridge, 2004; Onyx & Leonard, 2010).

Nutritional Care and Enhancement of Social Capital

Within the nutrition and dietetic field, assessment of the social and environmental factors that influence health and well-being are key elements of the nutritional care process and model (NCPM) (Academy of Nutrition and Dietetics, 2018). The NCPM is used as the practice guide for the dietetic profession as developed by the Academy of Nutrition and Dietetics (the Academy) (Academy of Nutrition and Dietetics, 2018; Stein, 2016). NCPM entails a systematic cyclical four-step process of nutritional assessment, nutritional diagnosis, nutrition intervention, and nutritional monitoring with outcome evaluation in a continuous feedback loop (Stein, 2016).

The NCPM is intended to work well in all practice settings to address health issues (Stein, 2016). This includes whether clinical treatment or community health promotion settings (Stein, 2016). In keeping with the intent of the NCPM to provide guidance to the dietetic professional, the Academy's Public Health/Community Nutrition Dietetic Practice Group (PHCN-DPG) developed specific Standards of Practice (SOP) and Standard of Professional Performance (SOPP) for those working in prevention and community nutrition (Bruening et al., 2015; Stein, 2016).

The SOP and SOPP are meant to assure that the public health and community nutrition professionals are providing nutrition education, counseling, coaching, and food services that are effective, evidence-based, client-centered, and appropriately planned to impact the nutritional issues encountered, which may include hunger and food insecurity (Academy of Nutrition and Dietetics, 2018; Bruening et al., 2015; Stein, 2016). The standards provide a framework for self-evaluation and enhancement of practice through

continuing professional education, skill-building, and resources to demonstrate competency (Bruening et al., 2015). The Academy also supports on-going research so that new practice innovation can be included for continuous quality improvement to promote positive social change through evidence-based healthy eating strategies (Academy of Nutrition and Dietetics, 2018; Stein, 2016).

In a position statement guidance to nutrition professionals working with food insecure at-risk populations, the Academy (2017) said:

Systematic and sustained action is needed to achieve food and nutrition security in the U.S....Effective interventions are needed along with adequate funding for and increased utilization of food and nutrition assistance programs...RDN's and DTR's can play a significant role in addressing food insecurity and are uniquely positioned to make contributions through competent and collaborative practice, provisions of comprehensive food and nutrition education and training, innovative research related to all aspects of food insecurity, and advocacy efforts at the local, state, regional, and national levels. (p. 1991)

The parameters of the NCPM also forms the foundation of the Accreditation Council of Education in Nutrition and Dietetics (ACEND) knowledge and skills competency standards that were established in 2012 and recently updated in 2017 to guide dietetic educational programs (Turner et al., 2016). These standards are intended to

meet the elements of the IOM recommended core competencies established in 2003 to guide all health professions to more efficient and effective health services (Turner et al., 2016). The IOM emphasized five core competencies for incorporation into all health profession's instructions which included: using a patient-centered care framework, working in interdisciplinary teams, the use of evidence-based practices, centering on quality improvement, and utilizing informatics. (Turner et al., 2016, p. 1710).

The new ACEND competency standards-2017 places an emphasis on patient-centered care which is framed around enhancing the cultural competence of the practitioner and tailoring of the nutritional care plan based on the patient's individual cultural, financial, and environmental needs (Turner et al., 2016). Although assessment of culture, age appropriateness, literacy levels, affordability, acceptability, and population diversity were directly mentioned in the ACEND standards, no direct reference to social capital, social connectedness, social support, social isolation, or social structures were found (Turner et al., 2016). This presented a gap that was addressed through this research study for expanded patient-centered care assessment and coaching recommendations when working with individuals experiencing or at-risk for food hardship.

Turner et al. (2016) conducted an online survey to examine to what extent has the IOM core competencies been incorporated into ACEND dietetic educational programming as compared to other health disciplines. The survey was e-mailed to 535 ACEND dietetic program heads throughout the US, with a 35% return rate, or a total of 186 individual program representatives responding. A variety of nutrition and dietetic program types were represented including coordinated undergraduate (7%);

undergraduate didactic (38%); dietetic internship (49%), and dietetic technician (6%) programs (Turner, et al., 2016). Previously conducted surveys of the Association of Schools of Allied Health (2009) and Schools of Doctor of Pharmacy Programs (2012) were used as a comparison.

The ACEND dietetic survey revealed that a high percentage of the nutrition and dietetic program respondents have implemented the core competencies of patient-centered care (84%) and evidence-based practice (92%), respectively, which were like the levels seen in the other health professions (Turner et al., 2016). Much lower levels were found in the remaining three competencies, with interdisciplinary teams receiving 59% from both ACEND Programs and Allied Health, and a low 34% from Pharmacy Programs. Quality Improvement received 42% (ACEND), 67% (Allied Health) and 29% (Pharmacy). And informatics received 51% (ACEND), 46% (Allied Health) and 36% (Pharmacy). These lower levels revealed that there was still work needed to ensure the quality of services provided as well as to improve the connectedness and collaboration that exist within the healthcare system (Turner et al., 2016).

Differences between nutrition education and nutritional counseling versus nutritional coaching may be viewed in terms of the knowledge to action (KTA) framework. The KTA framework outlined three levels of knowledge transfers - the traditional linear, transactional, and multilevel transformational knowledge exchanges (Best & Holmes, 2010; Noland & Richards, 2014). When applied to nutritional exchanges, traditional nutrition education and nutritional counseling uses a linear and/or transactional transfer of knowledge from the teacher (or counselor) to the student (or

patient) with the professionals viewed as the experts and yielding the power in the relationship (Best & Holmes, 2010; Noland & Richards, 2014)).

Nutrition counseling is more transactional for disease control or risk reduction using the framework of the NCPM (Stein, 2016). Through the transaction of the patient complying with the diet instructions provided by the nutrition practitioner, the patient can manage their disease or achieve health maintenance (Best & Holmes, 2010; Stein, 2016). Some transactional considerations may also be given to the food preferences of the patient that are honored, although the nutritional expert maintains the primary role of development of the nutritional care plan. The patient is expected to follow the nutritional care plan, as designed, or be deemed non-compliant (Stein, 2016). Achievement of transactional exchange goals is dependent on the patient having appropriate access to the resources, including food, needed to accomplish the tasks promoted (Best & Holmes, 2010).

In contrast to linear and transactional knowledge exchanges, nutritional coaching is more transformational, empowering, and motivating, resulting in behavioral changes and self-efficacy that transforms or elevates the individual to a higher functional state of overall health and wellbeing (Best & Holmes, 2010; Jordan, 2013; Smith et al., 2013-a). In the nutritional coaching relationship, which uses a patient-centered approach, the power is shifted more to the patient for what gets implemented (Best & Holmes, 2010; Jordan, 2013; Noland & Richards, 2014; Smith et al., 2013-a). Both coach and patient exchange their knowledge and experiences to establish mutually agreed-upon goals to guide the health action plan that is perceived to be achievable (Best & Holmes, 2010;

Jordan, 2013). The patient-centered, multilevel exchange framework requires the active engagement of the individual patient with an adequate degree of knowledge, skills, and capabilities (Smith et al., 2013-a).

The nutritional coach will need to use an expanded set of abilities and skills such as behavioral modification techniques (e.g., motivational interviewing, mindful eating), goal setting, assessment of perceptions of health, guidance for accessing healthy affordable food outlets, and being a cheerleader of successes (Jordan, 2013; Noland & Richards, 2014; Smith et al., 2013-a). These enhanced skills sets would enable a nutritional coach to assess, guide, and support the areas of desired learning and behavioral change identified by the patient in creating acceptable options for their health improvement plan (Jordan, 2013; Noland & Richards, 2014; Smith et al., 2013-a).

Nutritional coaching of the food insecure may assist individuals in moving to a different level of functioning through the expansion of awareness of viable choices for connecting to resources and building supportive networks (Jordan, 2013; Martinez-Donate et al., 2016; Smith et al., 2013-a). Coaching may also help to increase the perceived ability of the individual/community to impact their current situation and provide motivation to increase their health promotion practices (Jordan, 2013; Smith et al., 2013-a).

Using a coaching model, such as the integrative health coaching (IHC) model developed by Duke University, involves being skilled in active listening and thought-provoking questioning to enable individuals to reflect on their personal desires and explore the external resources available to enhance personal growth (Noland & Richards, 2014; Smith et al., 2013-a). Individuals are assisted in the use of goals setting,

motivational interviewing, mindfulness, and planning techniques to mold their healthy lifestyles. IHC supports humanistic psychology promoting patient-centered interaction, on-going learning, and achieving self-actualization by revisiting core values and purpose (Noland & Richards, 2014; Smith et al., 2013-a). Jordan (2013) said the health coaching model could break through the social isolation and loneliness of the homeless adult and low-income individuals with chronic health problems. The coaching encounters helped individuals develop the capacity to meet their short-term health goals (Jordan, 2013). It was effective in promoting increased use of community health services through inspiring more empowered individuals with firsthand knowledge of available preventative health services (Jordan, 2013). Five coaching tasks involved assessing and enhancing social interactions to support health behavioral change (Jordan, 2013; Noland & Richards, 2014; Smith et al., 2013-a).

Nutritional coaching may also be influential in impacting the household social functioning around the family meal (Greer & Nelson, 2014; Hunter et al., 2014). Practitioners will need to be aware of and incorporate tailored strategies into their practices to address food hardship and build social capital for healthy eating (Greer & Nelson, 2014; Hunter et al., 2014). Nutritional coaching interventions have been shown to be effective in empowering individuals in weight loss programs to achieve healthier eating habits, although results were varied due to limited cultural diversity, age disparities, and differing health priorities (Adams et al., 2013; Foley et al., 2013; Greer & Nelson, 2014; Heimendinger et al., 2007; Karhula et al., 2015).

In looking to enhance understanding of health literacy skills in patients with cardiovascular disease and diabetes, both McKenna et al. (2020) and Dunn et al. (2016) highlighted the importance of addressing the issues of emotional and social support before instructional concepts could be internalized. McKenna et al. (2020) concluded that the bridging support of the health care provider was key to promoting both emotional stability and motivation to address the health concerns, impacting all aspects of health literacy achievement, including the care plan decisions. Having strong social support formed the foundation of successful chronic disease self-management whether addressing cancer, CVD, or diabetes conditions (Dunn et al., 2016; Jordan, 2013; McKenna et al., 2020).

In looking at the broader community context, KTA has been used in conjunction with systems thinking and community based participatory action to promote greater community capacity for addressing social determinants of health, including food insecurity (Best & Holmes, 2010; Kaiser, 2013; Minkler et al., 2003; Mui et al., 2019; Nelson et al., 2015; Pellmar et al., 2002). Bateman et al. (2017) conducted a pre-intervention survey to gain an understanding of the extent to which policies, systems, and the environment (PSE) affect the fruit and vegetable intake patterns of limited income African American residents of Jefferson and Mobile counties of Alabama and Forrest County in Mississippi. Using a modified Behavioral Risk Factor Surveillance System (BRFSS) tool, which encompassed an ecological framework with multiple factors of influence, 256 participants were surveyed over the summer of 2015 (Bateman et al., 2017).

Results showed that meeting the recommended fruit and vegetable intake level was associated with having children who participated in schools or childcare facilities with active wellness protocols. Also, being connected to a food safety net program, and individuals that could recall nutrition-related marketing campaigns showed positive results (Bateman et al., 2017). In addition, those that were active in or had a relative which attended a health advocacy meeting within a 24-month period also were shown to achieve adequate fruit and vegetable intake levels (Bateman et al., 2017). It was concluded that health interventions with a focus on policy advocacy have the potential to improve the health practices of the targeted at-risk community, including the low-income African American population (Bateman et al., 2017; Kaiser, 2013).

From 2009 to 2011, the Academy (formerly known as the American Dietetic Association) conducted an Evidence Analysis Library (EAL) Project to systematically review the issue of health disparities (HD) and what nutrition professionals can do to make an impact. Four key topics were selected for extensive literature review. The four HD areas of focus included: availability and access to nutritional care, cross-cultural communications, effectiveness of nutrition interventions methods, and food insecurity (Academy of Nutrition and Dietetics, 2018; Greer, 2011; Greer & Longstreet, 2010).

Only limited research (2 studies) that directly looked at the extent of access to nutrition services were found although it was not specified if the registered dietitian provided the service (Croxley & Herwehe, 2002; Hasnain-Wynia et al., 2007). Hasnain-Wynia et al. (2007) reviewed teaching hospitals across the US and found that patients of racial and ethnic backgrounds presenting with congestive heart failure (CHF) were

significantly less likely to receive CHF discharge counseling (including nutritional instructions) than white patients with CHF. It was concluded that patients of racial and ethnic backgrounds were routinely provided reduced quality of healthcare, that the differences in levels of care were often related to the sites where individuals seek services, and that differences in discharge counseling rates were still significant after controlling for place of care (Hasnain-Wynia et al., 2007).

When looking at the broader health practitioner team pool which included physician, nurses, registered dietitian nutritionist, psychologists, peer educators, and community health workers, intervention methods that included one-on-one counseling, group education, support groups, creating buddy systems, faith-based interventions, and tailoring of health messages based on the culture context of the target population were effective in promoting positive health outcomes in diabetes, cardiovascular disease, obesity prevention, and in breastfeeding promotion (Anderson et al., 2007; Elmer et al., 2006; Funk et al., 2008; Kim et al., 2009; Lesley, 2007; McCarthy et al., 2007; Scisney-Matlock et al., 2006). In addition, skills-building education such as food preparation workshops and fitness classes, increasing availability to fresh fruits and vegetables, exercise sites, and fitness tools yielded positive outcomes. Effective communication modes included video technology (e.g., fitness tapes, videotaped discussions with community role models), telephone follow-up, and tailored written educational handouts (Elder et al., 2006; Garvin et al., 2004; Gilmer, et al., 2005; Utz et al., 2008).

Addressing social issues such as childcare during workshops and transportation, enhancement of self-efficacy and self-management skills, plus strategies for building

family and social support were also highlighted (Elder et al., 2006; Garvin et al., 2004; Gilmer et al., 2005; Kennedy et al., 2009; Liebman et al., 2007). Furthermore, in analyzing food insecurity research, it was concluded that more targeted research was needed on how to empower the food insecure individuals and households to healthy eating practices, community engagement, and outreach strategies, public policy and advocacy reform needs, and increasing access to healthy foods within at-risk neighborhoods (Kennedy et al., 2009; Lohman et al., 2009; Martin, et al., 2004; Pan & Jensen, 2008; Rose, 2007).

Cultural and Structural Competency: Addressing Unmet Social Needs

Culture functions as the vehicle that guides the acceptable ways of doing, including the beliefs, social norms, family traditions, and skills for engaging in a society which is passed down through the ages and affects behavior (Campinha-Bacote, 2009; Swierad et al., 2017). These factors are then bound together through the collective interplay of social and environmental connections (Swierad et al., 2017). Swierad et al. (2017) sought to develop a richer understanding of the role of culture and other psychological, social, and environmental factors influencing African American health behaviors. They contended that a willingness to participate in healthy living activities by African Americans were dependent on the array of interconnectedness at was found at various levels, from the individual, social, and the environment spears of influence.

Yet, culture was also said to be adaptable, having aspects that can change, with both fixed and fluid qualities (Campinha-Bacote, 2009; Swierad et al., 2017). Fixed

aspects were the communal or personal identification factors that are passed down from one generation to the next. Whereas the fluid aspects of culture were those that evolve as the social environment changes and become more diverse such as acculturation to new foods that are introduced cross-culturally (Swierad et al., 2017). Culture affects how food is prepared, as well as what is eaten and the context surrounding how it is consumed by creating social norms surrounding these practices (e.g., what is served on a special occasion) (Greer, & Nelson, 2014; ODPHP, 2021) . It was stressed that African Americans may have to function “bi-culturally” through influences of both their ethnic culture as well as the societal or mainstream culture. (Swierad et al., 2017, p.2)

Understanding the influences of African American ethnic culture and mainstream culture in the context of the facilitators of and barriers to healthy food intake and physical activity is crucial for effective health promotion (Greer, & Nelson, 2014; ODPHP, 2021; Swierad et al., 2017). Yet, it was also important to look at other practical considerations beyond culture, including economics, food affordability, and access. Swierad et al. (2017) reported:

The cultural traits of resilience and strength were identified as positively impacting healthy behaviors and happiness. Respondents stated that “making it a culture of speaking and engaging with each other about the things that are relevant to our health, happiness, and healthy eating habits is important. And once we can spread the word, we can make that become more of a culture in the Black community in terms of what we eat. (p. 7)

Church and spirituality were factors that helped people engage in healthy eating and physical activity. It served as an essential social support system for health and well-being. It promoted a sense of community by bringing people together for a unified purpose and motivated each other to lead healthier lives (Swierad et al., 2017; Young et al., 2014).

Traditional cultural foods strengthened the ties within their families and community but were also said to be unhealthy (e.g., traditional soul food). The soul food cuisine was reported as one of the most important cultural factors that compromise healthy food intake within African American communities. Preparing healthy makeovers of some of the less healthy dishes was found to be quite popular. This suggested that African Americans may embrace learning to adjust their cooking styles to the healthier versions to improve their health while maintaining the connection with their cultural traditions (Greer, & Nelson, 2014; ODPHP, 2021). (Swierad et al., 2017, p.9).

Perceived lack of caring or support by mainstream culture for African American health and wellness contributed to negative health practices (). It was believed that not doing any new or innovative programming for the African American community to promote healthy lifestyle behaviors emanates from the prejudice viewpoint that African Americans are not human beings and not part of humanity. “The experience of discrimination was one of the biggest issues that compromise health” (Swierad et al., 2017, p.12)

Strong social support increased personal health activities. The social environment (e.g., family and friends) was a powerful motivator for healthy behaviors (.Garner &

Yogman, 2021; Swierad et al., 2017). Some respondents stated that various significant others, including friends, were their source of inspiration for healthy eating and physical activity as well as helped to resist the consumption of low nutrient foods, with the following statements, “If your friends are running, you are more likely to run too...My friends and I really encourage each other.” (Swierad et al., 2017, p.12)

Generational influences on healthy behaviors were seen by both the young and the elderly in the family through role modeling healthy practices (Garner & Yogman, 2021; Swierad et al., 2017). A respondent said, “She will be making smoothies or going to the gym more if I’m with her...Companionship helps her to be more inclined to work out...I’m always talking about eating healthy and you know, they joke around with me about it, but I influence them. They lean more towards the healthy side because of me.” (Swierad et al., 2017, p. 13)

The concept of bicultural identity integration (BII) is consistent with the act of picking and choosing healthy behaviors from both the ethnic culture and mainstream culture to normalize a healthy lifestyle for the African American population (Swierad et al., 2017). Engaging in both ethnic and mainstream cultural behaviors by African Americans would create a wider range of healthy options to select from as opposed to relying on just one source of general information about health and well-being. Being active in the selection of healthy choices can enhance the individual’s motivation and perceived self-management, which may promote the achievement of behavioral change goals (Greer, & Nelson, 2014; ODPHP, 2021; Swierad et al., 2017).

The influence of both cultures should be examined in relation to the broader social context which is consistent with the ecological models of health behaviors. The effectiveness of tailored dietary messages may depend on an individual's connection to their cultures, as well as differences within the cultures (Greer, & Nelson, 2014; Hams, & Bellows, 2003; ODPHP, 2021; Swierad et al., 2017). For African Americans, this could mean that their willingness to consume healthy makeovers may depend on their level of social connectedness to both their ethnic and mainstream cultures (Greer, & Nelson, 2014; Swierad et al., 2017).

Economic status was identified as impacting the types and the amount of healthy food eaten by African Americans. The willingness to eat more fruits and vegetables, which is highly promoted in mainstream culture, was dependent on the affordability and access to these types of foods in local markets (Greer, & Nelson, 2014;. Lack of affordable food and exercise options was a major barrier to healthy living for African Americans. There was a dilemma to either pay more for a smaller quantity of healthier food or pay less for a larger quantity of unhealthy food (e.g., \$1.00 for an apple vs \$1.00 for a fast-food meal; or \$4.00 for tomatoes vs \$4.00 for 4 McDonalds hamburgers) (Greer, & Nelson, 2014; ODPHP, 2021). Healthier choices would need to be more affordable. In many low-income families, the cost-benefit value of a food item gets judged based on what is going to make the family feel fuller. (Swierad et al., 2017).

The need for health education – knowledge of healthy living practices, ways to plan and cook healthful menus, and affordable places to exercise or to purchase healthy foods were identified as common issues (Greer, & Nelson, 2014; Hams, & Bellows, 2003;

ODPHP, 2021; Swierad et al., 2017). Respondents stated, “Education [is needed] on where people can find affordable food that is healthier within the community, so you don’t have to travel so far is key...Showing people how to incorporate different food into their diets is important... They don’t know what to eat, how food affects their bodies, or how to cook them...Education [is needed] on what constitutes a healthy lifestyle.”

(Swierad et al., 2017, p.14)

It was concluded that effective health initiatives should key on healthy practices already accepted by the ethnic culture, instead of only focusing on reducing risky health behaviors (Greer, & Nelson, 2014; Hams, & Bellows, 2003; ODPHP, 2021; Swierad et al., 2017). The African American culture exerted positive influences on healthy lifestyle practices through resilience, reliance on spirituality, dance and music, and strong social support networks (Swierad et al., 2017). Changing from a risk reduction model to a strength-building model promotes cultural empowerment and acknowledges their experiences without demonizing their health practices (Briscoe et al., 2014; Campinha-Bacote, 2009; Swierad et al., 2017). It was suggested that additional research was warranted to examine the effectiveness of integrating practices from both cultures in enhancing the health and wellbeing of African Americans (Swierad et al., 2017). Health promotion projects could be developed to assist individuals in selecting healthy options from both cultural contexts (ethnic and mainstream) preserving their right to pick and choose among options including healthy makeovers of favorite cultural foods (Swierad et al., 2017). Being able to choose may contribute to greater self-efficacy which can be

empowering and leading to positive achievement of health outcomes (Swierad et al., 2017).

The importance of cultural competency in health promotion and nutritional care has been established as a pillar of patient-centered care (Campinha-Bacote, 2009; ODPHP, 2021; Swierad et al., 2017)). Yet, Jordan (2013) emphasized the concept of “structural competency” as possibly being even more important in working with the poor or at-risk populations. (p.82) Structural competency refers to the ability of the health coach or community outreach worker to direct appropriate guidance to positively impact health disparities by addressing the social norms, organizational frameworks, and environmental landscape that influence the mental and physical status and well-being (Jordan, 2013). Structural competency acted as the foundation for addressing the social and economic conditions that were presented, regardless of the client’s cultural background (Jordan, 2013). Although still important, being culturally competent was not enough when the individual lacked the functional capacity and resources to manifest their cultural traditions due to extreme poverty or other social determinants such as very low food insecurity (Anderson et al., 2016; Campinha-Bacote, 2009; Jordan, 2013; Swierad et al., 2017).

In a project by Robert Wood Johnson Foundation (2011) that surveyed 1000 physicians from across the US (i.e., 690 primary care physicians, 310 pediatricians), it was discovered that while 85% of physicians were able to identify the unmet social issues that affected their patients, only one in five (20%) felt competent to address their needs. In addition, four in five respondents (85%) believed that these unmet social issues were

directly contributing to poor health outcomes for the US population; while three in four physicians (76%) expressed a desire for the health care network to pay the expense related to connecting individuals to the social services that the healthcare provider deemed necessary to meet their overall health goals (Robert Wood Johnson Foundation, 2011). Efforts have been initiated to assist the health care professional in creating greater structural competency in addressing social determinants of health and unmet social needs (Baden et al., 2014; Campinha-Bacote, 2009; Greer et al., 2021; MCOPP, 2022; Jordan, 2013; Swierad et al., 2017).

These surveys and reports confirm that our current system of care, with a focus on medical treatment, underestimates the impact that social networks and connectedness exert on achieving optimal health and well-being (Gundersen & Ziliak, 2014; MCOPP, 2022; Minkler et al., 2003; NPC, 2011; Pascoe et al., 2016; Weaver et al., 2013). Social factors such as poor living conditions, low paying jobs, limited access to healthy food or food hardship in purchasing food, safety concerns, and low community resources may lead to higher usage of emergency room, longer hospital visits, and poor health status (Gundersen & Ziliak, 2014; Pabalan et al., 2013; Smalls et al., 2015; Whitmore Schanzenbach, 2016; WDHS, 2011). This higher usage can add to the burden on the health care system and society (Pabalan et al., 2013; WDHS, 2011). In this research study, through exploring the relationship of the four types of social capital to risk of food insecurity in Milwaukee and Dane County, Wisconsin, findings were used to develop recommended future actions to enhance the nutritional coach and health practitioner's

skill level, including cultural and structural competency , to impact the unmet needs encountered

Nutritional Interventions with a Focus on Social Capital

The level of social capital has been linked to increased self-efficacy for disease control and prevention, including healthy food practices (Dean et al., 2011; Jordan, 2013). Social capital covers both internal and external connections needed for nutrition and health promotion (Jordan, 2013; Pellmar et al., 2002). In considering food insecurity, increasing awareness of and self-efficacy for accessing healthy and affordable food resources within the community setting were shown to be vital for the nutritional coach or health practitioner to understand (Jordan, 2013; Leroy et al., 2015; Nguyen et al., 2015; Rummo et al., 2015; Smith et al., 2013-b).

In a study by Farajzadegan et al. (2013), it was pointed out that social capital had a protective influence on risk-taking habits and disease outcomes in Iran. The social capital parameters of “trust and solidarity” and “empowerment and political action” determined the extent of self-management of diabetes that was observed. (Farajzadegan et al., 2013, p.101) Those individuals exhibiting more trust and civic engagement, showed improved blood glucose control. It concluded that addressing social capital could have wide application for several medical and social issues (Farajzadegan et al., 2013). It also identified a need to formulate strategies to promote greater social capital in the geographic locations of Iran with populations exhibiting high rates of diabetes (Farajzadegan et al., 2013).

Grimm et al. (2013) looked at the percent of census tracts without at least one healthier food retailer within the tract or within ½ mile in the surrounding areas. It revealed that 36% of census tracts in the Midwest, which includes the Milwaukee and Dane County areas, were without at least one healthier food retailer as compared to 24.1% in the West (Grimm et al., 2013). In addition, sensitivity analysis revealed that access to chain supermarkets were lower in census tracts with predominately non-Hispanic Black residents than in tracts with non-Hispanic White residents (Grimm et al., 2013). It was concluded that because of the heterogeneity of the U.S. food environment, more in-depth evaluation of food access was required to determine whether interventions were needed for specific neighborhoods (Grimm et al., 2013; Leroy et al., 2015).

Vaughn et al. (2017) surveyed two low-income African American communities in Pittsburgh, PA to gain increased knowledge on the role of dietary and shopping habits. Using statistical modeling, they found a significant relationship between food shopping habits and the types of food selected, such as the level of fruits and vegetables purchased, or sugar-sweetened beverage intake based on age, male gender, educational achievement (e.g., with or without a college education), and whether participating in the Supplemental Nutrition Assistance Program (SNAP). It was concluded that there was a need for initiatives at both the environmental and individual levels to impact the food patterns seen in neighborhoods with lower food access so that targeted strategies could be formulated (Vaughn et al., 2017).

In follow-up evaluations of a mixed-method faith-based study that looked to empower African American women to make healthy choices, by providing them both

healthy lifestyle coaching and social support through a group learning format, Tkatch et al., (2018) reported women felt that making their own personal promises (plan) for healthy practices led to a greater sense of commitment. They confirmed that having the social support of the women in the group was a key component to its success (Tkach et al., 2018). This intervention showed that through the tailoring of a wellness program, designed to be acceptable to the target group and providing social support, with common technology and conducted in a familiar faith-based setting, effective engagement of African American women could be accomplished (Tkatch et al., 2018).

Food Insecurity, Social Capital, and Health Equity

Some countries have identified hunger and food insecurity issues as obstacles to overcome to meet the health and wellness goals of the future (FAO et al., 2015; Odone et al., 2014; Prakash Upadhyay & Palanivel, 2011). In reports by Odone et al. (2014) and Prakash Upadhyay & Palanivel (2011) the obstacles to meeting the World Health Organization's future development goals were reviewed. Both concluded that due to the issues of hunger and food insecurity, many health goals, such as the reduction of TB, diabetes, and obesity rates, may not be achieved (Odone et al., 2014; Prakash Upadhyay & Palanivel, 2011). Prakash Upadhyay & Palanivel (2011) went on to point out that although India had one of the highest agricultural productions of all nations (2nd in the world), other factors, including cultural issues, social policies, and inequitable agricultural distribution, continued to affect the food insecurity problem. Economic

inequities and lack of political will need to be addressed to impact the food insecurity problem and health improvement goals (Odone et al., 2014).

In children suffering from severe malnutrition, stunting of growth is a major health issue (Psaki et al., 2012). Life expectancy for these children is usually lower and a cycle of poor life achievement is perpetuated (Psaki et al., 2012). In an eight-country study by Psaki et al., (2012), a measurement tool entitled the Household Food Insecurity Access Scale (HFIAS) was tested to assess its efficacy in examining country-wide household food security and childhood malnutrition, particularly defined by the WHO's stunting and wasting criteria. One-hundred households with children were randomly selected from the census results for each country to participate in the survey. Although there was wide variability in food access insecurity between countries, only 37% of all households indicated no food access insecurity issues (Psaki et al., 2012). Examples ranged from the high food access insecurity rates reported by Brazilian household (46.9%) to the households in Nepal (73.0%) and Tanzania (66.7%) that indicated high food access security with sufficient access to the healthy food that is needed. In these countries, 42% (8-55%) of the children met the criteria for stunting, while 6% (0-17%) were classified as wasted (Psaki et al., 2012).

The US has implemented several safety net programs designed to address hunger and food insecurity. These programs have been shown to have positive effects on health outcomes from reducing iron deficiency anemia through participation in the school feeding programs (e.g., SBP, NSLP, Fruit & Vegetable Snack Program) to preventing low birth weight infants through participation in the Women, Infants, and Children (WIC)

Supplemental Nutrition Program (Lu et al., 2016; The Nutrition-Cognition National Initiative, 1994; USDA FNS, 2013). WIC has continued to provide social support for positive parenting as well as breastfeeding education and a variety of other support services (USDA FNS, 2013). The supplemental food packages provided by WIC support the health and well-being of expectant mothers, infants, and children with a nutritional risk up to the age of 5 (USDA FNS, 2013). Yet, studies have found that for the very low food insecure households, it is not as effective, despite these supports.

It has been documented that although SNAP is the social program most often used by the food insecure with a positive return on investment dollars of both financial and health outcomes, almost one-third of eligible low-income families do not utilize the program (Paynter et al., 2014; Curtis et al., 2014). Differences in administration across the states, the complexity of the application process, stigma associated with obtaining assistance, eligibility with new work requirements, and lack of awareness of how to apply for services were all found to impact SNAP participation rates (Beck, 2015; Paynter et al., 2014). It was concluded that implementing strategies for increasing participation rates in SNAP can lead to positive health benefits for the at-risk families as well as economic benefits to the local economy through the increased jobs and sales taxes generated (Paynter et al., 2014; Curtis et al., 2014).

Dean et al. (2014) examined the relative importance of the various types of food assistance and acquisition used by food-insecure households through review of a sample of elderly US adults from the 2010 Brazos Valley Health Assessment of Central Texas households. The study was stratified by income eligibility for SNAP, below poverty, 130-

185% of poverty, and 200% poverty. SNAP participation was the only specific capital asset associated with all levels of food insecurity, for both SNAP-eligible and ineligible low-income groups (Dean et al., 2014). Other capital assets examined included personal vegetable gardens, family meals, animal raising, food gifts from family, food assistance, and place of residence, whether urban, rural, or suburban.

Results indicated that there was no significant difference seen between urban or rural areas, although there was a difference seen in the suburban region (Dean et al., 2014). There was a higher use of gardens and animal raising in rural areas with lower food assistance. Whereas for the urban areas, there was higher food assistance use with lower gardens and no animal raising. Both had similar uses of family meals and gifts from families (Dean et al., 2014). However, the very low-income family relations had fewer resources which limited their ability to provide gifted food (Dean et al., 2014). This study emphasized the continued importance of food assistance among poverty-level older adults (Dean et al., 2014).

Robin et al. (2017), conducted a qualitative study with the goal of gaining a greater understanding of low-income mothers' experiences in signing up for and maintaining SNAP participation. Findings from in-depth interviews and focus group inquiry revealed that although viewed as a necessary social program, there was on-going frustration concerning the steps for signing up for the program as well as continuing to receive services related to communication and service coordination issues (Robin et al., 2017). Participants viewed having a good rapport with case managers as well as having prior knowledge of the program's specifics led to continued participation in the program.

It was concluded that the SNAP program would benefit from better communication within the program, assisting participants in gaining a stronger relationship with their case managers, and establishing improved outreach and integration with other safety net and health programs (Robin et al., 2017).

Food Insecurity and High-Risk Groups

Food insecurity can still be seen when income is 2-3 times that of poverty, indicating that other factors that influence food insecurity are at play (Chilton & Doar, 2015; Gundersen & Ziliak, 2014). To gain a greater understanding of food insecurity, social capital, and equity issues, several studies have identified some specific groups and social structures that might put individuals and households at increased risk for food hardship (Anderson et al., 2016; Chilton & Doar, 2015).

Marital or Partnership Status

Family structures related to married couple parenting or single parenting can impact whether a household is at risk for hunger. The hunger rates for married households are a low of 3.2%; single mother households are the highest risk at 12.8%, followed by single father households at 7.0 % (Chilton & Doar, 2015). For low-income families, those in stepfamilies, the mother's work patterns predict food insecurity at higher rates than in 100% biological families. Moreover, the involvement of the non-custodial father – both in-kind and consistent cash support by fathers is, related to lower food insecurity for both children and adolescents, and less very low food insecurity among young children (Anderson et al., 2016). Using NHANES data, families

experiencing very low food insecurity reported having significantly weaker social and emotional support networks (Anderson et al., 2016).

The effect of nonmarried childrearing related to fathers' involvement is moderated by increases in children born into cohabiting households. Martinez et al. (2016) reported that 23% of births to women aged 15–44 in 2006–2010 were to cohabiting couples, as compared to the 14% rates seen in 2002. Furthermore, it has been documented that cohabiting fathers (as well as non-cohabiting engaged fathers) who are active and engaged in their children's lives have a positive impact on their wellbeing (Jones & Mosher, 2013). The involvement of fathers has been shown to impact academic success, risk of delinquent behavior, and substance abuse (Jones & Mosher, 2013). Jones and Mosher (2013) found that for children ages 0-5 years, 70% of cohabiting non-Hispanic Black fathers were bathing, dressing, diapering, or helping their children go to the bathroom daily compared with 60% of non-Hispanic white fathers and 45% of Hispanic fathers. Of men and women who have ever had a child, 50% had a child outside of marriage (Martinez et al., 2016).

Single Parenting Females

Overall, 40% of US children are now born to single parents which points to the continued high rates of food insecurity and hunger (Chilton & Doar, 2015). Youth living in single-parent households or those living with an unmarried parent in a complex family partnership have a greater risk of food insecurity (Hoefer & Curry, 2012). According to Broussard (2010), research indicates that the lower social-economic status of single

mothers and their offspring leaves them susceptible to health risks due to inadequate finances and limited access to comprehensive medical insurance. The combination of limited finances and work instability can lead to issues of food insecurity (Broussard, 2010).

Other issues that can increase the stress of single parenting are working several jobs, inadequate childcare supervision, homelessness, moving frequently, living in crime-infested neighborhoods in sub-par accommodations, where environmental health issues such as lead poisoning are a risk (Gundersen & Ziliak, 2014; Hoefler & Curry, 2012). A high rate of single-parent, female-headed households have been seen in the African American population which has been shown to limit the household income level and the food budget (Hoefler & Curry, 2012; Lino et al., 2017). In looking at households at twice the poverty line and lower, these lower-income and food-insecure families are more likely to be headed by poorly educated single mothers and more likely to report maternal depression and substance abuse than food-secure families with similar income (Anderson et al., 2016).

In looking at social support, neglect and inadequate supervision of children were found in single mothers who received lower amounts of childcare support from their partners and relatives, but not their friends (Coohey, 2007). Coohey (2007) found that inadequate supervision is linked to several qualities of the mother's social network. Neglectful mothers only knew their partners for less than a year, had fewer relatives in their social network who provided adequate supervision (Coohey, 2007). It was recommended that professionals involved in providing social support for single mothers,

evaluate and enlist support from a broader range of potential providers from informal and formal childcare (Coohey, 2007). They also stressed the importance of professionals helping mothers to evaluate their social networks and conflict-resolution skills (Coohey, 2007).

In a study that looked at the relationship between stress, coping, and social support, among single mothers versus mothers who are not single, Williams (2016) found that although there were significant differences in levels of perceived stress and social support between single women and non-single women, when social support was held consistent, there were no significant differences found between stress and coping strategies. The results pointed to the importance of assessing and building social support in single mothers (Williams, 2016).

Food Insecure Single Males

Food insecure single males (with and without children) are at high risk for health impairments (e.g., prediabetes, heart disease) as they are many times socially isolated, with limited social networks (Ding et al., 2014). Unlike single women, they usually are not directly connected to a food safety net program (Ding et al., 2014). Additionally, they may not have the nutritional knowledge or cooking skills necessary to prepare healthy home-cooked meals on their own, for themselves or for their children (Ding et al., 2014).

In a project report by Harley and Frazer (2011) that reviewed the outcomes of a follow-up initiative from the Milwaukee Linsey Heights Men's Wellness Council, recommendations for a more holistic health promotion initiative were formulated. The

Men's Wellness Council was formed in direct response to the Milwaukee's Lifecourse Initiative results that called for the strengthening of father's involvement in African American family life (Harley & Frazer, 2011; Lifecourse Initiative for Healthy Families, Milwaukee, 2014; Salinas-Mirandan et al., 2017). It had an initial aim of engaging African American men in the community to inspire greater physical activity and wellness practices (Harley & Frazer, 2011).

Through the ongoing monthly dialogue meetings over a year by 12 Men's Wellness Council members, a need for a broader program to address the emotional, mental, and financial hardship that was being experienced was realized (Harley & Frazer, 2011). This included the extreme levels of social isolation and perceived pressure African American fathers and men felt, which they described using the analogy of being "an island of one." (Harley & Frazer, 2011, pp.3) The Men's Council meetings were viewed as the safe space that allowed for expressions of true feelings. It was a place to work through life stressors, to learn positive parenting skills, and to gain knowledge from other men's experiences (Harley & Frazer, 2011).

As a result, the No Longer an Island peer-group evolved, and a tool kit was developed to guide the formation of similar men's peer groups throughout the city (Harley & Frazer, 2011). Four integrative objectives were formed to provide engagement and social support at the individual, interpersonal, and community spheres. Actions included: 1) a Porch-to-Porch (P2P) outreach initiative that connected men in the neighborhood to a support network; 2) providing safe spaces for men to gather; 3) enhance cross-generational interaction and mentoring; and 4) the creation and distribution

of peer information resources to stimulate a cultural change in African American men's self-perceptions of their self-worth and value to society (Harley & Frazer, 2011).

The outcomes revealed that a social support intervention that was generated through the needs identified by the target community was able to go from a single concept intervention to a community-based initiative (Harley & Frazer, 2011). It impacted the social environment for engaged men and their children. Additionally, it built individual and collective capacity for community change and empowerment through the lifecourse perspective (Harley & Frazer, 2011; Salinas-Mirandan et al., 2017).

Adult Caregivers' Mental and Physical Health

Food secure low-income households are in better physical and mental health and are less likely to report intimate partner violence and substance use as compared with food insecure poor households (Gundersen & Ziliak, 2014; Leung et al., 2015). In considering mental health, social support networks and connections to medical and mental health assistance are key factors. Drug use in the last 30 days (particularly heroin) was strongly associated with food insecurity among children (Gundersen & Ziliak, 2014).

Residing in a household with an adult living with a disability, which includes 38% of all households that experience hunger, increases the likelihood of children experiencing very low food insecurity (Anderson et al., 2016; Chilton & Doar, 2015; Coleman-Jensen & Nord, 2013; Huang et al., 2013). In these households, food insecurity was shown to be almost 3 times as likely when all other factors remain constant (Anderson et al., 2016; Coleman-Jensen & Nord, 2013; Huang et al., 2013).

Other Groups At Risk for Food Insecurity

Several other groups may be at increased for food insecurity. Elderly people who live alone may need the assistance of home-delivered meals to survive and stay socially connected (Chilton & Doar, 2015). Veterans of recent wars (Iraq and Afghanistan) were found to be food insecure (Windome et al., 2015). It has been documented that 12% of veterans reported hunger, while approximately 2% of active-duty members received SNAP benefits (USDA, Food and Nutrition Service, 2014; Windome et al., 2015).

Formerly incarcerated individuals may have problems finding employment, adequate shelter, issues related to social isolation, and reconnecting with family and friends, increasing risks of food hardship (Chilton & Doar, 2015). Children of an incarcerated parent may have a lower household income-to-need, increasing their eligibility for services; yet an increased probability of food insecurity due to the loss of the incarcerated parent's household contributions (Gundersen & Ziliak, 2014).

Indigenous and non-English speaking households may have issues with accessing healthy foods (Chilton & Doar, 2015). Children of immigrants are at high risk for very low food security. Children of foreign-born mothers were 3 times as likely to experience very low food security as compared to those having US-born mothers (Chilton & Doar, 2015; Gundersen & Ziliak, 2014).

For these diverse groups, outreach and advocacy strategies were called for to build self-efficacy, social capital networks, and community capacity to impact hunger and food insecurity risks (Anderson et al., 2016; Chilton & Doar, 2015; Gundersen & Ziliak, 2014).

Effects of Income, Household Food Budget, and Cost of Food

Extensive research has shown that household income level has a significant inverse relationship to household food insecurity such that as income goes up, food insecurity goes down (Gregory & Coleman-Jensen, 2017; Gundersen & Ziliak, 2014). Globalization and technological automation have led to fewer high paying jobs for individuals without a college education (Chilton & Doar, 2015). In lower-income households there may be significant unemployment or under-employment, which includes part-time jobs, fluctuating hours, and very low wages, resulting in income instability and fluctuations which increases risk of hunger or food insecurity (Chilton & Doar, 2015; Coleman-Jensen, 2011; Gregory & Coleman-Jensen, 2017). For example, in Wisconsin, approximately 30% of the workforce earn poverty-level wages (Curtis et al., 2014). Housing instability has been linked to food insecurity as well as mental and physical hardships that affect the overall wellbeing of all household members (Liu et al., 2014).

The effects of household income have been clearly illustrated by looking at the cost of raising a young child in a two-child household and the percentage of the household budget that was used for food based on income level (Lino et al., 2017). Table 3. reveals how the percent of the household budget allocated to food and other needs were influenced by the level of income in the family and family type (i.e., married, or single parenting) (Lino et al., 2017). It showed that the food budget is usually maintained at a constant level while other areas like childcare, education, and clothing show marked differences as income increases (Lino et al., 2017). The lower income households were

limited in having the income to adjust to meet additional needs that might occur in raising a child as they transitioned to older ages (Gundersen & Ziliak, 2014; Lino et al., 2017).

This caused decisions to be made on how best to make ends meet, including buying lower cost foods, skipping bill payments, or selling or pawning household goods (Gundersen & Ziliak, 2014; Lino et al., 2017).

Table 3

Household Budget for Raising a Young Child in a Two-Child Household at Various Income Levels

Budget category	Low-income married & single parent households	Middle income married	Highest income Married
Housing	33%	29%	26%
Food	20%	18%	15%
Transportation	14%	15%	15%
Clothing	5%	6%	7%
Healthcare	9%	9%	8%
Childcare & Education	12%	16%	23%
Miscellaneous	7%	7%	6%

Adapted From: "Expenditures on Children by Families, 2015." Lino et al., (2017).

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It was estimated, using gross income, that low-income families (incomes less than \$59,200) spent 27-34 percent of their income on raising a child or from \$9,330 to \$9,980 annually; the middle-income group (incomes \$59,200 to \$107,400) spent 16 -25 percent

or from \$12,350 to \$13,900 annually; and the highest income group (incomes above \$107,400) spent 11-15 percent or from \$19,380 to \$23,380 annually (Lino et al., 2017).

It is important to note that although having the lowest percentage of their income used for household expenses, the highest income households spent, on average, more than twice the aggregate amount as spent by families in the lowest income group. This amount varied by budgetary component. In general, expenses spent on a child for goods and services that are viewed as necessities (e.g., housing, food, and clothing) were held stable as compared to the variability of those items deemed to be discretionary (e.g., childcare, educational expenses, miscellaneous expenses) among all household income groups (Lino et al., 2017). Some specifics per categories have been outlined.

Housing

Housing consumed the highest proportion of the total child-rearing budgetary allocation. Based on expenses incurred among all age groups, households in the lowest income groups spent 33 percent of their child-rearing allotment on housing, the middle-income group spent 29 percent, the highest income groups spent 26% (Lino et al., 2017).

Food

The allocation of the food budget spent on children ranged from 17 to 25 percent per child in a two-child, married household. For a two-child, single-parent household, the allocations increased to 25 to 34 percent per child. This higher percentage reflects the lower household income from having one less wage earner in the household. The amount of the budget spent on children typically increases as children age with a higher

percentage spent during the teen years with minimal variations by income level (Lino et al., 2017).

Transportation

Transportation was the third largest expense in raising a child for households with the lowest incomes, accounting for 14 percent of the total allocation. Transportation cost may increase in the teen years due to educational demands or when a teen starts to drive (Lino et al., 2017).

Clothing

Allocations for clothing showed the least amount of variability among groups, with a range of 6-7% for all income groups (Lino et al., 2017). However, the highest income group would have the most discretionary income once essential costs were met, which could be used for additional clothing desires (Lino et al., 2017).

Healthcare

The share of the health care budget ranged between 15 to 20 percent per child in a two-child, married-couple family and 23 to 26 percent per child in a two-child, single-parent family (again these amounts being higher for a three-person household). Health care budget shares generally increased by household income level (Lino et al., 2017).

Childcare and Education

Childcare and education accounted for the third-largest allocation for middle-income married-couple families (i.e., 16 percent), whereas food was the third-largest expense for families in the highest income group (15 percent of the total). Although a high percentage in the lowest income groups did not allocate any funds to this category,

for those that did, childcare and education made up 12 percent of total child-rearing allocation. These lower-income households may be accessing lower-cost alternative childcare options or depending on family members, such as grandparents, with no payment provided (Lino et al., 2017).

Miscellaneous/Other

For miscellaneous goods and services allocations, such as videos and personal care items, the per capita method allocation was utilized as items are commonly shared by all household members. A range of 6-8 was noted in this category. Lower-income families have less ability to adjust to this level if unforeseen needs arise. This has been shown to impact being able to participate in extracurricular sports or school events, limiting a child's school experience (Lino et al., 2017).

Regional Child-Rearing Expenses

Region-specific child-rearing expenses reflected patterns similar to those observed in the overall United States for married-couple families. In each region, expenses for a child increased with household income level and typically with the age of the child. Overall, child-rearing expenses were highest in the urban Northeast, followed by the urban West and urban South. Child-rearing expenses were lowest in the urban Midwest and rural areas. Comparing the region with the highest expenditures to the lowest, child-rearing expenses were 27 percent lower in rural areas than the urban Northeast. Much of the regional difference in expenses for a child was related to housing costs and childcare and education expenses. Total housing expenses per child were highest in the urban Northeast and urban West and lowest in rural areas. Childcare and

education expenses were highest for families in the urban Northeast (Lino et al., 2017).

The measure used to assess food insecurity might vary based on the definition of poverty used. Traditional definition using the federal poverty cutoffs versus newer Income to Needs which considers safety net services accessed will generate different rates (Federal Register, 2018; Gundersen & Ziliak, 2014). Current income such as the amount of income obtained through temporary work and aid versus permanent income from full-time employment averaged over several years affects food insecurity risk. Not having a consistent source of income adds to the stress of the household (Gundersen & Ziliak, 2014).

The level of financial management skills has been inversely linked to food insecurity. Households with the highest financial literacy had the lowest rates of food hardship (Gundersen & Garasky, 2012). Low financial literacy and lack of skills at managing the household budget has been linked to increased food insecurity as indicated by having a bank account versus no banking services (Gundersen & Garasky, 2012; Gundersen & Ziliak, 2014). In looking at long term food insecurity, 20 % who had extreme food hardship remained food insecure over one year (Gundersen & Garasky, 2012).

Household Food Budget and Food Cost

The cost of food has remained at high levels despite improvements seen in the US economy (Hoefler & Curry, 2012; Nord et al., 2014). There are wide regional variations in food prices due to the effects of climate change and extreme natural weather events

(Grimm et al., 2013). Extreme weather may present in various forms from excessive rainfalls events leading to flooding to prolonged droughts with precipitation rates below average for extended periods of time which can impact both people and the overall environment, including the regional food distribution supplies (CDC et al., 2010).

Recognizing the prediction of future extreme weather events due to global warming, the CDC as well as the other agencies (e.g., US Environmental Protection Agency [US EPA]; USDA) have developed several guidance documents to help public health administrators, health promotion practitioners, farmers, distributors, and concerned community partners in understanding and preparing to respond appropriately. In the case of droughts, the quality and quantity of the water and food supply could be affected resulting in low crop yields and higher food prices or shortages (CDC et al., 2010; Jerry et al., 2014). The food hardship endured by the at-risk population could lead to malnutrition and mental strain leading to anxiety and depression if not adequately addressed (CDC et al., 2010).

Geographic distribution of healthy fruits and vegetables in parts of the country directly affects the availability in other parts of the country (Hoefler & Curry, 2012; ODPHP, 2021). Additionally, the cost of food may also vary impacting the reach of the food safety net system (Brown et al., 2015; Hoefler & Curry, 2012). The higher cost of produce may affect the household's ability to meet the recommended healthy meal patterns for optimal health and well-being (Bhushan et al., 2017; Hoefler & Curry, 2012; ODPHP, 2021). Examples of healthy eating plans include the MyPlate, Vegetarian Eating Styles, the DASH Diet, or the Mediterranean Meal Pattern (American Diabetes

Association, 2017; Bhushan et al., 2017; Darmon & Drewnowski, 2015; Greer, 2013; Hoefler & Curry, 2012; ODPHP, 2021).

These healthy eating plans have been used in various clinical trials (American Diabetes Association, 2017; Maruthur et al., 2013). Positive results were documented in reducing chronic diseases rates including prediabetes, diabetes, hypertension, heart disease, fatty liver disease, and various forms of cancer (Academy of Nutrition and Dietetics, 2017; American Diabetes Association, 2017; Maruthur et al., 2013). In addition, when the healthier (nutrient dense) foods were incorporated into daily meals, they promoted optimal growth, development, brain functioning, and longevity throughout the lifespan (Academy of Nutrition and Dietetics, 2017; American Diabetes Association, 2017; Aridi et al., 2017; Bhushan et al., 2017; Estruch et al., 2013; Gopinath et al., 2013; Herman et al., 2013; Johnson et al., 2010; Maruthur et al., 2013; ODPHP, 2021).

As a result of all meal planning guides' promotion of higher intakes of fruits and vegetables, whole grains, and healthy protein sources, those on a limited food budget may find it harder to achieve the healthy eating goals (Academy of Nutrition and Dietetics, 2017; Darmon & Drewnowski, 2015; ODPHP, 2021). Therefore, targeted assessments of the local food environment were warranted to increase understanding of the influence that the local economy has on the low-income household's food budget, access to affordable healthy food, and risk factors of food insecurity in Milwaukee and Dane Counties (Academy of Nutrition and Dietetics, 2017; Curtis et al., 2014; Greer et al., 2013; Grimm et al., 2013; Gundersen et al., 2018 ; Heckman, 2016; Hoefler & Curry, 2012).

Skill Building and the Food Insecure

Skill-building to enhance food resource management, food preparation, and self-confidence in low-income populations for accessing and preparing healthy meals is essential (Academy of Nutrition and Dietetics, 2017; Greer & Nelson, 2014; Hunter et al., 2014; Pooler et al., 2017). Nutrient-dense, healthy individual and family meal patterns have been recognized as key elements for inclusion in various nutrition education documents and interventions (Greer, 2013; Greer & Nelson, 2014; Hunter et al., 2014; Kaiser et al., 2015; Knoblock-Hahn et al., 2017; Mill et al., 2020; Pooler et al., 2017; Whitt-Glover et al., 2017; Young et al., 2014).

Food resource management involves such skills as the selection of healthy, nutrient dense fruits and vegetables, as well as comparison shopping for identifying the most cost-saving options (Greer, 2013; Greer & Nelson, 2014; Pooler et al., 2017). It also includes menu planning to meet nutritional needs within the household budget with taking advantage of coupons and store specials (Hunter et al., 2014; Kaiser et al., 2015; Pooler et al., 2017). These skills have the potential to improve the nutritional profile of the food brought into the home by enhancing food buying and acquisition skills (Pooler et al., 2017). They also employ empowerment strategies for stretching the food dollar (Hunter et al., 2014; Knoblock-Hahn et al., 2017; Pooler et al., 2017).

Developing a greater understanding of the specific needs of the food insecure targeted population, including how to access the food safety net system, was recommended to assure that tailored intervention and appropriate awareness and outreach messages were delivered by nutrition and health practitioners (Ivens & Edge,

2016; Minkler et al., 2003; NPC, 2011; National Research Council and Institute of Medicine, 2013; Nelson et al., 2015; Pooler et al., 2017). Most of the previously cited nutrition interventions provided some levels of social support through eating healthy meals together; while others facilitated knowledge exchange opportunities through participatory food preparation skill-building activities (Greer, 2013; Greer & Nelson, 2014; Hunter et al., 2014; Kaiser et al., 2015; Knoblock-Hahn et al., 2017; Pooler et al., 2017; Young et al., 2014). Yet, I found only one study that specifically included an evaluation of social networks and extent of community connectedness of their participants (Hunter et al., 2014). Lack of inclusion of an assessment of community social capital or connectedness to food safety networks utilized by program participants revealed another gap that this research study seeks to address (Greer & Nelson, 2014; Dean et al., 2014; Leischik et al., 2016; Pronk & Remington, 2015).

Transition and Summary

In Section 1, I introduced the issue of hunger and food insecurity from international, national, and local perspectives. I explored if there was a relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity within Milwaukee and Dane County. An extensive examination of professional and academic literature was conducted to address how the study adds to the body of knowledge so that effective practice and advocacy strategies tailored to promote social change and empowerment could be formulated.

In Sections 2 and 3, I review the research project in specific detail, outlining the methodology, research design, population and inclusion criteria, and data analysis protocols. Results of findings and discussion are followed by a conclusion and future recommendations.

Section 2: Research Design and Data Collection

The aim of this quantitative retrospective descriptive correlational research study was to explore if there was a relationship between four specific social capital types (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity within Milwaukee and Dane County, WI. This also included looking at whether there was a relationship between income and social capital and risks of food insecurity in these two selected counties. In this section, I outlined the research design, rationale, and methodology, along with data collection and data analysis.

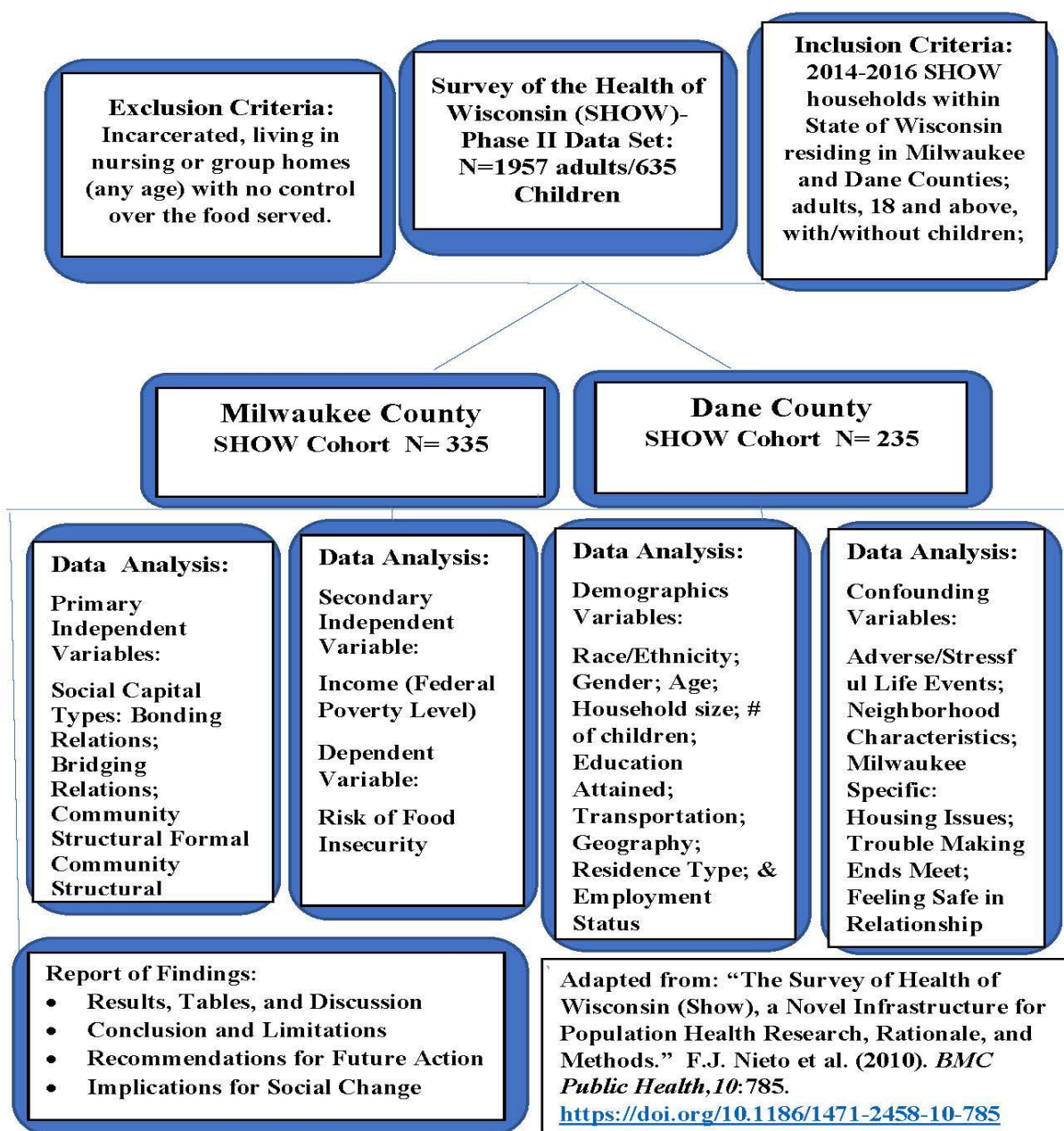
Specific SHOW variables were selected to address the research questions. Findings aided in identifying specific social capital enhancement strategies to address food insecurity risks and issues related to meeting healthy eating guidelines. In addition, a list of recommended tailored interventions and advocacy strategies were developed to be disseminated to Wisconsin practitioners and community stakeholders for incorporation into nutritional and health coaching interactions and community engagement initiatives to better address food insecurity, build community capacity, and increase self-efficacy for healthier eating and enhanced wellbeing.

Research Design and Rationale

This research study was designed as a quantitative retrospective descriptive correlational study involving cross-sectional secondary data from the 2014-2016 SHOW Phase II. Through SHOW survey data, which includes random sampling of individuals and households residing in all regions of Wisconsin who were asked a variety of questions involving specific health and social issues, this study was conducted to describe if a relationship exist between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and income and risk of food insecurity. My goal was to assess associations between variables to determine the effect size of the probable relationship for development of realistic strategies in order to address risks of food insecurity in at-risk households and communities in Milwaukee and Dane County, Wisconsin (see Figure 3).

Figure 3

Research Process Flow Diagram



There are limitations regarding use of experimental designs when examining populations given the lack of manipulation and randomization of variables such as race or gender. The cross-sectional design has been used for formative analysis of natural and real-world settings to examine relationships between properties and dispositions. Properties are the characteristics or qualities of a person, while dispositions are corresponding attitudes or inclinations that are present (Frankfort-Nachmias & Nachmias, 2008; Soriano, 2013). In research that involves properties and dispositions, variables may occur over longer periods of time, are more general, and incorporate various factors, which make it harder to determine actual causes or time sequencing, especially when looking at factors that do not change (e.g., gender) (Frankfort-Nachmias & Nachmias, 2008). Yet, with the use of statistical analysis, patterns of relationships and probable inferences can be identified (Frankfort-Nachmias & Nachmias, 2008).

Descriptive statistics enable data to be organized and analyzed in ways that are effective and meaningful. It involves using tools for describing collections of statistical observations and organizing information into understandable formats. Descriptive measures may include frequency tables, measures of central tendencies (e.g., mean, median, mode) and dispersion (e.g., range; Frankfort-Nachmias & Nachmias, 2008; Soriano, 2013).

Inferential statistics enable researchers to make decisions or inferences by comparing, analyzing, and interpreting data patterns regarding whether a potential relationship is found during observations. Inferential measures may include covariate or

multiple regression analysis, logistic regression analysis, Lambda, or the Guttman coefficient of predictability, used for calculating relationships between nominal or interval variables (Frankfort-Nachmias & Nachmias, 2008; Soriano, 2013).

Both descriptive and inferential statistics were used to formulate explanations for complex social and health issues resulting from the relationships found between variables. Statistical analysis used for comparison between or within social networks can assist in clarifying the extent of generalizations. It can also provide insight into events and processes such that effective social change strategies can be formulated (Creswell, 2009; Frankfort-Nachmias & Nachmias, 2008; Soriano, 2013). The cross-sectional design attempts to approximate the post-test control group by statistical data analysis techniques (Frankfort-Nachmias & Nachmias, 2008). The primary, confounding, and demographic control variables used in this research study are listed in Tables 4, 5, and 6, respectively.

Table 4

Primary Independent Variables

Bonding social capital	Bridging social capital	Community structural – formal	Community structural – informal	Income levels
Intimate family relationships, marital status (e.g., husband, wife, partner, child);	Primary health care provider (e.g., physician, physician assistant, Other health professionals (e.g., nurse practitioner)	Food safety net agencies accessed past year (e.g., WIC, SNAP, Head Start);	Emergency food assistance (e.g., food pantries, free meals) Full-service supermarkets/grocery stores (distance to store, reasons for shopping there)	% Federal Poverty: 100% & below 101 – 200% 201 – 300%

Importance of Living close to family and friends	Medical facilities used (e.g., hospital, community health clinic, urgent care) Health and Dental Insurance Coverage	Perceptions of government assistance (it helps, prevents hunger, humiliating, takes away freedom)	CSA Food Coop memberships; farmer's markets or local farms frequented	301 - 400% 401% & above Milwaukee County Income levels
Importance of having Friendly Neighbors	Seeking health information or advice through the internet for self or family	Job-status (e.g., not working, # hours worked/week, kind of work, #miles to work), Type of business or industry	Grow or produce own food; Eating at restaurants (fast food, casual style, all you can eat, sit down)	Dane County Income Levels
Bonding with neighbors				
Feeling safe in my relationship	Health Literacy, needing assistance in understanding written materials (e.g., instructions, pamphlets) from your doctor or pharmacy	Politically involved (can affect what the government does, sent letter or call to affect policy, attended a meeting to affect change)	Active participation in the community (neighborhood meets needs, belong to neighborhood, attend meeting on neighborhood issues)	

Adapted From: "Survey of the Health of Wisconsin." *University of Wisconsin-Madison, School of Medicine and Public Health* (2017). <http://www.med.wisc.edu/show/about-survey-of-the-health-of-wisconsin/36193>

Table 5*Confounding Variables on Social and Environmental Issues*

Adverse (stressful) life events, past year	Neighborhood characteristics	Milwaukee specific inquiry
Death of a spouse; the death of family member; death of friend	Access by walking to various locations (e.g., parks, grocery store, church, community center)	Not enough money for rent; Evicted by the landlord
Detention in jail or institution	Safe from crime, transportation	Trouble making ends meet
Major illness or injury	Affordable housing	Threatened with foreclosure

Adapted From: "Survey of the Health of Wisconsin." *University of Wisconsin-Madison, School of Medicine and Public Health* (2017). <http://www.med.wisc.edu/show/about-survey-of-the-health-of-wisconsin/36193>

Table 6*Demographic Variables*

Household size	age group	Gender	Race/ethnicity	Education attained
Number of Persons in the Households,	Adults 18-44;	Male	White, Black,	Less than High School;
Number of Children in the Households, 0-17 years	Adults 45-65;	Female	Asian, Native Hawaiian or Islander Pacific,	High School;
	Adults 66 and above		Islander Pacific, American Indian or Alaska Native,	Some College;
			More than one race	2-year Associate or Technical Degree College. 4-year Grad and above

Transportation	Marital status	Geographic location	Residence type
(bonding SC)			
Own or lease car or truck	Married or Living with Partner, Single, Divorced or Widowed	Urban or Rural	Own home, Rent

Adapted From: "Survey of the Health of Wisconsin." *University of Wisconsin-Madison, School of Medicine and Public Health* (2017). <http://www.med.wisc.edu/show/about-survey-of-the-health-of-wisconsin/36193>

My role in this study was to retrieve and merge data sources to comprehensively examine targeted variables related to the four social capital types and risk of food insecurity within Milwaukee and Dane County. In addition, I analyzed results and provided a summary of conclusions with recommended strategies for future practice, building community capacity, and public policy advocacy. Although I am also a nutrition practitioner, my role required objective gathering of data with clear reporting of findings based on descriptive and inferential statistical analysis (Creswell, 2009).

The conclusions and recommendations although generated from the objective findings were framed by my understanding of the practice-based application that could be enhanced such as nutritional coaching, service coordination, food access, policy reform, and advocacy. Using the IM, I proposed targeted strategies for nutrition and health practitioners to guide future food insecurity interventions that included a focus on social capital within Milwaukee and Dane County, Wisconsin to promote positive social change

towards greater household and community food security (Lundy, 2010; Pellmar, et al., 2002).

Methodology

This study was a cross-sectional secondary data analysis, using the primary data obtained by the Survey of Health of Wisconsin (SHOW) for the years 2014-2016 (i.e., SHOW Phase II). The SHOW is a series of health and social surveys patterned after the federal *National Health and Nutrition Examination Surveys* (NHANES). They were designed to provide researchers an opportunity to take an in-depth examination into the health and well-being of Wisconsin residents (Nieto et al., 2010; School of Medicine and Public Health, 2017). Although originally implemented by a prominent physician's group, the SHOW is now maintained by the University of Wisconsin School of Medicine and Public Health located in Madison, Wisconsin.

The SHOW included a total cohort (i.e., Phase I, II, & III) of approximately 6000 individuals, both adults, and children (School of Medicine and Public Health, 2017). There was no charge to download the data set, however, researchers were required to apply and meet requirements for use which included being able to demonstrate the ability to maintain data security and confidentiality protocols (School of Medicine and Public Health, 2017). (See Appendix B, SHOW Student Researcher Application and Approval, p. 294) A SHOW mentor was assigned, and IRB approval obtained before the data sets were downloaded for analysis. (See Appendix A, IRB Approval Notice, p. 291) In addition, a SHOW Committee must approve any manuscript developed before

submission for publication with acknowledgment of the SHOW listed in the document (School of Medicine and Public Health, 2017).

Sampling and Sampling Procedure in Secondary Data

The SHOW collected voluntary individual and household non-duplicated survey data from 2008-2013 (Phase I) stratified by census track and income (School of Medicine and Public Health, 2017). In 2014-2016 (Phase II), mortality was added to the stratification, as well as analysis by county for ten sites, including Milwaukee and Dane Counties (School of Medicine and Public Health, 2017). Additionally, zip code stratification was added for enhanced analysis at the local level in some selected counties. In 2017 (Phase III), the first year of longitudinal data was collected on previous SHOW participants; however, this updated data year was not yet available at the start of this study (School of Medicine and Public Health, 2017). There was approximately 6000+ participants included in the multi-year SHOW cohort.

Several types of assessments were used in the SHOW to triangulate information including paper surveys, in-person interviews with visual hand cards, computer-generated surveys, physical exams, activity and sleep measures, and lab analysis (School of Medicine and Public Health, 2017). The SHOW provided a comprehensive snapshot of the health of Wisconsin residents such that appropriate resources and interventions were targeted towards the specific needs identified (School of Medicine and Public Health, 2017). The SHOW was previously used to assess Wisconsin's resident prevalence rates and health implications of obesity (Eggers et al, 2016).

SHOW Population

The SHOW collected household data on representative samples of the overall Wisconsin population from all regions of the State, to include small and large cities, rural areas, and the suburbs (School of Medicine and Public Health, 2017). All participants were free-living and non-institutionalized. Targeted households were provided with advanced notice by mail inviting them to be part of the study and a trained fieldworker scheduled a home visit to provide an on-site explanation of the program. A follow-up visit was planned to conduct screenings, labs, and to administer the surveys. Children interviews were included in the survey with parent's consent (School of Medicine and Public Health, 2017).

Ethical Protection of SHOW Participants

Informed consent was obtained at the initial home visit prior to the follow-up home visit. All the identifiable information collected by the SHOW is kept confidential. SHOW findings are reported in aggregate form only. SHOW administrators maintain strict security during all phases of data collection and when used for research so as not to release confidential identifiable data and to assure the on-going integrity of the data set . As part of the study participant's prior permission, it is agreed that the data would be made available to qualified researchers for future evaluation(School of Medicine and Public Health, 2017). To ensure ethical practice, participants are given copies of the assessment data generated as well as a stipend at the end of the survey period for their involvement.

Types of SHOW Data

The SHOW obtained a wide array of data on the health conditions, practices, and perception of individual and household members, primarily from self-reported data (School of Medicine and Public Health, 2017). Not only was information on health risks, such as hypertension and high cholesterol collected but also, through the computer-assisted survey, healthy eating and physical activity practices, access to medical care, neighborhood characteristics that support wellness (e.g., distance to grocery stores, access to fitness centers), community connections and engagement, and perceptions on the quality of their health were obtained (School of Medicine and Public Health, 2017). Participation in food safety net services such as WIC and SNAP were included as well as survey tools that examine the extent of food insecurity and economic hardship in the household were available, among others (School of Medicine and Public Health, 2017).

Research Study Target Population and Study Cohort

The population from which the research cohort was drawn were the households located in the State of Wisconsin that participated in the 2014-2016 SHOW – Phase II (School of Medicine and Public Health, 2017). This included a total of 1957 adults and 645 children. Inclusion criteria consisted of SHOW household adults, 18 and above, with or without children residing in either Milwaukee or Dane County (cohort totals of 335 and 235, respectively). Children were included as part of the household counts. Exclusion criteria included those that were incarcerated, living in nursing or group homes (at any age), with no control of the food served.

In looking at the 50 US metropolitan areas with the largest Black populations, Milwaukee County has held the designated as one of the most segregated areas for Black people in American, tied only with Detroit, MI (Logan & Stults, 2011). Furthermore, when looking at the dissimilarity index between black/white neighborhoods, there has been little change over the last thirty years, with Milwaukee being within the top five with the highest dissimilarity levels nationwide (Logan & Stults, 2011; Milwaukee Health Care Partnership, 2021).

The Index of Dissimilarity (D) is an established measurement for segregation that takes into account how much two racial groups are evenly distributed within a specified area of the locality, such as the census tracts of a metropolis. The D is listed from 0 to 100% and is an indication of how much movement one racial group would need to move to establish an evenly distributed residential pattern (Logan & Stults, 2011). Having a D of 60% or above is considered highly dissimilar or high segregation, whereas a measure of 30% or less is low segregation. In looking at the black-white D for the 50 metropolitan locations with the top African American residents, Detroit-Livonia-Dearborn, MI and Milwaukee-Waukesha-West Allis, WI leads the nation, tied at 76.6; whereas the Minneapolis-St Paul-Bloomington, MN-WI, has a D of 21.5, with a city ranking of 47th, with Phoenix-Mesa-

Glendale, AZ having a D of 8,8%, the lowest of the 50 metro areas (Logan & Stults, 2011).

Therefore, given that Milwaukee County has a high urban population density centered around the City of Milwaukee, with the highest concentration of African American population in the State along with the highest rates of food insecurity and low socioeconomic status, an analysis specific to examining if there is a relationship between social capital types and risk of food insecurity was undertaken specific to this location (County Health Rankings & Roadmaps, 2022; Curtis et al., 2014; Greer et al., 2013; Milwaukee Health Care Partnership, 2021). This analysis also explored if there is a relationship between income levels and social capital and risk of food insecurity controlling for other variables included as confounders.

Dane County, although having the second-highest African American population in the State with high racial disparities in food insecurity and other health outcomes (e.g., high black maternal and infant mortality), boast a higher socioeconomic status than Milwaukee County. Despite including the city of Madison, WI, the State's Capital, Dane County has a significantly lower population size (almost half that of Milwaukee County) as well as a lower population density with higher rural areas and was also assessed in a similar manner (County Health Rankings & Roadmaps, 2022; Foundation for Black Women's Wellness, 2019; Heckman, 2016).

Using cohorts from both Milwaukee and Dane counties to examine if there was a relationship between social capital, income, and risk of food insecurity assisted in

targeting the results to the appropriate political representatives at both the state and national levels to advocate for effective public policy and environmental change strategies to impact food insecurity (Wisconsin State Legislature, n.d.). At the county level, local food safety net organizations and stakeholder groups, including nutrition and health coaches, were targeted to share research results with practical recommendations and actions for addressing the unmet social capital and food insecurity needs included (Baiden et al., 2014; Robert Wood Johnson Foundation, 2011).

To this end, the specified four types of social capital (bonding, bridging, community structural-formal, community structural-informal) as seen within the State of Wisconsin, with its high geographic, racial, and health disparities, were examined to determine if there was a relationship to risk of food insecurity using the SHOW cohorts of Milwaukee County, the State's largest county, located in the southeastern region of the Wisconsin, and Dane County, the State's second largest county, located in the south central region of Wisconsin (County Health Rankings & Roadmaps, 2022; Curtis et al., 2014; Feeding Wisconsin, 2015; Greer et al., 2013; Heckman, 2016). Table 7 shows the population totals for the state of Wisconsin, Milwaukee and Dane Counties, and their food insecurity rates. While Table 8 shows the target population SHOW totals from which study cohorts were stratified with demographic data illustrating some of the disparities assessed in this research project.

Table 7*Population Size and Food Insecurity Prevalence*

Population	Population size	Food insecurity rate
State of Wisconsin ^a	5,711,767	11.6% Adult; 20.4% Childhood
Milwaukee County ^b	956,586	22.1% Adults; 26.9 Children
Dane County ^b	522,837	12.2 % Adult; 19.1 % Childhood

Adapted From: a) “Hunger & Food Insecurity in Wisconsin and Dane County,” N. Heckman (2016). *Public Health Madison & Dane County, Division of Policy, Planning, and Evaluation*. <https://www.publichealthmdc.com/documents/foodSecurityWhitePaper.pdf>; b) “Map the Meal Gap 2018: A Report on County and Congressional District Food Insecurity and County Food Cost in the United States in 2016,” C. Gundersen et al., 2018. *Milwaukee, WI: Feeding America*, https://www.feedingwi.org/data_research/food_insecurity_rates.php

Table 8*Target SHOW Population, Poverty, and Race*

Target SHOW populations	#SHOW surveys 2014-2016	Poverty levels	Race/ethnicity
2014-2016 State of Wisconsin	1957 Adults & 645 Children	Poverty \leq 200% = 556 or 30.5% Poverty \geq 200% = 1303 or 69.5%	Non-Hispanic White – 1623 or 85% Non-Hispanic Black – 151 or 6.3%

Adapted From: “Survey of the Health of Wisconsin.” *University of Wisconsin-Madison, School of Medicine and Public Health* (2017). <http://www.med.wisc.edu/show/about-survey-of-the-health-of-wisconsin/36193>

Guerrero et al. (2013) said although there were no statistical differences in food insecurity rates across the 5 regions of the States, whether urban or rural setting, there was pervasive food insecurity throughout all regions of Wisconsin. Food insecurity rates ranged from a high of 14.1% to a low of 8.7% (Guerrero et al., 2013). However, when looking at Wisconsin's food hardship rates (a measure of food insecurity) by Congressional Districts, data showed great disparities with Milwaukee County having the highest food hardship rate in Wisconsin (Curtis et al., 2014; Feeding Wisconsin, 2015; Heckman, 2016). Congressional District 4, which encompasses the inner city, low socioeconomic status, high African American neighborhoods of the city of Milwaukee, the largest city in the State, has an overall food hardship rate of 22.1% (Curtis et al., 2014; Greer et al., 2013; Gundersen et al., 2018).

Whereas, the lowest food hardship Congressional District in the State, District 5, which encompasses the outskirts of Milwaukee County (i.e., Milwaukee, Greenfield,) as well as the surrounding counties of Jefferson, Waukesha, Dodge, Walworth, and Washington, has an overall food hardship rate of 9.9% (Curtis et al., 2014; Greer et al., 2013; Gundersen et al., 2018). This illustrates the wide diversity that is seen in this geographic area of the State (Curtis, et al., 2014; Feeding Wisconsin, 2015; Greer et al., 2013; Heckman, 2016).

Dane County, which sits in the south-central region of the State, in Congressional District 2, has a food hardship rate of 12.2%. Although still high, this food hardship level is almost half that of Milwaukee County (Gundersen et al., 2018; Heckman, 2016). Dane County have the second-highest African American population in the State (Curtis et

al., 2014; Gundersen et al., 2018; Heckman, 2016). In addition, it differs from Milwaukee County in that its population is half that of Milwaukee County, with double the median income and a higher rural population (Curtis, et al., 2014; Feeding Wisconsin, 2015; Heckman, 2016).

Study Cohort Size Determination and Power Analysis

For this research study, utilizing the 2014-2016 SHOW dataset, all units meeting the inclusion criteria formed the Milwaukee County SHOW Cohort and the Dane County SHOW Cohort were used for analysis. The total population in each cohort was 335 units for Milwaukee County and 235 units for Dane County. Moreover, although the study utilized all possible cohort units, critical sample size calculations for statistical significance based on the type of analysis utilized were still necessary and have been included for review.

An adequate sample size for statistical significance can be determined by using a variety of methods from manually calculated equations to technological software packages (Walden University Academic Skills Center, 2014; Horse, 2019; Israel, 2003; Kim, 2015; Buchner et al., 2007; Soriano, 2013). All would involve the use of a selected level of precision, confidence level, and effect size to compute the minimum required sample size (Horse, 2019; Israel, 2003; Kim, 2015). However, in some cases the final sample size may need to be larger than what's calculated, considering other issues such as the types of statistics that will be used, the level of missing data, and when a high nonresponse rate is a concern (Israel, 2003).

For this research proposal, the sample sizes required to assure statistical significance for the research questions (i.e., RQ1, RQ2, RQ3, RQ4) were calculated using the G-Power statistical software package. G-Power is a free, statistical power assessment program developed by Faul et al. (2009), that has been widely used with reliable results (American Statistical Association, 2017; Faul et al., 2009). Yet, over the years, revisions have been made, which led to the 3.1 version used in this research study (American Statistical Association, 2017).

To answer the research questions, multiple linear regression analysis was conducted. In determining the minimum sample size, I utilized widely accepted standard ranges for the input parameters. The power parameter represents the probability that a test of the null hypothesis will correctly yield statistical significance when the null hypothesis is, in fact, false (Rose & Bowen, 2009). The power analysis must match the model for data analysis to assure an appropriate power level to prevent a type II error from being reached. The power was set at 80% or .80.

For the other parameters, a standard confidence level of 95%, which denotes a level of significance or alpha of 5% or .05, was used (Rose & Bowen, 2009). For the effect size, which represents the amount of difference between compared groups, an expression of the actual clinical effect and derived importance, the standard level for a medium effect size using multiple linear regression, .15, was used (American Statistical Association, 2017; Kim, 2015; Rose & Bowen, 2009). It is important to note, given that this research study is a secondary data study using the SHOW surveys, with access to a higher volume of records, the actual sample size utilized in the study is likely to exceed

the calculated required sample size. However, this higher case volume was not deemed warranted given the low level of missing data observed in the SHOW (Israel, 2003).

Table 9 reveals the sample sizes required to assure statistical significance using the multiple linear regression statistic for analysis of the research questions for the selected counties.

Table 9

Power Analysis: A priori to compute required sample size given alpha, power, and effect size

Research questions	Dependent variables (DV)/ Independent variables (IV)	Test family & test statistics	Input parameters	Calculated minimum sample size
RQ1 and RQ2	DV: Risk of food insecurity (scale) IVs: 1) Bonding SC, 2) Bridging SC, 3) Community Structural-Formal SC, 4) Community Structural-Informal SC	F tests Linear Multiple Regression: Fixed model, R ² deviation from zero	Alpha: .05, Power: .80, Effect Size: .15, Number of Predictors: 4	85 samples per county (Milwaukee and Dane Counties)
RQ3 and RQ4	DV: Risk of food insecurity (scale) IVs 3 & 4: Federal Poverty Level (ratio), social capital (scales)	F tests Linear Multiple Regression: Fixed model, R ² deviation from zero	Alpha: .05, Power: .80, Effect Size: .15, Number Predictors 2	68 samples per county (Milwaukee and Dane Counties)

Adapted from: "G*Power 3.1 Manual." American Statistical Association (2017). *American Statistical Association*, 76, 27-32.

Instruments

SPSS version 25 was used to provide computer level statistical analysis of the research data. Data sets were imported into SPSS25 from the SHOW password protected data file, which served as the main data analysis technology for both the descriptive and correlational statistical analysis. SPSS offered the capability to accurately complete a variety of complicated mathematical calculations for greater understanding of the data, as well as the graphics needed to clearly present the findings. (Creswell, 2009; Green & Salkind, 2014). In additions, as mentioned earlier, G*Power was employed to determine the minimum required sample sizes to answer the research questions given the use of the multiple linear regression statistics (American Statistical Association, 2017).

Data Organization Techniques

To assure the quality and soundness of the data collection and analysis plan, meetings with SHOW Research Specialist and the Walden's Center for Research Quality Specialist were scheduled prior to file uploading to uncover any questions or issues that needed addressing. Furthermore, to assure accuracy and completeness, all data was evaluated after uploading and data cleaned, as needed. All supporting information was saved in a general research file and backed up on a flash drive for long term retrieval. All data sets will be properly disposed of within 6 months of manuscript development per SHOW agreement. (See Appendix A) A complete data dictionary table was included to guide the data analysis process. (See Appendix B) The relevant technical explanations

from the SHOW are also included in the appendices to assure transparency in analysis and interpretation (School of Medicine and Public Health, 2017). (See Appendix D)

Operationalization of the Variables

The descriptions of the categories and survey questions from the SHOW dataset along with the operational measures and scoring that define the dependent, independent, income, confounding, and other demographic variables used in this research study are reviewed in this section (School of Medicine and Public Health, 2017). Given the use of the IM that promotes a comprehensive mapping of four specific domains, from the individual to the community context, the large number of factors as listed in each variable category (e.g., 27 elements for community-structural-informal social capital alone), was reviewed. It is important to note that in looking at the primary independent variable, social capital, the review was divided into the four sub-types of social capital of focus (i.e., bonding, bridging, community structural-formal, community structural-informal) with both a sub-unit score and a combined composite score, to provide a consistent conceptual framework in keeping with the study design.

Food insecurity, the dependent variable, was operationalized through a series of questions, patterned after the CFSM from USDA, which were related to either having enough food or about the cost of food for the respondent or (his/her) household. Given that the survey questions were taken from the CFSM which should be interpreted as a measure of food security with the highest numbers indicative of high food security and the lowest numbers meaning low food security (or high food insecurity)

adjustments were needed to enhance clarity of concept. Therefore, for this study, the numbers needed to be re-coded, so the higher numbers were consistent with risk of food insecurity.

As displayed in Table 10, four questions used ordinal level response measures that included: Was that often true; sometimes true; or never true for (you/your household) in the last 12 months? For each question, a continuous point score was assigned to each possible answer based on the extent of agreement to the food security question. Measures were then re-coded such that the higher the score, the higher the food insecurity risk. A composite score consisting of all positive responses to the survey questions, with a total possible maximum score of 12, was used to affirm a risk for food insecurity.

Table 10

SHOW Survey Questionnaire – Food Security

Food Security Survey Questions	Highest Score
FSQ002 “(I/We) worried whether (my/our) food would run out before (I/We) got money to buy more.”	3
FSQ003 “The food that (I/We) bought just didn’t last, and (I/We) didn’t have money to get more.”	3
FSQ004 “(I/We) could not afford to eat balanced meals.”	3
FSQ080 “In the last 12 months, have you been concerned about having enough food for you or your family?”	3
Ordinal response measures (*original scores) for all above: 1=often true, 2 = sometimes true, 3 = never true.	3
*Measures were re-coded and transposed such that the highest scores = high food insecurity: 3.) often true; 2.) sometimes true; 1.) never true for (you/your household) in the last 12 months?	
*Food Insecurity Highest Possible Score:	12

Social capital, the independent variable, is a multidimensional construct that can be measured through examining several indicator parameters (Pendley, Mock, & Theall, 2020; Stone, 2001). These may range from structural types of social connections (social networks from the individual to community context); engagement social capital parameters (extent of civic and political engagement); to cognitive social capital parameters (perceived trust/respectful relationships) (Stone, 2001). The approach and constructs of focus needed to be based on the intent of the research and the questions the researcher was attempting to answer (Pendley et al., 2020; Stone, 2001).

Heterogeneous was the term used to describe the state of measurements of social capital related to the numerous types of tools available and the number of items used (Agampodi et al., 2015; Stone, 2001). This held true whether looking at systematic reviews focused on tools to be used in low to moderate income countries or in those used in high income countries (Agampodi et al., 2015; Pendley et al., 2020; Stone, 2001). In addition to the common social capital constructs (e.g., social networks, trust, civic engagement), it was pointed out that “access to resources” and specifically, those relevant to the health issue at hand, should also be measured in developing a comprehensive assessment (Agampodi et al., 2015; Pendley et al., 2020). Access to resources as well as social influence were considered essential for inclusion in measuring social capital in low resource countries, which was not present in many measures of social capital reviewed (Agampodi et al., 2015; Pendley et al., 2020).

Social capital measurement scales that were reviewed included long survey’s with multiple types of constructs, short surveys with more targeted constructs around bonding

and bridging constructs, psychological constructs related to trust and power, health focused surveys related to health practices, mental health, and relationships with health care providers, surveys focused on the individual's social networks, and community wide focused surveys that keyed on community capacity and collective engagement (Agampodi et al., 2015; Chazdon et al., 2013; Chen et al., 2009; Grootaert et al., 2004; Lee & Kim, 2012; Magson et al., 2014; Pendley et al., 2020; Putnam, 2000; Williams, 2006). And, although at times the same validated tool was used, different researchers selected specific items from the tool to study, thus adding to the heterogeneity among the social capital measures (Agampodi et al., 2015).

To date, a “gold” standard for measuring social capital through refinement of a specific tool has not been established (Agampodi et al., 2015; Putnam, 2000; Stone, 2001). Some of the tools focused considerable attention on trust as a high priority versus bridging relationships or community linkages to resources (Agampodi et al., 2015). One study, the Adaptive Social Capital Assessment Tool (A-SCAT), a version of the original Social Capital Assessment Tool (SCAT) developed under the World Bank's social capital initiative, thoroughly assessed the concept with eleven different constructs, distinguishing between structural and cognitive dimensions, as well as eight factors representing different social capital constructs (Agampodi et al., 2015). However, it did not address linking social capital which is a key component of the current research proposal (Agampodi et al., 2015).

Several other validated models and measurement scales were reviewed that contained similar domains/constructs of social capital needed in this study (Agampodi et

al., 2015; Chen et al., 2009; Chen et al., 2015; Grootaert et al., 2004; Williams, 2006).

However, most were missing some major constructs that this research study deemed pertinent to examining the relationship to the health issue at hand, specifically risk of food insecurity. For example, the primary social capital categories (i.e., bonding, bridging, linking social capital) in the University of Minnesota (U of M) Extension Social Capital Model (2013) are similar to those in this research study and aided in defining the measuring framework (Chazdon et al., 2013; School of Medicine and Public Health, 2017). However, the U of M Extension Model has an emphasis on evaluating trust and engagement with limited information on community formal or informal access to resources, which was included in this research study (Chazdon et al., 2013). The U of M Extension Model was found to be a valid and reliable measurement tool and its educational model centers on both structural types and cognitive aspects of social capital (Chazdon et al., 2013).

The current research study primarily involved examining the social capital networks and structures that are present in the two Wisconsin cohorts, Milwaukee, and Dane Counties, and if there is a relationship to risk of food insecurity. The examination of social networks is viewed as fundamental to the study of relational research. Networks form the structural framework of social capital (Stone, 2001). It centers on intimate bonds, levels of connectedness (both formal and informal), group membership, and civic participation that facilitates engagement of one individual with another (Stone, 2001).

Yet, it must be noted that measures of social capital through secondary data analysis are limited given that the reasons for the primary survey questionnaires were not

created for the social capital analysis (Stone, 2001). Secondary data analysis can, however, reveal formative information on the extent of the social relations present. Thus, it may guide future qualitative inquiry for a more comprehensive, in-depth assessment, such as examining the quality or strength of the relationships identified (Stone, 2001).

In looking at the *SHOW* secondary data set and the types of social capital constructs available to be used for this research study, some important trust and engagement concepts, such as community belonging and civic engagement, were available (School of Medicine and Public Health, 2017). These parameters were included in the research. However, there was limited data on the cognitive aspects of social capital, such as perceptions of the quality or strength of the bridging relationship (School of Medicine and Public Health, 2017).

The survey questionnaires were more inclusive of the various types of social networks and connections to resources (School of Medicine and Public Health, 2017). The *SHOW* data set contained community structural formal social capital questions (e.g., WIC program participation) that constitutes linking relationships to governmental food safety net resources. There were also questions related to community structural informal social capital resources (e.g., shopping at farmers markets) which depicts access to food sources that are open to the general public (School of Medicine and Public Health, 2017).

Therefore, given that my research study is primarily concerned with examining the networks and structural types of social capital (bonding, bridging, community structural formal and informal social capital) as it relates to food insecurity risks using secondary survey data previously collected from the *SHOW*, the independent variables

were operationalized through development of a measuring framework using selected survey questions that coincide with each of the four social capital types. For each question, a continuous point score was assigned to each possible answer based on the potential for connectedness such that the higher the points assigned, the higher the social capital. The questions were re-coded as needed and a total social capital composite score was calculated based on the sum of the highest positive response scores for each social capital type (see Table 11).

Table 11.

SHOW Survey Questionnaire – Social Capital

Social Capital Survey Questions	
Bonding Social Capital: Intimate connections within one's close social environment	Highest Score
<p><i>Marital Status (also considered a Demographic variable) – Survey Question:</i></p> <p>DMQ040 “<i>What is your marital status?</i>”</p> <p>Nominal response measures (*original scores) include: 1.) Married; 2.) Widowed; 3.) Divorced; 4.) Separated; 5.) Never Married; 6.) Living with Partner</p> <p>*Measures were recoded and rearranged such that higher scores = higher bonding SC (Married or Living with partner = highest bonding (1=6, 2=2, 3=2, 4=3, 5=1, 6=6)</p>	6
<p><i>Residing close to family/friends – Survey Question:</i></p> <p>NBRHD006_C_R2 “<i>Thinking back to when you moved to your current residence, at that time, how important were each of the following factors in your decision to move to your current residence? Close to family/friends.</i></p> <p>Ordinal response measures (original scores ok) include: 1.) Not at all important; 2.) Slightly important; 3.) Neutral; 4.) Moderately important; 5.) Very important.</p>	5

Friendly Neighbors – Survey Question:

NBRHD006_F_R2 “Thinking back to when you moved to your current residence, at that time, how important were each of the following factors in your decision to move to your current residence?” Friendly neighbors **5**

Ordinal response measures (original scores ok) include: 1.) Not at all important; 2.) Slightly important; 3.) Neutral; 4.) Moderately important; 5.) Very important .

Community150 “I have a bond with others in the neighborhood”

Ordinal response measures (*original scores): 1.) Strongly agree; 2.) Agree; 3.) Neutral; 4.) Disagree; 5.) Strongly disagree **5**

(Original lower scores = higher bonding) Measures were recoded and transposed such that higher scores = higher bonding SC

Safe in Relationship (Milwaukee Supplemental) – Survey Question:

Milwaukee120 “Do you feel safe in your relationship?” **2**

Nominal response measures (*original scores): 1.) Yes; 2.) No; 3.) Does not apply/not in a relationship.

*(Original lower scores = higher bonding) Measures were recoded and transposed such that higher scores = higher bonding SC

Bonding Subtotal: 23

Bridging Social Capital: Connections outside of one’s intimate social environment that can be of influence or aid in establishing connections to health or food resources or services.

Connection to Medical Care – Survey Questions:

IUQ120 “Do you have a usual place where you go when you feel sick or need advice about your health?” (If you have more than one place you go, depending on the most often.) 4

Nominal response measures (*original scores) : 1.) Yes, I usually go to the hospital emergency room; 2.) Yes, I usually go to a hospital outpatient department; 3.) Yes, I usually go to a clinic or doctor’s office; 4.) Yes, I usually go to a community health center; 5.) Yes, I usually go to some other place (specify; __); 6.) No, I don’t have a usual place of care. (don’t know will be coded as missing)

*Measures recoded and rearranged such that the higher score = higher bridging sc. (3=4, 4=3, 2=3, 1=2, 5=2, 6=1)

IUQ128 “When you go to this health facility, do you usually see a general doctor, a specialist doctor, a nurse practitioner or physician assistant or someone else?” 4

Nominal response measures (*original score): 1.) General Doctor; 2.) Specialist Doctor; 3.) Nurse Practitioner/Physician Assistant; 4.) Someone else.

*(Original lower scores = higher bridging) Measures were recoded and transposed such that higher scores = higher bridging SC (1=4, 2=3, 3=2, 4=1)

IUQ260_R2 “Sometimes people have problems getting health care when they need it. During the last 12 months, was there any time that you felt that you needed medical care or surgery but did not get it?” 2

Nominal response measures (original score ok): 1.) Yes; 2.) No.

Health Information/Health Literacy – Survey Questions:

IUQ100 “In the last 12 months, have you used the internet to seek information or advice on your health, or that of your family?” 2

Nominal response measures (*original score): 1.) Yes; 2.) No

*Measures were recoded and transposed such that higher scores = higher bonding SC (1=2, 2=1)

IUQ115 *“How often do you need to have someone help you when you read instructions, pamphlets, or other written material from your doctor or pharmacy? Would you say?”* **5**

Ordinal response measures (original score ok): 1.) Never; 2.) Rarely; 3.) Sometimes; 4.) Often ; 5.) Always.

Health and dental insurance coverage (included as a bridge to health resources and its potential effect on the household income, if not covered).

Survey question:

IUQ020_R2_A *“What kind(s) of health insurance or health care coverage do you have now, or did you have during the last 12 months?”* **3**

Nominal response (*original measures): 1.) Employer or union sponsored plan; 2.) Private individually purchased health plan; 3.) Medicare, for people 65 or older, or people with certain disabilities; 5.) Medicaid, Medical Assistance, MA, BadgerCare, BadgerCare-Plus; 6.) HIRS: Health Insurance Risk Sharing Plan-Wisconsin of Federal; 8.) Indiana Health Service; 9.) Military Care (TriCare,VA) ; 10.) Other plan (Specify ____).

*Measures were recoded and rearranged such that higher scores = higher bridging SC (1=3, 2=3, 3=2, 5=2, 6=3, 8=2, 9=3, 10=1)

IUQ030 *“{Does/Did} your health insurance plan (including any supplemental coverage you might {have/have had}) cover the costs associated with prescription medications”* **3**

IUQ040 *“{Does/Did} your health insurance plan cover the costs associated with preventive dental services (oral exam, cleaning, sealant, etc.)?”* **3**

IUQ050 *“{Does/Did} your health insurance plan cover the costs associated with other preventive services for adults (checkups, immunizations, screenings)?”* **3**

Ordinal response measures (*original scores): 1.) All of the cost; 2.) Some of the cost; 3.) None of the cost

*Measures were recoded and transposed such that higher scores = higher bonding SC (1=3, 2=2, 3=1)

Bridging Subtotal: 29

Community Structural – Formal Social Capital: Formal governmental or private organizations that can provide a link to resources or support to assist in meeting needs.

Access to formal food safety net sources. Survey Questions:

FSQ162_R2 “*In the last 12 months, did you receive benefits from the WIC program, that is, the Women, Infants and Children program?*” 2

FSQ170_R2 “*In the last 12 months, were you authorized to receive Food Stamps[Food Share], which includes a food stamp card or voucher, or cash grants from the State for food?*” 2

Nominal response measure (*original score) for all: 1.) Yes; 2.) No.

*Measures were recoded and transposed such that higher scores = higher Community Formal SC ((1=2, 2=1)

Head Start (Milwaukee Supplemental). Survey Questions:

Milwaukee100 “*Have any of your children participated in Head Start, preschool, or other early childhood enrichment?*” 2

Nominal response measure(*original score): 1.) Yes; 2.) No; 3.) Don’t apply, don’t have children.

*Measures were recoded and transposed such that higher scores = higher Community Formal SC (1=2, 2=1, 3 = missing)

Milwaukee110 “*Do you now have a child participating in Head Start, preschool, or other early childhood enrichment?*” 2

Nominal response measure (*original score): 1.) Yes; 2.) No; 3.) Don’t have children/don’t apply, don’t have preschool children.

*Measures were recoded and transposed such that higher scores = higher Community Formal SC (1=2, 2=1, 3 = missing)

Perceptions of government assistance. The following are some opinions other people have expressed about government assistance (for example, welfare, food stamps, WIC). Please tell us whether you apply to Survey Questions:

FSQ180 “*Government assistance helps people get on their feet when facing difficult situations such as unemployment, a divorce, or a death in the family.*” 5

FSQ185 *“Government assistance helps to prevent hunger and starvation.”* 5

Ordinal response measures (*original score) for questions 180 & 185 above: 1.) Strongly agree; 2.) Agree; 4.) Disagree; or 5.) Strongly disagree.

*Measures were recoded and transposed such that higher scores = higher Community Formal SC (1=5, 2=4, 3=3, 4=2, 5=1 for 180 & 185)

FSQ190 *“The application process to apply for government assistance is humiliating.”* 5

FSQ195 *“The rules of government assistance take away personal freedom.”* 5

Ordinal response measures (original score ok) for questions 190 & 195 above: 1.) Strongly agree; 2.) Agree; 4.) Disagree; or 5.) Strongly disagree.

Political engagement. The following set of questions requests information about your social and emotional connection to a variety of issues. Please rate your agreement with the following survey questions:

Community050 *“I enjoy political participation because I want to have as much say in running government as possible”* 5

Community060 *“There are plenty of ways for people like me to have a say in what our government does.”* 5

Ordinal response measures (*original scores) for above questions: 1.) Strongly agree; 2.) Agree; 3.) Neutral; 4.) Disagree; or 5.) Strongly disagree with each statement.

*Measures were recoded and transposed such that higher scores = higher Community Formal SC (1=5, 2=4, 3=3, 4=2, 5=1 for Comm 050-060)

Community170 *“Written a letter or made a telephone call to influence a policy issue.”* 5

Community190 *“Attended a meeting to pressure for city or county policy change.”* 5

Ordinal response measure (*original score): 1) Very Frequently, 2) Frequently, 3) Sometimes, 4.) Rarely, 5.) Never

*Measures were recoded and transposed such that higher scores = higher Community-Formal SC (1=5, 2=4, 3=3, 4=2, 5=1 for both Comm 170 & 190))

Occupation/Job Status. This category asks questions about work experience and provides details on the type of work performed. Survey questions:

OCQ100 “*Which of the following were you doing last week...?*” **4**

Nominal response measures (*original scores): Working at a job or business (1); With a job or business but not at work (for example, on vacation or sick) (2); Not working but looking for work (3); Not working at a job or business & not looking for a job (4); Don’t know (0).

*Measures were recoded and transposed such that higher scores = higher Community-Formal SC (1=4, 2=3, 3=2, 4=1, 0=missing)

OCQ110 “*What is the main reason you are not in the paid workforce?*” **4**

Nominal measures (*original scores): 1.) Taking care of house or family; 2.) Going to school; 3.) Retired; 4.) Unable to work due to health reasons; 5.) On layoff; 6.) Disabled.

*Measures were transposed such that higher scores = higher Community-Formal SC (1=4, 2=3, 3=2, 4=2, 5=1, 6=2)

OCQ127 “*Do you usually work 35 hours or more per week in total at all jobs or businesses?*” **2**

Nominal response measures (*original score): 1.) Yes; 2.) No.

*Measures were transposed such that higher scores = higher Community-Formal SC (1=2; 2=1)

Community Structural Formal Subtotal: 58

Community Structural – Informal Social Capital: Various community-based organizations and informal entities, including the neighborhood, which may provide social support or connections to resources.

Access to emergency food. Survey Question:

FSQ151_R2 “*In the last 12 months, did you ever get emergency food from a church, a food pantry, or a food bank, or eat in a soup kitchen?*” **2**

Nominal response measures (*original score): 1.) Yes; 2.) No.

*Measures were recoded and transposed such that higher scores = higher
Community-Informal SC (1=2, 2=1)

Farmer's markets/local farms. Survey Question:

DIQ420 "How often do you shop at a farmer's market or local farms?" 4

Ordinal response measures (*original score): 1.) Regularly; 2.) Often; 3.)
Seldom; 4.) Never.

*Measures were recoded and transposed such that higher scores = higher
Community-Informal SC (1=4, 2=3, 3=2, 4=1)

Community Supported Agriculture (CSA) Food Coops. Survey Question:

DIQ430 "Over the past year have you been a member of a Community
Supported Agriculture or CSA group?" 2

Nominal response measures (*original score): 1.) Yes; 2.) No.

*Measures were recoded and transposed such that higher scores = higher
Community-Informal SC (1=2; 2=1)

Grow or produce own food. Survey Question:

DIQ440 "Over the past year have you grown or produced any of your own
food?" 2

Nominal response measure (score): 1.) Yes; 2.) No.

*Measures were recoded and transposed such that higher scores = higher
Community-Informal SC (1=2; 2=1)

Eating at various food establishments. Survey questions:

DIQ100 "During the last year, how frequently did you eat a meal at a fast-
food restaurant? (For example: McDonalds, Pizza Hut, Burger King, KFC,
Taco Bell, Subway, Culvers, and so on.) Would you say it was...?" 6

DIQ110 "During the last year, how frequently did you eat a meal at a fast-
casual restaurant? For example: Noodles and Company, Panera Bread,
cafeterias, and so on; do not include all-you-can-eat meals." 6

”DIQ115 “During the last year, how frequently did you have an “all-you-can-eat” meal? For example: Old Country Buffet, Ponderosa, all-you-can-eat Friday fish fries, and so on.” 6

DIQ120 “During the last year, how frequently did you eat a meal at a sit-down restaurant? Family-style restaurants are included in this category.” 6

Ordinal response measures (original score ok) for all: 1.) Never ; 2.) Rarely (less than once a month); 3.) Sometimes (between 1-3 times a month); 4.) 1-2 times per week; 5.) 3-4 times per week; 6.) 5 or more times per week.

Sense of Community/Civic Engagement

Community070 “It is important that I actively participate in my community” 5

Community090 “I can get what I need in this neighborhood” 5

Community 100 “This neighborhood helps me fulfill my needs” 5

Community110 “I feel I belong in this neighborhood” 5

Community 120 “I have a say about what goes on in this neighborhood” 5

Community130 “People in this neighborhood are good at influencing one another” 5

Community140 “I feel connected to this neighborhood” 5

Ordinal response measure for all above (*original score): 1.) Strongly agree; 2.) Agree; 3.) Neutral; 4.) Disagree; 5.) Strongly disagree

*Measures were recoded and transposed such that higher scores = higher Community-Informal SC (1=5, 2=4, 3=3, 4=2, 5=1 for 070 – 140)

Community180 “Attended an event that provided information about community services” 5

Community200 “Attended a meeting to gather information about a neighborhood issue” 5

Ordinal response measure (*original score): 1) Very Frequently, 2) Frequently, 3) Sometimes, 4.) Rarely, 5.) Never

*Measures were recoded and transposed such that higher scores = higher Community-Informal SC (1=5, 2=4, 3=3, 4=2, 5=1 for 180 & 200)

Community Structural Informal Subtotal: 79

Social Capital - Highest Possible Score	189
(Bonding + Bridging + Community-Formal +Community-Informal)	

Income was analyzed as a secondary independent variable to assess if there is a relationship between Federal Poverty level and social capital and risk of food insecurity for each county specified, with the confounding variables used as controls. It was operationalized using the parameters in Table 12.

Table 12

SHOW Survey Questionnaire - Income

Income
<i>Demographic characteristic data.</i> The income for each county was calculated as part of the cohort description.
<i>Personal and Household Income Levels.</i> Survey questions: INQ200 “Now, considering all the sources of income, can you tell me which letter on this card best represents the combined family income before taxes in the last 12 months or in the last month?” Ratio response measures: Income listed in \$5,000 intervals starting at less than \$10,000, then 10,000-1499, continuing up to \$200,000 or above. Household Members Supported by Combined Family Income. Survey Question INQ201 “How many people were supported by this combined family income in the last 12 months”? Interval response measures: Range from 1 to 9 individuals. <i>Verification of Combined Family Income Above or Below Poverty Threshold (Autofill).</i> SHOW Note: Federal poverty income ranges will be preprogrammed so that if a family income falls in a range containing the federal poverty level for that size family, the CAPI will generate an extra question to determine if household income is below the federal poverty level. Survey Question: Poverty_100 “Is your income below or above \$(variable*) per {year/month}?”

Poverty_150 *“Is your income below or above \$(variable*) per {year/month}?”*

Poverty_200 *“Is your income below or above \$(variable*) per {year/month}?”*

Ordinal response measures for all above: 1.) Below; 2.) Above

In addition to the above computer-generated income calculation, using the mid-points of the combined family income, the families above or below 300%, and 400% of federal poverty level would be derived.

Confounding variables. In keeping with the IM which strives to gain a comprehensive, systematic gathering of facts surrounding an issue in order to inform which priority or targeted actions should be taken, three categories of potential confounding variables were also included in the measurement tool and scored based on the number of possible affirmative responses (Lundy, 2010). These confounding variables included several factors that may have an impact on the individual or household’s neighborhood or home environments and potential risk of food insecurity. In addition, some Milwaukee specific issues were included based on past inquiries. Using the multiple regression analysis statistics, the composite scores for each of the confounding variables was used as controls in determining the extent of relationships between the independent variables (Federal Poverty Level and social capital) and the dependent variable (risk of food insecurity). Tables 13, 14, and 15 below outline the operational measures and scores related to three confounding categories: Neighborhood Characteristics, Adverse Life Events, and Milwaukee Supplemental Inquiry that was assessed in this research study.

Table 13*SHOW Survey Questionnaire – Neighborhood Characteristics*

Neighborhood Characteristics: Provides insight into walking distances to specific destinations from home and perceptions about the neighborhood	Score
<i>Walking distances to specific destinations from home. Survey questions:</i>	
NBRHD001_E “About how many minutes would it take to walk from your home to the nearest of these facilities? Convenience or small grocery store?”	6
NBRHD001_F “About how many minutes would it take to walk from your home to the nearest of these facilities? Supermarket?”	6
NBRHD001_K “About how many minutes would it take to walk from your home to the nearest of these facilities? Fast food restaurant?”	6
NBRHD001_L “About how many minutes would it take to walk from your home to the nearest of these facilities? Other restaurant?”	6
NBRHD001_Q “About how many minutes would it take to walk from your home to the nearest of these facilities? Indoor fitness facility?”	6
NBRHD001_S “About how many minutes would it take to walk from your home to the nearest of these facilities? Senior center?”	6
The interval level response measures (*original scores) for all the questions include: 1.) 0-5 minutes; 2.) 6-10 minutes; 3.) 11-20 minutes; 4.) 21-30 minutes; 5.) More than 30 minutes; 6.) None within walking distance.	6
*Measures were recoded and transposed such that higher scores = higher Neighborhood resources/access (1=6, 2=5, 3=4, 4=3, 5=2, 6=1)	
<hr/> <i>Rate your community as...Survey Questions:</i>	
NRBHD003 “How safe from crime is your community for walking or riding a bike?”	4
Ordinal measure (original score ok): 1.) Not at all safe; 2.) Not very safe; 3.) Somewhat safe; 4.) Very Safe.	
NRBHD005-D “I have easy access to fresh fruits and vegetables in my community.”	4

Ordinal measure (original score ok): 1.) Strongly disagree; 2.) Disagree; 3.) Agree; 4.) Strongly agree (higher scores = higher neighborhood access/perceptions)

Neighborhood Characteristics Subtotal	44
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Table 14

SHOW Survey Questionnaire - Adverse Life Events

Adverse Life Events: Stressful life events that can impact the individual and household functioning

Survey questions: *"In the past 12 months, did you experience..."*

Life_1 "Death of spouse or partner"	2
Life_2 "Divorce"	2
Life_3 "Separation from spouse or partner"	2
Life_4 "Detention in jail or other institution"	2
Life_5 "Death of a close family member other than spouse or partner"	2
Life_6 "Major personal injury or illness"	2
Life_8 "Being fired at work"	2
Life_10 "Retirement from work"	2
Life_11 "Major change in the health or behavior of a family member"	2
Life_12 "Pregnancy"	2
Life_17 "Death of a close friend"	2
Life_21 "Foreclosure on a mortgage or loan"	2
Life_30 "Troubles with the boss"	2
Life_31 "Major changes in working hours or conditions"	2
Life_39 "Major change in number of family get-togethers"	2
Life_42 "Major holiday spent alone"	2
Life_44 "None of these events happened to me in the past 12 months"	2

A nominal response measure (*original score): 1.) Yes or 2.) No

*Measures recoded and transposed so that the highest score = an affirmative response for the Adverse Life Event (1=2, 2=1)

Adverse Life Events Subtotal:	34
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Table 15

SHOW Survey Questionnaire - Milwaukee Supplemental

Milwaukee Supplemental Inquiry: Specific inquiry for the Milwaukee area that was added in 2016 by the Milwaukee Health Department	Score
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Survey questions include:

Milwaukee070 “Do you ever have trouble making ends meet?”	4
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Ordinal measures (original scores ok): 1.) Never; 2.) Sometimes; 3.) Often; 4.) Always

Milwaukee080 “Is housing ever a problem for you?”	2
---	---

Milwaukee090_A “Have you ever been threatened with foreclosure?”	2
--	---

Milwaukee090_B “Have you ever not had enough money to pay rent?”	2
--	---

Milwaukee090_C “Have you been evicted by your landlord?”	2
--	---

Nominal measures (*original scores): 1.) Yes; 2.) No.

*Measure recoded so that the highest score is affirmative for Milwaukee Supplemental Inquire (housing adversity) (1=2, 2=1)

Milwaukee Supplemental Inquiry Subtotal:	12
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Confounding Variables - Highest Possible Combined Score	90
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(Adverse Life Events+ Neighborhood Characteristics + Milwaukee Inquiry)

Demographic characteristic data. The demographic characteristics of the research participants that were used in the analysis of this research study are operationalized and outlined in Table 16.

Table 16*SHOW Survey Questionnaire - Demographics*

Demographics
<p>Age - Three ordinal categories of 18-44 years, 45-65 years, and 66-and above was formulated that assess the ages with the most influence on raising children (i.e., parents and grandparents)</p>
<p>Gender - A nominal value between 1.) male or 2.) female.</p>
<p>Marital Status – (will also be used as a bonding social capital component).</p> <p>DMQ040 “<i>What is your marital status?</i>”</p> <p>Nominal response (*original measures) include: 1.) Married; 2.) Widowed; 3.) Divorced; 4.) Separated; 5.) Never Married; 6.) Living with a Partner</p> <p>*Measures were recoded and rearranged such that higher scores = higher bonding SC (Married or Living with partner = highest bonding (1=6, 2=2, 3=2, 4=3, 5=1, 6=6)</p>
<p>Race/Ethnicity - For the overall demographic description of the cohorts, would use the <i>Race_Ethnicity_7CAT</i> variable which is a combination of race and ethnicity into four nominal categories that includes: 1.) White (alone), 2.) Black (alone or in combination), 3.) Asian (alone), 3.) Native Hawaiian or Islander Pacific (alone), 5.) American Indian or Alaska Native, 6.) More than one race, 7.) Unknown or Unreported</p> <p>For the purpose of looking at racial/ethnic disparities in social capital and income (given Wisconsin’s historic racial equity/segregation issues), the variables (DMQ060_1) Non-Hispanic White (alone or in combination), (DMQ060_2) Non-Hispanic Black (alone or in combination), and (DMQ050) Hispanic or Latino would be used as confounding variables in statistical analysis.</p> <p>Nominal measures for all: 1.) Yes; 2.) No.</p>
<p>Household Size - # of persons in the households as explained in determining the household income levels/percent poverty). <i>NPERSONSHH</i></p> <p><i>NKIDSHH</i> - # of kids (children) in the household, 0-17 years.</p>

Education Attained – Originally measured in 15 ordinal categories starting at 5th grade and continuing through to a doctorate. Survey question:

DMQ010 “*What is the highest grade or level of school you completed or the highest degree you received?*”

For this variable, I merged the data to make five ordinal categories of: 1) Less than high school; 2) High school; 3) Some college; 4.) Associate Degree/Technical Certificate; 5) College graduate and above.

Transportation - Nominal measure between two transportation choices. Survey Question:

DMQ100_rec “*Do you currently own or lease a car or truck?*”

Nominal response (original) *measures: 1.) Yes; 2.) No. (*recoded to 1=2, 2=1 for this study)

Geographic Location –

FMT_Urban_2CAT

Nominal response measures: 1) urban or 2) rural.

Residential Type - Nominal measure of housing type. Survey Question:

HOQ065_R2 “*Is this (house, apartment, or mobile home) owned by you, owned by someone in this household, rented, or occupied without payment?*”

Nominal response measures: 1) Owned by you or someone in this household with a mortgage or loan?; 2) Owned by you or someone in this household free and clear without a mortgage or loan?; 3) Rented for cash rent; 4) Occupied without payment of cash rent.

Merging data sets, recoding and transposing variables, setting value levels, revising the data table to match the selected variable categories of interest, conversion of string variables to numeric, and addressing missing data, all were conducted in getting the data ready for analysis (Frankfort-Nachmias & Nachmias, 2008; Green & Salkind, 2014; Soriano, 2013; UCLA Institute for Digital Research and Education). In reviewing the missing data for this study, although questions presented with minimal missing values

(10 or less), there was considerable variability by question and by cases answering the questions. Therefore, it was decided to include all questions with missing values of less than 25 to assure a missing value rate of no more than 3-5% for each question used. Those with higher missing response rates were excluded from the study.

Specifically, when I added up the total questions used in the study (Milwaukee + Dane County = 570 questions), then the 3-5% came out to be 17.1 - 28.5 missing response questions. If divided up per county cases, then the 3-5% for Milwaukee County would be 10-16.75 questions and for Dane County 7-11.75 questions with missing responses. Given the low levels of missing data found, and the remaining cases used for each question remained well over the critical sample size for statistical significance ($n = 68-85$ cases when using multiple linear regression analysis), no other corrections were deemed necessary (American Statistical Association, 2017; Kim, 2015; Rose & Bowen, 2009; Soriano, 2013; UCLA Institute for Digital Research and Education).

Although the original data set reported age in intervals of 10 starting at age 18, for this research study, ages were merged to create the new ordinal adult categories of 18-44 years, 45-65 years, and 66-years and above (Frankfort-Nachmias & Nachmias, 2008; School of Medicine and Public Health, 2017; Soriano, 2013). The 18-44 age category was the group at the highest potential to influence the social environment of young children as it represents the largest reproduction period (Martinez et al., 2012).

Martinez et al. (2012) reported the mean age for having a first baby is 23 for women and 25 for men, with the majority (above 50%) of all births occurring to parents

that are in their 20's. By 40 years of age, 85% of women and 76% of men are parents (Martinez et al., 2012). The 45-65 age category was highlighted given the role that grandparents and other family members (e.g., aunts) play in supporting parents in caring for children (Anderson Steeves et al., 2016).

Data Analysis Plan

The key purpose of this quantitative, retrospective, descriptive correlational research study is to obtain formative background information to assist in the development of targeted strategies to impact food insecurity in at risks populations in two counties in Wisconsin (Milwaukee and Dane County)(Curtis et al., 2014; Nguyen et al., 2015). The statistical analysis used in this study to address the research questions included descriptive statistics (e.g., frequency distribution) to describe the cohorts' demographic characteristics and used as control variables in the multiple regression analysis. Inferential statistical analysis (i.e., multiple linear regression analysis) was conducted to identify the extent of relationship between variables as shown in Table 17. The multiple linear regression model was used to assess if there's a relationship between variables given that there was one continuous level dependent variable, risk for food insecurity, and multiple continuous level independent variables, the four types of social capital (bonding, bridging, community structural-formal, community structural-informal). R^2 goodness-of-fit measures and residual scatter plots evaluations were conducted to test assumptions.

Table 17*Statistical Analysis Based on Research Questions*

Research Questions	Statistical Analysis	Statistical Tool
Describing Cohorts Demographic Characteristics	Descriptive Statistics:	Frequency Distributions; Measures of Central Tendency (e.g., means, median, mode) Measures of Dispersion; (range)
RQ1 Is there a relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and the risk of food insecurity within Milwaukee County?	Inferential Statistics	For both questions, <i>Multiple Regression Analysis</i> with $p < 0.05$ and 95% confidence; effect size .15 (medium for multiple linear regression)
RQ2. Is there a relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and the risk of food insecurity within Dane County?		Evaluations: R^2 goodness-of-fit Residual scatter plots
RQ3. Is there a relationship between Federal Poverty Level and social capital and risk of food insecurity within Milwaukee County, controlling for neighborhood characteristics, adverse life events, and Milwaukee specific inquiry?	Inferential Statistics	For both questions, <i>Multiple Regression Analysis</i> with $p < 0.05$ and 95% confidence; effect size .15 (medium for multiple linear regression)
RQ4. Is there a relationship between Federal Poverty Level and social capital and risk of food insecurity		Evaluations: R^2 goodness-of-fit

within Dane County, controlling for neighborhood characteristics?

Residual scatter plots

The multiple regression analysis was also used to further assess if there is a relationship with the one continuous dependent variable, risk for food insecurity, and the continuous independent variables of social capital and Federal Poverty Level (ratio), while controlling for the confounding variables: neighborhood characteristics, adverse life events, and Milwaukee specific inquiry.

Covariations are considered nonspurious if the variations observed cannot be explained by another relationship (Frankfort-Nachmias & Nachmias, 2008; Soriano, 2013; Creswell, 2009). Variables that are not considered which could be associated with both the independent variable and the dependent variable have the potential to bias the results. Therefore, in this study, other relevant variables such as age group, gender, household size, race/ethnicity, transportation, education attained, geographic location (rural or urban), and residential type were also included in the regression analysis as controls.

To assure that the multiple linear regression analysis will yield valid results, eight assumptions were evaluated and met (Laerd Statistics, 2018). The first two involved how the dependent and independent variables are measured. Assumption-one states that the dependent variable must be measured using a continuous scale; while assumption-two you must have two or more independent variables measured at either the continuous or categorical levels (Laerd Statistics, 2018). In examining the research, these first two

assumptions have been met given that the dependent variable, risk of food insecurity, is measured on a continuous scale and the independent variables, four types of social capital and income level (e.g., Federal Poverty Level) is measured as a continuous scale and ratio level, respectively.

For assumptions 3-8, statistical analysis using SPSS was performed with corrections made, as needed. These tests of assumptions included: 3) Independence of observation using the Durbin-Watson statistics; 4) Testing for linear relationship between the dependent variable and the independent variables, singularly and combined, by creating scatterplots and partial regression plots to check for linearity using SPSS and visual observation; 5) Testing for homoscedasticity, wherein the variances along the line of best fit remain similar as you move along the line; 6) To rule out multicollinearity which can result from having two or more independent variables being significantly related to each other, data was evaluated using correlation coefficients and Tolerance/VIF values; 7) Using SPSS, test to assure that there are not any extreme outliers, high leverage points, or highly influential points through the use of “casewise diagnostics” and “studentized deleted residuals” as well as tests such as the Cook’s Distance for influential points; and, 8) Check to confirm that the residuals (errors) are mostly normally distributed using histogram and a Normal P-P Plot or a Normal Q-Q plot of the studentized residuals (Laerd Statistics, 2018).

Research Questions and Hypotheses

RQ1: Is there a relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity within Milwaukee County?

H₀₁: There is no significant relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity within Milwaukee County.

H_{a1}: There is a significant relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity in Milwaukee County.

RQ2: Is there a relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity within Dane County?

H₀₂: There is no significant relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity within Dane County.

H_{a2}: There is a significant relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity in Dane County.

RQ1 and RQ2 were answered using multiple linear regression statistics to identify if a relationship exists between the one dependent variable (risk of food insecurity) and the four independent variables, social capital (SC) types (bonding SC, bridging SC, community structural-formal SC, community structural-informal SC), for each selected county (i.e., Milwaukee and Dane County). Descriptive statistics were used to describe the demographic characteristics of each cohort and the demographic variables were also used as controls in the multiple regression analysis. The level of significance to prevent a type 1 error was an alpha set at $p \leq 0.05$ or 5% and a 95% confidence interval. R^2 goodness-of-fit measures and residual scatter plot evaluations.

RQ3: Is there a relationship between federal poverty level ratio and social capital and risk of food insecurity within Milwaukee County, controlling for neighborhood characteristics, adverse life events, and Milwaukee specific inquiry?

H₀₃: There is no relationship between federal poverty level ratio and social capital and risk of food insecurity in Milwaukee County, controlling for neighborhood characteristics, adverse life events, and Milwaukee specific inquiry.

H_{a3}: There is a relationship between federal poverty level ratio and social capital and risk of food insecurity in Milwaukee County, controlling for neighborhood characteristics, adverse life events, and Milwaukee specific inquiry.

RQ4: Is there a relationship between federal poverty level ratio and social capital and risk of food insecurity within Dane County when controlling for neighborhood characteristics?

H₀₄: There is no relationship between federal poverty level (ratio) and social capital and risk of food insecurity in Dane County when controlling for neighborhood characteristics.

H_{a4}: There is a relationship between federal poverty level ratio and social capital and risk of food insecurity in Dane County when controlling for neighborhood characteristics.

RQ3 and RQ4 was answered using multiple linear regression statistics to identify if a relationship exists between the one dependent variable (risk of food insecurity) and two independent variables (Federal Poverty Level (ratio) and social capital) for each selected county (i.e., Milwaukee and Dane County), controlling for neighborhood characteristics, adverse life events, and a Milwaukee specific inquiry. Demographic variables were used as controls in the regression analysis. The level of significance to prevent a type 1 error was an alpha set at $p \leq 0.05$ or 5% and a 95% confidence interval. R^2 goodness-of-fit measures and residual scatter plot evaluations (see Table 18).

Data Directory Table

The data tables from the SHOW data set contained numerous variables that were not needed for this social capital and food insecurity study (SCFIS). Therefore, a new data table was created by selecting the parameters needed first from the primary data set, the SHOW, and then merging the selected variables as needed to create the new SCFIS data set (Federal Register, 2018; School of Medicine and Public Health, 2017). The

SCFIS data table created displays the original variables, along with comments on the converted variables and other aspects needed to guide the computer analysis processing. Some data manipulation (recoding) was needed in order to address the research questions as well as to maintain the validity of the study given that the original data was not specifically collected for the new study's purpose (Frankfort-Nachmias & Nachmias, 2008; Soriano, 2013). Table B1, included in Appendix B., shows the new data dictionary table (SCFIS) that displays the data units and parameters for the research study. Findings were summarized and reported in a table that indicates the Integral Model Map categories with targeted recommendations listed for future consideration.

Reliability and Threats to Validity

Reliability

Given the SHOW guidelines for accessing the dataset that I had to abide by, specifically that I needed to do the analysis on a password secured network or personal computer where encrypted files could be uploaded from the University of Wisconsin in Madison, WI, and working under the direction of a SHOW mentor, I anticipated a high degree of reliability in the instrument used as well as in the consistency of data collection and analysis (School of Medicine and Public Health, 2017). Also, the data collection protocols used by the SHOW had both on-site interviews, concept cards (visuals) and computer-assisted questionnaires that served to assure reliable responses from study participants as well as consistency of the documentation of what makes up the data set (School of Medicine and Public Health, 2017).

Validity

In looking at the content validity of the selected variables to examine if there's a relationship between social capital types and risk of food insecurity in two counties in Wisconsin (Milwaukee and Dane County), I concluded that the selected SHOW variables were well suited to answer the research questions that were examined. There is data for each of the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) as well as several other demographics and confounding variables (e.g., neighborhood characteristics) that provided a comprehensive picture of the social capital structures of interest and issues of connectedness (School of Medicine and Public Health, 2017). The SHOW data set also has some information on the perceptions of individuals related to their overall health, mental health, and quality of healthcare; however, as mentioned earlier in this study, the quality of the social connections would need to be explored further in a future follow-up study.

A limitation of secondary data analysis is that the study is confined to the primary data that was previously obtained. Therefore, in considering external validity, interpretation of findings needed to consider that there were some unknowns still to be explored, such as, "who do you consider to be the most influential social connection that impacts your household food practices?" Nevertheless, the wealth of information on the types of social capital connections provided valuable insight on which to build targeted strategies and recommendations to promote positive social change to impact food insecurity risks (School of Medicine and Public Health, 2017).

Transition and Summary

In Section 2, I reviewed the plan for this quantitative retrospective descriptive correlational research study to address if there was a relationship between the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) and the risk of food insecurity within Milwaukee and Dane County, WI. Specific attention was also given to examining if there was a relationship between income level and social capital and risks of food insecurity in each specified county. The role of the researcher, research design, and methodology were outlined. Operationalization of dependent, independent, confounding, and descriptive variables and data analysis plan was also reviewed.

The SHOW dataset, housed at the University of Wisconsin School of Medicine and Public Health, was used with a discussion of data collection method and analysis plans. Reliability and threats to validity of the dataset to address research questions were described. Completion of this section led to the first oral defense and IRB approval prior to downloading research data.

In Section 3, I reported the findings. Tables, graphs, and figures were included to add clarity to the information presented.

Section 3: Presentation of Results and Findings

Wisconsin has been shown to have significant levels of food insecurity within all regions of the state (Guerrero et al., 2013; Gundersen et al., 2018). The highest rates are seen in Milwaukee County and Dane County (Curtis et al., 2014; Heckman, 2016; Greer et al., 2013; Gundersen et al., 2018). Although many issues have been shown to affect food insecurity rates (e.g., low income, single parenting, incarceration, drug use, being disabled, food access), there are still unknowns in terms of the interplay between social capital and risk of food insecurity that deserve further investigation).

Social capital refers to interconnections and bonding relationships that are created with people and networks both within and external to the familial or cohabitating group (Pellmar et al., 2002; Widmer et al., 2008). When residents of a neighborhood connect with each other, social capital is generated (Cattell, 2001; Pellmar et al., 2002; Widmer et al., 2008). Individuals with higher social capital have been shown to have better health outcomes (Hunter et al., 2011; Onyx & Leonard, 2010; Pellmar et al., 2002). Those who are socially isolated have higher health risks similar to those who smoke tobacco or are physically inactive (Cattell, 2001; Cruwys et al., 2013; Leung et al., 2015; Luke & Harris, 2007; Martino et al., 2017; Mertens et al., 201; Pantell et al., 2013, Pellmar et al., 2002). Interventions to enhance social connectedness are a cost-effective health promotion strategy for addressing health disparities (Givens et al., 2018; Hunter et al., 2011; Pinderhughes, 2017).

Overview of Study

In this study, I explored if there was a relationship between four specific social capital types (bonding, bridging, community structural-formal, community structural-informal) and risk of food insecurity within Milwaukee and Dane County, WI. I also set out to determine if there was a relationship between social capital, income, and food insecurity risk while controlling for various confounding variables and demographics to aid in increasing understanding factors that influence food insecurity within specified locations. This study was designed as a quantitative retrospective descriptive and correlational study utilizing cross-sectional secondary data from the 2014-2016SHOW Phase II.

The SHOW is a databank of various surveys patterned after the NHANES to take a deeper look at the health and social environment of Wisconsin residents. Specific questions were selected from surveys based on their social capital potential to make up the new SCFIS dataset. Given that the survey in the SHOW was coded to look at food security and not food insecurity, this data needed to be recoded and transposed such that higher numbers were indicative of high food insecurity. The same was true for questions that involved types of social capital and confounding variables (neighborhood characteristics, adverse life events, Milwaukee specific inquiry) so that high values were indicative of high social capital or high affirmative for confounder.

Presentation of the Findings

I reported on results and findings from the descriptive analysis of demographic data along with results of correlational analysis using multiple linear regression statistics for each of the four research questions. . Interpretation of findings in narrative format is provided to add clarity to results.

Descriptive Analysis

There were 235 respondents in the Dane County sample and 335 respondents in the Milwaukee County sample collected as part II SHOW dataset between 2014 and 2016. Among the Dane County sample, 48.5% were male and 51.5% were female, while 42.7% were male and 57.3% were female among Milwaukee County participants. 47.8% of respondents in Milwaukee and 48.9% in Dane County were between the ages of 18 and 44. Additionally, most respondents were White in both Dane (86.8%) and Milwaukee (54.9%) counties. 31.9% of Milwaukee County respondents were African American, as compared to only 1.7% of Dane County respondents.

About 55% of respondents in Dane County and 36.1% of Milwaukee respondents were college graduates. In addition, 5.1% of participants had less than a high school degree in Dane County, compared to 10.7% for Milwaukee County. In Milwaukee County, 39.1% of respondents were 200% below the federal poverty level, with 20.9% below 100%. For Dane, 14.9% of county respondents were below the 200% federal poverty level, with 3.8% below 100%. There were about three times as many individuals

in Milwaukee (29.3%) as compared to Dane County (13.6%) who did not own a car or truck.

There were also major differences in terms of distribution of residential types between Dane and Milwaukee County. There were higher numbers of respondents owning their home with a mortgage in Dane County (56.2%) compared to Milwaukee County (39.2%). 28.9% of residents in Dane County rented compared to 45% in Milwaukee County. The percentages among those owning their homes for free were the same for both counties (14.5%). 8.1% of respondents lived in rural communities in Dane County, with 91.9% living in urban settings. Rural information for Milwaukee County was not available. All 335 Milwaukee respondents resided in urban settings.

Finally, most respondents were married for both Dane (68.1%) and Milwaukee Counties (52.7%). 19.6% of participants in Dane County and 28.7% in Milwaukee County were never married. 11.5% of participants in Dane County and 17.1% in Milwaukee County were divorced or widowed. 0.9% of participants in Dane County and 1.5% of residents in Milwaukee County were separated (see Table 18).

Table 18*Demographics for Milwaukee and Dane Counties*

	Dane County		Milwaukee County	
	N	%	N	%
Gender				
Male	114	48.5%	143	42.7%
Female	121	51.5%	192	57.3%
Age Group				
18-44	115	48.9%	160	47.8%
45-65	82	34.9%	115	34.3%
66+	38	16.2%	60	17.9%
Race/Ethnicity				
White	204	86.8%	184	54.9%
African American	4	1.7%	107	31.9%
Asian	4	1.7%	7	2.1%
Native Hawaiian/Pacific Islander	1	.4%	0	0.0%
Indigenous person	3	1.3%	1	0.3%
More than one race	14	6.0%	26	7.8%
Unknown	4	2.1%	10	3.0%
Education Attained				
Less than high school	12	5.1%	36	10.7%
High school	27	11.5%	65	19.4%
Some college	36	15.3%	70	20.9%
Associates degree	31	13.2%	42	12.5%
Bachelor's degree and higher	129	54.9%	121	36.1%

Federal Poverty Level				
Below 100% of federal poverty	9	3.8%	70	20.9%
Below 150% of federal poverty	24	10.2%	104	31.0%
Below 200% of federal poverty	35	14.9%	131	39.1%
Below 300% of federal poverty	35	14.9%	131	39.1%
Below 400% of federal poverty	72	30.6%	169	50.4%
Transportation (Own car or truck)				
Yes	203	86.4%	236	70.7%
No	32	13.6%	98	29.3%
Resident Type				
Owned with mortgage	132	56.2%	129	39.2%
Owned free and clear	34	14.5%	48	14.6%
Rented for cash rent	68	28.9%	148	45.0%
Occupied without rent payment	1	0.4%	4	1.2%
Geographic Location				
Urban	216	91.9%	335	100.0%
Rural	19	8.1%	0	0.0%
Marital Status				
Never married	46	19.6%	96	28.7%
Divorced or widowed	27	11.5%	57	17.1%
Separated	2	0.9%	5	1.5%
Married or Living with Partner	160	68.1%	176	52.7%

Table 19 revealed that there were few households in this dataset with children, (0-17 years). A mean of less than one percent of households reported children in both Dane

County and Milwaukee County (0.65, SD 1.14 and 0.84, SD 1.37, respectively). As for the number of persons in the household (household size), the average was 2.72 (SD 1.45) for Dane County and 3.0 (SD 1.93) for Milwaukee County, both showing similar levels in the study population.

Table 19

Mean Number of Children and Persons in Household

	Dane County (<i>n</i> = 235)		Milwaukee County (<i>n</i> = 335)	
	Mean	SD	Mean	SD
Children in the household	.65	1.14	.84	1.37
Persons in the household	2.72	1.45	3.0	1.93

Report of Descriptive Statistics for the Key Variable

There were several variables used in this study. The main variables included social capital (bonding, bridging, community structural-formal, community structural-informal), and risk of food insecurity. There were several control variables associated with this study, also, including neighborhood characteristics, adverse life events, and Milwaukee supplemental inquire. The means and standard deviations for each of these scales were reported by Dane and Milwaukee counties (see Table 20).

Table 20*Key Variables for Milwaukee and Dane Counties*

	Dane County (n = 235)		Milwaukee County (n = 335)	
	Mean	SD	Mean	SD
Risk of Food Insecurity	5.57	1.34	6.33	1.98
Bonding Social Capital	7.53	2.80	12.79	6.12
Bridging Social Capital	13.25	3.09	14.20	3.83
Community Structural- Formal Social Capital	23.31	14.55	31.38	14.52
Community Structural- Informal Social Capital	39.85	10.11	36.95	12.52
Neighborhood Characteristics	24.42	7.13	25.97	7.29
Adverse Life Events			18.57	1.55
Milwaukee Supplemental Inquiry			6.01	1.36

Correlational Analysis

For each research question listed, testing of assumptions were conducted prior to the multiple linear regression analysis. Results and findings are listed for each research question.

RQ1

There are several assumptions associated with multiple linear regression. First, the outcome variable must be continuous (Field, 2017, Pallant, 2020). This assumption was met as the dependent variable, risk of food insecurity, was measured on a continuous scale, where higher scores represented higher food insecurity risk.

Next, the predictor variables can either be categorical or continuous (Field, 2017, Pallant, 2020). There were four continuous predictor variables in this analysis. They were bonding social capital, defined as intimate connections within one's social environment; bridging social capital, defined as connections outside one's social environment that can be of influence of establishing aid or help to obtaining food resources; community structural-formal social capital, defined as formal governmental organizations that can assist in meeting needs; and finally, community structural-informal social capital, defined as various community-based organizations and informal entities, that may provide social support in connection with resources. Increases in each of these variables' scores were associated with increases in the variables represented characteristic.

The third assumption of independence was evaluated using the Durbin-Watson test. Scores between 1.5 and 2.5 are considered acceptable, reflecting independence. The Durbin-Watson value was 1.85, so the assumption of independence was met.

The fourth assumption was linearity. A review of the plots of the standardized predicted values and the standardized residuals (see Figure 4) indicated that the plot pattern was not curvilinear. Therefore, there was no violation of linearity. The plot also revealed that there was no violation in the fifth assumption, which was homoscedasticity, as the plots were rectangular in shape.

The sixth assumption was normality. A review of the histogram of the residuals indicated that there was a slight positive skew (see Figure 5). However, the central limit theorem states that the distribution of sample means will be normally distributed, given large sample sizes (above 30) (Field 2017, Tabachnick & Fidell, 2018). Additionally, regression is robust against violations in normality, indicating that the p values are still reliably accurate, with $\pm .02$ of the true p value (Boneau, 1960; Field, 2017; Posten, 1984).

The seventh assumption of the multiple linear regression was no multicollinearity (Field, 2017, Pallant, 2020). Multicollinearity was measured using the variable inflation factor (VIF), where scores of 10 or above reflect high multicollinearity. The results of the VIF in table three indicated that there were no values above 2.6. So, there was no violation in multicollinearity.

The eighth and final assumption was no extreme outliers, measured by Cooks distance. Values of 1 or less are considered acceptable (Field, 2017; Tabachnick and Fidell, 2017). The highest value was .10, which was well below 1. So, there were no extreme outliers.

Figure 4

RQ1 Plots of Standardized Residuals and Standardized Predictive Values - Social Capital and Food Insecurity Risk in Milwaukee County

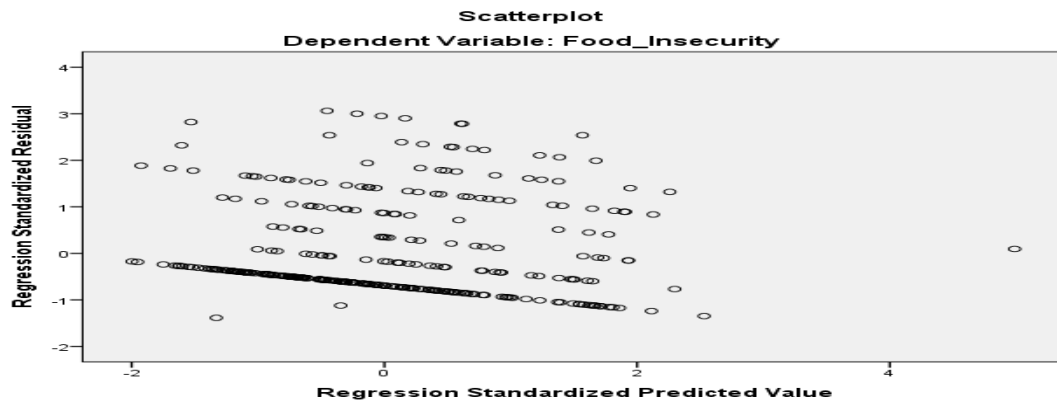
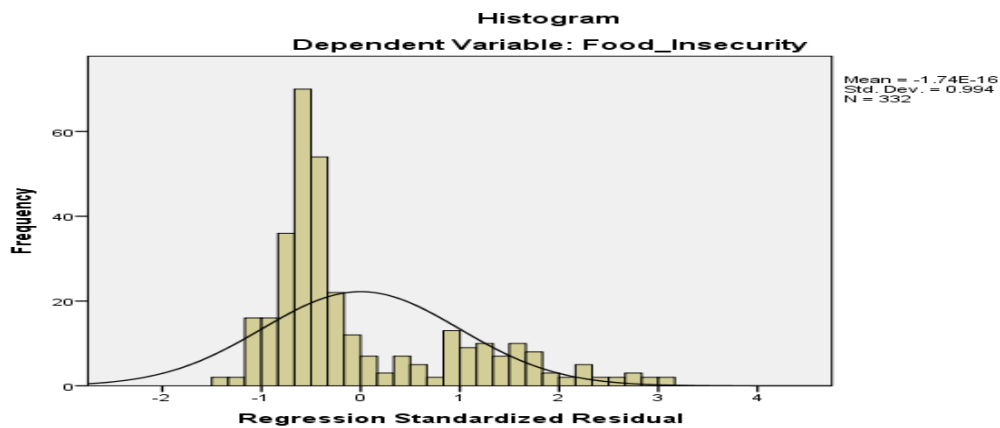


Figure 5

RQ1 Histogram of Standardized Residuals - Social Capital and Food Insecurity Risk in Milwaukee County



RQ1 Results and Findings

The results of the multiple linear regression indicated that the model was a significant predictor of food insecurity risk within Milwaukee county, $F(4, 327) = 5.56$, $p < .001$. The variability explained by the model was 6.4% ($R^2 = .064$), which was a small effect, based on Cohen's effect size standards (Cohen, 1988). A review of the coefficients table indicated that community structural-formal social capital made a significant contribution to the model ($\beta = .135$, $p = .015$), where increases in community structural-formal social capital scores were associated with increases in food insecurity risk. The size of community structural-formal social capital's effect on food insecurity risk was small, based on Cohen's (1988) standards of .1 (small), .3 (medium), and .5 (large). Community structural-informal social capital also made a significant contribution to the model ($\beta = -.190$, $p = .028$), where increases in community structural-informal social capital were associated with decrease food insecurity risk. The size of the effect on food insecurity risk was small. Bonding social capital ($\beta = -.042$, $p = .624$) and bridging social capital ($\beta = .002$, $p = .978$), did not make a significant contribution to the model. Based on the results of the regression analysis, the null hypothesis was rejected. See Tables 21, 22, and 23.

Table 21

RQ1 Model Summary Table - Social Capital and Food Insecurity Risk in Milwaukee County

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.252	.064	.052	1.92456	1.849

Table 22

RQ1 Regression ANOVA Table – Social Capital and Food Insecurity Risk in Milwaukee County

Model	Sum of Squares	df.	Mean Square	F	p
Regression	82.371	4	20.593	5.560	.000
Residual	1211.183	327	3.704		
Total	1293.554	331			

Table 23

RQ1 Regression Coefficients Table - Social Capital and Food Insecurity Risk in Milwaukee County

Model	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF

(Constant)	7.037	.513		13.71 2	.000		
Bonding social capital	-.014	.028	-.042	-.491	.624	.386	2.594
Bridging social capital	.001	.026	.002	.028	.978	.949	1.054
Community Structural Formal SC	.019	.008	.135	2.448	.015	.944	1.059
Community Structural Informal SC	-.030	.014	-.190	- 2.211	.028	.387	2.582

RQ2

First, the measurement assumption of the outcome variable was met, as the food insecurity was continuous. Second, the measurement assumption of the predictor variables was met as they were both continuous and categorical. The Durbin Watson value was 1.9, so there was no violation in the third assumption, as this was within the acceptable range of 1.5 and 2.5. There was also no violation in the fourth assumption, linearity, as the plot of the standardized residuals and the standardized predicted values (Figure 6) was not curvilinear. Additionally, the fifth assumption, homoscedasticity, was not violated as the scatter plots formed a relative rectangular structure. The histogram of the standardized residuals (Figure 7) had a slight positive skew, however, given the large sample size and the tenets of the central limit theorem, this slight violation will have no effect on the validity of the p values (Boneau, 1960; Field, 2017; Posten, 1984). No VIF values exceeded 2, so there was no violation in the sixth assumption of multicollinearity. Finally, the highest cook distance value among the cases was .21, which was below the 1.0 threshold. So, there was no violation in the seventh assumption of extreme outliers.

Figure 6

RQ2 Plots of Standardized Residuals and Standardized Predictive Values - Social Capital and Food Insecurity Risk in Dane County

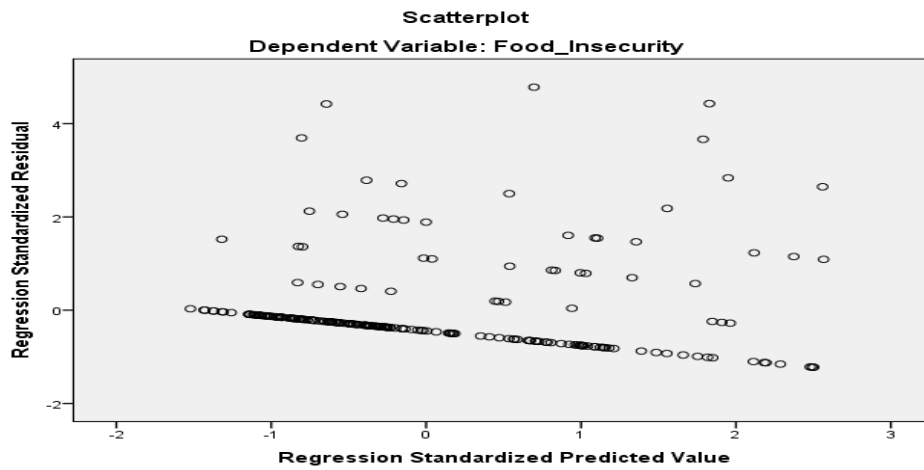
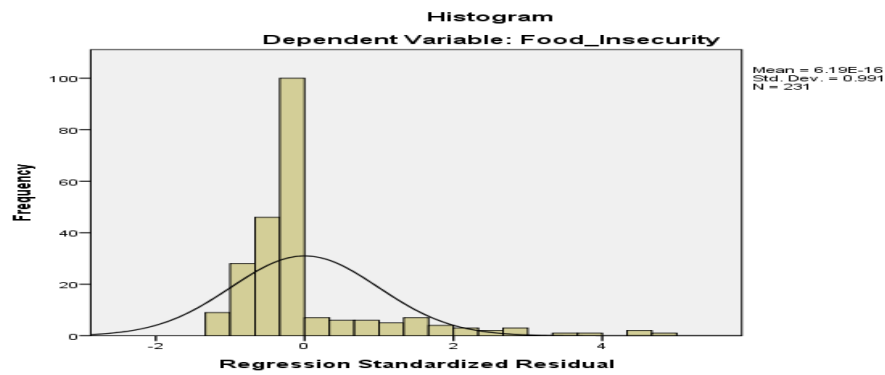


Figure 7

RQ2 Histogram of Standardized Residuals - Social Capital and Food Insecurity Risk in Dane County



RQ2 Results and Findings

The results of the multiple regression indicated that the model was significant, $F(4, 226) = 5.58, p < .001, R^2 = .09$. Based on the result, the null hypothesis was rejected, where the model accounted for 9% of the variability in food insecurity scores. The coefficients table indicated that bonding social capital was the only variable to make a significant contribution to the model ($\beta = -.283, p < .001$), where increases in bonding social capital were associated with decreases in food insecurity risk. Bridging ($\beta = .094, p = .149$), community structural-formal ($\beta = .019, p = .769$), and community structural-informal social capital ($\beta = -.047, p = .517$) did not make significant contributions to the model.

Table 24

RQ2 Model Summary Table - Social Capital and Food Insecurity Risk in Dane County

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.300	.090	.074	1.28590	1.993

Table 25

RQ2 Regression ANOVA Table – Social Capital and Food Insecurity Risk in Dane County

Model	Sum of Squares	df	Mean Square	F	p
Regression	36.872	4	9.218	5.575	.000
Residual	373.699	226	1.654		
Total	410.571	230			

Table 26

RQ2 Regression Coefficients Table - Social Capital and Food Insecurity Risk in Dane County

Model	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	6.264	.493		12.704	.000		
Bonding Social Capital	-.135	.035	-.283	-3.805	.000	.730	1.369
Bridging Social Capital	.040	.028	.094	1.448	.149	.958	1.044
Community Structural Formal SC	.002	.006	.019	.294	.769	.921	1.086
Community Structural Informal SC	-.006	.010	-.047	-.649	.517	.760	1.315

RQ3

The assumptions of the multiple regression were met for this analysis. The predictor, control, and outcome variables were both measured appropriately to meet the assumptions. The Durbin-Watson value was 1.72, which is within the normal range of 1.5 to 2.5 (Field, 2017). There was no violation in linearity or homoscedasticity, as the shape of the plots of the standardized predicted values and the standardized residuals (Figure 8.) formed a rectangular shape. The histogram of the residuals (Figure 9.) was relatively normal in shape, so there was no violation in normality. All the VIF values were less than 2.5, which is below the threshold of 10. So, there was no violation in multicollinearity. The maximum Cook's distance value was .218, so there were no extreme outliers.

Figure 8

RQ3 Plots of the Standardized Residuals and Standardized Predictive Values - Social Capital and Food Insecurity Risk in Milwaukee County

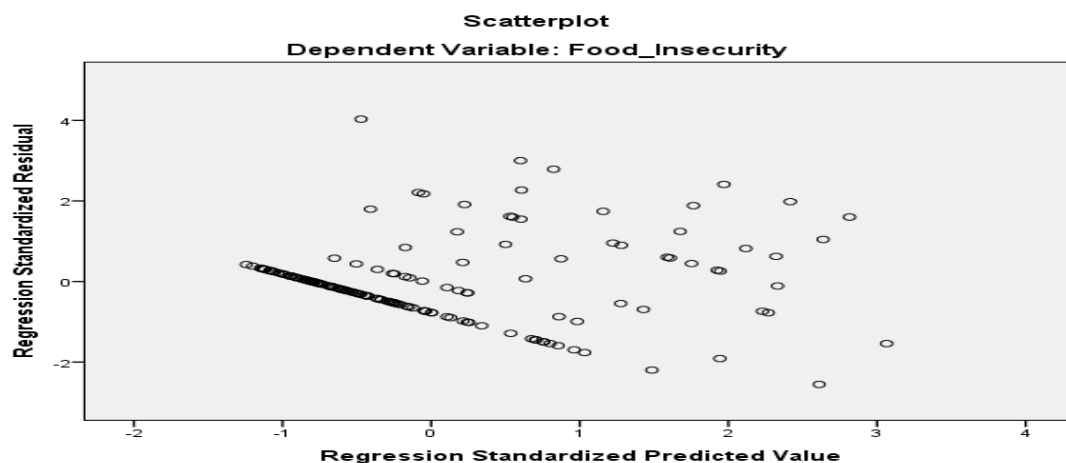
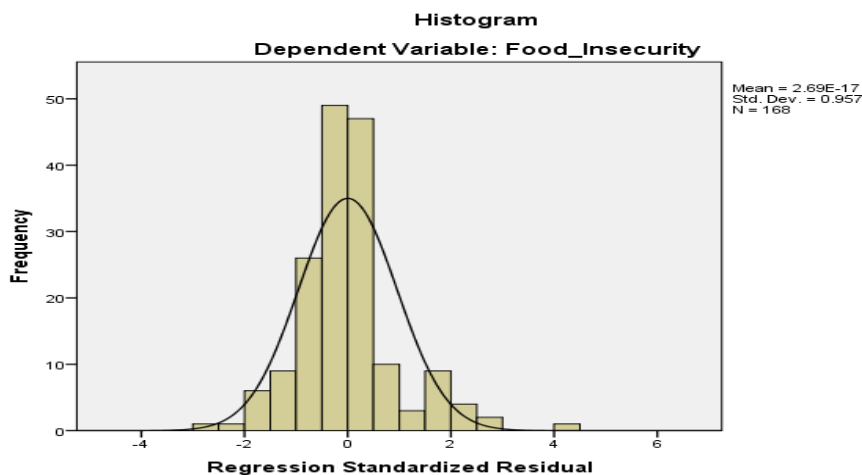


Figure 9

RQ3 Histogram of the Standardized Residuals - Social Capital and Food Insecurity Risk in Milwaukee County



RQ3 Results and Findings

After controlling for adverse life events, race/ethnicity, neighborhood characteristics, gender, federal income level, Milwaukee specific inquiry, and education attained, the model was a significant predictor of food insecurity risk, $F(14, 153) = 11.00$, $p < .001$. The model explained 50.2% ($R^2 = .502$) of the variability in food insecurity scores. The specific variables that made a significant contribution to the model were bonding social capital ($\beta = -.152$, $p = .025$), education attained ($\beta = -.187$, $p = .013$), and federal poverty level at the 200 percentile ($\beta = -.346$, $p < .001$). Increases in bonding social capital were associated with decreases in food insecurity risk. Those who were at or above the federal poverty 200% level had lower food insecurity than those who were

below the federal poverty 200% level. Finally, those with higher education attained had lower food insecurity risk.

Table 27

RQ3 Model Summary Table - Social Capital, Income, and Food Insecurity Risk in Milwaukee County, Controlling for Neighborhood Characteristics, Adverse Life Events, and Milwaukee Specific Inquiry

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.628	.395	.360	1.49628	
2	.708	.502	.456	1.37955	1.716

Table 28

RQ3 Regression ANOVA Table – Social Capital, Income, and Food Insecurity Risk in Milwaukee County, Controlling for Neighborhood Characteristics, Adverse Life Events, and Milwaukee Specific Inquiry

Model		Sum of Squares	df	Mean Square	F	p
1	Regression	230.539	9	25.615	11.441	.000
	Residual	353.740	158	2.239		
	Total	584.280	167			
2	Regression	293.095	14	20.935	11.000	.000
	Residual	291.185	153	1.903		
	Total	584.280	167			

Table 29

RQ3 Regression Coefficients Table - Social Capital, Income, and Food Insecurity Risk in Milwaukee County, Controlling for Neighborhood Characteristics, Adverse Life Events, and Milwaukee Supplemental Inquiry

Model	Unstandardized		Standardize	Collinearity			
	Coefficients		d	Statistics			
	B	Std. Error	Beta	t	p	Toleranc	VIF
1 (Constant)	7.214	2.159		3.341	.001		
Neighbor Characteristics	-.014	.017	-.055	-.802	.424	.814	
Adverse Life Events	.015	.086	.012	.171	.865	.748	1.338
Milwaukee Supplemental Inquiry	.306	.108	.215	2.831	.005	.663	1.509
Age Group	-.209	.180	-.086	-1.161	.247	.700	
Gender	.247	.247	.066	1.001	.318	.886	1.228
White Alone or in Combination with Other Races	.814	.302	.201	2.695	.008	.691	1.447
Hispanic or Latino	-1.258	.574	-.144	-2.191	.030	.892	1.122
Number of People in the Household	-.050	.091	-.038	-.553	.581	.831	1.204
Education Attained	-.365	.100	-.280	-3.643	.000	.650	1.538
2 (Constant)	10.585	2.202		4.808	.000		

Neighbor Characteristics	-.010	.016	-.041	-.628	.531	.760	1.316
Adverse Life Events	-.001	.081	-.001	-.010	.992	.712	1.404
Milwaukee Supplemental Inquiry	.162	.106	.114	1.518	.131	.582	1.719
Age Group	.003	.174	.001	.020	.984	.639	1.565
Gender	.131	.240	.035	.546	.586	.800	1.250
White Alone or in Combination with Other Races	.395	.298	.097	1.325	.187	.604	1.654
Hispanic or Latino	-.724	.552	-.083	-1.312	.192	.820	1.219
Number of People in the Household	.041	.088	.031	.466	.642	.741	1.349
Education Attained	-.244	.097	-.187	-2.519	.013	.593	1.688
Below 200% of Federal Poverty Level	-1.642	.341	-.346	-4.816	.000	.632	1.581
Bonding Social Capital	-.082	.036	-.152	-2.269	.025	.725	1.380
Bridging Social Capital	.008	.034	.016	.249	.804	.742	1.347
Community Structural- Formal Social Capital	.001	.009	.007	.110	.913	.758	1.320

Community Structural-							
Informal Social Capital	-0.028	.018	-.103	-1.589	.114	.772	1.295

RQ4

There were several assumptions of the multiple regression that were met for this analysis. First, the predictor, control, and outcome variables were all measured on a categorical or continuous scale. The Durbin-Watson value was .731, which is not within the normal range of 1.5 to 2.5 (Field, 2018). There was no violation in linearity or homoscedasticity, as the shape of the plots of the standardized predicted values and the standardized residuals (Figure 10.) formed a rectangular shape. The histogram of the residuals (Figure 11) was relatively normal, so there was no violation in normality. All the VIF values were less than 1.6, which is below the threshold of 10. So, there was no violation in multicollinearity. The maximum Cook's distance value was .440, so there were no extreme outliers.

Figure 10

RQ4 Plots of Standardized Residuals and Standardized Predictive Values - Social Capital and Food Insecurity Risk in Dane County

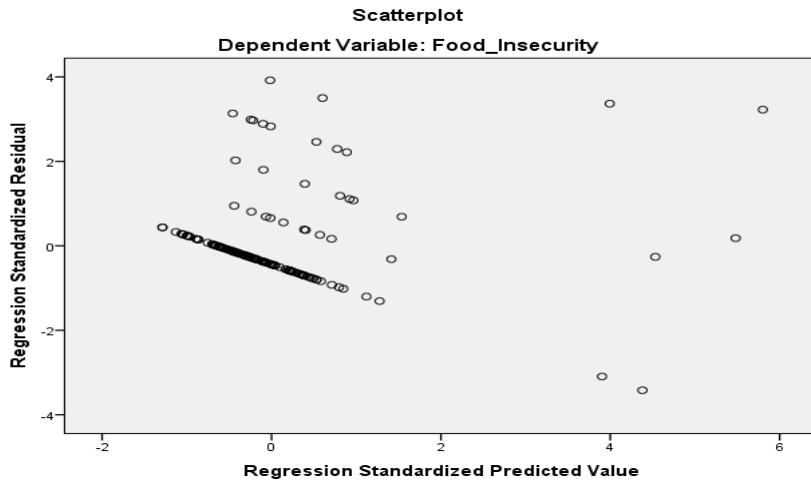
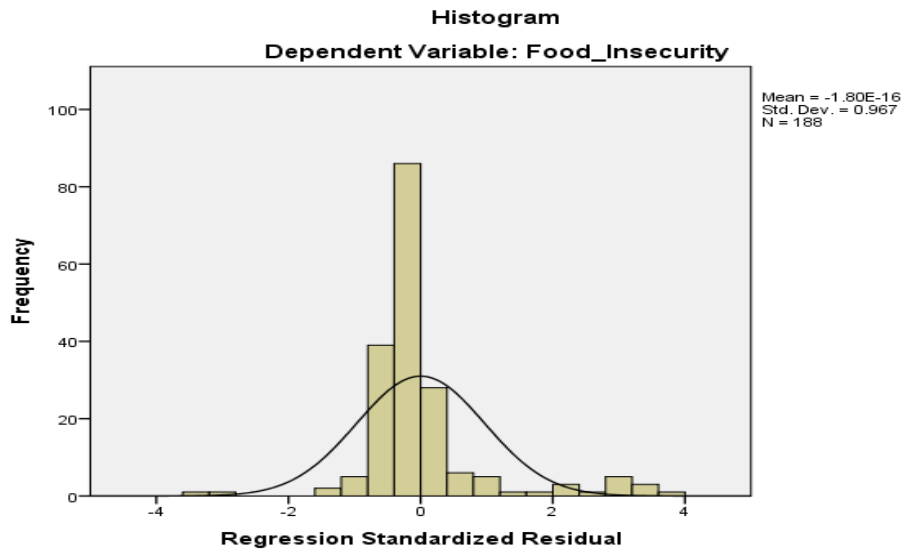


Figure 11

RQ4 Histogram of Standardized Residuals - Social Capital and Food Insecurity Risk in Dane County



RQ4 Results and Finding

The results of the final multiple regression model indicated that the model was significant, after controlling for neighborhood characteristics and demographic variables, $F(12, 175) = 7.21, p < .001, R^2 = .331$, where the model accounted for 33.1% of the variability in food insecurity risk scores. A review of the coefficients table indicated that those who were below the 200% federal poverty level had higher food insecurity risk than those who were above the 200% federal poverty level ($\beta = -.418, p < .001$). The education attained also made a significant contribution to the model, where higher levels of education were associated with lower food insecurity risk ($\beta = -.157, p = .021$). Finally, bonding social capital had a negative relationship to food insecurity risk, where increases in bonding social capital were associated with decreases in food insecurity risk ($\beta = -.178, p = .024$). Based on these results, the null hypothesis was rejected.

Table 30

RQ4 Model Summary Table - Social Capital, Income, and Food Insecurity Risk in Dane County, Controlling for Neighborhood Characteristics and Demographic Variables

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.353	.125	.091	1.03739	
2	.575	.331	.285	.91986	.731

Table 31

RQ4 Regression ANOVA Table – Social Capital, Income, and Food Insecurity Risk in Dane County, Controlling for Neighborhood Characteristics and Demographic Variables

Model	Sum of Squares	Df	Mean Square	F	p
1 Regression	27.564	7	3.938	3.659	.001
Residual	193.712	180	1.076		
Total	221.277	187			
2 Regression	73.202	12	6.100	7.209	.000 ^c
Residual	148.074	175	.846		
Total	221.277	187			

Table 32

RQ4 Regression Coefficients Table - Social Capital, Income, and Food Insecurity Risk in Dane County, Controlling for Neighborhood Characteristics and Demographic Variables

Model	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
	B	Std. Error	Beta	t	P	Tolerance	VIF
(Constant)	8.795	1.150		7.649	.000		
Neighborhood Characteristics	-.010	.011	-.061	-.858	.392	.953	1.050
Adverse Life Events	-.312	.110	-.208	-2.824	.005	.894	1.119

Milwaukee Supplemental Inquiry	.039	.153	.018	.254	.800	.983	1.018
Age Group	-.328	.307	-.082	-1.066	.288	.825	1.213
Gender	-.561	.448	-.098	-1.251	.213	.795	1.258
White alone or in combination with other Race	-.075	.057	-.097	-1.316	.190	.896	1.116
Hispanic or Latinx	-.250	.066	-.277	-3.790	.000	.911	1.098
(Constant)	10.895	1.104		9.871	.000		
Neighborhood Characteristics	-.005	.010	-.029	-.453	.651	.907	1.103
Age Group	-.194	.102	-.130	-1.899	.059	.822	1.217
Gender	-.029	.137	-.014	-.214	.831	.954	1.048
White alone or in combination with other Race	-.380	.274	-.095	-1.387	.167	.816	1.225
Hispanic or Latinx	-.262	.401	-.046	-.653	.515	.781	1.281
Number of People in the Household	.028	.057	.037	.493	.623	.694	1.440
Education Attained	-.142	.061	-.157	-2.321	.021	.831	1.203
Below 200% of Federal Poverty Level	-2.577	.404	-.418	-6.380	.000	.893	1.120

Bonding Social Capital	-.076	.034	-.178	-2.277	.024	.627	1.594
Bridging Social Capital	-.016	.023	-.045	-.692	.490	.907	1.103
Community Structural- Formal Social Capital	-4.486E- 5	.005	-.001	-.009	.992	.869	1.150
Community Structural- Informal Social Capital	-.006	.010	-.045	-.642	.522	.778	1.285

Transition and Summary

In Section 3, I conducted a descriptive correlational analysis of the modified SCFIS dataset which included testing of assumptions and multiple linear regression statistics to examine if there was a relationship between types of social capital and food insecurity in Milwaukee and Dane County, WI. Analysis was also conducted to examine if a relationship exists between social capital, income, and food insecurity risk while controlling for various confounding and demographic variables.

Findings revealed that in Milwaukee County, a significant positive relationship was found for community structural-formal social capital and risk of food insecurity, while a significant inverse relationship was seen for community structural-informal social capital and food insecurity risk. There was also a statistically significant inverse relationship between bonding social capital and food insecurity risk in both Dane and Milwaukee Counties. In addition, significant inverse relationships were found for education attained and food insecurity risk, as well as households below 200% of federal poverty level and food insecurity risk in both Milwaukee and Dane Counties.

Section 4 includes a discussion of applications to professional practice. Recommendations for action, social change, and future research were provided along with reflections and a final summary statement.

Section 4: Application to Professional Practice and Implications for Social Change

I examined if there was a relationship between social capital and food insecurity in Milwaukee and Dane County, WI and how this can be applied to professional practice. I looked at how nutrition and health practitioners can enhance their particular practice setting so it is more responsive to clients and patients who are experiencing food insecurity. I also addressed how the overall social support system may need to change to impact food insecurity in terms of healthcare, food safety net, and public policy systems. Advocacy through collective action to expand community capacity and interdisciplinary collaboration may be the best strategy to address those systemic issues to achieve positive social change.

It is important to point out that given demographic differences between the two counties, it would be prudent to use this research model to repeat the data analysis process in other counties as findings may not be representative of other counties in Wisconsin. Strategies to address social capital issues would need to be tailored based on factors such as having access to a full-service grocery store within walking distance versus living in a food desert, and adequate versus limited transportation. The Milwaukee metropolitan area has the highest D measurement of the 50 largest cities examined at 76.6, tied only with Detroit, with WI listed as one of the most racially segregated states in the nation (Logan & Stults, 2011). However, most WI regions have significant levels of food insecurity with varying degrees of food hardship (Guerrero et al., 2013; Gundersen et al., 2018; Tolzman et al., 2014).

Wisconsin has representative populations which include several Indigenous nations (Ho Chunk, Potawatomi, Menominee, Ojibwe), other racial/ethnic groups (e.g., African American, Latinx, Asian) and cultures with different spoken languages (e.g., Spanish, Croatian, Mandarin). Having a greater understanding of how social capital and income affects the risk of food insecurity within a particular county can help to promote targeted strategies that lead to a more responsive social support system and build community capacity. Findings showed that there was a significant inverse relationship between food insecurity risk and bonding social capital in both Milwaukee and Dane County.

In looking closer at the racial/ethnic diversity in WI, I reviewed the federal Diversity Index (DI) for the selected counties. The DI measure indicates the potential that two randomly selected individuals would come from a different race or ethnic population. The measure factors in seven racial/ethnic categories including Hispanic, White, Black or African American, American Indian or Alaska Native, Native Hawaiian and other Pacific Islander, some other race, and two or more races. According to the US Census Bureau (2021), the DI for WI was a low of 37%. While Milwaukee County had the highest DI in the state of 66.8%, which was higher than the US level of 61%. Although Dane County has the second largest population of African Americans residing in Madison, the WI state capital, it had a DI of just 40%. These wide disparities in racial and ethnic diversity in addition to geographical, educational, cultural, economic differences make it important to tailor any initiative to enhance social capital in WI to the specific county through further

analysis. Using this model to assess cities or counties in the state may reveal valuable information to create specific and tailored strategies for other local WI communities to foster building social capital in this manner (Christens et al., 2016, Curtis et al., 2014; Jordan, 2013; Smith et al., 2013; UW Population Health Institute, 2022; WDHS, 2021).

Application to Professional Practice

Nutrition or Health Practitioner Enhancing Practice

Information on family history and the home environment is routinely gathered as part of the NCPM, a quality assurance care model used by all nutrition practitioners. However, to better understand and impact clients' social support and connectedness, specific assessment mechanisms and action initiatives may need to be put in place by nutrition and health practitioners. Building bonding social capital relationships and a sense of belonging have been shown through this study to impact food insecurity rates in both Milwaukee and Dane counties.

Healthy living programs targeting African Americans such as the healthy living program for breast cancer survivors who resided in Milwaukee which was based on group social support and integrative healthy skill-building and included relaxation and stress management, yoga endurance, and healthy food preparation education, were effective in developing a sense of belonging and sisterhood as well as achieving positive health improvements (Foley et al., 2012; Holder et al., 2018; Huntley et al., 2019). Bi-monthly group meetings over a 6-month period motivated the healthy lifestyle program

participants to eat healthier, increased their physical activity, and led to losing weight (Holder et al., 2018; Huntley et al., 2019). Swierad et al. (2017) said enhancing social connectedness was a key factor identified by participants as promoting healthy behaviors. Individuals interviewed stated that they felt more motivated to eat healthy foods when they had a friend or family to support them. While Dunn et al. (2016) and Mckenna et al. (2020) said the emotional, motivational, and social environment of individuals living with diabetes and cardiovascular disease must be addressed before instructional learning about health management can be achieved whether looking at diabetes or cardiovascular disease. Emotional support was expanded to include levels of motivation, assessment of readiness for transformation, self-empowerment skill building, and willingness to participate. Examples of supportive environments included heart rehabilitation programs, diabetes workshops, and weight management group sessions, as well as online social connections such as being a member of a social media recipe sharing or exercise group. Providers and patients involved deemed these types of programs as essential to reducing stress, increasing self-confidence, and creating a support system to set the stage for learning about health (Dunn et al., 2016; Mckenna et al., 2020).

By adding ways to build social support through bonding relationships in their practice as well as promoting community connections to food resources, nutrition and health practitioners in Milwaukee and Dane counties may not only improve health outcomes due to improved nutritional intake, but patients' motivation for self-efficacy for managing their health may also be enhanced (Mettler et al., 2014). Trusting relationships

would be developed as a result of respectful practitioner-client interactions (Bolin et al., 2003; Jordan, 2013; Leischik et al., 2016; Mettler et al., 2014). For communities experiencing health disparities, implementing strategies to enhance social capital can function as a bridge to improving health outcomes (WDHS, 2018; Young et al., 2014). This can in turn be a positive factor to show cost-effective patient-centered care (Jordan, 2013; Mettler et al., 2014; Smith et al., 2013a; WDHS, 2018).

Support groups have been successful in faith-based and other community settings (e.g., neighborhood centers, community health clinics, online social media groups) and are recommended to provide the emotional support and motivation needed for positive health promotion outcomes, including in food security efforts (Pinderhughes, 2017; Pooler et al., 2017; Pronk, & Remington, 2015; Young et al., 2014). During COVID-19, new online nutritional support groups and programming that included food preparation skill building showed sustained popularity and community engagement (Greer et al., 2021; MCOPP, 2022). Through showcasing a healthy food demonstration out of the registered dietitian's kitchen with informal health and wellness conversations with local community health champions, this local social media program was recognized as a model program for presentation at the 2021 American Public Health Association Conference (Greer et al., 2021).

From the results of this study, specific types of social capital (bonding, community structural-formal, and community-structural informal) as well as level of education and wage earnings, above 200% of the federal poverty level, were shown to be significant issues for the practitioner to address in order to impact food insecurity as

identified in their practice and the broader community. Additionally, addressing these social factors to impact food insecurity would be in keeping with the Wisconsin State Health Plan priorities (Wisconsin Department of Health Services, 2021).

Collective Action for Systems Change

Being a part of a local coalition that is dedicated to promoting the health of communities through healthy eating and active living has led to success in changing policies and practices within the Milwaukee community through collective impact strategies (e.g., educational round robin afterschool staff trainings, collaboration on community-based participatory research grants, partnering on service provision, agency policy development for land use, staff education, healthy food access, and active living programming) (Adams et al., 2016; Amed et al., 2015; Behlmann, & Brennan, 2014; Chaskin, 2001; Christens et al., 2016; Greer, & Nelson, 2014; Harley, & Frazer, 2011; Hunter et al., 2014; Lifecourse Initiative for Healthy Families, MCOPP, 2022; Nelson et al., 2015; Pabalan et al., 2015; Young et al., 2014). MCOPP, through partnership with Tufts University Friedman School of Nutrition and Policy, healthTIDE/University of Wisconsin, Y-EAT Right, and the Medical College of Wisconsin Cancer Center, have committed to working together to address cultural norms and public policy issues related to child health equity, which includes food insecurity and children eating healthy meals (Catalyzing Communities, 2021; MCOPP, 2022).

Using community-based systems dynamics tools and activities (e.g., hopes and fears assessment, future mental model, causal loop diagrams), a greater understanding of

enablers and inhibitors of the desired future system was gained (Catalyzing Communities, 2021; MCOPP, 2021; Mui et al., 2019; Nelson et al., 2015). Collective action recommendations were formulated for community engagement and health promotion skill-building. In addition, public policy reforms and advocacy initiatives to address the social determinants of health that impact food insecurity and achievement of healthy weights in children were proposed (Catalyzing Communities, 2021; MCOPP, 2021).

As a result of this work, MCOPP, in partnership with the WDHS CDPP, applied for and received funding from the CDC to develop a Closing the Gap, Social Determinant of Health (SDOH) Accelerator Plan for Milwaukee (CDC, 2021; MCOPP, 2022). This WI initiative adds to the body of health organizations (e.g., AMA, AAP, APA) that have committed to a focus on enhancing community-clinical linkages and social connectedness through a restorative justice (RJ) framework (American Medical Association, 2021; Foundation for Black Women's Wellness, 2019; MCOPP, 2022). The RJ framework centers on uplifting the voice of the community that has experienced historical and on-going harms, as the experts in uncovering root causes and development of solutions to be included in SDOH accelerator action plan which was presented to the CDC in September 2022 (CDC, 2021; Foundation for Black Women's Wellness, 2019).

As part of this community engagement process, practitioners and health systems acknowledged historic and systemic harms and have committed to working in collaboration with community member (experts) in creating an equitable, trusting, and inclusive health and wellness environment in which all can thrive (Best, & Holmes, 2010;

Foundation for Black Women's Wellness, 2019; MCOPP, 2022). Several other initiatives have shown success in building social support, community capacity, and advocacy to create sustainable food security through enhancement of both formal and informal food systems (e.g., Milwaukee Market Match Programs), which supports the finding of this research (Ball et al., 2018; Christensen, & Phillips, 2016; Jose et al., 2020; King, 2017; McDaniel et al., 2021; UW Extension Milwaukee County, 2022).

Implications for Social Change

The implications for social change can be far reaching, not just for the clients and the public of today but also affecting generational health and well-being into the future (Burke et al., 2017; Chilton et al., 2017). As the quantity and quality of the food brought into the home improves, the motivation to cook healthier home cooked meals may in turn improve (Knoblock-Hahn et al., 2017; Kuzmarski et al., 2017; Mill et al., 2020; Mills et al., 2017; O'Connor et al., 2009; Pooler et al., 2017). The impact may be seen through optimal health and growth patterns in at-risk childhood as well as enhanced academic achievement and school success (Benson et al., 2012; Gundersen & Ziliak, 2014; Hammami et al., 2020). This may exert a positive influence on their adult health and earning capacity throughout the life course as well as for the future children not yet born (Claridge, 2020; Martino et al., 2017; Whitmore Schanzenbach, 2016).

In nutrition and health settings low literacy and low health literacy has been shown to inhibit adherence to medication regimens, nutrition, and health outcomes (Dunn et al., 2016; McKenna et al., 2020). For example, reading the Nutrition Facts Food

Label has been shown to require both a high literacy and health literacy level given the nutrition and health terms that are presented (Malloy-Weir et al., 2017; Rivera Rivero et al., 2021). It also requires a high numeracy level to understand the percentages and measurements that are listed as well as how the quantity in a serving matches up with the individual's actual amount consumed (Mulders et al., 2018). Nogueira et al. (2016) reported that in reading the Nutrition Facts Label, those with lower numeracy levels were correlated with the elderly, African American and Latinx cultures, those with limited education, the low wage earner and individuals residing in the southern US. Furthermore, both food facts numeracy and earning level were associated with about half of the disparities in fruit intake and degree of engagement, anxiety, worry, and anxiousness in obtaining medical guidance and literature.

Limited educational attainment coupled with lower household incomes was shown to have a significant effect on food insecurity in this capstone research study as well. Hunger and food insecurity effects a child's brain development and learning capacity (Halfon, 2009; Leischik et al., 2016; Lende, 2012). A lack of nutritional knowledge along with a limited food budget from living below poverty or not making a living wage, can affect the types of foods that are seen in the home due to attempting to stretch the food dollar (Burke et al., 2017; Coleman-Jensen, 2011). These foods then become a part of the individual's food culture regardless of their nutritional value (Anderson Steeves et al., 2016; Swierad et al., 2017).

As summarized in the County Health Rankings National Finding Report (2022), a living wage is essential to meeting the cost-of-living requirements for achieving a

healthy lifestyle (County Health Rankings & Roadmaps, 2022). When considering the income variations throughout the nation, they found a mean of \$35.80 per hour for a family unit of three (one parent with two children) would be needed with a range of between \$29.81 and \$65.45 per hour depending on location. Given that the current federal minimum wage in the US is only \$7.25 an hour, most counties would need wage increases in the ranges of 73% to as much as 229% to achieve a living wage for all of their residence (County Health Rankings & Roadmaps, 2022; Federal Register, 2022). This research study has shown that household incomes below 200% of poverty carries a higher risk for food insecurity.

As practitioners expand their practice to address issues of bonding social capital, education attainment, and adequate income to achieve a living wage, the potential to affect the quality of the food seen in the home as well as the motivation and skills to serve healthy and enjoyable home cooked meals may be enhanced (Hunter et al., 2014; Martino et al., 2017). In addition, increasing awareness of the opportunities to access healthier foods through formal and informal food ways such as community support agriculture (CSAs) and accessing food safety net resources such as the WIC Program, practitioners would expand the practitioner's bridging social capital abilities to better address the unmet needs of their clients (Chhabra et al., 2014; Ivens, & Edge, 2016; King, 2017; McDaniel et al., 2021; Robert Wood Johnson Foundation, 2011; Robin et al., 2017; Siegner et al., 2018).

Building trusting relationships with the individuals and parents in the practitioner's care will set the stage for greater self-efficacy and creating supportive

environments for children's optimal growth and development (Martin et al., 2016; Mettler et al., 2014). Through supportive home and community environments, positive relational health and wellness will be fostered that can affect a child's entire life course (Chilton et al., 2017; Davies et al., 2006; Jose et al., 2020; The Nutrition-Cognition National Initiative, 1994; Walsh, & Theodorakakis, 2017). The positive social change strategies related to addressing social capital and food insecurity implemented today may also affect future generations through the healthy living practices that become incorporated into their client's family cultural and lifestyle traditions (Chilton et al., 2017; Christens et al., 2016; Salinas-Miranda et al., 2017).

Practitioners, through their bridging relationships, can be a catalyst for the creation of stronger bonding relationships and social connections which may also increase the individual's ability to cope with life's adversities (Cruwys et al., 2013; Mettler et al., 2014; Williams, 2016). Enhancing their practice by assessing an individual's social connections and centering the individual in the creation of their own social connection action plan, will assist in developing a strong patient-healthcare provider relationship (Mettler et al., 2014; Smith et al., 2013a). This may ultimately improve health and wellness outcomes.

To affect systemic changes such as increasing minimum wage or greater opportunities for higher education, the practitioner may have to partner or join in coalitions with others, such as MCOPP or local or State health departments, to foster a collective impact to create positive social change through advocacy and public policy reforms (Amed et al., 2015; Bateman et al., 2017; Behlmann, & Brennan, 2014; Givens et

al., 2018). In the 2022 County Health Rankings National Finding Report, 41 strategies for impacting the racial wealth gap were offered that includes promoting a living wage, increasing job options, eliminating obstacles to educational attainment, and expanding home ownership (County Health Rankings & Roadmaps, 2022). Through collective engagement and advocacy efforts, society would benefit from well and economically sound individuals, less healthcare expenditures though reduced hospitalizations, and overall healthier and nutrition secure communities (Benson et al., 2012; Christens et al., 2016; County Health Rankings & Roadmaps, 2022; Givens et al., 2018).

Recommendations for Action

Table 33 provides a complete summary, using the IM map categories, of the findings and recommendations for action that have been formulated as a result of this research study. When speaking of practitioners, it is meant to include both nutrition and health practitioners that act as facilitators of bridging social capital and advocates for the health and well-being of their patients and society in general. Some efforts are directed at what the practitioner can individually do to enhance their own practice to empower the clients that they directly encounter. Whereas other recommendations are reflective of being part of a coalition working together with others to create positive social change in the health and public policy systems through collective actions.

Table 33

Food Insecurity: Integral Map Summary, Significant Findings, and Recommendations for Future Action

Food insecurity: Integral map summary	Significant findings	Recommendation for future action
<p>Individual Inner:</p> <p>Knowledge, Skills, & Abilities</p> <p>Perceptions of Self & Quality of Life</p>	<p>Educational Attainment was inversely correlated to food insecurity in Milwaukee and Dane County (RQ 3 & RQ4)</p>	<p>Practitioners should include level of educational attainment in their client risk profile with an understanding of the generational food insecurity implications that is at play which is shared with the client for holistic health coaching</p> <p>Practitioners to find ways to increase awareness of and/or partnerships with local community colleges and technical certificate programs that may assist the individual in enhancing educational attainment and earning a living wage as a long-term plan to combat food insecurity</p> <p>Need more qualitative research analysis on perceptions of self, social capital constructs (e.g., trust, motivation, and quality of life indicators) that affect food insecurity risk</p>
<p>Individual Outer:</p> <p>Food Hardship/ Hunger/Malnutrition</p> <p>Medical Home/ Insurance</p>	<p>200% of Federal Poverty Level or below was inversely correlated to food insecurity in both</p>	<p>Practitioners and health systems should establish a user-friendly on-site referral/application process to food safety net resources to assure the food insecure clients receives</p>

	<p>Milwaukee and Dane Counties (RQ3 & RQ4)</p>	<p>the nutritious food needed. This process should have an option for either pick-up or delivery (e.g., healthy food box) given the transportation disparities</p> <p>Practitioners should join with others to advocate for public policy reforms to increase the minimum wage to meet the cost of living with particular attention to the cost of nutritious foods, nutrition security, and health equity</p> <p>Support efforts to conduct research to see how many employers in Wisconsin are not providing a living wage and how that is affecting the working poor and food hardship rates per WI Congressional Districts. This information could be shared with elected officials to advocate for a living wage and/or used to write grants to provide support for those experiencing food hardship who don't qualify for federal food safety net services</p>
<p>Community Inner: Social Connectedness & Networks Group Membership/ Class</p>	<p>Bonding Social Capital was inversely associated with food insecurity in both Milwaukee and Dane County (RQ2, RQ3, & RQ4)</p>	<p>Practitioners should assess client's social connectedness and social networks as a part of their routine nutrition and health histories/assessments and include actions developed with the client in care plans and counseling sessions</p>

In addition to nutrition education counseling and classes, establish and offer monthly nutrition and health connections programming through social media groups or on-site nutritional support groups that promote the buddy system or team approach for sharing healthy recipes, healthy shopping tips or tours, stretching your food dollar, and eating together round robin outings to enhance bonding relationships and a sense of social connectedness and belonging

Employ community health workers, nutrition outreach ambassadors, or navigators to provide follow-up calls, social media engagements, and/or visits on nutrition and health issues to enhance social connectedness, trust, and belonging

<p>Community Outer: Food Safety Net Participation Rates Access to Healthy Food Outlets</p>	<p>Community Structural Formal SC had a positive correlation on food insecurity^a; while Community Structural Informal SC was inversely correlated to food insecurity, (RQ1 - Milwaukee County only)</p>	<p>Practitioners should form relationships with local food safety net organizations to understand the process of applying for services so that you can provide accurate guidance and support on accessing services</p> <p>Create user-friendly tools (Geo maps, links, handouts, posters) that highlights the informal resources where individual can get low-cost nutritious foods within the local community (e.g., CSA's, farmer's markets, mobile</p>
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fruit and vegetable trucks,
affordable fresh food markets, pay
what you can restaurants)

Establish or join a local Food
Policy Council or Coalition to
help advocate for community food
needs and public policy reforms at
the local, state, and national levels
(e.g., Food Share Match
Programs; Default Beverage
Policies, Summer Meals Wavier
Programs)

^a Note: Community structural formal SC represents the food safety net system (i.e., WIC, SNAP, Head Start) in which only income limited households at or below 200% of the Federal Poverty level could participate; therefore, as participation increases, so would individuals at risk for food insecure that now would be recognized as being connected to the food system.

Recommendations for Further Study

In the secondary dataset (i.e., SHOW) used in this study, the majority of households were married and had no children. Future research could focus on identifying the social capital constructs that are significant for single parents and food insecurity risks, whether headed by a female or male. Also looking at how the number of children in the household effect social capital and food insecurity risk. Female-headed single parenting households have been shown to have the lowest income levels with high rates of food insecurity (Broussard, 2010).

Examining the 2022 Wisconsin County Health Rankings and Roadmaps for Milwaukee County as compared to the State of Wisconsin and top United States performers, alarming disparities have been documented. Children living in single-parent households were 41% for Milwaukee County compared to 23% for the State of Wisconsin and 14% for the top US performers. For Dane County, 21% of children live in single parent households, which is lower than the State average.

When looking at children living in poverty, Milwaukee County showed an average of 26% compared to 12% for the State of Wisconsin and 9% for the top US performers, while Dane County had 9% of children living in poverty. In breaking down the Milwaukee County childhood poverty level by racial/ethnic groups, the following was discovered: African American, 42%, Asian, 32%, Hispanic 28%, American Indian & Alaska Native, 26%, and White, 9% (UW Population Health Institute, 2022). Gaining a greater understanding of the social capital constructs that is most significant in low-

income households with children and single parenting segments may assist in providing equitable services to impact food insecurity in childhood (Anderson et al., 2016; Anderson Steeves et al., 2016; Burke et al., 2017; Curtis et al., 2014; Foundation for Black Women's Wellness, 2019; Kruger et al., 2015; Lifecourse Initiative for Healthy Families, Milwaukee, 2014; Walsh, & Theodorakakis, 2017).

A similar issue occurred when looking at racial and ethnic differences as there were not sufficient records from African Americans in the Dane County cohort to be able to assess if there were significant group differences in social capital constructs. With the exception of the city of Madison, WI, which resides in Dane County and boasts of having the 2nd largest population of African Americans in the State, there is a low density of racial/ethnic groups in the other municipalities of Dane county (Curtis et al., 2014; Heckman, 2016). For future studies, I would need to oversample in the African American as well as the Hispanic, Hmong/Asian, and Native Ingenuous groups to get a clearer picture of how social capital types and food insecurity risk manifest in each diverse population group (Foundation for Black Women's Wellness, 2019; Heckman, 2016).

Another limitation of the dataset that could be addressed in future research is the measurement of the respondents' perspectives related to the strengths or degree of influence of their bonding and bridging relationships, as well as the level of belonging they feel for their neighborhood (Baden et al., 2014). The constructs of trust, respect, and belonging have been shown to be related to a person's self-efficacy for managing their health condition, such as diabetes, which also has been shown to impact risk of food insecurity (Bandura, 1995; Farajzadegan et al., 2013; Mettler et al., 2014). A mixed

method study design using primary data analysis that would explore quantitatively the types of bonding and bridging relationships present, along with a qualitative assessment of the individual's perceptions related to which relationships were perceived as most positive or influential in promoting a sense of trust, respect, and belonging may provide valuable information to tailor programming.

Finally, although Milwaukee County is primarily an urban setting, the surrounding rural community was not represented in this dataset. Past studies of food insecurity have shown differences in characteristics between urban, rural, and suburban settings (Dean et al., 2011; Guerrero et al., 2013). This could be reexamined using a social capital focus to assess if targeted strategies are warranted.

Reflections

When I first embarked on this capstone research study, I envisioned a broad study that looked to examine not only the types of social capital and their impact of food insecurity risk, but also if low social capital could be viewed as a predictor of food insecurity in the African American population as well as how the cost of food impacts the nutritional quality of the low income, food insecure population, This would have been, in essence, three studies in one. I came to realize that focusing on just one priority, social capital and food insecurity using secondary data and the IM, was more than enough to focus my research on, with its large number of independent variables.

My overall knowledge as a researcher has grown as I now understand the benefits and shortcomings of using a secondary data source for conducting research. This includes the benefit of gaining a thorough understanding of the dataset in advance of selecting it for conducting your research so that you can anticipate the types of data cleaning and adjustments that would be required prior to conducting the statistical analysis. One thing that working with the SHOW dataset revealed that I had not anticipated, was that the dataset was originally analyzed using the SAS software which meant that the data would need to be adapted to the SPSS software that I was prepared to use. Although I did not think that this would be a problem, for some of the data, it did not easily transfer, which slowed down my data analysis until I realized what was the problem. In the future, if planning to utilize a secondary data source, I would take more time to thoroughly understand the dataset and how the surveys were configured, before starting the data

analysis process. This would prevent having to rerun my statistical analysis due to needing to recode variables or for missing questions being identified late.

When thinking of the outcomes that were generated, I was not surprised that bonding social capital was shown to be significant given the large amount of research on this subject that I had uncovered (Baden et al., 2014; Dean et al., 2014; Givens et al., 2018; Olf, 2012; Pantell et al., 2013; Putnam, 2001; Tkatch et al., 2018). However, I did think that bridging social capital was going to be significant as well. But for both Milwaukee and Dane County it was not shown to be statistically significant. This might be because Milwaukee County has a high level of the population (overall, 89%), which includes individuals that are low income, which has some type of medical care coverage given the Affordable Care Act, Federally Qualified Health Centers, and the State's Badger Care Program (Milwaukee Health Care Partnership, 2021). Also, in Dane County, with the high educational achievement and higher incomes, there would also be more employer sponsored health insurance benefit packages (Givens et al., 2018).

And finally, the significance of the community structural social capital, both formal and informal, in Milwaukee County, was not a surprise. The outcomes were a validation as to what I was thinking prior to the study. Having access to nutrient dense and affordable fresh foods within one's own neighborhood has been shown to be a key factor in establishing healthy eating practices and achievement of optimal health and wellness (City of Milwaukee, 2019; Hunter et al., 2014; Johnson et al., 2010; Kaiser, 2013). Given the demographic disparities in income and transportation seen in Milwaukee County versus those seen in Dane County, coupled with the knowledge of

lower access to full-service grocery stores in Milwaukee's inner-city neighborhoods, it was not surprising that community structural social capital would show up as significant for Milwaukee County (City of Milwaukee, 2019; Greer, et al., 2013).

In Dane County, distance to grocery stores would not be as much of a problem given that they were shown to have higher access to transportation. Moreover, with their higher incomes, they would be able to purchase the quality food needed regardless of cost or location. This research provided more evidence of the need for targeted initiatives and public policy advocacy to impact healthy food access and a living wage in Milwaukee County (City of Milwaukee, 2019; Furness, & Gallaher, 2018; Givens et al., 2018).

Summary and Study Conclusions

This study revealed a significant relationship between types of social capital and food insecurity risk in both Milwaukee and Dane County, WI. Specifically, key findings for Milwaukee County revealed a significant positive relationship for community structural-formal social capital and food insecurity risk which relates to at-risk individuals using the governmental food safety net system programs like WIC and SNAP. In addition, significant inverse relationships were also found in Milwaukee County related to bonding social capital and community structural-informal social capital and food insecurity risk, which correlates with strong ties to family, friends, and neighbors as well as access to informal community food resources (e.g., farmers markets and CSAs).

Dane County analysis also revealed a significant inverse relationship between bonding social capital and risk of food insecurity. For both Milwaukee and Dane County, significant inverse relationships were seen between incomes below 200% of the federal poverty level, level of education, and food insecurity risk, whereas incomes below 200% of the federal poverty level and low educational attainment were related to higher risk of food insecurity.

These findings informed new recommendations for future action by nutrition and health practitioners and public policy advocacy to impact social capital and food insecurity risk for achievement of optimal nutrition, health, and wellbeing. By incorporating targeted actions into nutrition and health practice that enhance the food

insecure's bonding relationships, sense of belonging, awareness of and access to community food resources, and self-efficacy, while promoting public policy reforms for greater education attained and a living wage, positive social change can be achieved for today's citizens as well as for the generations to come.

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Appendix A: Notification of Approval to Proceed to Final Study Stage

W

workflow@laureate.net

To: Yvonne Greer

Cc: Patrick A. Tschida; Vibha Kumar

Wed 2/3/2021 5:57 PM

Congratulations! Your Walden Institutional Review Board application has been approved. As such, you are approved by Walden University to proceed to the final study stage.

If you have questions about the final study process, please contact drph@mail.waldenu.edu.

Notification of Approval to Conduct Research - Yvonne Greer

I

IRB irb@mail.waldenu.edu

To: Yvonne Greer

Cc: Patrick A. Tschida

Wed 2/3/2021 5:53 PM

Dear Ms. Greer,

This email confirms receipt of the documentation for the partner organization and also serves as your notification that Walden University has approved BOTH your doctoral study proposal and your application to the Institutional Review Board. As such, you are approved by Walden University to conduct research with this site.

Congratulations!

Libby Munson

Research Ethics Support Specialist, Office of Research Ethics and Compliance

Leilani Gjellstad

IRB Chair, Walden University

Information about the Walden University Institutional Review Board, including instructions for application, may be found at this link: <http://academicguides.waldenu.edu/researchcenter/orec>

IRB Approval Granted, Conditional upon Partner Approval - Yvonne Greer

I

IRB irb@mail.waldenu.edu

To: Yvonne Greer

Cc: Patrick A. Tschida

Tue 12/8/2020 2:39 PM

Dear Ms. Greer,

This email is to notify you that the Institutional Review Board (IRB) has approved your application for the study entitled, "Social Capital and Food Insecurity in Two Counties in Wisconsin," conditional upon the approval of the research partner, as documented in the notification of approval, which will need to be submitted to the Walden IRB when obtained. You may not commence the study until the Walden IRB confirms receipt of that notification of approval. Our records indicate that you will be analyzing data provided to you by The University of Wisconsin Madison as collected under its oversight. Since this study will serve as a Walden doctoral capstone, the Walden IRB will oversee your capstone data analysis and results reporting. The IRB approval number for this study is 12-08-20-0541808, which expires when your student status ends.

This confirmation is contingent upon your adherence to the exact procedures described in the final version of the documents that have been submitted to IRB@mail.waldenu.edu as of this date. This includes maintaining your current status with the university and the oversight relationship is only valid while you are an actively enrolled student at Walden University. If you need to take a leave of absence or are otherwise unable to remain actively enrolled, this is suspended.

If you need to make any changes to your research staff or procedures, you must obtain IRB approval by submitting the IRB Request for Change in Procedures Form. You will receive confirmation with a status update of the request within 10 business days of submitting the change request form and are not permitted to implement changes prior to receiving approval. Please note that Walden University does not accept responsibility or liability for research activities conducted without the IRB's approval, and the University will not accept or grant credit for student work that fails to comply with the policies and procedures related to ethical standards in research.

When you submitted your IRB materials, you made a commitment to communicate both discrete adverse events and general problems to the IRB within 1 week of their occurrence/realization. Failure to do so may result in invalidation of data, loss of academic credit, and/or loss of legal protections otherwise available to the researcher.

Both the Adverse Event Reporting form and Request for Change in Procedures form can be obtained on the Tools and Guides page of the Walden website: <https://academicguides.waldenu.edu/research-center/research-ethics/tools-guides>

Doctoral researchers are required to fulfill all of the Student Handbook's [Doctoral Student Responsibilities Regarding Research Data](#) regarding raw data retention and

dataset confidentiality, as well as logging of all recruitment, data collection, and data management steps. If, in the future, you require copies of the originally submitted IRB materials, you may request them from Institutional Review Board.

Please note that this letter indicates that the IRB has confirmed your study meets Walden University's ethical standards. You may not begin the doctoral study analysis phase of your doctoral study, however, until you have received the **Notification of Approval to Conduct Research** e-mail. Once you have received this notification by email, you may begin your study's data analysis.

Both students and faculty are invited to provide feedback on this IRB experience at the link below:

http://www.surveymonkey.com/s.aspx?sm=qHBJzkJMUx43pZegKlmdiQ_3d_3d

Sincerely,
Libby Munson
Research Ethics Support Specialist
Office of Research Ethics and Compliance
Walden University
100 Washington Avenue South, Suite 1210
Minneapolis, MN 55401
Email: irb@mail.waldenu.edu

Appendix B: SHOW Student Research Application and Approval Letter

7/20/2018

Walden University Doctoral Candidate in Public Health

Goal: To use SHOW data as the basis for doctoral capstone research. To look more specifically at the differences in the types of social capital present (bonding, bridging, informal and formal community structural) within the highest food hardship versus lowest food hardship congressional districts so that tailored recommendations can be formulated to guide nutritional coaching of high-risk households in Milwaukee County.

Model similar to Social Ecological Model

Individual internal, individual external, community internal and community external factors as evaluation points for intervening to bring about change. Social Capital – need social structure, social support, social connectedness to bring about social change

Steps/timeline

MONTH	WHO	WHAT
July	SHOW	1. Share relevant codebooks for instruments with potential data points of interest and begin to map out variables for request
August	YG	2. Provide zip code groupings to SHOW for congressional districts of interest so SHOW can determine N available for main comparisons.
	YG	3. Confirm key variables of interest and map out structure of target dataset (1 record per household or multiple records for household, etc.) for addressing research questions. May require additional consultation with SHOW.

	SHOW	4. Determine N with data available in Milwaukee by zip code groupings identified for key research question/s (SHOW).
Sept	YG/SHOW	5. Work with mentors/collaborators/SHOW to map out plans for data analysis (de-identified vs. limited dataset) including where data will be stored/analyzed (SPSS vs. SAS/SHOW servers* vs. elsewhere depending on nature of dataset).
	YG	6. Complete LOI student data request form to describe the project for approval and for identifying potential additional collaborator(s)/mentor(s). Submit to SHOW.
	SHOW	7. Build dataset once approved by SHOW Directors
Oct	YG	8. Obtain IRB approval for the project.
Nov	SHOW	9. Deliver dataset once receive IRB approval.

*If working on SHOW servers – once have IRB approval, request UW NetID and SHOW login (takes 1-2 weeks)

Notes. Has worked with Amy Meinen and Pat Remington (Health Tide)

Targeting SHOW 2014-2016 data

Interested in working with data at SHOW site? – if needed/if can't work with dataset otherwise. Discuss whether SHOW will have remote data access by fall.

Survey of the Health of Wisconsin (SHOW)

1300 University Ave, Room 1097 Medical Sciences Center

610 N. Walnut St., Room 628 WARF

Bldg. tjlecaire@show.wisc.edu



School of Medicine and Public Health

UNIVERSITY OF WISCONSIN MADISON

SHOW Student Project Proposal and Data Request Form

College Affiliation: Walden University, School Public Health Department Health Sciences

Project type:

- Undergraduate Project
 - MPH Capstone
 - CI MS Thesis
 - CJ PhD Dissertation
 - Other, specify: DrPH Candidate from Walden University, Capstone Research Project
-

1) Title of Project

Examining Social Capital and Food Hardship Disparities in Milwaukee County

2) Advisors & SHOW Mentor(s) (Name(s) / Affiliation(s))

Tammy LeCarie, SHOW Associate Director; My Walden DrPH Committee Chair,
Dr. Patrick Tschida

Committee member, Dr. Vibha Kumar, & URR reviewer, Dr. Michael Furukawa.

3) Background/Rationale (max 200 words)

Addressing hunger and food insecurity has been recognized as a global public health issue. In the United States, approximately 48 million people struggle with food insecurity, which is significantly higher than the level seen in 2006 (i.e., 35 million) prior to the recent recession period (Food Research & Action Center, 2015). Today, there are more than 15 food assistance programs that make up the US food safety net system (FRAC, 2017). Yet, it was reported that the food assistance system was still not sufficient to elevate households experiencing very low food insecurity out of food hardship, leading to the greater use of food pantries and meal assistance programs (Friedens Community Ministries, 2017). Moreover, State reforms, such as the work requirement for SNAP recipients enacted in 2015 by the State of Wisconsin, have led to thousands of individuals being deemed ineligible for assistance, resulting in capacity concerns by the private food assistance networks (Beck, 2015; Friedens Community Ministries, 2017). Hunger advocates concluded that other influencing factors need to be addressed such as social connectedness and community support capacity with continued public policy and environmental strategies/innovations, if we are to achieve food security for all (Anderson, Butcher, Hoynes, & Whitmore Schanzenbach, 2016).

4) Aims/Specific Objectives (or hypotheses to be addressed)

A. How does the four types of social capital (bonding, bridging, community structural-formal, community structural-informal) differ between households within the highest food hardship district versus the households within the lowest food hardship district within Milwaukee County?

B. Does the level of social capital offset the effects of lower income on food hardship in African Americans households in Milwaukee County?

C. Is the level of social capital predictive of food hardship in African Americans households within Milwaukee County?

D. How does the perceptions of health and health practices differ between households within the highest food hardship district versus the households within the lowest food hardship district within Milwaukee County?

5) Keywords (up to five)

Food Hardship, Social Capital, Health Promotion, Food Insecurity
--

6) Type of Study

The project is based on the following (check one or both):

SHOW core data

Ancillary Study (please specify) City of Mil. Comm. Health Assessment

7) Data Needed (Please list the variables by name, rather than by topic only. See the SHOW codebooks at <https://show.wisc.edu/data/> for variable names and descriptions. Feel free to email us at data@show.wisc.edu if you have any questions. You may attach a separate listing/spreadsheet if needed.

Years of data collection:

2014-2016

Main Outcome(s):

Disparities in WI's highest & lowest food hardship districts by zip

Main Exposure(s):

Four types of Social Capital Variables: Bonding, Bridging, Community Structural Formal & Informal Connections (See Attached)

Other data [Confounders, Modifiers]:

Other variables: age, gender, educational level, income, race, family size, job status, perceptions of health & health practices examined to determine the relationship effect size (See Attached)

8) Anticipated type of publication (check all that apply)

Peer reviewed journal

Presentation at a scientific conference

Lay press/media

To be determined

Other (please specify): Presentation at Coalition Meeting/Community Town Hall

9) IRB Status

[3 SHOW Core Team Member

Separate IRB protocol by investigator: Walden IRB protocol #

C] IRB approved

IRB pending

I request to be a SHOW core team member for the duration of the project

10) Proposed Timeline/Milestones:

Expected time frame during which you will be analyzing the requested data:

11/2018 -12/2019

Expected date for destruction of data files*:

5/31/2020

Notes/Special Requirements

May need assistance with SAS statistical analysis software.

Walden provides SPSS training/software. Willing to learn SAS, if necessary.

Data Use Agreement

By submitting this application, I agree to the below conditions of use:

I understand that via my application I am agreeing to the following statements and terms (please check each box):

I agree to use data only for the purpose outlined in this Request for Data form. If a secondary use is desired, I will complete a new data request/agreement form.

I agree to document IRB approval for proposed use of the SHOW data prior to release of the data by SHOW.

I agree that I will maintain the confidentiality of the data and not share any SHOW data with persons not noted on this form. I assume responsibility for ensuring that my research team listed on this form is aware of confidentiality requirements and will adhere to all IRB and data privacy and security requirements. No attempts to identify individuals, families, or households may be made. We will not disclose or publish data whereby a sample unit or survey respondent could be identified or related to any particular individual, family, or household.

I agree that data must be stored on a password-protected drive (personal computer or server). Data should be transferred directly to this drive using UW-Box or other secure method with the assistance of the SHOW Data Team. No other copy of the data is allowed. I agree to permanently delete/destroy dataset files after completion of this project, per the expected date of destruction of data files as noted in the data request.

I agree to submit a manuscript proposal form to the SHOW Publication Committee should I wish to produce a publication based on the requested data and to adhere to the policies outlined in the SHOW Publication Policy. This includes review of a manuscript or abstract at least 2 weeks prior to the submission deadline for publication, if requested by the Publication Committee at the time of approval.

I agree to cite the "Survey of the Health of Wisconsin" as a source of the data in all publications proceeding from the proposed study.

I understand that failure to adhere to these terms by me or anyone on my research team will be deemed non-compliant with SHOW policies as well as UW-Madison rules and regulations and at minimum could result in the loss of the opportunity to use SHOW data in the future.

* SHOW policy on Data Management:

SHOW has devised the most stringent data security plan that is feasible given the complex nature of the survey design. All data and specimens collected on human subjects in the

Survey of the Health of Wisconsin are protected from technical and physical loss and damage and from disclosure of identifiable data from the initial point of collection through interim storage, transport, transmissions, downloads, processing, final storage, and distribution of datasets and specimens. Per SHOW policies datasets obtained via this request cannot be shared with persons not listed on this request. After completion of your project, we request that dataset files are permanently deleted/destroyed.

Please send completed form electronically to data@show.wisc.edu



January 26, 2021

Yvonne D. Greer, MPH, RD, CD

Nutritional Consultant for Healthy Living

Doctor of Public Health Candidate

Walden University

Dear Yvonne Greer:

We are writing to express our enthusiastic support and collaborative commitment to the use of the Survey of the Health of Wisconsin (SHOW) data. SHOW is a state-wide public health survey infrastructure, funded by the Wisconsin Partnership Program. SHOW is funded with the intent of providing data and services to researchers, practitioners, and other interested parties in order to improve our understanding of health and health equity in the state of Wisconsin and beyond.

We are excited and eager to provide data to Yvonne to support her research interests on social capital and food insecurity. This research project is well-aligned with the overall mission of the SHOW program to support and promote public health in the state of Wisconsin. All participants in SHOW completed an informed consent at the in-home recruitment visit, as approved by the University of Wisconsin-Madison Institutional Review Board. SHOW participant health data shared with Yvonne and her research team will be coded and de-identified.

Thank you for including the SHOW project in your research proposal. We look forward to our continued collaborations and a favorable review of this proposal.

Sincerely,

A handwritten signature in cursive script that reads "Amy Schultz". The signature is written in black ink and includes a long horizontal flourish extending to the right.

Amy Schultz, PhD, MS

Assistant Director - Survey of the Health of Wisconsin (SHOW)

Department of Population Health Sciences

University of Wisconsin School of Medicine and Public Health

Appendix C: Number of Children and Number of People in the Household

Dane County (FIPS 25) and Milwaukee County (FIPS 79)

Table C1*Number of Children 0-17 Living in the Household*

		Dane	Milwaukee	Total
Number of children age 0-17 living in the household	Count	163	206	369
	% within FIPS	69.4%	61.5%	64.7%
1	Count	24	50	74
	% within FIPS	10.2%	14.9%	13.0%
2	Count	25	39	64
	% within FIPS	10.6%	11.6%	11.2%
3	Count	13	23	36
	% within FIPS	5.5%	6.9%	6.3%
4	Count	10	12	22
	% within FIPS	4.3%	3.6%	3.9%
5	Count	0	1	1
	% within FIPS	0.0%	0.3%	0.2%
7	Count	0	2	2
	% within FIPS			

		% within FIPS	0.0%	0.6%	0.4%
	8	Count	0	2	2
		% within FIPS	0.0%	0.6%	0.4%
<hr/>					
Total		Count	235	335	570
		% within FIPS	100.0%	100.0%	100.0%

Adapted From: "Survey of the Health of Wisconsin." *University of Wisconsin-Madison, School of Medicine and Public Health* (2017). <http://www.med.wisc.edu/show/about-survey-of-the-health-of-wisconsin/36193>

Table C2

Number of People of Any Age Living in the Household

			Dane	Milwaukee	Total
Number of people of any age living in the household	1	Count	39	64	103
		% within FIPS	16.6%	19.1%	18.1%
	2	Count	96	111	207
		% within FIPS	40.9%	33.1%	36.3%
	3	Count	42	56	98
		% within FIPS	17.9%	16.7%	17.2%
	4	Count	25	45	70
		% within FIPS	10.6%	13.4%	12.3%

5	Count	21	30	51
	% within FIPS	8.9%	9.0%	8.9%
6	Count	6	10	16
	% within FIPS	2.6%	3.0%	2.8%
7	Count	6	1	7
	% within FIPS	2.6%	0.3%	1.2%
8	Count	0	15	15
	% within FIPS	0.0%	4.5%	2.6%
9	Count	0	1	1
	% within FIPS	0.0%	0.3%	0.2%
13	Count	0	2	2
	% within FIPS	0.0%	0.6%	0.4%
<hr/>				
Total	Count	235	335	570
	% within FIPS	100.0%	100.0%	100.0%
		%		

Adapted From: "Survey of the Health of Wisconsin." *University of Wisconsin-Madison, School of Medicine and Public Health* (2017). <http://www.med.wisc.edu/show/about-survey-of-the-health-of-wisconsin/36193>

Appendix D: Data Dictionary Table for SCFIS Analysis

Table D1.

Data Dictionary Table for the Social Capital and Food Insecurity Survey (SCFIS) Analysis

Variable category	Working file	Variable description	Field range	Field level	Comments/ adjustments
Demographics					
School/ Educational level	DMQ010	Highest level of school completed, or highest degree received	1-15, starting at 6 th grade through Doctoral degree	Ordinal	Would merge to create five ordinal categories
Marital Status	DMQ040	What is your marital status?	1-6	Nominal	Also includes never married and living with a partner
Race	DMQ060_1	White alone or in combination	2	Nominal	
	DMQ060_2	Black alone or in combination	2	Nominal	
	Race_Ethnicity_4CAT	Combination of race and ethnicity into 4 categories	4	Nominal	Used for demographic review

Transportation	DMQ100	Currently, own or lease a car or truck	2	Nominal	
Gender	Adm data	Female, male	2	Nominal	
Age of Adults	Adm data	18 years of age and up to 98	1-6 categories	Interval	Will also merge ages to create two additional categories, 18-44 and 45-65
Ages of Children in the household	Adm data	In 2-year intervals	0-17	Interval	Will use only total of households with 0-17 children in analysis
Income	INQ200	The combined income of all household members	1-18	Ratio	Before taxes
	INQ201	# People in Household supported by the combined income	1-9	Interval	
*Poverty levels updated Annually	Poverty_100	Annual combined family income above or below 100% of	2	Ratio	

	Federal Poverty Guidelines				
Poverty_150	Midpoint of annual combined household income range above or below 150% of Federal Poverty Guidelines	2	Ratio		
Poverty_200	Midpoint of annual combined household income range above or below 200% of Federal Poverty Guidelines	2	Ratio		
Poverty Level	Annual federal poverty guidelines from HHS based on number of people in the household	1-9	Ratio	Would need to develop Poverty categories for midpoint above or below 300% & 400% of Federal Poverty Guidelines	

Residence	HOQ065_R2	Residence: Ownership of home or Renting	1-4	Nominal
Geography	FMT_Urban_2 CAT	Urban or Rural	2	Nominal
Insurance/ Medical Coverage	IUQ020_R2_A	What kind(s) of health insurance or health care coverage do you have now	1-3	Nominal
	IUQ030	Prescription medication cost covered	1-3	Ordinal
	IUQ040	Cost of preventive dental care covered	1-3	Ordinal
	IUQ050	Cost of other preventative care covered for adults	1-4	Ordinal
Connections to healthcare or health information	IUQ100	Used the internet for information on health	2	Nominal

IUQ115	Need help when reading written instructions from doctor or pharmacy	2	Nominal
IUQ120	Have a usual place to go when feeling sick	7	Nominal
IUQ128	At this health facility usually see: General doctor, specialist doctor, nurse practitioner, physician assistant, or someone else	1-5	Nominal
IUQ180	Last 12 months, # of times went to an emergency room	Frequency of all respondents	Ratio
IUQ190	Last 12 months, # of times a patient in the hospital for one night or longer	Frequency of all respondents	Ratio
IUQ260_R2	Any time needed	2	Nominal

		medical care but did not get it		
	IUQ265	Main reason did not get health care	10	Nominal
<hr/>				
Food Security	FSQ002	Worried food would run out	1-5	Nominal
	FSQ003	Food did not last through the month	1-5	Nominal
	FSQ004	Could not afford balanced meals	1-5	Nominal
	FSQ080	Not enough food for the family	1-3	Nominal
	FSQ151_R2	Emergency food last year	1-4	Ordinal
	FSQ170_R2	Food Stamps last year	1-4	Ordinal
	FSQ162_R2	WIC last year	1-4	Ordinal
	FSQ180	Government assistance helps with difficult situation	1-6	Nominal
	FSQ185	Government assistance	1-6	Nominal

		helps prevent hunger		
	FSQ190	Application process is humiliating	1-6	Nominal
	FSQ195	Government assistance rules takes away personal freedom	1-6	Nominal
Diet	DIQ100	Times eaten at fast food	1-6	Ratio
	DIQ110	Times eaten at fast-casual restaurants	1-7	Ratio
	DIQ115	Times eaten at All-U-Can- Eat	1-7	Ratio
	DIQ120	Times eaten at sit down restaurants	1-7	Ratio
	DIQ410M	Grocery store distance	Text response	Ratio
	DIQ410N	Grocery store name	Text response	Nominal
	DIQ415	Percent of groceries purchased there	Frequency of all respondents	Interval

	DIQ416_A	Reasons for shopping at this store	1-14	Nominal	
	DIQ420	How often shopping at farmer's market or local farms	1-4	Ratio	
	DIQ430	Membership in CSA group	1-3	Nominal	
	DIQ440	Grown or produced any of your own food	1-2	Nominal	
Occupation	OCQ100	Job status, last week	1-5	Nominal	
	OCQ110	Not working, reason out of work	1-8	Nominal	
	OCQ125	Worked past week, hours in past week	Frequency of respondents	Interval	
	OCQ127	Worked past week, normal work hours <u>>35 hours</u>	2	Interval	Will address high missing data using mean worked
	OCQ130	Current job: Kind of work done, Code	Text Code	Nominal	

OCQ130_TEX T	Current job: Kind of work done, Text	Text Response	Nominal	
OCQ150	Current job: Type of business or industry, Code	Text Code	Nominal	
OCQ150_TEX T	Current Job: Type of business or industry, Text	Text Response	Nominal	
OCQ175	Current Job: On average, hours per week worked	Frequency of Respondents	Interval	Will address high missing data using mean worked
OCQ14020	Current Job: Distance from home to place of work (miles)	Frequency of Distance	Ratio	Will address high missing data using mean of distance

Sense of Community/Ci vic Engagement	Community050	Political Participation	1-5	Nominal	Comm. Structural – formal SC
	Community060	Have a say in what government does	1-5	Nominal	Comm. Structural – formal SC
	Community070	Actively participates	1-5	Nominal	Comm. Structural – informal SC

	in my community			
Community090	Can get what I need in my neighborhood	1-5	Nominal	Comm. Structural – Informal SC
Community100	Neighborhood fulfills my needs	1-5	Nominal	Comm. Structural – Informal SC
Community110	Belong to neighborhood	1-5	Nominal	Comm. Structural - Informal
Community120	Have a say about what goes on in neighborhood	1-5	Nominal	Comm. Structural – Informal SC
Community130	Influence one another	1-5	Nominal	Comm. Structural – Informal SC
Community140	Connected to the neighborhood	1-5	Nominal	Comm. Structural – Informal SC
Community150	Bond with others in the neighborhood	1-5	Nominal	Comm. Structural – Informal SC
Community170	Sent a letter or call to influence policy	1-5	Nominal	Comm. Structural – formal SC
Community180	Attended community services event	1-5	Nominal	Comm. Structural – Informal SC

Community190	Attended a meeting to pressure for change	1-5	Nominal	Comm. Structural – formal SC
Community200	Attended a meeting about neighborhood issues	1-5	Nominal	Comm. Structural – Informal SC

Neighborhood Characteristics	NBRHD001_A	Walk to the park	1-6	Ratio
	NBRHD001_B	Walk to the recreation center	1-6	Ratio
	NBRHD001_C	Walk to the trail	1-6	Ratio
	NBRHD001_D	Walk to the public pool	1-6	Ratio
	NBRHD001_E	Walk to the grocery store	1-6	Ratio
	NBRHD001_F	Walk to the supermarket	1-6	Ratio
	NBRHD001_H	Walk to library	1-6	Ratio
	NBRHD001_K	Walk to fast food	1-6	Ratio
	NBRHD001_L	Walk to other restaurant	1-6	Ratio

NBRHD001_M	Walk to pharmacy	1-6	Ratio
NBRHD001_O	Walk to other type of store	1-6	Ratio
NBRHD001_P	Walk to place of worship	1-6	Ratio
NBRHD001_Q	Walk to fitness facility	1-6	Ratio
NBRHD001_S	Walk to senior center	1-6	Ratio
NBRHD002	Rate your community as physically active	1-4	Ordinal
NBRHD003	Safe from crime	1-4	Ordinal
NBRHD004	Safe from traffic	1-4	Ordinal
NBRHD005_C	Community well maintained	1-4	Ordinal
NBRHD005_D	Access to fruits and vegetables	1-4	Ordinal
NBRHD006_A_R2	Close to work/job	1-4	Ordinal

NBRHD006_B _R2	Lots of trees and other greenery	1-4	Ordinal
NBRHD006_C _R2	Close to family and friends	1-4	Ordinal
NBRHD006_E _R2	Affordable housing	1-4	Ordinal
NBRHD006_F _R2	Friendly neighbors	1-4	Ordinal
NBRHD006_G _R2	Safe, low crime area	1-4	Ordinal
NBRHD006_K _R2	High racial or ethnic diversity	1-4	Ordinal
NBRHD006_ M_R2	Lots of things to do	1-4	Ordinal
NBRHD006_N _R2	Outdoor recreational opportunities	1-4	Ordinal
NBRHD006_O _R2	Easy access to public transportation	1-4	Ordinal
NBRHD006_P _R2	Easy access to healthcare or other services	1-4	Ordinal
NBRHD006_Q	Ease of walking or biking to services	1-4	Ordinal

	NBRHD006_R	Opportunities for outdoor activities during free time	1-4	Ordinal	
	NBRHD006_S	Easy access to gym or other workout facilities	1-4	Ordinal	
Milwaukee Supplemental	Milwaukee070	Trouble making ends meet	1-4	Nominal	
	Milwaukee080	Housing a problem	2	Nominal	
	Milwaukee090_A	Threatened with foreclosure	2	Nominal	
	Milwaukee090_B	Not enough money for rent	2	Nominal	
	Milwaukee090_C	Evicted by landlord	2	Nominal	
	Milwaukee090_D	None of the above	2	Nominal	
	Milwaukee100	Child in Head Start – Ever	1-3	Nominal	Comm. Structural – Formal SC
	Milwaukee110	Child in Head Start/Preschool – Now	1-4	Nominal	Comm. Structural – formal SC

	Milwaukee120	Do you feel safe in your relationship	1-3	Nominal	Bonding SC
Adverse Life Events in past 12 months	Life_1	Death of a spouse	2	Nominal	
	Life_2	Divorced	2	Nominal	
	Life_3	Separated	2	Nominal	
	Life_4	Detention in jail or institution	2	Nominal	
	Life_5	Death of a family member (not including spouse)	2	Nominal	
	Life_6	Major illness or injury	2	Nominal	
	Life_7	Marriage in last 12 months	2	Nominal	
	Life_8	Being fired	2	Nominal	
	Life_9	Reconciliation with spouse	2	Nominal	
	Life_10	Retirement from work	2	Nominal	
	Life_11	Major change in health or behavior of a family member	2	Nominal	

Life_12	Pregnancy	2	Nominal
Life_14	New family member	2	Nominal
Life_17	Death of a friend	2	Nominal
Life_18	Change in work	2	Nominal
Life_19	Arguments	2	Nominal
Life_21	Foreclosure on a mortgage or loan	2	Nominal
Life_23	Son or daughter leaving home	2	Nominal
Life_30	Trouble with boss	2	Nominal
Life_39	Family get together	2	Nominal
Life_40	Eating habits	2	Nominal
Life_41	Vacation	2	Nominal
Life_42	Holiday spent alone	2	Nominal
Life_44	None of these events	2	Nominal

Adapted From: "Survey of the Health of Wisconsin." *University of Wisconsin-Madison, School of Medicine and Public Health* (2017). <http://www.med.wisc.edu/show/about-survey-of-the-health-of-wisconsin/36193>

Appendix E: SHOW Dataset Summary

Dataset information:**Created for:** YDG**Created by:** Andy Bersch**Email contact:** abersch@show.wisc.edu**Date created:** 2021-01-07**Date request number:** 361**Dataset metadata:****Years included:** 2014 - 2016**Data populations included:** civilian, non-institutionalized adults in WI age 18 years or older**Sub-group population variables created for analysis:**

None, but we recommend coding a categorical variable based on county of residence with categories for Milwaukee, Dane, and all other counties.

Main Outcome(s): Food Insecurity**Recommended survey design variables to use:**

In SAS, use the proc survey functions (surveylogistic, surveymeans, surveyreg etc.).

In SPSS, use the Complex Samples Analysis Preparation Wizard to create an analysis plan.

https://www.ibm.com/support/knowledgecenter/en/SSLVMB_26.0.0/statistics_casestudies_project_ddita/spss/tutorials/prepwiz_nhis_howto.html

Weight = WEIGHT_SAQ

Cluster = PSU

Strata = STRATA_FINAL

Domain = to be determined (see sub-group population variable described above)

*In SAS if you do any sub-population analyses, you must use the domain statement as well. For example, if you stratify your analysis into 2 age groups, create a binary variable (0,1) for the 2 age groups and put that variable into the domain statement.

Questions to think about when analyzing these data?

- When were the data collected in the survey, in-home questionnaire (aka IHQ or time 1), self-administered questionnaire (aka SAQ or time2) or exam appointment / biological sample collection (aka BSC or time 3)? This information is summarized in SHOW Instruments Time Table.xlsx. The answer to this question may help you understand patterns of missing data and is needed to decide which sampling weight variable(s) to use in your analysis.
- The spreadsheet, dr361_contents_20210107.xlsx, contains the list of variables in the analytic data set (in the 'Variables' sheet), as well as the value labels (what each value means) for each custom format defined for the variables in this data set (in the 'Formats' sheet).
- A few instruments changed over time from 2014 thru 2016. The 'Variables' sheet in dr361_contents_20210107.xlsx contains columns named IN_2014, IN_2015, and IN_2016 indicating whether or not a given variable is present in the data set for the specified survey year.
 - A useful way to identify these changes over time is to cross-tabulate the variable you are interested in with the variable SURVEY_YEAR. If you see an usual number of missing values or a strange pattern of missing values, then there is a good chance that something about that variable changed or maybe there is skip pattern that you need to take a closer look at.
 - Several food insecurity variables, FSQ162R2, FSQ180, FSQ185, FSQ190 and FSQ195, were only collected in 2016.
 - Similarly, IUQ128 was only collected in 2016.
 - LIFE was not administered in 2014 so that explains the odd pattern of missing data for that instrument.
 - A few different changes occurred in the neighborhood questionnaire (NBRHD). A potentially major change was the elimination of response

option 'Neutral' in 2015 and 2016 (Note: this change is connected to the change in variable name adding _R2 and format). The other changes are the addition of a few items in 2016.

- SHOW data collected from 2014 through 2016 are from one sample collected over a three-year period. The distinction of survey year was made primarily for logistical reasons related to data collection and processing. For statistical purposes it is best to treat these data as one sample where the results are interpreted as averages spanning 2014 through 2016.