FOOD INSECURITY IN OLDER ADULTS LIVING IN RURAL OKLAHOMA

By

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Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF PUBLIC HEALTH
December 2017

FOOD INSECURITY IN OLDER

ADULTS LIVING IN RURAL OKLAHOMA

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ACKNOWLEDGEMENTS

I would like to begin by thanking my thesis committee, Dr. Croff, Dr. Hubach, and Dr. Stoecker for their guidance and support throughout this process. With the utmost respect I would like to thank Dr. Hubach again for serving as my thesis advisor and for believing in my ability as a researcher, without his input this research could not have been successful.

Most importantly, I would like to thank my family. To my husband, George, you have always encouraged me, and I thank you for that. Words cannot express my love for all that you have done for me so tirelessly over the years. Thank you to my children, Taylor, Magen and Noah, for their love and for cheering me on in my endeavors. I would like to thank my mom, who believed in me and taught me the value of perseverance.

Finally, I would like to thank my good friend Carla; you taught me how to believe in myself and recognize that it takes a village to change the world.

Name: TRACIE LYNN VERKLER

Date of Degree: DECEMBER, 2017

Title of Study: FOOD INSECURITY IN OLDER ADULTS LIVING IN RURAL OKLAHOMA

Major Field: MASTER IN PUBLIC HEALTH

Abstract

Food insecurity is multifaceted and often exists among older adults with low income, living alone, less education, minority status or chronic illness. The purpose of this study is to use qualitative methodology to explore facilitators and barriers to food security for older adults living in rural Western Oklahoma. Fifteen older adults, 58 – 90 years of age, who reside in the counties of Kingfisher, Blaine or Logan were interviewed between Aug 1st and October 15. Main topics addressed during the interview included: 1) Patterns of obtaining food and meal preparation 2) Participant's eating habits 3) Food insecurity risks, 4) Knowledge of and participation in food programs, 5) Health care access and 6) Outreach programs for Seniors. The data show food insecurity exists for older adults with comorbid health conditions including chronic illness and physical impairments. Moreover, food insecurity is present in individuals that are receiving supplemental food assistance. Seniors are at substantial risk for food insecurity if they live alone, lack transportation and have little familial or social capital.

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CHAPTER I

INTRODUCTION

Healthy nutrition is important for older adults to maintain well-being and an active life. Nutrition is also vital in the prevention and maintenance of many health conditions that are prevalent in older populations including: obesity, diabetes, hypertension, heart disease and other chronic illnesses ("Senior Hunger Facts," 2017). Food insecurity is complex and is higher among older adults with low income, less education, minority status or other financial constraints such as medical expenses. Furthermore, older adults who live alone, are single, and reside in the South are more likely to have a higher risk of food insecurity (Ziliak & Gundersen, 2016).

A review of the literature suggests there are gaps in research that focuses on older adults living in rural areas. At present, the outcomes for children have been studied extensively as summarized by Coleman-Jensen, Rabbitt, Gregory, & Singh (2016). In addition, many studies have focused on dietary quality or access in urban areas among older adults (Lee & Frongillo, 2001; Sharkey, Johnson, & Dean, 2010; Walker, Keane, & Burke, 2010).

There are unique factors that limit the ability of older adults to have food access all of the time in order to maintain nutrition for a healthy life. Factors that limit an individual's ability to purchase, prepare, and eat foods include poor health, chronic illness, disability, social isolation and community characteristics. More than 80% of older adults have one chronic illness and 62%

have multiple problems (Lee, Fischer, & Johnson, 2010). Overall it is the young old or those slightly above poverty that are most at risk for food insecurity because they are ineligible for government food programs. However, older individuals below poverty are eligible for many food assistance programs, but they may not have access to them or stigma prevents them from enrolling.

Focusing on food insecurity in rural areas is especially important because individuals living in rural environments experience food insecurity differently than those living in urban environments (Johnson et al., 2014; Morton, Bitto, Oakland, & Sand, 2008; Quandt, Arcury, McDonald, Bell, & Vitolins, 2001). Aging in place is becoming more common for older adults and living in rural environments becomes a major determinant of food insecurity among this population. Many older adults living in rural areas experience access problems, poorer health, higher rates of poverty, higher food costs, longer distances to food shops and fewer healthy options. Formal food assistance programs are unevenly distributed in rural areas compared to urban areas and access to those may be limited. In addition, older adults may resist these programs because of pride and social stigma. These particular tendencies are troubling for elderly populations due to the fact that health conditions and other socioeconomic factors create a larger burden of food insecurity among the elderly than the general population. Nevertheless, improved understanding of the causal relationships of food insecurity of older adults living in rural environments may improve programmatic design.

Purpose of the Study

The purpose of this study is to use qualitative methodology to explore facilitators and barriers to food security for older adults (age 58 and older) living in rural Western Oklahoma.

Hypothesis

As an inductive explorative study, no hypotheses will be tested during the course of this study.

Significance

It is clear from the literature that adequate food intake is a strong force in shaping older adult health and well-being. This is particularly true for women living alone, minority populations or adults with chronic illness. Changes in resources may not be obvious as they occur in elders, but by examining the linkages between food acquisition, use or food insecurity we may be able to identify the facilitators or barriers of food insecurity. For example, older adults living alone are more likely to skip meals than those that do not live alone. If researchers and practitioners understand what determinants are implicated in food insecurity within the older adult population, there is the ability to develop better public health intervention strategies as they pertain to older adults living in rural communities.

Operational Definitions

Age of Older Adult

Previous studies have defined older adults ranging from age 60 and older (Dean, Sharkey, & Johnson, 2011; Dunn, Dean, Johnson, Leidner, & Sharkey, 2012; Lee & Frongillo, 2001) or age 65 and older (Inder, Lewin, & Kelly, 2012; Lee et al., 2010; Quandt & Rao, 1999). For the purpose of this study, older adults are defined as individuals age 58 and older.

Delimitations

Delimitations for this study include geographic location, recruitment location, and age. This study included participants recruited through local venues, neighborhood acquaintances and organizations providing housing for senior adults living in Kingfisher County, Logan County, or Blaine County. Additionally the study included individuals who are may be at risk for food insecurity or perceive themselves as having been food insecure at some time during the past

twelve months. The results of this study may not generalize well to other locations or populations.

CHAPTER II

REVIEW OF LITERATURE

The number of Americans aged 65 and older is growing rapidly and by the year 2030 it is estimated that older adults will comprise approximately 19.7% - 21.3% of the U.S. population (Berstein & Munoz, 2016; Lee et al., 2010). Meeting the nutritional needs to maintain a healthy and active life will be critical for this aging population; however, nutritional health is overshadowed by access or constraints associated with acquiring healthy foods leading to food insecurity for this vulnerable population. The World Health Organization (WHO) defines food security as existing "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life" (*WTO Agreements & Public Health: A joint study by the WHO and the WTO Secretariat*, 2002). In the United States, food security is defined as households having consistent, dependable access to enough food for active, healthy living (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2016; Johnson et al., 2014). Although these two definitions are similar, they are distinctly different in what it means to be food secure. Through review of the previous literature on identifying risk factors of food insecurity in older adults, there is a need to understand the barriers, constraints and determinants of food insecurity for older adults living in rural areas.

Food Insecurity in the United States

An estimated 12.7 percent (15.8 million households) of U.S. households were food insecure at least some time during the year 2015 (Coleman-Jensen et al., 2016). Food insecure

households have low or very low food security - what this means is that these households had difficulty providing enough food for all of the members in their household due to lack of resources. It is also estimated that in 2015, 5.0 percent (6.3 million households) had very low food security (Coleman-Jensen et al., 2016). This is a severe form of food insecurity that describes the food intake of some household members as reduced, and normal eating patterns were disrupted at times during the year due to limited resources.

Most households in America have enough dependable access to food for a healthy life, however food insecurity is occurring for 15.8 million (12.7 percent) households (Coleman-Jensen et al., 2016). If we tease apart this figure and concentrate on specific groups, there are significant food security gaps among specific populations with different economic and demographic backgrounds. Examples include: households having an income below the official poverty line (38.3 percent), households with incomes below 185 percent of the poverty threshold (32.8 percent), households with children headed by single women (30.3 percent) or single men (22.4 percent), women living alone (14.7 percent) and men living alone (14 percent), African-American (21.5 percent) and Hispanic-headed households (19.1 percent) (Coleman-Jensen et al., 2016).

For seniors, adults over the age of 60, protecting oneself is more difficult and problematic than the general population due to confounding factors that contribute to food insecurity. The rate of senior households experiencing food insecurity is 14.6 percent and when grandchildren are present in the home of seniors, the rate of food insecurity is three times higher (40.3 percent) (Ziliak & Gundersen, 2016). These particular trends are troubling for elderly populations due to the presence of other health and socioeconomic factors that may work synergistically to create a larger burden among the elderly than the general population.

Food Insecurity Among Older Adults in the United States

Older adults are known to be a group that is vulnerable to nutritional risk (Lee & Frongillo, 2001; Quandt et al., 2001). Food insecurity among seniors increased 119 percent since 2001 and trends demonstrate that even after the end of the recession in 2009, the risk of hunger faced by seniors remained high (Ziliak & Gundersen, 2016). For the U.S., in 2015, food insecurity for older adults ages 60 and over was 15.75 percent (Coleman-Jensen et al., 2016; Ziliak & Gundersen, 2016). In addition, the rate of seniors experiencing very low food insecurity was 3.2 percent and if they lived alone this rate increased to 4.2 percent (Coleman-Jensen et al., 2016). Moreover, seniors age 60 and older can have an increased risk of hunger as a result of many physical and socioeconomic conditions; chronic health conditions, living alone, poor food-management skills, limited mobility, lack of reliable social support, raising grandchildren and living at or near poverty increases the risk of food insecurity (Buys & Locher, 2014; "Senior Hunger Facts," 2017; Ziliak & Gundersen, 2016). Identifying seniors that experience food insecurity is necessary for public health interventions in this vulnerable population.

Geographical location can also influence these food insecurity rates. Food insecurity among all households fluctuates among geographical regions within the U.S. The highest percentage of food insecurity for all households is located in the Southern region of the U.S. at 13.3 percent and the lowest number of households with food insecurity is located in the Northeast region at 11.9 percent (Buys & Locher, 2014; Coleman-Jensen et al., 2016). Higher food insecurity rates among populations living in Southern states is significant in that these areas also have higher rates of poverty, health disparities, poor health behaviors, and low SES which together contribute to increased years of potential life lost (YPLL) ("County Health Rankings & Roadmaps," 2016; Renwick & Fox, 2016; Stuff et al., 2004).

Food Insecurity in Oklahoma

Oklahoma is ranked tenth in the U.S. for having significantly higher food insecurity, among all households, than the U.S. average for the period of 2013-2015 (Coleman-Jensen et al., 2016). The prevalence of low and very low food insecurity in all Oklahoma households averaged 15.5 percent and was significantly higher than the national average of 13.7 percent (Coleman-Jensen et al., 2016). Moreover, the prevalence of households with very low food insecurity, 6.4 percent, has significantly increased since the 2003 average rate of 4.8 percent (Coleman-Jensen et al., 2016).

For seniors living in Oklahoma in 2014, the threat of hunger was estimated to be 16 percent (Ziliak & Gundersen, 2016). The number of older adults is projected to increase over the next two decades and the changing demographics within the U.S. population will also have a profound effect on senior populations within Oklahoma; increased demand for social services will likely occur, including meeting the nutritional needs for our aging population.

Food Insecurity in Rural America

Populations living in rural locations experience a combination of socioeconomic conditions not experienced by urban dwellers that include higher rates of poverty, lower education levels, poorer quality housing and difficulties in making retail purchases (Morton et al., 2008; Quandt & Rao, 1999; Stuff et al., 2004). When geographical regions are broken down into metropolitan, suburb and rural locations, food insecurity for all households is highest among rural areas (15.4 percent) and lowest in the suburbs (10.4 percent) (Coleman-Jensen et al., 2016; Farrigan, 2017; Ziliak & Gundersen, 2016). Other factors that predict food insecurity among older adults include: living with a grandchild, living alone, living in or near poverty, having less

than a high school education, being a renter, and being African American or Hispanic (Buys & Locher, 2014; Ziliak & Gundersen, 2016).

One primary barrier to food security, especially among rural areas, is access (Buys & Locher, 2014; Whitley, 2013). America is experiencing many changes, many areas that have had economic focus on agriculture, mining and logging have declined (Whitley, 2013). This has led to a decline in economic opportunities resulting in a demographic shift among rural areas as an aging population increases and younger residents leave for urban areas seeking employment (Inder et al., 2012; Whitley, 2013). The outcome for many rural regions experiencing significant economic and social changes includes loss of infrastructure, fewer food retailers, reduced social or health services and increased poverty (Stuff et al., 2004; Whitley, 2013).

Poverty plays a significant role in food security; individuals living in areas where poverty is prevalent face barriers and limited opportunities (Farrigan, 2017). In 2015, the average number of individuals living in poverty in Oklahoma was 16.1 percent; however, pockets of severe poverty exist throughout Oklahoma's rural counties ranging from 10 to 30 percent (Farrigan, 2017; "Map The Meal Gap," 2014). Poverty and access work synergistically as primary drivers of food insecurity and can have a profound impact on a community's aging population especially for those living in rural communities.

Determinants of Food Insecurity of Older Adults

Meeting nutritional needs for optimal health across the lifespan can be challenging, especially for older adults. It becomes important to understand what factors may enable, prevent or are associated with food insecurity. For older adults, food insecurity is associated with multiple barriers and includes: poverty or near poverty, reduced social capital (limited family or social networks), chronic health problems, living in a food desert, social stigma, and rurality

(Buys & Locher, 2014; Dean et al., 2011; Morton et al., 2008). The literature suggests that individually or in combination these barriers increase food insecurity. Furthermore, persistent or intermittent food insecurity that occurred in the past among elderly persons may lead them to consume less nutrients, and change their body composition and eating habits making them at risk for poor health (Lee & Frongillo, 2001). Malnutrition further complicates diseases, increases disability, and increases infections and time spent in the hospital (Lee & Frongillo, 2001). The co-morbidity associated with being food insecure and inability to care for oneself makes this more difficult among the older population than the general population (Lee & Frongillo, 2001).

Poverty as a Measurement of Food Insecurity

One possible explanation of food insecurity among rural residents could be the amount of income spent on everyday living expenses. In 2015 rural households spent 10.3 percent more of their income on housing, medicine, transportation and food than urban households (Bureau of Labor Statistics, 2016). For older populations this can be particularly problematic because most seniors rely on fixed income resources (Ziliak & Gundersen, 2016). The role that income plays is heterogenic across the income spectra. For example, in 2014 nearly 49 percent of all seniors, age 60 and older, with incomes at or below the federal poverty level faced the threat of hunger whereas, individual with incomes twice the poverty level fell to 7.7 percent (Ziliak & Gundersen, 2016). More importantly, 31 percent of *near-poor* seniors with incomes between 100 percent and 200 percent of poverty were also facing the threat of hunger (Ziliak & Gundersen, 2016).

Another way of looking at poverty among seniors is to use the Supplemental Poverty Measure (SPM); this measurement reflects variations in housing costs, taxes paid and medical expenses, which tend to be higher in older adults. Under SPM, senior poverty levels in 2015 were 15 percent, compared to 10 percent under the standard poverty measure (Juliette Cubanski,

2015). In 2015, the standard poverty rates for seniors living in Oklahoma was 11 percent, above the National level of 9 percent (*Poverty Rate by Age*, 2015).

Food Deserts as a Measurement of Food Insecurity

There is evidence that those who reside in rural areas lack accessibility to supermarkets and healthy foods (Johnson et al., 2014; Morton et al., 2008; Sharkey et al., 2010). Other environmental stressors that create vulnerability in rural communities include migration of youth out of rural areas, geographical isolation, patterns of poverty, unemployment and declining economic sectors (Keyes, Cerdá, Brady, Havens, & Galea, 2014; "Rural America At A Glance," 2016). This out-migration leads to limited infrastructure forcing the closure of many grocery stores and supermarkets. This makes buying groceries more expensive and difficult for rural residents; they must rely on quick stop convenience stores which offer more processed and less fresh food (Johnson et al., 2014).

Inadequate household food resources and perceptions of poor community food resources are associated with a lower intake of a healthy foods for rural senior adults (Sharkey et al., 2010). Moreover, food insecurity is complicated and challenging to seniors that live in a food desert. In their study, Morton and colleagues found that 11 percent of seniors over the age of 70 do not own their own vehicle and cannot walk to a grocery store, relying on friends, family or others for travel to purchase food. Residents in many rural areas of Oklahoma live 10 miles or more from a supermarket or grocery store. Reduced access prevents older adults living in rural areas from obtaining food needed for a healthy diet and increases risk for diet related chronic illness (Morton et al., 2008; Sharkey et al., 2010). Furthermore, older adults may have physical limitations that prevent them from driving and might also require assistance when shopping for food, carrying food purchases or preparing meals.

Chronic Health Conditions as a Measurement of Food Insecurity

It is well established that adequate nutrition among older adults is important for improving and maintaining health for quality of life (Dean et al., 2011). Nutrition is the framework for the maintenance and prevention of chronic health conditions such as: diabetes, hypertension, lower cognitive function, obesity, and heart disease (Dean et al., 2011). Those individuals without resources to maintain adequate nutrition or access to healthy nutrition are described as food insecure. Furthermore, for seniors living with a disability the threat of hunger is almost four times higher than persons without a disability (Ziliak & Gundersen, 2016). Physical limitations can also decrease or prevent an individual from preparing food leading the individual to depend on social networks or choose quick means of food preparation such as frozen or fast-food meals (Johnson et al., 2014). Many times these food choices are poor in nutritional quality, containing high salt and high fat content. Energy-dense diets lead to over-nutrition; over-nutrition further complicates diabetes, obesity and other chronic health problems (Lee et al., 2010).

Nutrition related health problems, lack of income, and living with a disability, are not only exacerbated by food insecurity, but disproportionately affect rural segments of the senior population (Johnson et al., 2014; Lee et al., 2010). Nearly 75 percent of rural counties have areas within them designated as medically underserved and includes physician shortages and poorer health outcomes (*The Uninsured in Rural America*, 2003). Moreover, rural residents are 10-20 percent less likely than urban residents to receive preventive screening and regular medical checkups (*The Uninsured in Rural America*, 2003). This evidence suggests that seniors living in rural communities have fair or poor health and may not be receiving adequate care (*The Uninsured in Rural America*, 2003).

Social Stigma as a Measurement of Food Insecurity

Populations that live in rural areas are somewhat older than their urban counterparts and individuals living in rural environments experience food insecurity differently than those living in urban environments (Johnson et al., 2014; Morton et al., 2008; Quandt et al., 2001). Rurality can be a determinant of food insecurity for households due to: access problems, poorer health, higher rates of poverty, higher food costs, long distances to food outlets and fewer healthy options (Johnson et al., 2014; Quandt et al., 2001). To overcome some of these barriers, rural residents have established social connections and survival strategies unique to them (Johnson et al., 2014; Quandt et al., 2001). For example, reciprocity is a common occurrence in impoverished communities, and they depend on a system of mutual reciprocal actions to survive (Morton et al., 2008). Rural households are twice as likely to give and receive social and monetary support, specifically from relatives, than urban households (Morton et al., 2008). Moreover, rural residents have a greater sense of responsibility to others than urban families (Morton et al., 2008). Other protective factors for rural elders include practices of gardening or food preservation techniques and the support that is provided by traditional gender roles within this population (Quandt et al., 2001).

These rural strategies act as a buffering system against food insecurity in older adults, however this may also conceal nutritional deficiencies. Specifically, older residents may be willing to "do without" and be accustomed to periods of shortage or may make compromises in food consumption due to the cyclical nature of agrarian life that is common in rural environments (Quandt et al., 2001; Quandt & Rao, 1999) Older adults have developed coping strategies for weathering hard times and are proud to reference self-sufficiency as a part of their family heritage (Quandt et al., 2001). Moreover, a common strategy for rural elders includes the

use of religion as a coping strategy for dealing with hardships and adversity (Quandt, Arcury, & Bell, 1998; Quandt et al., 2001).

The endurance of hard times and pride at being self-sufficient can negatively affect nutrition, health and well-being in older adults. Under nutrition impacts health and further complicates chronic illness in older adults (Lee & Frongillo, 2001). Food insecure individuals have significantly lower intakes of key foods and nutrients than those who are food secure (Lee & Frongillo, 2001). Sadly, the highest rate of food insecurity for seniors is present in those individuals who live alone (Coleman-Jensen et al., 2016). In 2015, the food insecurity rate for seniors living alone in the U.S was 9.2 percent compared to 8.3 percent of seniors who do not live alone (Coleman-Jensen et al., 2016). This is a critical aspect for health, especially for those seniors who may also lack social capital to help them meet their own nutritional needs.

Social Capital as a Measurement of Food Insecurity

The ability to access food through a wide range of social networks or relations within one's own community is known as social capital. It is the basic framework associated with and surrounding an individual's social structure that they have or placed some level of trust in. Social capital consists of a network of neighbors, family, friends, and the environment that they live. Community social capital provides food insecure individuals the resources they need by providing access to transportation services and food assistance programs (Dean et al., 2011; Morton et al., 2008). Family and friends are connections within this social framework that also enable older adults access to resources by providing transportation, food, income to obtain food, and emotional support for eating normal healthy meals (Dean et al., 2011; Morton et al., 2008). A lack of social support can significantly increase food insecurity among a population. Older adults are particularly affected due to other confounding factors like chronic health problems and

physical limitations. For example, food insecurity rates increase if older adults are homebound (Dean et al., 2011). Food insecurity can also be affected by a community's lack of resources; furthermore, Dean et al., (2011) suggest that food insecurity may reflect the failure of the structural opportunities within a community to facilitate access to food among older and senior adults living within those communities.

Conclusion

The literature has demonstrated that food insecurity in older adults is complex and multifaceted. At the community level, reduced employment opportunities and decreased social and health services combine to create economic instability that impacts social well-being. At the household level, food insecurity is dependent upon individual income, price of goods, individual health, accessibility and social networks. Alone or in combination, these are the determinants of food insecurity that have a significant impact on the elderly.

It is known that the number of Americans aged 60 and older is growing rapidly, meaning that meeting the nutritional needs for this population is a challenge. Being food secure is a basic human right and a measurement of health and wellness within a community. Although redistribution of food resources is a mechanism used by governments and charities to solve the problem of food insecurity for low-income households, there is some evidence that food safety networks are insufficient (Morton et al., 2008). Communities need to address accessibility, social capital, stigma or other confounding factors associated with acquiring healthy foods. Together, these factors can reduce food insecurity within this vulnerable population.

CHAPTER III

METHODS

Study Design

This thesis study utilized a qualitative research design in which older adults living in three rural counties in Oklahoma were recruited for in-depth interviews, specifically Kingfisher, Blaine and Logan counties. These counties were chosen based upon their rural location and classification as food deserts, as well as having a higher percentage of people over 65 living in the county than the state's average. An inductive qualitative approach was used to explore food insecurity and preferences for public health programming among this population. Prior to initiation of the study, procedures were approved by the Institutional Review Board (IRB) at Oklahoma State University Stillwater, Oklahoma.

Participants and Recruitment

This study area is located in Oklahoma with a population of approximately 32,000 residents living in three counties, Kingfisher, Logan and Blaine. The population of adults over the age of 60 living in the three counties ranges from 20.9% to 25.9%, well above the state average of 19.9% ("American Community Survey," 2015). The poverty level in these counties varies between 10.6%-16.3%. More importantly, each county is classified as a food desert with more than 33% of its population living more than 10 miles from a supermarket ("Food Access Research Atlas," 2015). Many Oklahoma counties have suffered economic downturns, in the past

these rural economies were dominated by agriculture ("Rural America At A Glance," 2016), but today they are primarily made up of oil and gas mining, retail and service sectors ("American Community Survey," 2015; "Rural America At A Glance," 2016). What this means is many rural communities rely on the success and continued production levels of the oil industry. If oil industry demand production falls, so too does the economic stability within these rural counties. This has a boomerang effect for many community services including social programs and infrastructure support.

The initial phase of this study utilized core concepts of voluntary sampling to identify participants for the study. During this phase, 15 participants were enrolled on the basis of meeting eligibility criteria: 1) Over the age of 55, 2) Residing in Logan, Kingfisher or Blaine counties and 3) Having experienced food insecurity within the last 12 months. Sampling and data collection continued until the level of data "saturation" was reached, meaning no significant new codes or themes are noted. Sampling occurred at low-income senior housing units, community food banks, congregate meal locations, senior citizen centers, and local churches that would yield the highest portion of older adults. I performed telephone or in person conversations to establish dialog and addressed any concerns the participants had about the study. During this time, participants were screened for eligibility (see Appendix A).

Procedures

If the participant met the eligibility criteria and wished to participate in the study, an in-person interview was scheduled with the participant at a location that allowed for privacy, confidentiality, and transportation convenience for the participant. The study involved in-depth interviews utilizing a semi-structured interview guide developed by the principal investigator. Interviews were 20-60 minutes in length and conducted by the principal investigator. At the

beginning of each interview, participants were given informed consent documentation to sign in order to participate in the research study. The form includes confidentiality practices, an outline of the interview process, and an explanation of how the data will be used by the investigator.

After participants consented to participate in the study, participants completed a brief demographic questionnaire (see Appendix B) that included age, gender, ethnicity, marital status, education, income/retirement, employment status, family status and health status.

During each interview, narratives were elicited from each participant. Questions were given to participants about defining food insecurity: applying the definition to their life experience, details on how they obtain or prepare food, what if any barriers do they have in obtaining food, what food programs they participate in and details about their social capital.

Interviews were digitally audio-recorded, fully transcribed and checked for accuracy. During the course of conducting interviews the principal investigator took interview notes to record key aspects of the interview discussion, descriptions by participants, observations, impressions and emerging conceptual issues. All hand-written notes were transcribed into digital format.

Measures

Interview Guide

A semi-structured interview guide (see Appendix C) was developed to capture narratives from participants. Participants were asked ten questions with twenty various probes. During the interviews the questions and probes were moved around as deemed appropriate by the principal investigator. This was done so that as participants were giving narratives, they were encouraged to elaborate on their response. In an effort not to insert unnecessary bias, probes were used to

generate participant discussion. Due to the methodology questions and or probes were altered as needed during preliminary analyses of interviews before any subsequent interviews.

Narratives were elicited from participants on various topics, sub-topics and applicable probing questions. Main topics included were: 1) participants' definition of food insecurity; 2) impact of food insecurity on daily life; 3) perception of participants' own food insecurity; 4) exploration of participants' food-insecurity in regards to their health 5) exploration of the impact of food insecurity on participants' social behaviors. Sub-topics discussed during the interview included: 1) applying the participants' definition of food-insecurity and comparing it to how they perceive themselves to be food-insecure; 2) occurrence and duration of symptoms of food insecurity; 3) knowledge level about social programs available for food security; 4) Social capital they have for food security. Probes were used at the discretion of the interviewer to: 1) encourage elaboration and clarification from participants and 2) to assist with obtaining narratives from reticent participants.

Demographic Questionnaire

Participants' demographic data was acquired using a questionnaire instrument. Additionally, health and social structure characteristics were assessed. Demographic variables to be captured in the questionnaire included: age, gender, ethnicity, marital status, educational level, annual household income, and employment status. Additional questions addressed chronic health conditions and history of treatment of mental health diagnosis.

Data Analysis

Demographic Data Analysis.

For the demographic variable "age", mean and standard deviation of the sample was calculated. For the demographic variables "family composition", "ethnicity," "personal education level,"

"personal income," and frequency and percentage of the sample was calculated due to the nominal or ordinal level of measurement of these variables.

Interview Data Analysis

The interviews were semi-structured, digitally audio-recorded, transcribed verbatim and checked for accuracy against the recordings. Interview data from this study was analyzed using a qualitative method to inductively identify and interpret concepts and themes that emerge from each interview transcript (Corbin & Strauss, 2008). This method included multiple readings of transcripts and interview notes, and analytic induction via open and axial coding to thematically organize transcripts. Demographic data was used to highlight occurring themes.

CHAPTER IV

RESULTS

Descriptive Statistics of the Sample

In total, 15 interviews were conducted. Table 1 displays the descriptive statistics of the sample. Participants ranged in age from 58 to 91($\bar{x}$=72.3, *SD*=9.3) and included 9 (60 %) females and 6 (40%) males. In terms of ethnicity, twelve (80.0%) identified as white, two (13%) as African American, and one (7%) as American Indian. Nearly all participants lived alone (80%), whereas only three participants (20%) lived with a spouse. In regards to education, the majority (60%) of participants reported having completed at least some college or technical trade school training. This is in comparison to five participants (33%) whose highest level of education was a high school diploma or GED, while one participant reported completing an undergraduate degree (7%).

In regards to income, 13% of participants were ineligible for social security benefits. The majority of participants, 40%, reported annual pre-tax household income of $12,000 or less, 20% reported $12,001 - $15,000, 13% reported earning $15,001-$20,000, and 27% reported earning more than $20,000. The majority of participants (93%) identified as not working or retired.

Of those interviewed, one participant claims to have never been to a doctor and only takes over the counter medicines. This individual is not included in the medical health analysis. The remainder of participants 100% report having been diagnosed and treated for a chronic condition for which they take daily medication. In addition, half (50%) of the participants

reported having been diagnosed or treated for a mental health condition, while half (50%) reported having no treatment or history of a mental health condition.

Table 1

Demographic and Other Characteristics of Study Participants, Food Insecurity Study (n=15)

	$\bar{x}$	SD
Age	72.3	9.3
	f	%
Gender		
Female	9	60
Male	6	40
Ethnicity		
American Indian	1	7
Black/African American	2	13
White	12	80
Education		
High School Diploma/GED	5	33
Some College or Technical Trade Schooling	9	60
Completion of Undergraduate Degree	1	7
Annual Household Income (Before taxes)		
$12,000 or Less	6	40
$12,001-$15,000	3	20
$15,001-$20,000	2	13
over $20,001	4	27
Lives Alone		
Yes	12	80
No	3	20
History of Mental Health Treatment		
Yes	7	50
No	7	50
Diagnosed and Treatment for Chronic Illness		
Yes	14	100
No	0	

Older Adults and Risk of Food Insecurity

Table 2 displays the emerging codes and sub-codes for the study. The 15 participants identified five main codes to expound on the risk of food insecurity for older adults living in a

rural environment: 1) seniors living in or near poverty have increased risk of food insecurity, 2) the impact living in rural communities has on food insecurity, 3) food programs and chronic illness, 4) willingness to seek help or guidance about food assistance programs, 5) weak or absent family relations. Ultimately the lack of monetary income, minimal community resources, weak or absent family relations and inadequate food programs lead to poor nutrition that directly impacts the health for older adults.

During the in-depth interviews, participants identified a number of issues surrounding older adults food security and challenges to maintaining good health. These underlying issues are additional factors that increase older adults risk of food insecurity and include: 1) unexpected monetary expenses; 2) oral health problems; 3) inadequate food programs; 4) poor community transportation system; 5) perception that others need assistance more; 6) isolation and loneliness leads to unhealthy eating habits.

Table 2

Emergent Codes and Sub-Codes for the Study

Code	Sub-Code
Food insecurity definition	Healthy food insecurity defined
Poverty or near poverty determines food insecurity	Unexpected expenses Higher cost for healthy foods Lack of dental health Monetary pressure
Food programs impact on food security	Nutrient dense Not appropriate for chronic health Poor quality
Rural community resources	Transportation services Activities for seniors Enrollment services Non-profit organizations Internet availability

Family relations	Isolation Desire not to burden Improves food security
Direct impact on health	Loneliness Social isolation Poor nutrition and food behavior Health care system

Codes are presented below to highlight and identify emergent codes and connections. Pseudonym participant names are used to maintain participant confidentiality. No changes were made to participant responses to ensure correct interpretation during analysis.

Food Insecurity Definitions

Although some participants describe food insecurity as having enough food to eat, for others the definition of food insecurity included several themes related to health and access; including having the means to purchase nutritious foods for good health, maintaining oral health, having reliable transportation to purchase food, feeling socially connected and having the physical ability to perform this daily living activity. Shelly (age 69) describes food security this way, "I think it's a combination of being able to afford what I should eat, having the strength to be able to cook and clean it up and getting there."

Poverty or Near Poverty is a Determinant of Food Insecurity

The majority (73%) of participants in this study are living below or near poverty. Poverty is a multifaceted problem that can be further compounded by unexpected expenses and for many of these participants not having the money to purchase food occurs every month. John (age 60) describes it like this "…right now, I have 80 dollars in my wallet to last me until the 3rd of next month and this is only the 10th, that's a long time". This is a common theme that was observed

within this study group. Many older adults are on a fixed income and this can be a constant concern and worry. Janet (age 58) "Money for food…It happens all months, it happens the last two weeks of the month".

In addition to basic food needs, many participants also report having expenses that fall out of their normal budget. These unexpected monetary expenses include transportation costs, unforeseen medical expenses, and the cost to maintain good oral health. One participant described a transportation expense this way:

> My car just blew up and motor locked up and had it towed, it was almost $200.00, I said I don't have any money; I'll just give you the car for it. I was gonna have to borrow to pay them and $300.00 to fix it up and it wasn't worth it. (David age 77)

Other individuals who no longer drive or own a car experience these expenses when utilizing the community transit bus as Shelly (age, 69) describes it, "…it costs so much a stop. First of the month I go to the bank and the store. Each stop is $1.50. I've spent $15.00 so far, it varies on how often."

Individuals with fixed incomes can have monthly budget shortfalls where they have to decide on how or if they will buy medication or obtain health services. Nancy (age 66) experiences this, "if it wasn't for one church friend of mine, I wouldn't be able to take one of my medications I'm suppose to take. They're very expensive" One crucial overlooked health need among seniors is oral health. As people age they can have persistent and painful teeth or mouth problems that determines type of foods that can be eaten. In addition, many seniors can lose dental insurance at retirement and dental health expenses are not covered under Medicare. This gap in dental coverage also applies to Veteran's services as described by one participant:

> When you retire the first thing they take away is dental insurance. I'm a veteran of 2 wars, Korea and Vietnam and you would think being a veteran that the VA would offer you some dental health. I had two teeth that had to be pulled and I needed dentures. I was told in order to qualify one of two things had to happen, I had to have a

> service disability of the jaw and teeth or I had to be a prisoner of war. I give up on the VA, I'm independent I'm not gonna beg anybody for anything. (Don, 85 years old)

What happens is that many times older adults with oral problems end up sacrificing their own health by eating unhealthy foods or foods that further complicate their existing health problems as described by David (age 77) "My dentures can't hardly bite a banana. It has me eating stuff I shouldn't be eating. The teeth just don't fit and can't chew. Save up $500.00 to get the top plate done again, but I didn't do it." Having good oral health can be critical for seniors because as one participant explains it, having painful mouth problems can change eating patterns resulting in significant weight loss:

> I have a partial on the bottom when I got it, it got infected with blisters on my mouth, they don't know what it is. I can only eat so long and I have to take it out because food gets under it and hurts the blisters. …I've lost a lot of weight, about 40 pounds in the last three years. I can't eat potatoes I like. I can't chew meat or anything that can get under it. It limits me. I eat cream of wheat and bananas. For lunch I eat Chinese dinners. I eat cheese and soups. Suppertime I have my diabetic drink glucerna and I fix jello. (Becky, 78 years old)

Unexpected transportation, oral health and medical expenses were common for participants in this study. Some participants acknowledge short falls and make allowances in their food budget: "I had 3 teeth pulled and thank god my doctor let me charge. I got him paid off, so I had to make allowances for that in my grocery bill" (Shelly, age 69). For older adults monetary pressures are created when individuals try to include buying healthy food, paying for bills, and anticipating unexpected expenses in a monthly budget. This brings stress and worry about not having enough money to cover these expenses:

> Well its like I get my check on the 3rd of every month I get my money and I pay my bills, I get my rent, I pay my utilities, I have loans that I have to pay on. Then you got gas for your vehicle by end of the day on the 3rd I'm broke basically. So planning meals or wanting to cook is difficult cause you can't spend the money you wanna spend to get the food to cook. (John, age 60)

As a result of these monetary pressures, participants are choosing unhealthy foods because these foods are cheaper and have a longer shelf life as highlighted by two participants:

> Healthy stuff like fruit, fruit is so high. If you eat fruit and you eat the right kinds of fresh vegetables, sometimes it gets expensive. Especially towards the last of the month because you know they don't keep. (Paula, age 74)

> Well last week or week and half of the month I might have to choose gas over food. My bills stay pretty much the same. I've got a supplement that's $150.00 of course $125.00 comes out for Medicare that's new this month. So as I see my money go down of course it gives me limited choices on food. Food actually comes last. Of course you gotta eat to live. I've even bought stuff I shouldn't have because it's cheaper. That's been rough. (Nancy, 66 years old)

Food Assistance Programs

One primary safety net for assisting seniors in need or living in poverty is federal and state food assistance programs. Although participants in this study are receiving federal assistance from the SNAP program to help with food expenses, many of them consider it a meager amount that can fluctuate as monthly changes occur:

> "…oh yeah I get $16. The pharmacy bill from my last re-cert went down, my rent went down and I lost food stamps. If you gain here you lose there, it's a wash. We get a social security raise, you lose on food stamps and your rent goes up. (Shelly, 69 years old)

In addition, some participants see SNAP assistance as something for others that need it more and not necessarily to help themselves, Becky (age 78) "I put in for them and only got $7, somebody else could use it that needs it worse than I do." and David (age 77) describes his benefits like this "It's mostly for children".

Many participants in this study also receive a monthly commodity box from USDA's Commodity Supplemental Food Program (CSFP). Nevertheless, there are many foods in this program that participants are unable to eat due to dietary restrictions or chronic illness. Shelly (age 69) describes commodities in this way "some of it I can eat, some I can't eat" and Becky (age 91) admits "the commodities there's lots of things that don't suit me. I don't do juices."

There is also a congregate adult nutrition program known as the Wheatheart Nutrition project. A few housebound participants get these meals delivered, however only one individual in this study regularly attends meals at the congregate site. Reasons for not participating in the congregate meals vary among the participants, some report not having reliable transportation, others are choosing not to participate due to dietary restrictions, "I wouldn't get it, because I fix what I can have." (Becky, age 78) or as one participant responded, "I've got friends that go…I'm not that old yet, to sit around with a bunch of old women." (John, age 60). While others report that food quality and the types of foods provided are not acceptable for seniors with chronic health problems. David (age 77) describes it like this, "…most of the time didn't like what they send…I was throwing more away than I was eating." and from another participant "…the food quality has gone down in taste and not adequate for seniors that have difficulties with certain foods. They use to have baked goods, now many of those foods are processed foods." (Paula, age 74).

Rural Community Resources

All participants in this study live in a rural community. Senior adults can struggle in these rural communities if resources are limited or not available. More than 25% of the participants in this study are not able to drive or do not have a vehicle and must rely on the community's transportation system for shopping or medical appointments:

> ...there's only one transportation here and they quit running at 4:00 p.m., unless you have an appointment already scheduled. You can't call them most of the time on that day and say "I've ran out of milk can you run me to Wal-Mart?" because it won't happen. (Shelly, age 69)

This community transport system does charge fees that can add up for individuals on fixed incomes and requires planning as described by Nancy (age, 66), "…they have so many riders

they can be very choosey. It's $1.50 each way, round trip is $3.00 and if you have to go somewhere else they may or may not agree to take you."

Many of the participants in this study described at least one familiar source such as neighbors or church members that they have relied on for transportation, information about social services and help with enrolling in food assistance programs. Janet (age, 58) discussed how heavily she relied on the non-profit organization Opportunities Inc. in her community as a food bank and resource for information about services available. Others in this study received food program information from the social coordinator in their community neighborhood or from a local church:

> My church family, they help me tremendously, if they see me struggling then they'll pitch in. Like I say I have the food bank here at church and I can also go to the food bank in Watonga at the Indian Food bank. (John, age 60)

Some participants also have very supportive family members that will provide food or money described here:

> "Now I don't worry a whole lot about my housing because my two children are going to make sure I'm going to be ok on that because they are helping me with some of the other things like a couple of my higher bills." (Linda, age 70)

And Joann (age 72) discusses support from her family in this way "…my family brings me meals everyday."

Nevertheless, some of these participants describe not "wanting to bother" family members Don (age, 85) describes his family this way "Most of the time I try to get by. I don't want to bother her, she's got enough to do without worrying about me." and Shelly (age, 69) describes her hesitation about asking family for a ride to the store "My kids always working so I hate to bother them, so I try not to ask."

Although many of the participants reported having good family relationships, one-third of participants in the study reported not having good family relationships or lived more than an hour from family members and have leaned on others as described here by Nancy (age 66) "…he's (son) more than willing to let people at church help me. He's been here one time in the last year". David (age 77) describes a similar situation "My son lives in Oklahoma City and daughter in Texas, but I don't see them much. I get that car though and we're gonna go see them cause he doesn't work on Fridays". The absence of family can leave some older adults no other choice but to rely on friends or their community neighbors to fill this role as described by Becky (age 78) ":…I wasn't getting along with my family and this can be my family and that's what I'm gonna do".

Food Insecurity and Health Implications

Affording healthy nutritious food is also a primary determinant of health for seniors, however many of the participants in this study describe healthy food as an "idea" and not common practice for them. As mentioned previously monetary constraints not only have an effect on food choices but also impact purchasing power. This is especially true when buying fresh produce. Nancy (age 66) describes it this way, "I'm not gonna tell you I stay on the diet I'm suppose to be on because sometimes I just don't have the money, especially the last week. And a lot of stuff I eat is little frozen dinners, something as cheap as I can get usually to last." What this means is purchasing power for fresh produce is limited and these foods must continually be replaced further placing strain on individuals with fixed incomes as Paula (age 74) describes it, "If you buy them when I get my check on the 3rd, they don't last, you know it's harder to get food at the end of the month. When you only get paid once a month, it's hard". The monetary pressure and short shelf-life of fresh produce is a constant strain endured by these

participants, forcing them into choosing foods that are harmful to their health and further complicate their chronic illnesses.

All participants but one in this study disclosed having at least one chronic health condition. In addition, 12 participants in this study reported that they live alone. Isolation can leave individuals feeling lonely and depressed leading to unhealthy eating behaviors further exacerbating chronic health illness:

> With older folks if you eat alone…some days, a lot of days I'm alone, and those days I don't want to cook a big meal, just me. So I just snack around. And that way they don't eat like they're suppose to. (Paula, age 74)

This idea of snack eating or not preparing a meal when alone was a common theme among these participants no matter their income level as highlighted here by two participants:

> I snack off and on that's why I don't eat good, I eat cookies and all that. I very seldom eat a meal because I can't afford to go out to eat and I don't like to cook for just myself. (Becky, age 78)

> No, cause I usually eat cereal for breakfast and packaged salad for lunch and supper. I have like pot pies or something like that, that I can microwave. I don't cook anything. The only thing I use the stove for is to make tea. I just don't wanna go through the mess of doing it since its just for myself. (Tom, age 68)

The majority of participants in this study are single and eat most of their meals alone leading to loneliness or depression. Half of the seniors in this study report having been or currently receiving treatment for a mental health condition. Becky (age 78) describes her community this way "… because a lot of them are lonely. When you don't got any visitors, their kids don't come see them and that's sad…"

One way to help with loneliness and depression is engagement with others and feeling a part of a community. Although this community does have a senior center and there is a local congregate meal program for older adults, many of the study's participants do not attend these programs as previously mentioned. Nevertheless, several of the participants discussed how much

they missed their neighborhood's community dinners and activities as told by Barbara (age 91) "When I first came here they had a Wednesday meal every week. Now it's once in a while. I miss that. I miss that community." and Don (age 77) discusses the resident that organized the neighborhood meals " … she kept things going, had the meals. They cut out the bingo thing, had a lot of fun playing bingo." One participant Becky (age 78) describes the neighborhood community as "my family" and goes on to say "Getting together, that's what we need here. We can help each other."

Besides the role of community, one participant also identified a strong social life helps him feel good and keep active:

> Old people don't like to be around old people. Everyone is going through their problems. I got good friends that we go play cards with. We keep active that way, we laugh, we feel good when we leave, the people that set around, think inward. (Leon, age 83)

Feeling or being part of a community can also include online activities. When participants were asked about their participation in online social media groups, like Facebook, many seniors are aware of and do participate in these internet groups: "Yeah I do Facebook, kids know me as Granny and Grandpa" (Melba, age 72). Nevertheless, several participants mentioned that they do not participate or dropped internet service because of the extra expense, Don (age 85) "the internet costs so much…" and another participant responded this way "I was, I couldn't afford it I had it discontinued. (Shelly age 69)"

Health Care and Chronic Illness

All of the participants in this study identified as having at least one chronic illness. With this in mind, participants were asked if any discussion about food security or eating healthy foods were made by their primary health care provider. Most of the participants had not been counseled on healthy eating, Leon (age 83) describes the situation this way "…they are

knowledgeable about some things, but some things you need to go to a nutritionist. But the doctors are not into it." In addition, most participants had not been asked about their food security and were hesitant about having any discussion as described by David (age 77) "…they never ask about it. I probably could talk to them, but I'd have to swallow some pride". Even so, there were two participants that had discussed healthy eating behaviors and food security issues with their physician as highlighted below:

> Oh I tell her all the time, you guys want me to eat right, but there ain't nobody gonna offer me money to help me eat right because it's expensive to eat right….I can go spend 100 dollars on fruits and what not, healthy stuff and don't have nothing when I get home. But I can spend a 100 dollars buying "john food" and I've got a lot of stuff. (John, age 60)

> Yeah, I can talk to him and I have done it. There's nothing he can personally do, but we have a hard time making ends meet and buying food. He says, "It pisses him off when I have to sit here and tell you, that you should be eating this and this, but in my heart and in my mind you can't afford to do that." (Shelly, age 69)

As presented above, participants reported that food insecurity is multifaceted and that there are complicated parameters that must be overcome for older adults to maintain food security.

CHAPTER V

DISCUSSION

Although this study found a large connection between food insecurity for older adults living in poverty or near poverty, food insecurity is multifaceted and also encompasses familial, social, and community capital. A number of connections attributed to poverty or those living near poverty are common to 73% of the individuals interviewed for this study. More importantly, food insecurity experienced by these participants reflects failed opportunities within the community to facilitate access and provide adequate food services needed by older senior adults. These findings also suggest that strong familial and social relationships are important for maintaining food security. This thesis represents one attempt to explore, using qualitative methodology, facilitators and barriers of food security for older adults living in rural Oklahoma.

Similar to the work of Buys & Locher, 2014; Deat et al., 2011; Ziliak & Gundersen, 2016, the results of these qualitative interviews suggest that older adults experience food insecurity if they live in poverty or near poverty, have reduced social capital (limited family or social networks), live alone, have a chronic illness, or live in a food desert. Other barriers of food security that emerged include inadequate food programs, poor oral health, and loneliness.

The data suggest that many older adults do not actively seek out available senior food programs for maintaining food security. One reason for this is older adults do not perceive themselves to be food insecure as compared to others and therefore do not actively seek out or participate in available food programs. Furthermore, if individuals were turned away because

they did not qualify for assistance, this experience also prevented them from seeking assistance from other programs. Many times lack of family relations and reduced social networks determine the amount of assistance received by older adults. These findings are similar to what is found in the literature (Dean et al., 2011; Morton et al., 2008; Quandt & Rao, 1999). Nevertheless, senior adults with strong social capital including familial capital or strong social connections were often encouraged by these family members or through social networks in a coordinated effort to enroll or participate in senior food programs that are available to them. Similar to the findings of Morton et al., (2008) individuals were more likely to enroll or participate in food assistance programs if they had some level of trustworthiness for these social networks. Meaning if an individual trusted in these social connections they were more likely to participate or enroll in food programs.

Another finding from this study is food programs are inadequate for older adults living with chronic illness. Current food programs often contain foods with salt, added sugars and refined grains, all of which are not a healthy diet. This is similar to the findings by Morton et.al. (2008). I found that although food insecurity and the components of diet quality are different concepts, they both connect back to how and what kinds of foods are accessed. In this study 40% of participants living with diabetes are unable to eat much of the food provided by food assistance programs.

Community-oriented dietary interventions are suggested by the findings in this study. Enhance the community safety net by increasing community efforts to bolster civic activities such as community kitchens, farm-to-seniors, and cooking clubs. These types of programs could promote community action among older adults by not only delivering food to them, but also engaging them to participate in public food venues while also improving access to healthy foods.

This type of intervention might motivate older adults helping them to build strong social relationships, improve bouts of loneliness making them feel they are part of the community around them. The association between low community social capital and food insecurity supports findings of nutritional risk for older adults with low incomes as described by Dean and colleagues (2011). Older adults living in neighborhood communities demonstrate an overwhelming appreciation for their neighbors creating strong interwoven social networks. Furthermore, when these communities trust and engage socially they maintain strong social capital. These findings are similar to the growing literature suggesting social capital is an effective predictor of health behaviors (Dean et al., 2011; Keyes et al., 2014; Whitley, 2013). Rural communities should tap into this capital and broaden it among its older adult population. Strengthening social ties can serve as a buffer against loneliness and improve social connectedness.

This research also suggests that an aging-in-place older adult population requires transportation to access healthy food resources. These findings are similar to the findings within the literature (Dunn et al., 2012; Johnson et al., 2014; Morton & Blanchard, 2007). Rural communities should assess their transportation infrastructure and develop a mix of public and private transportation services for residents with low access. In addition, efforts by the federal transportation administration (U.S. Department of Transportation) to ensure the state rural transit assistance programs are devoting attention and resources towards older residents, particularly those residents that are living in rural communities, are warranted.

In this study oral health is critical for maintaining food security. Seniors often times reduce food intake or eat unhealthy foods because of oral health problems. Enhance the community safety net by developing a coalition of individuals and organizations to promote and

improve oral health for older adults. This collaboration among community stakeholders would have the primary task of providing and promoting good oral health programs to include sharing resources for oral healthcare for older adults in the community.

One additional intervention that came from this study is to improve the conversation among older adults with their health care providers. Ask and gather information during health visits to assess a patient's current life situation and make it available to providers and social workers. This information can give a much better understanding of what patients are going through to maintain food security and can also be used connect individuals to available services. This approach can proactively push health care in a personalized direction while also linking individuals to available community social services safety net.

Finally, it is well documented that a healthy diet reduces risk of chronic diseases such as cardiovascular disease, diabetes and some cancers. The challenge to community action and public policy is to find ways to increase access to nutritional foods so that health risks are reduced. Furthermore, improving social structures that enable nutritious food access and social functioning are important for older adults living in rural communities that lack social and familial capital.

Limitations

While these findings are established by a small sample size used in qualitative investigation, they do represent a potential understanding of the barriers and facilitators of food security for older adults living in rural Western Oklahoma. Interpretation of the findings and evaluation of their significance should be made within the context of the limitations of the study. Additionally, the present study employed purposeful and theoretical sampling of older adults living in rural Western Oklahoma. Participants were recruited through advertisements at low-

income housing areas, senior citizen centers and through organizations that serve older adults. It cannot be assumed that this sample is representative of the larger population of older adults living in rural Oklahoma; however, this is not the goal with qualitative studies. Further, these results may not generalize well to older adults living in other rural communities. Finally, I relied on the self-reported definitions, experiences, and behaviors presented by the older adult participants. Self-report may reflect potential bias inherent to the use of interviews for data collection.

Study Implications

Although the findings of this study are primarily intended to identify older adults at risk for food insecurity living in rural Oklahoma, these findings shed light on a number of implications for future public health research and for health promotion, interventions, practices and policies. Clearly these results show that older adults living at or near poverty are unable to consistently purchase fresh fruits and vegetables, lack oral healthcare, need social connections and are under monetary pressure in their everyday life activities. If these items are not addressed, a myriad of chronic health conditions can occur which further complicates other disease conditions leading to premature death or years of potential life lost before age 75 (YPLL-75). It is also clear senior adults enjoy community meals and activities within their local neighborhood community. Further research should address how to strengthen community partnerships and create networks of volunteers to bring these types of services to older adults living in rural communities. The challenge ahead is how to form these communities within the community at large and provide them with the tools and resources needed for maintaining a healthy lifestyle that includes meeting dietary needs and assisting them in overcoming monetary constraints for good health.

Conclusion

In summary, the present study explored and discovered the barriers that determine food insecurity in older adults and the mechanisms involved that increase the risk of being food insecure within this rural population.

Additional empirical research is needed in the area of older adults to improve their food security. Specifically, additional research is needed to fully explore and understand how to develop and implement adequate community food programs for older adults. This may include policy and program shifts for implementing foods that do not contribute to disease states or further complicate chronic illness as previously described by Morton at.al. (2008). Ultimately, future research is needed to understand and validate the community's role in providing resources and outreach services for their older population to improve health and ensure older adults are receiving assistance needed to overcome food insecurity.

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APPENDIX A

ELIGIBILITY SCREENING TOOL

Older Adults Food Insecurity Study

This is a tool to be utilized by the principal investigator during personal contacts with potential participants to screen for eligibility for the Older Adults Food Insecurity Study.

Q1. What is your age? _____ years old.

Q2. What is your gender?
……. Male
……. Female

Q3. Is your residence in Kingfisher, Blaine or Logan County?
……. Yes
……. No

Q4. Have you ever experienced a time where you have experienced skipping a meal, not had enough money for food that you want, eaten less than you wanted during the past 12 months?

APPENDIX B

OLDER ADULTS FOOD INSECURITY STUDY QUESTIONAIRE

This is a study about older adults and food insecurity. In this questionnaire you will be asked several personal questions; however, all your answers will **remain confidential** to the full extent allowed by law. Therefore, please read the questions carefully, and please answer truthfully and accurately. Your participation in this study is very important for my research and is greatly appreciated!

PLEASE DO NOT WRITE YOUR NAME ANYWHERE ON THIS QUESTIONAIRE.

DIRECTIONS: For each of the following questions, please **circle the number** corresponding to your response. **Circle only one response per question**.

Q1. What is your current age in years? (Please write in numbers.)

_____years old

Q2. What is your gender?

1…….Female

2…….Male

Q3. How would you identify your race or ethnicity?

1.....Asian

2.....Black/African American

3.....Latino/Hispanic

4.....Native American/Alaskan Native

5.....White

6.....Mixed

7…….Other

Q4. What is your current marital status?

1…..Single

2…..Married

3…..Separated

4…..Divorced

5…...Widowed

Q5. What is your highest level of completed education?

1…..Less than High School Diploma/GED

2…..High School Diploma/GED

3…..Some College or Technical Trade Schooling

4…..Completion of Undergraduate Degree

5…..Graduate Degree (e.g., MA, MS, MBA, PhD, MD)

Q6. What is your current monthly household income (before taxes)?

1…..less than $500.00

2…..$501.00 – $1,000.00

3…..$1,001.00 - $1,500.00

4…..$1501.00 - $ 2,000.00

5…..more than 2,001.00

Q7. What is your current employment status?

1…..Employed Full-Time (35+ hours per week)

2…..Employed Part-Time (less than 35 hours per week)

3…..Unemployed (Looking for work)

4…..Retired (Not looking for work)

Q8. Have you ever been diagnosed by a licensed professional (primary physician, psychologist, psychiatrist or therapist) for a mental health condition (e.g., depression, anxiety disorder, bi-polar disorder, et cetera)?

1…..Yes
2…..No

Q9. Have you ever been diagnosed by a licensed professional (primary physician, physician assistant, nurse practitioner) for a chronic health condition (e.g., heart disease, coronary obstructive pulmonary disease (COPD), high blood pressure, et cetera)?

1…..Yes
2…..No

End of questionnaire. Thank you for your time!

APPENDIX C
OLDER ADULTS FOOD INSECURITY INTERVIEW GUIDE

FOOD INSECURITY PROJECT
INTERVIEW GUIDE

Version: May 1, 2017

Study ID: _____

Interviewer: _____

Date of interview: _____

Location of interview: _____

Time: _____ am/pm

Introductory statement for all research participants:

[After obtaining Informed Consent]

First of all, I would like to thank you very much for participating in this project.

We're going to talk to you about your food security and those social relationships related to your food security for your health. I want to remind you that you are not under any obligation to complete the interview. If any of the questions we talk about make you feel uncomfortable, please let me know. We can go on to the next question or end the interview if you want.

If you need a break at any time, just let me know.

Do you have any questions for me before we start?

I. Patterns of food insecurity

Estimated time: 15 minutes—SMALL NUMBER OF QUESTIONS—DO NOT REQUIRE TOO MUCH DETAIL

<u>Intro</u>: First, I would like to ask you about any *food insecurity* you may have experienced in the *past twelve months (one year).*

Question	Objective
1. Think about how you have obtained food over the past twelve months. Tell me about that process. *Probes for all participants* **a. How many times during the day do you eat?** **b. Do you prepare your own meals? Do you have any physical difficulties that prevents you from preparing meals?** **c. Are most of the meals you eat done at home or do you go out and eat?** **d. Do you do things differently with your food purchases or eating meals depending on a particular time of the month? Have you skipped any meals during the day due to lack of food in your house or because you ran out of money to buy food, or used the money you had for medicines?** **e. What kind of help or food do you receive from the community? Do you receive food from your church or your family or neighbors? What kind of help with food or meals do you receive?**	To identify patterns of eating and meal preparation.

Question	Objective
2. With thinking about the food you shop for and how do you get the food you need? *Probes for all participants*	To find out what "barriers there are for shopping for food ".

f. Where do you purchase the majority of your food? (grocery, fast food, quick stop) How often do you shop? **g. Do you drive yourself to the store or call for a ride?** **h. Are you physically able to do your own shopping? Including can you carry purchases?**	

Question	Objective
3. (How) would you define "food insecurity"? **4. Have you ever experienced food insecurity?** **a. Yes____Tell me about that. Why were you food insecure?** **b. *No____ go to Q3***	To find out what "food security " means in participants own words.

ACCESS TO FOOD AND SUPPORT

Question	Objective
5. Have you ever worried you run out of money to buy food before you got paid? **a. Yes ____ Tell me about when that happened.** **b. No _____**	

Question	Objective
6. Do you ever eat less or differently than you normally would or "skip" a meal because you ran out of money or were unable to get to the store? **a. Yes** Proceed to Q7 **b. No next section**	To identify patterns of the participants

Question [If had skipped meal due to money)	Objective
7 . Thinking about the time you have	

eaten differently over the past twelve months, tell me about it in general. *Probes for all participants*? **f. How many times have you skipped meals during the past year because you did not have enough money to buy the food you wanted?** **g. Have you ever had to choose between medical or housing expenses and buying food?** **h. Do you ever receive money from family or friends to buy food?** **i. Do friends, family or your church ever bring you food to eat or give you money for food?** **j. Do you ever barter or trade goods or services for food? Do you have a vegetable garden?**	

III. <u>Experience and knowledge about food assistance programs.</u>

<u>Estimated time</u>: 10 minutes—SMALL NUMBER OF QUESTIONS THAT DO NOT REQUIRE TOO MANY DETAILS

<u>Intro</u>: Not we're going to talk a bit about food security programs. I would like to ask you about the different food programs in your community.

Question	Objective
1. In your own words, how would you describe what food assistance is?	To understand if the participant knows what food assistance is.

Question	Objective
2. Are you aware of the food assistance programs available in your community? a. Yes_____(if yes go to Q3) tell me about them. b. No _____go to Q?	

Question (if participates in food program)	Objective

3. Do you participate in these food assistance programs? a. Yes_____ go to Q4 b. No _____go to Q5	

Question	Objective
4. Can you tell me which programs you participate in? Tell more about how you found out about local food assistance programs? *Example probes (use only if participant does not speak or does not cover important topics)* a. When did you first begin using the food assistance program? b. Have you ever recommended to others or friends to use the program? Why did you recommend the program? c. What do you like most about the program? Least?	To understand how participant learned about food assistance programs.

Question	Objective
5. Why don't you participate in local food assistance programs? *Example probes (use only if participant does not speak or does not cover important topics):* a. Some people use words like 'welfare' or 'charity'. Do you use these words to describe people who participate or use local food assistance programs? b. Sometimes people are not aware of the types of food assistance programs. Do you know about the different food assistance programs available to you?	To understand why participant is not using food assistance.

c. Sometimes people are unable to sort through the paperwork of enrolling in programs, are you able to sort through the enrollment forms? d. Often people are embarrassed or feel shame for using food assistance programs, do you feel shame or embarrassment?	

Question	Objective
6. Among your friends and peers and the people you are around, do any of them participate in a food assistance program? a. yes___ which ones? b. no____ why?	To understand food assistance seeking

Question	Objective
7. If you ever feel needed to talk to someone about food insecurity, like a professional, do you know who to contact? Example probes (to be used only if participant does not speak or does not cover particularly important topics) a. Who would that person be? b. Do you know the phone number or location of the closest state agency? c. Do you know where your local food banks are located? Do you know the times and hours they are open?	To understand professional seeking

IV. Intervention opportunities

Estimated time: 25 minutes—SMALL NUMBER OF QUESTIONS—GET AS MUCH INFORMATION AS POSSIBLE

Intro: One of the ultimate goals that we have with this study is that we want to reach out to rural older adults and offer better access to health information and services. With that in mind, I would like to ask you a few questions.

Question	Objective

1. Would you say that you belong to any community programs for older adults ? *Example probes (to be used only if participant does not speak or does not cover particular important topics):* a. Do you feel there are other people like you in rural Oklahoma? b. Do you see yourself as part of any communities on the internet? Like Facebook? c. Do you see yourself as part of any ethnic communities? d. Do you see yourself as part of any social communities (religion, sports, hobbies)?	To understand community involvement

Question	**Objective**
2. What do you think are the best places and ways to reach other older adults living in rural communities? *Probes for all participants* **a. If we wanted to get information out…** **b. If we wanted to provide services… (health testing, food education, shopping education, care, annual health exams)** **c. If we wanted to offer support … (emotional support or other services)**	To determine channels for reaching rural older adults.

Question	**Objective**
3. Where do you currently go for health care visits? *Probes for all participants*	To understand health care access

a. **(IF you needed to) are you able to talk to your health care providers (doctor, nurse, etc.) about any problems with food security such as shopping or purchases?** b. **Have you ever done this? What was that experience like?** c. **Is there anything that might make it easier for you to discuss food insecurity with your health care provider, if necessary?**	

Question	Objective
4. From the following programs and services, which do you think people like yourself could use the most? *Probes for all participants* a. **Individual services (case management)—Information for programs, enrollment assistance about services available.** b. **Group services (group education congregate meal locations,)—** c. **Outreach (community activities for older adults)** d. **One-on-one counseling (for yourself)** e. **Public information (education to the larger community, transportation etc…)**	To understand need for services

Question	Objective
5. How could we make any of these types of health education programs or services more meaningful for you, as an older adult living in a rural community?	To understand how to tailor programs

Probes for all participants **a. What types of programs work best for older rural adults?** **b. What types of programs work least for rural older adults?** *Try to get as much information as possible!*	

Question	Objective
6. Where would you like to see advertisements posted to reach older adults in rural communities? What would work best for you in rural communities? What would you not want to see?	To understand how to tailor messaging in rural areas

Question	Objective
7. Is there any more information you can provide us that you think would be useful in terms of improving health among older adults living in rural Oklahoma? *Try to get as much information as possible!*	To get feedback from participant on developing interventions in his own words

Conclusion:

Well, that is the end of our interview today. How are you feeling? Do you have any questions for me before we end this session?

Thank you so much for being a part of our study.

APPEDNDIX D
INFORMED CONSENT DOCUMENT

IRB STUDY #ED-17-68

OKLAHOMA STATE UNIVERSITY STUDY INFORMATION SHEET & INFORMED CONSENT

OLDER ADULTS AND FOOD INSECURITY STUDY

Thank you for agreeing to participate in a research study looking at food insecurity among older adults living in rural Oklahoma. I ask that you read this form and ask any questions that you may have before agreeing to be in the study.

The study is being conducted by Tracie L. Verkler, graduate student at Oklahoma State University.

PROCEDURES FOR THE STUDY:

If you agree to be in the study, you will do the following things:

Participation in the study involves completion of a short demographic data questionnaire (e.g., age, race/ethnicity, education level) and one interview, which will last approximately 30-45 minutes. The interviews will be conducted at a setting that is mutually agreeable to the participant and the researcher. The interviews will be digitally audio-recorded by the researcher and later transcribed for the purpose of data analysis.
The data of all participants will be entered in data programs for analysis and the results will be written up in a report that may be published or the results delivered in presentations.

RISK OF PARTICIPATION

While on the study, the risks are:

The risks of completing the interview are being uncomfortable answering the questions and the possible loss of confidentiality.

While completing the interview, you can tell the researcher that you feel uncomfortable or do not care to answer a particular questions.

BENEFITS OF PARTICIPATION

The anticipated benefit of participation is to provide insight into older adults and food insecurity.

CONFIDENTIALITY
Efforts will be made to keep your personal information confidential. We cannot guarantee absolute confidentiality. Your personal information may be disclosed if required by law. Your identity will be held in confidence in reports in which the study may be published and data bases in which results may be stored. Audio recordings will be controlled by the investigators and destroyed after transcription is completed.

PAYMENT
There is no payment for the prescreening measure or for participating in the interview.

CONTACTS FOR QUESTIONS OR PROBLEMS

For questions about the study, contact the researcher, Tracie L. Verkler at verkler@okstate.edu.

For questions about your rights as a research participant or to discuss problems, complaints or concerns about a research study, or to obtain information, or offer input, contact the IRB Office at 223 Scott Hall, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu

VOLUNTARY NATURE OF STUDY
Taking part in this study is voluntary. You may choose not to take part or may leave the study at any time. Leaving the study will not result in any penalty or loss of benefits to which you are entitled. Your decision whether or not to participate in this study will not affect your current or future relations with Oklahoma State University.

SUBJECT'S CONSENT
In consideration of all of the above, I give my consent to participate in this research study.

I will be given a copy of this informed consent document to keep for my records. I agree to take part in this study.

Printed Name of Participant_____

Signature of Participant:_____Date:_____

Printed Name of Person Obtaining Consent:_____

Signature of Person Obtaining Consent:_____Date:_____

VITA

Tracie Lynn Verkler

Candidate for the Degree of

Master of Public Health

Thesis: FOOD INSECURITY IN OLDER ADULTS LIVING IN RURAL OKLAHOMA

Major Field: Biology

Biographical:

Education:

Completed the requirements for the Master of Public Health at Oklahoma State University, Stillwater, Oklahoma in December 2017.

Completed the requirements for the Bachelor of Science in Biology at Southwestern Oklahoma State University, Weatherford, Oklahoma in 1996.

Experience:

2015 – present Adjunct Science Instructor Oklahoma State University, Oklahoma City, Oklahoma
2010-2013 Environmental Specialist, Department of Environmental Quality, Oklahoma City, Oklahoma
1997-2009 United States Public Health Service Officer, Senior Regulatory Research Officer, Food and Drug Administration, National Center for Toxicological Research

Licenses, certificates and additional training
Oklahoma Registered Environmental Specialist License #1741 – 2011
Registered Medical Technologist, American Society of Clinical Pathology- 1996

Honors, awards, and publications
Mutagenesis, 2011
Molecular Carcinogenesis, 2008
United States Public Health Service: Commendation Medal, Achievement Medal, Crisis Response Service Award, USPHS Field Medical Badge
Honorable Discharge USPHS, 2009