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The Self-Perceived Impact of a Food Recovery-Meal Delivery Program on Homebound Seniors' Food Security, Nutrition Health, and Well-Being

Alice Marie Sanchez
University of North Florida, alicesanchez1234@gmail.com

THE SELF-PERCEIVED IMPACT OF A FOOD RECOVERY-MEAL DELIVERY PROGRAM ON HOMEBOUND SENIORS' FOOD SECURITY, NUTRITION HEALTH, AND WELL-BEING

by

Alice Marie Sanchez, RDN, LD/N

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ABSTRACT

INTRODUCTION: For many senior citizens, meeting nutritional needs is essential to good health and daily function. Studies indicate that many American older adults are not meeting their nutrition needs and often suffer from food insecurity. Meals on Wings (MOW) is a food recovery-meal delivery program that attempts to decrease the influence of food insecurity among older adults. This study aims to explore the self-perceived impact of a food recovery-meal delivery program on homebound seniors' nutrition health, food security, and well-being.

METHODOLOGY: Semi-structured interviews were administered to adults age 55 and older on the waitlist for Meals on Wheels America in Duval County who received meals for three months or longer from MOW (n=10). Themes related to food security, nutrition health, and well-being were identified using inductive thematic analysis based on participants' responses.

RESULTS: Ten major themes were revealed: 1) healthier eating, 2) balanced meals meet needs, 3) feel happier and/or worry less, 4) decreased feelings of isolation and loneliness, 5) food always available, 6) worry less about food running out, 7) food and SNAP benefits last longer, 8) less need for food pantries and/or food assistance programs, 9) more money available, and 10) coronavirus disease (COVID-19) pandemic makes it harder to leave home to buy food and meet nutrition needs. All the participants reported that receiving meals help them worry less or feel happier, make the food they buy last longer, and help them pay for other things including medications, rent or utilities. It was discovered that factors including transportation, physical capability, economic burdens, and awareness of community resources available may impact access to food.

CONCLUSION: Homebound senior adults perceive that food recovery-meal delivery programs may improve their nutrition health, food security, and well-being to some degree. The food recovery-meal delivery model can be considered a solution to hunger in homebound seniors in the future.

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Chapter 1

INTRODUCTION

Food recovery-meal delivery programs may be the future of nutrition and hunger relief for homebound senior citizens. The concept of food recovery programs as a solution for hunger relief in localized areas is relatively new and the research on the effects of food recovery programs on senior nutrition are still emerging. Even more scarce are investigations of the qualitative aspects of these systems. Understanding the self-perceived impact of a food recovery-meal delivery program on homebound seniors' food security, nutrition health, or well-being may reveal themes indicating its potential effectiveness as a solution for community hunger and preventing malnutrition. The following study explores the self-perceived impact of a food recovery-meal delivery program (based in Jacksonville, Florida) on homebound seniors' nutrition health, food security, and well-being.

A qualitative research study was conducted using explorative design and an inductive thematic analytical approach. A thematic analysis allows researchers to assess, analyze, and interpreting patterns and perceptions in data.[1] The thematic analysis is unique in that may be used to identify descriptive details and that cannot be shown in quantitative research studies.

The MOW food recovery-meal delivery program recovers food from various local hospitals and long-term care facilities in the Jacksonville area. The food is recovered and delivered as meals by trained, nutrition student volunteers. The volunteers are equipped with thermal food transport bags and ice packs to control the temperature of the foods. Student volunteers were required to sign liability forms and consent to use their own vehicles to recover and deliver foods, as described in Appendix A. The volunteers use their own transportation and receive gas cards as a compensation for travel. Once recovered from hospitals, the food is transported to the University

of North Florida where it is then packaged into healthy, balanced meals. Each meal recipient receives at least three meals every time they receive a delivery. The meals are labeled on-site at UNF with a description: the name of the program, the name of the meal and items included in the meal, heating and storage instructions, and a recommended date to discard the meal. The program typically operated three days each week, with the exception of some university holidays or breaks between semesters. Meal recipients were always provided advance notice and a local resource guide when deliveries were cancelled.

Prior to the COVID-19 pandemic, meal recipients would receive meals two days each week. After the COVID-19 pandemic, the need for food assistance increased significantly in the community but student volunteers were restricted from coming onto the campus due to university policies and guidelines. More meal recipients were added to the program and the number of delivery days changed from 3-4 meals delivered 2 days per week to 5 meals delivered once per week. Social distancing guidelines were implemented to support the least amount of contact possible, as senior populations are at higher risk for contracting the virus.[2] Volunteers, foodservice employees handling foods at the donating facilities, and meal recipients were all required to wear masks. Volunteers were required to adhere to dress code policies consistent with food safety standards in foodservice operations. During delivery, meals were placed by volunteers in a convenient location for the participants to pick up in order to comply with social distancing guidelines.

Participants for the MOW program are recruited through by case managers of ElderSource. The area agency on Aging and Aging Disability Resource center. Inclusion criteria were as follows: (i) participants are on the waitlist for MOW-D, (ii) participants are receiving meals from MOW, (iii) the participants have been receiving meals from MOW for at least three months, (iv)

the participants are able to consent to and answer questions during a recorded phone interview. Exclusion criteria were as follows: (i) participants were receiving meals for less than three months, (ii) participants were unable to consent to and answer questions during a recorded phone interview, (iii) participant's required a caregiver to complete the interview.

SIGNFICANCE OF STUDY

The most recent report of senior hunger in America, based on 2018 data, reveals that 5.3 million American seniors were food insecure.[3] This equates to approximately 7.3% of the senior population, aged 60 and older, in the United States of America (USA). Food insecurity may lead to unfavorable health outcomes, including malnutrition and its characteristics such as muscle and fat loss, fluid accumulation, diminished functional status, weight loss, and inadequate energy intake.[4] Furthermore, food insecurity may be independently associated with type 2 diabetes mellitus (T2DM), cardiovascular disease (CVD), human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) and mood disorders.[5] These chronic illnesses are some of the most prevalent conditions in the USA and the medical management of these ailments make up a significant portion of healthcare costs.[5] Moreover, the treatment of these diseases, namely T2DM and CVD, often require lifestyle interventions. However, food insecurity may be a barrier to making the appropriate lifestyle changes needed to manage chronic disease.[5] The development and implementation of novel and cost-effective programs addressing senior food insecurity may be indicated as a remedy.

A food recovery program is the act of collecting unused, edible food items that would otherwise end up in a landfill, and donating these foods to local food distribution centers to help feed people in need.[6] Food recovery is becoming an essential practice that not only provides food to those in need, but also has the ability to reduce waste. Approximately 40% of prepared foods

go uneaten annually in the USA according to the Florida Department of Agriculture and Consumer Services (FDACS).[6] Additionally, one-fifth of the waste in landfills is comprised of food and contributes to the production of the greenhouse gas methane. If that amount of wasted food were to be recovered or saved, it may be enough to feed those who are food insecure.[6] Food recovery programs may have the potential to solve two key issues in the USA: hunger and food waste.[6]

The largest and oldest meal delivery program in the USA serving low-income, homebound seniors is Meals on Wheels America (MOWA). This program is operated by volunteers and is independently funded partially through the Older Americans Act, Medicaid, United States Department of Agriculture (USDA), and through private donations or grants.[7] According to MOWA, their waitlist for receiving meals has grown, on average, approximately 26% for the entire country since the coronavirus disease 2019 (COVID-19) pandemic and existed prior to the crisis as well.[8] Food recovery-meal delivery programs may fill the gap in lack of access to food by acting as an intermediate program until elderly applicants are removed from the MOWA waitlist.

Barriers exist that impede access to a sufficient amount of food in order to meet nutritional needs and sustain the ability to go about daily life may in homebound seniors. This may include food, transportation, and/or housing insecurity; the lack of proper equipment to prepare or store foods, mental illness, and/or physical limitations.[9] A food recovery-meal delivery program may reduce these barriers by providing transported meals. These microwaveable meals, that are time and temperature controlled for safety, could be given to seniors who may lack an oven/range, are unable to withstand the physical requirements of cooking and obtaining foods, or who lack the transportation needed to obtain foods.

Homebound seniors are often lacking in social interaction. According to the Centers for Disease Control and Prevention (CDC), over one-third of adults aged 45 and older experience

loneliness and over one-fourth of adults aged 65 and older reported experiencing loneliness.[10] Moreover, adults aged 50 and older are socially isolated in ways that may put them at risk for adverse health events, including premature death from all causes, a 50% increased risk for dementia, 29% increased risk for CVD, 32% increased risk for stroke, four times increased risk of death in heart failure patients, 68% increased risk of hospitalization, 57% increased risk of emergency department visits, and higher rates of anxiety, depression, and suicide.[10] This could potentially be an indication for the creation of interventions that involve more social interaction, such as congregate meal programs and home-delivered meal programs.

More quantitative research is being produced in the area of food recovery-meal delivery and senior health, well-being, and food security outcomes. The outcomes of these studies do indicate that meal delivery programs may help seniors' nutrition health, well-being, and food security.[11–14] However, qualitative studies examining the perceptions, attitudes, and behaviors of these program recipients is highly underutilized and scarce in the literature. Qualitative studies may also reveal information about barriers to accessing food and implicate the need for policy changes. Identifying the existence of themes between recipients of a food recovery-meal delivery program may divulge its effectiveness as an intervention for homebound seniors. The following qualitative thematic analysis will explore the self-perceived impact of a food recovery-meal delivery on homebound seniors' food security, nutrition health, and well-being.

HYPOTHESES

1. Receiving meals from a food recovery-meal delivery program will make homebound seniors feel healthier.
2. Receiving meals from a food recovery-meal delivery program will help homebound seniors eat more nutritiously or healthier.
3. Receiving meals from a food recovery-meal delivery program will help homebound seniors worry less or feel happier.
4. Interacting with the student volunteers that deliver meals for a food recovery-meal delivery program will help homebound seniors feel less isolated/lonely.
5. Receiving meals from a food recovery-meal delivery program will help homebound seniors' food last longer.
6. Receiving meals from a food recovery-meal delivery program will help homebound seniors worry less about whether their food will run out before they receive money to buy more.
7. If participants are receiving supplemental nutrition assistance (SNAP) benefits, receiving meals from a food recovery-meal delivery program will help homebound seniors make their SNAP benefits last longer.
8. If participants go to food pantries or food assistance programs, receiving meals from a food recovery-meal delivery program will help decrease the number of times homebound seniors need to go to a food pantry or food assistance program.
9. Receiving meals from a food recovery-meal delivery program will free up money to help homebound seniors pay for other things such as medications, rent, or utilities.
10. The COVID-19 pandemic will impact the ability for homebound seniors to obtain enough food or meet nutritional requirements.

Chapter 2

REVIEW OF LITERATURE

Food Security

The State of Senior Hunger in America is an annual report that collects data on the demographics of the elder population living in America.[3] The data is collected using information from the Food Security Supplement portion of the Current Population Survey provided to American seniors ages 60 and older. The 2018 executive report reveals that 7.3% of seniors are food insecure and 2.7% had very low food security.[3] This is equivalent to approximately 5.3 million and 2.0 million elderly Americans, respectively. There was a statistically significant decline in very low food security from 2017 to 2018, however the rate of food insecurity continues to remain the same. The report also reveals that food insecurity is more common among racial and ethnic minority groups between the ages of 60 and 69 who rent their housing.[3] State-level estimates of elder-American food insecurity shows that 8.2% of seniors are food insecure and 2.8% have very low food security in Florida. In Jacksonville, Florida, the rate of food insecurity is higher than the national and state average with 9.8% of seniors being food insecure, with 2.8% of seniors having very low food security being comparable to the state average and higher than the national average.[3] The implications of this may indicate that there may be geographical factors contributing to a higher prevalence of food security in some areas.

A study conducted in 2003 used qualitative interviews based on ground theory to understand community-dwelling seniors' experience of food insecurity.[15] The study utilized two interviews that were conducted six months apart in 53 low-income elders residing in upstate New York between ages 53 and 88 years old. Using semi-structured, open-ended questions, the

interviewers dissected the meaning of participants' experience. The interviews were conducted in the elders' homes and were recruited from subsidized housing, congregate meal, and home-delivered meal programs or churches. A quantitative component of the interview analyzed the quantity of food participants had access to. The qualitative study was created to capture experiences of food insecurity that could not be described using the U.S. Household Food Security Survey Module (FSSM). The results of this study show that the lack of ability to get the proper foods for health promotion was a common element specific to the participants, based on severity, time, and food choice.[15] Furthermore, participants also shared that when they do have money, it can still be challenging to access food due to transportation, functional limitation, of they are not physically/mentally able to prepare or eat the foods.[15] The quantitative aspect of this showed that participants may have reduced food available on-hand or eat less than usual.[15] Psychological themes of the study showed that the participants may worry about eating properly for their conditions and become emotional about lacking the ability to obtain or prepare foods,[15] Food preferences were also impacted as well according to these participants, as some explained they may not be able to obtain foods that align with their cultural preferences.[15] Additionally, obtaining foods in a socially acceptable way was another challenge in food security, with some participants sharing that they would have to borrow money or use credit cards just to buy foods.[15] The results of this study have implications for policy and practice, are there were several gaps in accessing foods revealed that may not be appropriately addressed by the programs available. The study is limited in that it uses a convenience sample that is relatively small and geographically restricted. Therefore, the results may not be generalizable to other elders. Furthermore, the study does not specifically explore variations between the recruited populations (i.e. participants recruited from home-delivered meal programs vs. participants recruited from churches). Therefore, more research

focusing on participants of specific food assistance programs may reveal information about the effectiveness and impact of those programs on seniors' experiences. Response and interview bias are possible when conducting qualitative studies as well. This study also lacks components relating seniors' experience with social well-being. This study was also conducted over 15 years ago, and now that new A larger sample size across multiple geographic locations with control groups would have more implications for association and causation. However, this study offers pertinent information about the potential gaps that exist in food assistance programming and offer descriptive insight on the experiences of elderly adults experiencing food insecurity.

A study published in 2016 analyzed factors that may contribute to food insecurity in older adults attending senior centers in Georgia.[16] The convenience sample included participants aged 60 and older recruited from 40 senior centers by the end of 2007 and 621 participants met inclusion criteria. Variables that were assessed include food insecurity, body mass index (BMI) or waist circumference (WC) which were used to classify obesity, and physical limitations using the Disablement Process. Multivariate logistic regression models found that weight-associated disabilities and obesity may be potential risk factors for food insecurity. Additionally, similar to the most recent Feeding America State of Senior Hunger Report, the results showed that participants ages 60-69 and those who were of an ethnic minority (black) experienced more food insecurity (32.3% of participants ages 60-69, and 32.3% of participants who identified as being black) than older age groups and other ethnicities.[3] These results may imply that obesity and weight-associated disabilities may be risk factors to consider when assessing the senior population for food security and may prompt food assistance interventions to reduce this population's vulnerability. However, the study utilizes a convenience sample, which limits the generalizability of these findings. Additionally, the extensive exclusion criteria of the study also make these results

difficult to generalize to all seniors. Cognitive decline frequently presents in elderly populations however participants with cognitive disabilities were excluded, which constrict the point to which these discoveries can be generalized. Furthermore, the extent to which participants were experiencing food security was not explored as this is not typically measured with the six-item food security questionnaire. Future studies could benefit by including information on the extent to which individuals were food insecure to highlight factors that may affect the degree to which people are food insecure.[16]

A cross-sectional study was conducted on single, community-dwelling elders living in rural areas ages 65 and over to explore objective and perceived food environments and household economic resources as they relate to food insecurity.[17] Interviews for data collection were conducted face-to-face and included information on demographic features, household economic resources, food environment factors, and food security. The study excluded seniors with cognitive impairment, those who were not living at home during the time of data collection, and those who provided informed consent. 170 seniors met the criteria and were included in the study. The study was performed in rural locations of South Korea, including Yangpyeong County of the Gyeonggi Province and Hongcheon County of the Gangwon Province. Results between food-secure and food-insecure were compared using a Chi-square test for categorical variables and t-test for continuous variables. Multivariable-adjusted logistic regression was utilized to calculate odds ratios (OR) and 95% confidence intervals (CI) for a risk of food insecurity. Stepwise logistic regression was utilized to find the most explicable economic and food environmental factors. The study found a positive correlation between housing costs and the cost of heat during winter months and food insecurity. Additionally, one of the main environmental factors contributing to food insecurity was associated with food store proximity being too far away and inconvenient bus

routes. Using stepwise regression analysis, the researchers found that the percentage of total spending on housing (OR = 1.021, 95% CI: 1.008–1.034), the ability to purchase foods at super markets (OR = 0.398, 95% CI: 0.166–0.951), far food store proximity (OR = 14.487, 95% CI: 5.139–40.842), and inconvenient bus routes (OR = 0.083, 95% CI: 0.015–0.460) were the most explicable factors correlated with food insecurity.[17] These results may indicate that food environment and economic constraints may play a role in food insecurity, and it is possible that future interventions ameliorating food security may target reducing these barriers to food access and increasing senior food purchasing power. However, it must be considered that this study utilized a cross-sectional design, therefore causation associations between these factors and food security may not be made. Additionally, the study used a local sample in South Korea, and this may not be representative of all rural areas and is therefore not generalizable. Furthermore, the small sample size hinders the ability to identify meaningful inferences. Regardless of limitations, this is among one of few studies that examined used objective and perceived approaches to study the relationship between food security with food environment and economic constraints.[17]

A study conducted in Portugal sought to approximate the prevalence of senior food insecurity and its association with health-related quality of life features and chronic disease.[18] The researchers used data from the Promoting Food Security Study (2015-2016) of the Epidemiology of Chronic Diseases Cohort Study 3 (EpiDoC3). Food insecurity was determined using the Brazilian Food Insecurity Scale while sociodemographic factors, chronic disease, and chronic disease management were self-reported by participants. Furthermore, the European Quality of Life Survey was the validated tool used to determine health-related quality of life. Using logistic regression models, the researchers found that the odds of senior households experienced food insecurity were higher if their ages were between ages 70-74 (OR = 1.405, 95% CI 1.392–1.417),

female (OR = 1.545, 95% CI 1.534–1.556), had less education (OR = 3.355, 95% CI 3.306–3.404), lower income (OR = 4,150, 95% CI 4.091–4.210), and reported it was challenging to live off of their current income (OR = 16.665, 95% CI 16.482–16.851).[18] Additionally, the odds of having a chronic disease were higher in seniors living in food-insecure households.[18] This includes DM (OR = 1.832, 95% CI 1.818–1.846), pulmonary diseases (OR = 1.628, 95% CI 1.606–1.651), CVD (OR = 1.329, 95% CI 1.319–1.340), obesity (OR = 1.493, 95% CI 1.477–1.508), participants who decreased the frequency of medical visits (OR = 4.381, 95% CI 4.334–4.428), and those who stopped taking their medications due to economic constraints (OR = 5.477, 95% CI 5.422–5.532). Seniors in food-insecure homes had decreased health-related quality of life (OR = 0.212, 95% CI 0.210–0.214).[18] The results of this study may reveal that food insecurity in seniors living in the community was significantly associated with economic constraints, increased prevalence of chronic diseases, inadequate management of chronic diseases, and reduced health-related quality of life. In this study, the cross-sectional design limits the researchers' ability to infer causation and temporal sequence of associations (i.e. food insecurity associated with new onset of chronic disease). Additionally, some of the data was self-reported which may provide underestimations of BMI and disease diagnoses. Furthermore, the food insecurity scale utilized by this study assess household food insecurity and not necessarily the food security of an individual household member, making it challenging to identify food security status for individual household members. Additionally, the study is localized to Portugal, a country with differences in government structure and economic stability making these findings difficult to generalize to populations of similar characteristics in other countries. Regardless of these limitations, this study utilized a randomized sample that could be representative of an entire country, and future studies may utilize this study design as a model for assessing similar variables in other parts of the world.[18]

A cross-sectional study of 2,868 seniors ages 65 and over was conducted using the Health and Retirement Study to identify the association between food insecurity and variables including BMI, demographic features, psychiatric and medical history.[19] The researchers used multivariate logistic regression to assess the associations. The surveys were administered over the phone, in the mail, or in-person every two years. Food security was measured using a Six-Item Food Security Module. The Centers for Disease Control and Prevention (CDC) BMI categories were used to categorize weight. Cognition was assessed using word-recall tests, mental health was assessed by using self-report of having an official psychiatric diagnosis and scores using the Center for Epidemiologic Studies Depression Scale (CES-D). The results showed that having low versus high food security, being of African American ethnicity, having a psychiatric diagnosis, and having a history of chronic lung disease were each significantly associated with increased odds of food insecurity (OR = 4.37, 95% CI = 1.82, 10.50; OR = 3.34, 95% CI = 1.46, 7.69; OR = 1.74, 95% CI = 1.06, 2.88, respectively).[19] Furthermore, having depression was associated with more than six times greater odds of having very low food security compared to high food security, (OR = 6.57, 95% CI = 3.00, 14.37). Likewise, after adjusting for other factors, the results showed that being categorized as overweight or obese is not associated with increased odds of food security in the elderly.[19] This study was limited in that the ethnic/racial minorities were underrepresented, therefore limiting the ability to generalize the findings. Moreover, the study only evaluated participants with permanent addresses and therefore does not assess transient or homeless people. Due to the self-reporting nature of the data collection, some of the data is prone to biases that were not addressed in the analysis. Regardless, of the limitations, this study is the largest cross-sectional study assessing associations between weight and food insecurity. These results imply that self-reported and/or psychiatric diagnoses of clinically severe depression are significant predictors of

increased odds for being food insecure. The study provides implications that mental health plays a role in food security, and perhaps screening should be conducted for both food security and mental health conditions in older adults.[19]

The COVID-19 pandemic has generated a global health crisis with several food and nutrition-related implications. The mandatory quarantines have led to employment furloughs and layoffs and disruptions in food supply.[20] Food insecurity is more likely to occur when income is reduced, and consumer behaviors are changed (i.e. avoiding leaving home to purchase foods and panic food-buying or hoarding).[20] This may be the case for at-risk populations such as elderly people, especially those with comorbidities.[2] The projected annual food insecurity rate was projected to be at 15.6% or 4.1% higher than 2018 according to a study by Feeding America evaluating the potential impact of COVID-19 on American food security.[21] As a response to the pandemic, more healthcare systems started screening for food security as it still remains a social determinant of health.[22]

Food insecurity and its contributing factors continue to be an issue in the US, the state of Florida, and the Jacksonville senior community.[3] The factors influencing risk for food insecurity in this population may include those beyond economic constraint, including preexisting health risk factors such as physical disability or obesity or food environment.[16,17] Although more extensive studies are needed, including those that utilize large, randomized sample sizes with a control group, the need for interventions targeting food insecurity risk management and reducing barriers to accessing a sufficient amount of food in a socially acceptable manner could be indicated by the available research.

Senior Health and Nutrition

When food is inaccessible or unaffordable to a degree, this may potentially influence health behaviors and health status. Older adults who are food insecure are 50% more likely to have diabetes mellitus (DM), 60% more likely to experience congestive heart failure (CHF), are 30% more likely to have at least one activity of daily living (ADL) impairment, are three times more likely to experience depression, and are twice as likely to experience asthma and gum disease.[23] The medical management of chronic diseases further exacerbates economic constraint in low-income older adults. Arguably, a cycle ensues that makes it challenging for older adults to afford to live and manage their health, likely forcing older adults to make choices between paying for care, food, and other needs.

Food insecurity in older adults may also lead to coping strategies that can negatively affect nutrient intake.[23] A report by AARP Foundation and Feeding America found that purchasing cheaper food with lower nutritional quality was reported in 77% of participants and watering down food or drinks was reported in 38% of participants. Additionally, 60% of participants reported making tradeoffs between paying for food or utilities, 58% chose between food and transportation, 63% made tradeoffs between medical care or food, and 49% reported deciding between paying for housing or food.[23] These tradeoffs make it more likely for malnutrition to occur, and it is estimated that 50% of older adults may experience malnutrition. Malnutrition, being the clinical term used to describe the inadequate balance of nutrients and calories to maintain proper health, is estimated to increase healthcare costs by 300% and increase hospitalization by 33%.[23] Older adults who are malnourished may experience increased length of stay and readmissions to hospitals in addition to a greater risk for mortality than those who are no malnourished. It is estimated that more than 10 million elderly Americans, or 16% of older adult Americans, are experiencing hunger every year.[23]

The risk for malnutrition includes several factors. Notably, food insecurity has the potential for disruptions in patterns and quality of food intake.[11] Weight status is another factor with implications for malnutrition, and although more seniors are classified as obese, weight loss is a criteria for diagnosing malnutrition. Frailty is an issue characterized by reduced strength, endurance, and physical function that may make it more challenging for elderly people to be independent. Reduced independency can also occur with disability and diminished functional status, making it more challenging to physically go out and obtain foods. Sarcopenia, or reduced skeletal muscle, may make it harder to withstand the physical demands of cooking and carrying foods.[11] Another cyclic conundrum, the reduced physical ability to obtain, prepare, and eat foods may be associated with undernutrition and subsequently lead to other health issues.

A study using probabilistic linking techniques was conducted to connect MOWA program data to Medicare claims in an effort to examine client health and health care utilization.[24] The study included 14,019 MOWA clients aged 66 or older using Medicare beneficiaries. The MOWA clients had high instance of chronic diseases, including hypertension in 90% of participants. Furthermore, six months prior receiving MOWA meals, 31.6% of clients had been hospitalized, 24.9% had been admitted to the emergency department, and 13% received care in nursing homes. Six months after receiving MOWA meals, 24.2% had been hospitalized, 19.3% had been admitted to the emergency department, and 9.5% received care in nursing homes. The study was not randomized and the age limit did not represent all MOWA demographics or geographical locations, therefore generalizability cannot be inferred.[24] However, the study provides insight into the impact of receiving home-delivered meals on senior health factors.

The nutrient needs of elderly people change as age-related factors become more relevant. Older adults often need more calcium and vitamin D to support bone health, vitamin B12 is not as

readily absorbed and may need to be increased, dietary fiber to reduce the risk of chronic diseases, and potassium and unsaturated fats to support heart health.[25] A study using data from the 2005-2014 National Health and Nutrition Examination Survey (NHANES) found that older age groups (between the ages of 51 and older) reported significantly lower dietary protein intake, with as much as 46% of adults 71 years and older not meeting protein recommendations.[26] Participants of the study who consumed less than the recommendations for protein, across all age groups, were associated with having lower diet quality. In adults 70 years and older, adults not meeting the recommendations for protein had significantly lower grip strength.[26] These are implications that not only have the potential to affect other aspects of health but may also impact the physical ability for older adults to obtain, prepare, and eat foods.

Senior Well-Being

In addition to the physical condition, mental well-being is a component of health that often changes in the elderly population. There are many factors that have the potential to influence the well-being of older Americans. Whether it be losing a spouse, transitioning to an assisted living facility, or managing cognitive decline; the well-being of seniors may come with certain implications that could potentially affect mental, physical, and nutritional health.

The U.S. Census Bureau estimates that approximately 28% of older adults are living by themselves.[27] More than one-third of adults over the age of 45 report feeling lonely.[28] Risk factors for increased risk of social isolation may include retirement and physical disabilities including reduced mobility and hearing deficits.[28] Additionally, living alone, being unwed, lack of participation in social groups, having fewer friends, and strained relationships were associated with premature mortality.[28] As previously mentioned, the CDC reports an increased risk for dementia and premature death from all causes in adults aged 50 and older who are socially isolated.[10]

Loneliness in adults aged 50 or older was associated with increased rates of mental illness including depression, anxiety, and suicide and a higher risk of death, hospitalization, and emergency department visits.[10] Poor social relationships in this age group are also associated with increased risk for heart disease and stroke.[10] It is suggested that senior loneliness is a risk factor for disease with effects that exceed the risk associated with smoking 15 cigarettes daily.[28] Interestingly, pivotal transitions among older adults may also consequence in diminished social connection. These life changes may include retiring, losing a spouse, children leaving the home, and the health issues that come with aging.[28] These social disconnections may subsequently result in physical inactivity and obesity.[28] The connection between loneliness, isolation, and social disconnection with health in older adults may be an indication for programs that direct their efforts to improving senior well-being.

A cross-sectional study was conducted to examine the connection between physical health and emotional well-being on nutrition status in 171 rural, community-dwelling older adults, aged 65 years living in the northwest Oklahoma.[29] The study utilized a 4-item Subjective Health Perceptions Scale from the Duke Older Americans Resources and Services Procedures (OARS) as a method of screening for inclusion or exclusion based on the participant's cognition. The 13-item Self-Care Capacity Scale from the OARS to assess ability to self-care. The 10-item University of California-Los Angeles Loneliness Scale-Version to assess loneliness. The 10-item Geriatric Depression Scale to assess mental health in seniors. The Mini-Nutritional Assessment Short-Form to assess nutritional status. The results showed that there was a significant, positive correlation between the capacity for self-care and perceived health status (Pearson $r = 0.31$).[29] There was a significant negative relationship between depressive affect and nutritional status ($\beta = -.30$; $P<0.01$), possibly indicating that participants who report feeling more depressed were more

likely to have poor nutrition health.[29] Loneliness, however, did not show a significant relationship with nutrition health. Available research may suggest the existence of some relationship between depression and nutrition status, the interplays of this correlation are not detailed in most studies. The limitations of this study include selection bias through convenience sampling, the cross-sectional nature of this study do not allow for causal inferences, and the study was limited geographically to northwest Oklahoma and may not be generalizable to older adults living in other rural parts of the U.S.[29] However, the study still offers understanding on the connection between the elderly well-being and physical health. More randomized controlled trials on the impacts of mental well-being and senior physical health will allow for meaningful inferences.

There are not many studies highlighting the impact of receiving meals from a food recovery-meal delivery program on senior social isolation and loneliness, however this issue is becoming more relevant as the COVID-19 pandemic continues.[30] It is predicted that these factors of well-being and health in seniors are some of most likely to be affected by the pandemic. Social isolation and loneliness are considered to be major risk factors linking to poor physical and mental health. Community-based programs, such as meal delivery programs, may be a potential solution to promote social connection during these unprecedented times.[30]

Food Assistance Programs

Over time, the issue of senior hunger and food insecurity gained attention in the US. Programs were eventually developed to increase the purchasing power of seniors, reduce barriers to accessing food, and improve social well-being in older Americans. The USDA Food and Nutrition Service (FNS) has created programs to address the nutritional needs of older Americans and are available to Americans age 60 and over: Seniors Farmers' Market Nutrition Program

(SFMNP), Supplemental Nutrition Assistance Program (SNAP), Child and Adult Care Food Program (CACFP), and Commodity Supplemental Food Program (CSFP).[31]

The SMFNP provides income-constrained, older Americans with access the fresh produce, herbs, and honey that are locally grown.[32] The SFMNP not only increases access to these food commodities but increases the domestic consumption of local agricultural foods and helps develop new farmers' markets, roadside stands, and community supported agricultural (CSA) programs. Seniors age 60 years or older with incomes at or below 185% the federal poverty level is eligible for the program. The program is administered by state agencies as state Department of Agriculture or Aging. The funding for the SFMNP comes from the Farm Bill.[32]

SNAP is one of the largest government funded nutrition assistance programs in the USA.[33] The entitlement program allows low-income households to obtain electronic transfer benefits that can be used to purchase eligible food items, thus increasing the purchasing power of its participants. The eligibility criteria are contingent upon household size and monthly income. SNAP requires interested people to apply through a local state agency, online, or a participant may have an authorized representative assist them through the process. Elderly (defined as 60 years or older) applicants are only required to meet net income criteria (at or below 100% of federal poverty level) as opposed to both net and gross income (at or below 130% of poverty level) criteria. The program allows for medical expense deductions for elderly or disabled members that exceed $35 for the month if they are not paid through insurance or by someone else. Older Americans who reside in federally subsidized housing specifically for the elderly may be eligible for SNAP benefits, regardless if they obtain their meals at the facility. Additionally, elderly and disabled participants are excluded from work requirement eligibility criteria. SNAP is an example of a program that aims to increase the purchasing power of its participants, however the strains of

physically shopping may continue to be an issue for those who experience mobility and other physical limitations.[33]

The CSFP assists low-income elderly persons at least 60 years of age by supplementing their diets with USDA foods to improve health and nutrition.[34] Seniors age 60 years or older with incomes at or below 130% of the federal poverty level are eligible for the program. This program can provide shelf-stable items: dried milk; ultra-high temperature (UHT) fluid milk; juice; oats; ready-to-eat cereal; rice; pasta; peanut butter; dry beans; canned meat, poultry, or fish, and canned fruits and vegetables.[34] Although a significant supplement to senior diet, seniors are still obligated to prepare these foods which poses as a challenge for seniors with physical limitations.

The CACFP offers reimbursement for nutritious meals and snacks to eligible care centers, including day care facilities that enroll people over the age of 60 or living with a disability.[35] In fiscal year (FY) 2017, approximately 4,429 participants were served by the CACFP program.

The United States of America's Department of Health and Human Services (DHHS) supports the Older Americans Act (OAA) Nutrition Program. Through this program, the Administration on Aging (AoA) of the Administration on Community Living (ACL) provides nutrition support services to older Americans, ages 60 and older, by granting funding to states.[36] Section 339 of the OAA expands the eligibility of these nutrition support services to the spouses (of any age) of eligible older adults. The OAA Nutrition Program is designed to decrease hunger, food insecurity, and malnutrition in elderly Americans and promote social well-being.[36] The promotion of social well-being is an aspect of senior health not specifically addressed by the USDA FNS programs, making the OAA Nutrition Program unique in that it also fosters mental health. The program also offers other relevant linkages to care services including transportation, physical activity programs, chronic disease self-management programs, fall prevention programs,

among others. The OAA Nutrition Program targets adults ages 60 years and older who require the most social and financial need, including those who are low-income, of minority background, living in rural areas, language barriers, and at risk for hospitalization. These programs are funded through the AoA in addition to state or local funding, foundations, direct payment, fundraising, voluntary contribution, among other monetary sources. The two most prolific nutrition support programs include Congregate Nutrition Services and Home-Delivered Nutrition Services of the OAA.[36]

Congregate Nutrition Services addresses senior hunger and social well-being by providing meals and additional nutrition services to be provided in congregate settings. This program aims to prevent the need for expensive health interventions. Recent program data from the National Survey of OAA Participants shows that 58% of participants reported that one meal from a congregate meal program provides one-half or more of their total food for the day. Furthermore, 77% of congregate meal participants report that they eat healthier because of the meal program and 76% report that they believe their health has improved because of receiving congregate lunches. Additionally, over 50% of participants are 75 years of age or older with an average age of 76 years old, therefore reaching its target population.[36]

The Home-Delivered Nutrition Services of the OAA allows meals to be delivered to the homes of older individuals and their spouses of any age. These in-home services are typically the first to be offered under the OAA and usually act as a gateway for additional home- or community-based services. Participants receiving this service are often frail, homebound, or isolated people 60 and older. This program goes beyond nutrition services by acting as a safety check for some isolated seniors and allow what may be the only in-person interaction they receive that day. The most recent National Survey of OAA Participants data shows that 91% of individuals receiving

home-delivered meals report that these meals help them stay in their own home.[36] This factor may be more relevant now since the COVID-19 pandemic, with long-term care and assisted living facilities being the most socially restricted settings and increases in feelings of loneliness and isolation are predicted to occur.[37] Additionally, over 60% of individuals indicate that a home-delivered meal will provide one-half or more of their total food intake for the day. Similar to the Congregate Meal Nutrition Services, 69% of participants are 75 years or older with the average age being 79 years old. This program not only improves access to foods by delivering meals, but also has the potential for social interaction in population that may otherwise be isolated. With transportation insecurity and physical limitations being possible barriers to accessing foods and social engagement, this program fills the gaps in access to nutritious meals.[36]

The MOWA program operates on a similar model, in which volunteers deliver meals to people ages 60 and over, with flexible age requirements depending on the area.[8] The program specifically tries to target populations with mobility limitations that affect the ability of older Americans to obtain and prepare foods, or social with others.

Another source of food available to seniors are local food pantries and food banks. Food banks are centralized facilities that offer food to the community, whereas a food pantry may be based in a facility that offers other adjunct services.[38] Feeding America, the largest food distributor for food banks and food pantries in the USA, consists of a network of 200 food banks and 60,000 food pantries.[39] Offering what is usually monthly groceries to older adults in need, these organizations can also provide foods to the community.

Studies on the impact of food pantries on senior nutrition, food security, and well-being are scarce. One systematic review of 14 articles, including five randomized controlled trials and seven pre-post studies, investigated the impact of food pantry-based interventions on diet-related

outcomes.[40] In every article, the food pantry interventions were found to be effective in improving diet-related outcomes. These interventions included nutrition education, client-choice, and diabetes management. The study did not include the impact of food pantries alone as an intervention improving diet quality, therefore it cannot make inferences about food pantries as an effective solution for improving diet-related outcomes.[40]

A mixed-methods study on the access of food from 50 food pantries in Bronx, New York was conducted in 2018.[41] Although not specific to senior adults, age was often a factor considered for many of the food pantries included in the study. Access to food pantries was considered across five dimensions: availability, accessibility, accommodations, affordability, and acceptability. Qualitative data was considered in the context of quantitative discoveries. The study found that only 25 of the 50 food pantries included in the study were open, which the researchers found to be geographically related. In some cases, the pantries were closed because there was no food. Furthermore, the pantries that were open had limited availability of foods or there was not enough food available for all patrons because food ran out. The eligibility for some of the food pantries also limited accessibility to foods, some of which included criteria for use such as age, employment status, residential or shelter status, proof of income, or utility bills. Personal preferences were not always catered to as well, due to limited food supply. Although foods from food pantries are often free, the cost of transportation and time spent waiting to get food did not make attending food pantries a cost-free service. Furthermore, the clients of food pantries perceive labels as indicators of quality and found that foods were dated past their sell-by, use-by, good-by, or other expiration dates.[41] The study was geographically restricted to the Bronx, New York and included a small sample size of food pantries, therefore it lacks generalizability. Furthermore, any self-reported data may be subject to bias and the dimensions of access were not ranked. Employees of the program

reported that funding was often an issue affecting these dimensions.[41] The study was also nonrandomized. A larger, randomized study conducted across multiple geographical areas may be recommended to make the results of the study more meaningful. However, the results offer insight into the factors affecting use of food pantries and the barriers to accessing food in rural areas.

There is a need for more research on the impact of food pantries on senior nutrition health, well-being, and food security. Additionally, there are factors that may impact the cost-effectiveness and accessibility to quality food products at food pantries. Transportation may remain an issue for some older adults, regardless of whether the pantry is a stagnant facility or mobile. Furthermore, people who use these services still require to be mobile enough to stand in line and obtain food, then bring those foods back into their homes and prepare the foods.

The economic effect of the COVID-19 pandemic ensues fear and decreased purchasing power for many, and unfortunately highlights the need for food assistance programing. The Coronavirus Aid, Relief, and Economic Security (CARES) Act was implemented in March 2020 and allowed more funding to be allocated for food assistance through the Coronavirus Food Assistance Program (CFAP)[42] CFAP expanded eligibility to allow more people to qualify for benefits from programs such as SNAP.[42] The USDA FNS response to the pandemic offered an opportunity to allot $2 billion per month allocated to emergency SNAP supplements, 97% of SNAP recipients live in areas with SNAP Online Purchasing Services, and $3 billion to TEFAP in support of food banks.[43] 14.4 million people received food assistance through the Disaster Household Distributions.[43] Furthermore, the need for home-delivered meals in seniors as doubled since March 2020, and the Heroes Act provided an additional $19 million to the OAA to support additional costs associated with meeting this increased demand.[22] The Heroes Act also allocated an additional %150 million to local food banks/food pantries to assist the community.[22]

Effectiveness of Food Recovery-Meal Delivery Programs

Also referred to as food gleaning, food recovery involves the collection of prepared foods from local restaurants, hospitals, schools, events, and other sources.[44] At the University of North Florida (UNF), food recovery is a weekly practice under the Meals on Wings (MOW) program. MOW is modeled after the Campus Kitchens Project (CKP), which typically involves student volunteers saving unused, prepared foods from facilities such as university cafeterias.[45] Students at UNF collect fresh foods from local hospitals, rehabilitation centers, and long-term care facilities in Duval county and bring the foods back to the university Center for Nutrition and Food Security (CNFS) kitchen to be created into balanced meals. These meals are then delivered by the students to homebound seniors on the waitlist for Meals on Wheels in Duval County, Florida.

Programs like these helps improve access to an edible meal. and liabilities associated with food donation is covered under the Bill Emerson Good Samaritan Food Donation Act, otherwise known as the Good Samaritan Act.[46] Liability is cited as a concern for food-donating facilities, and often presents as a barrier to developing food recovery programs.[46] Both the donor and the organization receiving the donations are protected by the Good Samaritan Act for gross negligence, intention misconduct, or violations of food or food product regulations as long as the organization is practicing with due diligence.[46] This prevents the recipient of the food donation from filing a lawsuit against the donor or done for food-related injuries.[46] The MOW program at UNF is operated completely by student volunteers. Most of these volunteers consist of nutrition and dietetics students who are learning food safety in their courses. The MOW program trains all its volunteers in food safety to reduce the risk of microbial growth and, subsequently, foodborne illnesses.

Although this act protects donating facilities, food recovery programs are still a highly underutilized practice. This may be related to the barriers the present when food recovery programs attempt to establish relationships with potential donating organizations. Organizations in which foods are prepared may be unaware of the Good Samaritan Act, leading to hesitations about a decentralized food recovery operation.[47] Collaborations between participating organizations can be improved by knowing more about the liability protections that the Good Samaritan Act provides to all parties involved in food recovery program affiliations. Additionally, in many communities, kitchens that handle donated foods are often exempt from inspection. A universal inspection model may support the use of food recovery programs by assuring food safety practices are being properly implemented. Another solution may be the utilization of a coordinating council model, in which a board of representatives from food donation networks, government officials, and food service experts work together to oversee the operation of food recovery programs. Examples of this include the Waste Not Orange OC Coalition in Orange County, California and Food Rescue Partnership in the Quad Cities of Iowa/Illinois. The councils may also act to improve the connection between agencies that connect seniors with local resources and food recovery programs.[47] These approaches involve a multidisciplinary approach that includes local government and may be models to consider when advocating for policies related to food recovery programs.

Quantitative and qualitative data exists that examine and describe the impact of meal delivery programs on elderly food security, nutrition health, and well-being. A review of the impact of home-delivered meal programs on diet quality in the elderly, aged 60 years or older was conducted in 2014.[12] Eight studies met the inclusion criteria, and included two randomized controlled trials, one cohort study, two pre-post studies, and three cross-sectional studies. Six of these studies revealed that meal home-delivered meal programs could significantly improve diet

quality, nutrition health, food security, and nutrition risk in elderly participants.[12] The study also described these programs to help offer opportunities to socialize, improve dietary adherence and quality of life. Although the sample sizes for most of these studies were small which limits the generalizability of the outcomes and the interventions were not considered to be long-term, the review does suggest a potential benefit in using these programs as interventions addressing senior hunger and food security.[12]

A systematic review of 80 studies that investigated meal delivery programs in senior populations was conducted in 2015.[13] The researchers found that much of the available literature is more descriptive in nature, utilize small sample sizes, were limited geographically, and did not report outcomes. Of the outcomes that were reported, nutrition status was evaluated using self-reported dietary intakes, which is subject to bias. Furthermore, none of the studies included investigated the participants' perspectives on costs such as medical expenses, utilities, mortgage, rent, transportation, and other essential living expenses. It was concluded that larger, randomized controlled trial and/or observational studies need to be conducted to make more concrete interpretations of the impact of meal delivery programs catering to senior populations.[13]

Participants of home-delivered meal programs operated under the OAA showed improved outcomes since 2015, including reports of feeling better (approximately 85%), eating healthier (81%), reduced feelings of being worried or isolated, reduced falls, and overall improved nutritional health, food security, diet quality, and well-being.[11] Furthermore, 90% of home-delivered meal recipients remained in their homes.[11] During the COVID-19 pandemic, this may be especially implicated, as the risk for contracting COVID is increased in communal elderly living centers such as long-term care and assisted living facilities according to the CDC.[48]

A pre-test, post-test study was conducted on a MOWA program based in Central Florida.[14] Using self-reported data from interviews using tools such as the MNA-SF, USDA Six-Item Food Security Scale, World Health Organization Well-Being Index, and Three-Item Loneliness Scale were used to capture data related to food security, nutrition status, dietary intake, and well-being in elderly meal recipients aged 55 years or older. The study included 62 seniors meeting inclusion criteria. The results showed that intake of calories significantly increased from a preprogram mean of 1264.39 to a two-month enrollment mean of 1620.35 calories. Daily protein intake significantly improved from a preprogram mean of approximately 54.08 grams daily to a two-month enrollment meal of 73.71 grams daily. There was a significant improvement in emotional health reflect in loneliness by well-being interaction. Well-being significantly improved from the preprogram mean of 13.13 to a post-program mean of 16.87. 59.7% of participants had high food security, 9.7% had low food security, and 30.6% had very low food security. At the two-months of participation in the MOWA program, 78.4% had high food security, 21.6% had low food security, and no participants had very low food security. 41.2% of participants' food security improved and 15.7% of participants' food security went from very low to high food security.[14] The study utilized a convenience sample and was limited geographically, therefore negating generalizability inferences. Furthermore, self-reporting of data from participants implicates risks for bias. Additionally, the post-test period was after two months of participation and would require longer study periods to evaluate long-term effects of the study. Larger studies over multiple geographical areas may be implemented to address these limitations. However, the study does show to benefit senior nutrition status, dietary intake, food security, and well-being in the short-term use of meal delivery programs.[14]

The qualitative evaluation of the effectiveness of meal delivery programs, in which the meals consist of recovered foods, as a solution for senior hunger have yet to be explored. It is possible that the self-perceptions of homebound, senior meal recipients could reveal themes indicating a food recovery-meal delivery program impacts food security, nutrition health, and wellbeing.

Chapter 3

METHODOLOGY

Study Design

A convenience sample of participants who have received meals for at least three months from the MOW food-recovery-meal delivery program were included in the study. Sample size was determined during the collection period of the thematic analysis once data saturation was achieved. Ten meal recipients of the MOW program participated in the study.

Semi-structured interviews with meal recipients were conducted from July to August 2020. An interview guide, noted in Appendix C, was created to facilitate the discussions with the meal recipients and inquire about the self-perceived benefits of participating in the MOW program. The questions were developed to address aspects of either food security, nutrition health, and well-being in relation to receiving the MOW meals. Interviewers probed participants to detail and to share their experience or thoughts when responding. For example, one question may be, “does receiving meals help make the food you buy last longer?” After capturing the answer, participants would be asked to elaborate to provide more information on their perspective or experience. Interviews were conducted over the phone. Participants were informed the interview could be stopped at any point without giving a reason. The interviewer explored topics mentioned by the participant in detail and checked understanding by summarizing. At the end of the interview, participants were thanked and asked if they have any further comments. The interview was complete when the participant had nothing further to add. Interviews were recorded and transcribed verbatim with participants’ verbal informed consent using, as described in Appendix B. This study was approved by the UNF Institutional Review Board (IRB).

Thematic Analysis

Data was analyzed according to the principles of thematic analysis.[1] Interview records were uploaded to a data software program, Otter.ai, for transcription and data storage. Preliminary, inductive coding was completed according to a coding structure developed based on initial findings of the transcripts and new codes were added to the framework as coding progressed. Codes were established across all interviews and were adjusted and collated to capture emerging patterns of meanings through an iterative process. Codes were then refined by grouping and a thematic list was developed. Potential themes were reviewed and finalized to ensure that they presented the main concepts relating common, recurring patterns within interviews.[1] All transcripts were independently analyzed by two researchers with the aim of identifying whether the codes and themes produced were concordant, unbiased, and any discrepancies were explained through discussion.

Chapter 4

RESULTS

In approximately two-and-a-half years, MOW recovered over 26,000 pounds of food from local hospitals, long-term care facilities, and rehabilitation centers which allowed over 19,000 meals to be created for then delivered to homebound seniors on the waitlist for Meals on Wheels in Duval county (MOW-D). The present study seeks to identify the self-perceived impact of the food recovery-meal delivery program on homebound seniors' nutrition health, food security, and well-being. To explore these self-perceptions, a qualitative semi-structured interview was conducted with participants to produce a thematic analysis of their experience. A codebook was developed to organize the data of the thematic analysis, as shown in Appendix D. Major themes were discovered from the semi-structured interviews for each of the participants and are described in Table 1.

Table 1: Major Themes

Health Factor	Theme
Nutrition Health	• Healthier eating • Balanced meals meet needs
Well-Being	• Feel happier and/or worry less • Decreased feelings of isolation and loneliness
Food Security	• Food is always available • Worry less about food running out • Food and SNAP benefits last longer • Less need for food pantries and/or food assistance programs • More money available • COVID-19 pandemic makes it harder to leave home to buy food and meet nutrition needs

Upon interviewing MOW meal recipients, ten major themes regarding the impact of receiving meals emerged: 1) healthier eating, 2) balanced meals meet needs, 3) feel happier and/or worry less, 4) decreased feelings of isolation and loneliness, 5) food is always available, 6) worry less about food running out, 7) food and SNAP benefits last longer, 8) less need for food pantries and/or food assistance programs, 9) more money available, and 10) COVID-19 pandemic makes it harder to leave home to buy food and meet nutrition needs.

Eight of the meal recipients responded that receiving the meals made them healthier. Regarding the delivered MOW meals, one participant stated, “well, I’m not sleeping all the time like I used to during the day. And I’m walking more.” Unexpectedly, three participants reported that the meals helped their weight, with one recipient stating, “I’ve been gaining back weight which I’ve been trying to do,” and another participant reporting, “It helped me lose weight… about 10 to 15 lbs.” Eight of the participants responded that receiving meals helped them eat more nutritiously or healthier. As stated by one participant, “well, you just watch your bad stuff that you may eat. When you have something, you know, that is all balanced and you eat it. I guess, it must satisfy, you don't eat so much junk because you ate something balanced. Your body doesn’t look for other stuff.” Another recipient reported, “it’s got vegetables and everything. Otherwise, I don’t eat any vegetables in a meal.”

All of the participants reported that receiving meals helped them worry less or feel happier. Seven participants related this to their personal food supply, as one recipient disclosed, “I don’t have to worry about whether or not I got something to eat,” when discussing their experience with receiving meals. One recipient stated, “Yes… it makes me happier. Because, you know, I know I have the food. And it’s already prepared. All I have to do is heat it up… And it saves me a lot of

money." Four of the participants related worrying less or feeling happier to the ease of meal preparation, liked one participant explained, "Yes… I don't have to prep for those meals, all I have to do is warm it up. Because I can't use the stove." Another participant connected their experience to social interaction by stating, "Feel happier? Yes… To communicate more with more people." Eight of the meal recipients responded that interacting with the student volunteers that deliver your meals helped them feel less isolated or lonely. "I usually don't socialize with people but if I see them, I'll talk to them…" Another participant described, "they seem to be concerned of how you are doing and what you plan on doing for the day, and things I've got to do. Very friendly."

Every participant replied that receiving meals help make the food they buy last longer. "If I get a meal, I don't have to buy extra food…" Furthermore, nine of the participants reported that receiving meals helps them worry less about whether their food will run out before they receive money to buy more. One recipient elaborated, "I usually have enough left, like three or four, that lasts me and probably gets me through the week." Seven participants reported that they receive SNAP benefits, and all seven of these participants disclosed that receiving meals help make their SNAP benefits last longer. One of these meal recipients detailed that the meals help because "I don't receive that much," in regard to SNAP benefits. Five of the meal recipients responded that they do not go to food pantries or food assistance programs. The participants' elaborations on their participation in food assistance programs varied, with one recipient stating, "it's hard for me because I'm disabled," and another recipient verbalizing, "we just don't know where they are and because of the coronavirus I've been in a lot." One client revealed, "I don't go to food banks because I don't cook like I used to." Of the five participants who report that they go to food pantries or food assistance programs, four of the recipients replied that receiving meals does decrease the number of times they need to go to a food pantry or food assistance program. When asked how

receiving meals impacts reliance on food banks or other food assistance programs, one client stated, “I can’t go anywhere much because I’m in a wheelchair. But we do have a food pantry here if we run out of anything, we can see what they’ve got.” Another participant’s interpretation of the impact of receiving meals reducing the need to attend food assistance programs said, “If I can obtain a ride, sometimes I might do a food bank.” The impact of receiving meals on the need to participate in food pantries or food assistance programs appears to be contingent upon confounding variables, including economic or physical factors according to the participants. All of the participants responded that receiving meals help them pay for other things such as medications, rent or utilities. “It does give me a little extra money,” as stated by one participant.

Four of the participants responded that the recent COVID-19 pandemic has not impacted their ability to obtain enough food or meet their other nutrition needs. One participant elaborated, “No. I still go to the store, you know? I just gear up. Don’t stay in the stores no more than you have to,” regarding her precautions with food shopping during COVID-19. Six of the participants felt that the recent COVID-19 pandemic did impact their ability to obtain enough food or meet their other nutrition needs. On one recipient’s account, “if we can’t get out and stuff like that then basically you can’t get what you want. I’m the kind of person if you’ve always got the rent and the lease, you know, are expensive, then you can’t afford the food you want.” One participant associated, “well, there’s more of a variety of what I get from Meals on Wings… I don’t go use my food stamps because I’m afraid to go out.” Another participant reported, “there is no meat,” when speaking about their experience during the pandemic and the impact on obtaining enough food.

Table 2: Descriptive Hypotheses Outcomes

Health Outcome	Hypothesis	Theme
Nutrition Health	1. Receiving meals from a food recovery-meal delivery program made homebound seniors feel healthier. 2. Receiving meals from a food recovery-meal delivery program helped homebound seniors eat more nutritiously or healthier.	1. Healthier eating 2. Balanced meals meet needs
Well-Being	3. Receiving meals from a food recovery-meal delivery program helped homebound seniors worry less or feel happier. 4. Interacting with the student volunteers that deliver meals for a food recovery-meal delivery program helped homebound seniors feel less isolated/lonely.	3. Feel happier and/or worry less 4. Decreased feelings of isolation and loneliness
Food Security	5. Receiving meals from a food recovery-meal delivery program helped homebound seniors' food last longer. 6. Receiving meals from a food recovery-meal delivery program helped homebound seniors worry less about whether their food will run out before they receive money to buy more.	5. Food is always available 6. Worry less about food running out 7. Food and SNAP benefits last longer 8. Less need for food pantries and/or food assistance programs 9. More money available 10. COVID-19 pandemic makes it harder to leave home to buy food and meet nutrition needs

	7. When participants are receiving SNAP benefits, receiving meals from a food recovery-meal delivery program helped homebound seniors make their SNAP benefits last longer. 8. If participants go to food pantries or food assistance programs, receiving meals from a food recovery-meal delivery program helped decrease the number of times homebound seniors need to go to a food pantry or food assistance program. 9. Receiving meals from a food recovery-meal delivery program helped free up money to help homebound seniors pay for other things such as medications, rent, or utilities. 10. The COVID-19 pandemic impacted the ability for homebound seniors to obtain enough food or meet nutritional requirements.	

Chapter 5

DISCUSSION

This study aimed to explore the self-perceived impact of a food recovery-meal delivery on homebound seniors' food security, nutrition health, and well-being. The results of this study indicate that homebound seniors perceived the MOW program to impact aspects of their nutrition health, food security, and well-being to a degree, as outlined in Table 2. Participants who did not feel these health-related outcomes were impacted by receiving meals from the program typically disclosed that other factors interjected their experience. For example, one client stated she felt able to go to the store during the COVID-19 pandemic but felt the need to "gear up." Unpredicted topics were revealed during the interviews of this study. For example, clients elaborated on the various aspects of their health that, they perceived, were impacted by receiving meals including their energy for performing physical activities or weight-related achievements. Some participants had opposite weight-related goals (i.e. desired weight loss versus weight gain) that were met through receiving meals. Literature on the impact of food recovery-meal delivery programs specific to homebound senior weight status is scarce, and this research may be among one of the few that reveal these programs may support weight management.

The impact of the food recovery-meal delivery program on homebound seniors' well-being factors, including feelings of being worried, isolated, happy, or lonely also revealed some unanticipated findings. For example, the factors that the participants reported feeling less worried about or happier about varied. For some, it was the ease of preparing the meals that made them feel less worried. This is consistent with the literature, as many homebound elderly adults have physical and mobility limitations, making it more challenging to obtain, prepare, and consume foods.[9] Furthermore, each participant, at some point during their interviews, noted that the meals

allowed them to have food available when they need it. One participant unexpectedly explained that the meals help them "go to the doctor less." This may be an implication that meals from a food recovery-meal delivery program have the potential to reduce healthcare utilization in homebound seniors, subsequently reducing healthcare costs.[24,49] A reduced need to spend money on healthcare costs can allow for more money spend on food and other needs.[23]

Topics related to amount of benefits awarded through SNAP were also brought up. The study was completed before the USDA FNS increased SNAP benefits to the maximum amount in response to the COVID-19 pandemic, which did not take effect until October 2020.[50] Therefore, participants of the study who receive SNAP and perceived the benefits to be inadequate may have received additional SNAP benefits that could meet their needs after the study was completed. Additionally, a participant described that they were not able to use their SNAP benefits that they attributed to fears about leaving their home. This may reveal a gap in promotional efforts, as the USDA FNS offers SNAP Online Purchasing services in the state of Florida.[51] Nevertheless, this would still require the access to technology and the ability to navigate this pilot system, which may pose as a challenge for older adults, especially those with diminished functional status and mental decline.[52] Moreover, the barriers to utilizing food assistance programs or food pantries that were highlighted by participants support the use of food recovery-meal delivery programs. The MOW program does not require the recipient to have transportation, necessitates minimal efforts for preparation, and does not use up the participant's time that would be otherwise be needed to obtain or purchase foods. This addresses the barriers that exist in obtaining foods from food assistance programs and food pantries.[41] The clients also perceived that receiving meals freed up more money to spend on other important needs, such as rent, utilities, and medications. The

responses of the participants may indicate that food recovery-meal delivery programs can break the cycle of making choices between different factors, ultimately improving overall health.[5]

The COVID-19 pandemic impact some of our participants in different ways. For many, there was a fear of leaving their home that made it challenging to obtain food. This may indicate that older adults are aware of the risks regarding susceptibility to contracting the virus. This may also imply that homebound seniors will not obtain food when they need it regardless of income, SNAP benefits received, or food pantries/food assistance programs being open. In this case, a home-delivered meal program that practices social distancing and safety precautions may be the most ideal solution for homebound seniors during the COVID-19 pandemic.

An interview with a participant's son was conducted but not included in the thematic analysis or results. It is common for homebound seniors to have their family members speak on their behalf if they are experiencing cognitive dysfunction or have conditions that impact speech such as aphasia after having a stroke.[53] however it did reveal other themes related to the perceived impact of the program from the perspective of the participant's relatives. The son revealed themes related to his mother's well-being, including challenges related to cognition. For example, the son shared, "she had unexplained weight loss. And she had problems with eating and preparing her meals and with the meals that come ready to eat and are sort of fresh, you know, allow her to not have to put on the stove or leave the stove on. Or she may have a better chance to eat because she's not afraid. She's not afraid to eat because sometimes she wouldn't eat because she didn't want to leave the stove on, or she didn't want to leave a burner on or something." The son also shared that receiving meals would impact his well-being, which was shown when he explained, "because I help purchase her groceries and it allows me to maintain my household and to help her as well."

The son also reported the program allowed her to be independent, when he said, “the doctor wants her to maintain her independence long as possible. So, this program helped her maintain that independence.” Although this interview was not able to be included in the final analysis, it may indicate that future studies exploring the perceptions of relatives who act as caregivers for older adults receiving meals from food recovery-meal delivery programs may be needed.

Food recovery-meal delivery programs come with certain challenges in respect to the procurement of foods. For example, it is difficult to forecast how much food will be recovered until the volunteers arrive to pick the items up. The COVID-19 pandemic temporarily led to disruptions in food supply and volunteer availability, while demand for this service heightened. Regardless of these temporary setbacks, the cost of food procurement using a recovery approach is likely to result in less direct costs for producing meals than traditional approaches of purchasing food. Research on the cost effectiveness of food recovery programs compared versus traditional food procurement is scarce and is worth investigating in future studies. The MOW program was able to continue its operation during the COVID-19 pandemic and the findings of this study support its efficacy as solution to hunger according to meal recipients’ perceptions.

LIMITATIONS

This study was not without limitations. The sample size used for the study was small and nonrandomized without a control, hence no causal relationships could be deduced. Although saturation was reached, this sample would not be considered representative across demographics. The participants recruited were that of convenience sampling and did not include clients receiving meals for less than three months. Furthermore, the study was geographically restricted to people living within a 10-mile radius for each delivery route. Therefore, the findings may not be

generalizable to other areas or regions. Since the interviews were administered over the phone, physical interferences such as background noise did not allow for complete uniformity among all interviews. With any self-reported data, there is a risk for response bias. The semi-structured interview reduces risk for interviewer bias. A long-term, randomized controlled trial across multiple geographic locations with a large sample size would allow for more concrete inferences on the impact of the intervention on the outcomes in question. However, this is the first study offering insight into the perceptions homebound seniors have on the impact of a food recovery-meal delivery program on nutrition health, food security, and well-being using a qualitative, thematic analysis design. This analysis may complement a quantitative study in the form of a mixed-methods research model. The nature of the qualitative thematic analysis allows researchers to explore results that cannot be explained using quantitative design.

APPLICATION TO PRACTICE

The findings of this study may indicate a need for efforts to be directed toward innovative solutions to senior hunger in America. A food recovery-meal delivery program is an underutilized approach to improving access to foods. The registered dietitian nutritionist (RDN) can play a role in the advocacy, development, operation and educating of programs such as these.[11] RDNs can publicize the need for food recovery-meal delivery and their benefits in improving access to food. Dietitians may collaborate with local legislators to increase funding toward the development and operation of food recovery-meal delivery programs. This model may be duplicated and implemented in other universities or educational institutions with the assistance of dietitians in program or project development roles. In areas where food recovery-meal delivery programs are established, the dietitian may offer regulatory oversight services on a committee or coalition.[47]

RDNs play an instrumental role in evidence-based approaches and may research the cost-effectiveness and efficacy of these programs in improving food security, nutrition health, and well-being.[11]

In teaching future healthcare professionals, including dietitians, it is important that educators discuss food recovery-meal delivery programs as a model for elderly hunger solutions. Nutrition care in older adults may help in the prevention and treatment of chronic disease and malnutrition.[11] This may indicate a need for RDNs in programs that offer services specific to the older adult population. A RDN may play a role as an educator when creating partnerships between food service operations and food recovery-meal delivery programs, informing them of the Good Samaritan Act and operation of programs regarding safety and quality of meals. There are potential career opportunities for RDNs in the management of food recovery-meal delivery operations. The results of the study may also indicate the need for RDNs participation in Meals on Wheels programs. RDNs have the skill to counsel people receiving meals and coordinate the service around their health and needs. This may help meal recipients benefit more from the program as a RDN can guide clients to being more independent and participative in their health.[54] Furthermore, institutional healthcare RDNs may promote the linkage of care to programs such as these after discharge in addition to tracking outcomes and cost of healthcare after discharge of patients who then receive these services. Moreover, dietitians can take an active role in screening older adults for food security and malnutrition to identify people who may benefit from meal delivery services.[11] The USDA Six-Item Short Form of the Food Security Survey Module is validated for use in screening for the severity of food security in older adults.[55] This may help identify people of this population who are at risk for food security. Furthermore, RDNs working in clinical and community settings may use the Mini Nutritional Assessment – Short Form to screen for

malnutrition or risk for malnutrition in elderly adults.[56] Healthcare organizations can play a role in the continuation of care but not only supporting food recovery-meal delivery programs after discharge, but also as a donator of foods to the community.

The results and unexpected experiences revealed may indicate a need for policy changes. OAA provides meal delivery services to seniors, however limited funding may be holding this service back from reaching people who can benefit from it. Funding reforms may allow meal delivery programs to expand and reach more of those in need of this service. Furthermore, participants revealed that SNAP benefits may not be enough to meet their needs, which also supports the need for additional funding. Themes related to lack of transportation were revealed by multiple meal recipients. For those who are physically able to go grocery shopping or visit food pantries, a non-emergency medical transportation service could help address this barrier to accessing food.[57] More evidence would be needed to support the efficacy of these meals as an effective health intervention. However, programing and funding for transportation to and from grocery stores or food pantries may be a need worth exploring.

CONCLUSION

There is still much research to be done on senior nutrition health, food security, well-being, and food assistance programs. The health implications of aging and prevalence of food insecurity in the elder adult population supports the need for food assistance programming. Moreover, up until the COVID-19 pandemic, available food assistance programs may not have been meeting the needs of American senior citizens.[41,50,58] The COVID-19 pandemic has been a pivotal moment in history and has sparked a conversation about food security assistance programming.

The findings of this study are among one of the first that qualitatively explore the perceived impact of receiving meals from a food recovery-meal delivery program on homebound senior nutrition health, well-being, and food security. Qualitative methods of assessing perceptions and behaviors can be used to fill in gaps and provide insight into unexplainable quantitative discoveries. The use of the thematic analysis in conjunction with quantitative study designs may be the most holistic approach in researching food assistance program interventions in the future. A larger sample size, across multiple geographic locations and demographics, with randomization and control groups may provide stronger evidence into the efficacy of food recovery-meal delivery programs.

Homebound senior adults perceived the MOW food recovery-meal delivery program to improve their nutrition health, food security, and well-being to some degree across all participants. The participants saw the impact of receiving meals to positively affect their availability of food, made extra money available to be spent on other vital needs, made them feel happier or less worried, made their other nutrition assistance benefits last longer or reduce the need for additional food assistance, and helped them worry less about whether or not their food would run out before they had money to buy more. Based on the findings of this study, perhaps the food recovery-meal delivery model can be considered a solution to hunger in homebound seniors on the waitlist for MOWA in the future.

APPENDIX A: Liability Waiver for Volunteers

ACKNOWLEDGMENT

(With General Release for Emergency Medical Treatment and Student-Provided Transportation)
(Off-Site Internship, Practicum, Transformational Learning Opportunity, etc.)

THIS AFFECTS YOUR LEGAL RIGHTS.
PLEASE READ CAREFULLY BEFORE SIGNING BELOW.

As part of the requirement of participation in UNF Meals on Wings program, I am participating in UNF Meals on Wings program, at which I will be participating in the following activities associated with risks including, but not limited to the following: picking up food from Baptist Medical Center, packaging the food into meals and delivering meals to seniors in the community (collectively, the "Activities"). I have also been informed of the possible dangers, hazards and risks involved in the transportation to and from the Activities (if the Activities involve my providing transportation) and independent activities I undertake as a participant in the Activities. I have had an opportunity to ask questions about the Activities, and I understand the nature of those risks to me and to my property.

I have advised Dr. Wright [faculty member] of any condition that limits my ability to participate in the Activities, including any medical condition and I understand that reasonable accommodations are available in the event of any such condition. I represent that I am physically able, with or without accommodation, as the case may be, to participate in the Activities, and I am able to use any equipment and/or supplies associated with the Activities. I am fully responsible for taking reasonable and appropriate precautions to participate in the Activities.

I understand that the University of North Florida has not engaged medical personnel at the location of the Activities. I grant permission to Dr. Wright [faculty member] and/or to Jen Ross [site coordinator] to authorize emergency medical treatment for me. The University of North Florida Board of Trustees and the State of Florida assume no responsibility for any injury or damage arising out of or in connection with such emergency medical treatment. I release all of them from any claim by me or any person claiming through me arising out of or in connection with such emergency medical treatment. I understand that I am responsible for the cost of any such emergency medical treatment. The University of North Florida provides no health insurance for my benefit.

If the Activities involve my providing transportation, I understand that I am assuming responsibility for safely transporting myself and any passenger(s) I decide to transport to and from the Activities. I have a valid driver's license that authorizes me to drive in the State of Florida. I agree to be fully responsible for taking the appropriate precautions for safely transporting myself and passenger(s) including ensuring that my automobile collision insurance provides adequate property and liability coverage to passengers. The University of North Florida Board of Trustees and the State of Florida assume no responsibility for any injury or damage arising out of or in connection with my transporting myself and passenger(s). I release all of them from any claim by me or any person claiming through me arising out of or in connection with such transportation. I understand that the University of North Florida provides no collision insurance, and no property or liability insurance coverage for my benefit or for the benefit of my passenger(s).

If I am under 18 years of age, my parents are also required to sign this Acknowledgment. If my parent or guardian has not signed this Acknowledgment, I understand that I am representing that I am 18 years of age or older.

I have had an opportunity to ask any questions I had about this Acknowledgment and sign it voluntarily.

Student Signature:	Witness Signature
Printed Name:_____	Printed Name:_____
Date:_____	Date:_____

For Parent/Guardian of Student under the age of 18:

I am the parent or legal guardian of the Student. I have read this Acknowledgment and, by signing below, I acknowledge that I understand the terms of this Acknowledgment and agree to be bound by it.

Printed Name:_____
Date:_____

Last revised 1/17/2013

Appendix B: Informed Verbal Consent Document

Informed Consent Document*

Hi my name is Lauri Wright and I am a professor at the University of North Florida. We are conducting a research study on the Food Fighters program. Specifically, we will be measuring the impact of the program on the community agencies, meal recipients, and student volunteers participating in the program.

If you take part in my project, you will asked to complete one interview. We expect that approximately 60 minutes of your time. The interviews will be conducted over the phone by a member of the UNF research team who will call you. Your responses will be confidential. Only the UNF research team will have access to your full name and telephone number. All research materials will be stored in a locked file cabinet in the locked research office.

There are no foreseeable risks for taking part in this project while others may benefit from the information we learn from the results of this study. Participation is voluntary and there are no penalties for deciding not to participate, skipping questions, or withdrawing your participation. Choosing not to participate in the interview will not negatively impact your relationship with Food Fighters.

If you have any questions or concerns about this project, please contact me.

If you have questions about your rights as a research participant or if you would like to contact someone about a research-related injury, please contact the chair of the UNF Institutional Review board by calling (904) 620-2498 or emailing irb@unf.edu.

Thank you for your consideration.

Sincerely,

Lauri Wright
Phone: 904-620-1436
Email: l.wright@unf.edu

_____(print name) verbally attested that he/she is at least 18 years of age and agrees to take part in this research study.

Researcher Printed Name: _____
Signature: _____Date: _____

APPENDIX C: Meal Recipient Interview Guide

Exploring the Impact of Receiving Meals from the Meals on Wings Program

Interview Guide

Thank you for participating in this interview. We are interested in learning about how receiving meals from Meals on Wings might have impacted your health and wellbeing. As we discussed when we reviewed the informed consent, this interview is confidential, and the interview notes/recordings will be kept private. We will not use your name or any information that could identify you in any of our reports. You may choose not to answer questions or end this interview at any time. Your participation in this study will not affect your relationship with Meals on Wings or the University of North Florida (UNF).

Recording Consent:
This interview will be recorded for accuracy. No identifying information will be included in the recording and it will be destroyed immediately after transcription or within 3 months of today's date, whichever occurs first. Do you consent to the audio recording of this interview?

Yes: _____ No: _____

If recording consent is granted, proceed with the following questions:
Opening Questions
First, we will ask a few questions about your involvement with Meals on Wings.

- How long have you been receiving meals from Meals on Wings?
- On average, how many meals do you receive at one time?
- Are you receiving meals from any other organizations (Church, community groups, etc.)?

Key Questions (nutrition, health, well-being)
We're going to move on to discussing some potential health impact you may have experienced from receiving meals.

- Do you feel that receiving meals has made you healthier?
    - If yes: How do you feel they have helped you feel healthier?
- Does receiving meals help you eat more nutritiously or healthier?
    - If yes: How so?
- Do you think receiving meals has helped you worry less or feel happier?
    - If yes: In what ways?
- Does interacting with the student volunteers that deliver your meals help you feel less isolated/lonely?
    - If yes: can you elaborate?

Key Questions- (food security, meeting other financial responsibilities)

We're going to move on to discussing potential impact on meeting other needs you may have experienced from receiving meals.

- Does receiving meals help make the food you buy last longer?
- Does receiving meals help you worry less about whether your food will run out before you receive money to buy more?
- Do you receive SNAP?
    - If so, does receiving meals help make your SNAP benefits last longer?
- Do you go to food pantries or food assistance programs?
    - If so, does receiving meals decrease the number of times you need to go to a food pantry or food assistance program?
- Does receiving meals free up money to help you pay for other things such as medications, rent or utilities?
- Has the recent COVID-19 pandemic impacted your ability to obtain enough food or meet your nutritional needs?
    - If so, please discuss.

Closing Questions

- Are there other impacts of receiving meals that I didn't cover?
- Do you have suggestions on how we could improve the meals or program?
- Do you have any questions or comments about the project for me?

Thank you for taking the time to meet with me today, your contribution to this project is greatly appreciated.

APPENDIX D: Meal Recipient Interview Code Book

Concept	Code	Example	Frequency
a. Do you feel that receiving meals has made you healthier?	a. Yes b. No c. To a degree d. Receiving meals provides more energy for physical activity e. I don't know f. Receiving meals helps improve weight	a. "Yes, because at least I know that if there isn't anything else to choose from at least I get one of those and eat it." b. "The problem is most of them I am getting are highly seasoned. I can't eat a lot of highly seasoned food because of other ailments I have… It does give me something to eat that I can have if I need it." c. "Yes… because they're balanced, and they have vegetables and everything and protein and they're balanced meals." d. "Oh, yes… instead of just eating snacks, they're a nutritious meal and it's a good variety." e. "Well, I was losing weight when I was on my own, so yes… having a hot meal." f. "Yes… well, I'm not sleeping all the time like I used to during the day. And I'm walking more… At my age, there's only so many things I can elaborate on because there is so much difference in my routine." g. "I don't know if they've made me healthier, but they've filled my belly." h. "Yes…I feel healthy. I've been gaining back weight	a. 8 b. 0 c. 1 d. 1 e. 1 f. 3

		which I've been trying to do." i. "Yes, it has. It helped me lose weight… about 10 to 15 lbs." j. "Yes, it makes you eat healthier… because it has lots of things in it. It doesn't have a lot of salt."	
b. Does receiving meals help you eat more nutritiously or healthier?	a. Yes b. No c. Meals are satisfying	a. "Yes. Yes. There's always a vegetable and, you know, like something else, which is good." b. "Probably not. If I was cooking myself, I'd probably be eating healthy too." c. "Well, you just watch your bad stuff that you may eat. When you have something, you know, that is all balanced and you eat it. I guess, it must satisfy, you don't eat so much junk because you ate something balanced. Your body doesn't look for other stuff." d. Yes… because it's the basic food groups, you know? Like I said, there's a variety." e. "Oh, yeah… its got vegetables and everything. Otherwise, I don't eat any vegetables in a meal. I would just make a sandwich or something." f. "Yeah…well, they're more rounded out, a variety of vegetables and meat."	a. 8 b. 1 c. 1

		g. "Oh, yes. Because everything is there the vegetables and everything." h. "…I'm a diabetic and I got to be careful with my input. I'm very satisfied with them." i. "Yes, ma'am, it makes me eat more healthy." j. "Yes… it has meat, vegetables, it has a lot of healthy stuff in it. Carrots, and stuff like that."	
c. Do you think receiving meals has helped you worry less or feel happier?	a. Yes b. No c. Food is always available d. Meals are easy to prepare or reduce the stress of preparing a meal e. Receiving meals reduces the need to seek medical assistance.	a. "Yes, happier. I don't know about worrying, but happier, yes. At least I know I've got something I like to eat. I love your ziti, I'm a pasta person… Pasta and meatloaf: my two favorite foods." b. "I don't have to worry about whether or not I got something to eat." c. "Yes… You don't have to cook." d. "Yes… it makes me happier. Because, you know, I know I have the food. And it's already prepared. All I have to do is heat it up… And it saves me a lot of money." e. "Uh huh. I'm happy to get them… it's something to eat. Keeps me from getting hungry." f. "Well, worry less? No. Feel happier? Yes… To communicate more with more people." g. "I'm not really a worrier and I'm always happy,	a. 10 b. 0 c. 7 d. 4 e. 1

		but the meals help because they're there… oh yeah. Don't have to cook or wash dishes." h. "Oh, absolutely. Knowing I've got food coming takes a lot of stress off me." i. "Yes, I don't feel too bad, I'll be alright, good to go… I have to go to the doctor less." j. "Yes… I don't have to prep for those meals, all I have to do is warm it up. Because I can't use the stove."	
d. Does interacting with the student volunteers that deliver your meals help you feel less isolated or lonely?	a. Yes b. No	a. "Yeah, I do like the students. The one girl who has just quit or moved on… I have two cats, and my cats always see a lot of people but they have really taken to the people who come in. Yeah." b. "They're wonderful and they do great things. They're great." c. "Yes. It's nice to see them." d. "Oh, definitely… they're very friendly. And I have a dog and she always greets them at the door. They like her and I guess they like me, you know, so it's good to have some company." e. "No." f. "Yes, definitely... They seem to be concerned of how you are doing and what you plan on doing for the day, and things	a. 8 b. 2

		I've got to do. Very friendly." g. "Oh yeah. I love all of them. They're so nice." h. "Oh, they are very nice people. They are so cool." i. "Yes, they do the best they can… I usually don't socialize with people but if I see them, I'll talk to them about it." j. "No."	
e. Does receiving meals help make the food you buy last longer?	a. Yes b. No	a. "Yeah… I always know that at least there is a meal in there or something you know, I can get that instead of having to-because I'm a sandwich lover, you know, and its easy to make a sandwich, ok? But the meals, if there is a meal I like, then I will eat that over the sandwich." b. "Yes." c. "Yes." d. "Oh, yes." e. "Yeah." f. "Yes." g. "Yes." h. "If I get a meal, I don't have to buy extra food like that." i. "Yes, they last longer." j. "Yes."	a. 10 b. 0
f. Does receiving meals help you worry less about whether your food will run out before you receive money to buy more?	a. Yes b. No c. Receiving meals helps food last longer so don't have to worry as much	a. "Yes. Yes. Yes." b. "Yes." c. "Yes." d. "Definitely." e. "Yeah." f. "No, no." g. "Yes." h. "Absolutely."	a. 9 b. 1

		i. "Yes, they last longer." j. "Yeah, I usually have enough left, like three or four, that lasts me and probably gets me through the week." k. "Oh, it helps. It does help."	
g. Do you receive SNAP? a. If so, does receiving meals help make your SNAP benefits last longer?	a. Yes b. No c. SNAP benefits do not meet needs	a. "No, I don't get food stamps." b. "Yes… Yes." c. "Yes… yeah." d. "Yes…definitely, because I don't receive that much." e. "Oh, yeah." f. "Yes… yes." g. "Yes… yes." h. "Yeah… oh, yeah, absolutely." i. "Yeah, they give it to you at $15 for food stamps…yeah, they last a lot too." j. "No, I don't get food stamps. They cut them off."	a. 7 b. 3 c. 1
h. Do you go to food pantries or food assistance programs? a. If so, does receiving meals decrease the number of times you need to go to a food pantry or food assistance program?	a. Yes b. No c. Physical limitations make it harder to go out to get food. d. Require transportation services to go out to get food. e. Easier to heat food in microwave	a. "No, because we just don't know where they are and because of the coronavirus I've been in a lot." b. "I can't go anywhere much because I'm in a wheelchair. But we do have a food pantry here if we run out of anything, we can see what they've got… It decreases a lot." c. "Not lately but I did. I haven't been going many places lately… yeah." d. "No, it's hard for me because I'm disabled." e. "No."	a. 4 b. 6 c. 2 d. 1 e. 1

		f. "If I need something and I can't buy it, yes… no." g. "If I can obtain a ride, sometimes I might do a food bank… oh, yes." h. "No." i. "No, I just go to the grocery store and food markets. I don't go to food banks because I don't cook like I used to. I just throw pork and beans or burritos into the microwave." j. "Yes, I go to giveaways, like where they giveaway food. That helps a lot too… sometimes I don't have to go because the food that y'all send us helps out."	
i. Does receiving meals help you pay for other things such as medications, rent or utilities?	a. Yes b. No c. Receiving meals frees up extra money.	a. "Yes." b. "Yes, it does." c. "Yes." d. "Yes." e. "It does give me a little extra money." f. "Yes." g. "Yes." h. "Absolutely." i. "I try to keep a balance and pay for my utilities. Yes." j. Yes, it helps."	a. 10 b. 0 c. 1
j. Has the recent COVID-19 pandemic impacted your ability to obtain enough food or meet your other nutrition needs?	a. Yes b. No c. COVID-19 has financial burdens	a. "Yes. Well, we have a lot of people around us and being Social Security, if we can't get out and stuff like that then basically you can't get what you want. I'm the kind of person if you've always got the rent and the lease, you know, are expensive,	a. 6 b. 4 c. 6

		then you can't afford the food you want." b. "No." c. "No. I still go to the store, you know? I just gear up. Don't stay in the stores no more than you have to." d. "No, not really." e. "It's been rough, but I'm making it, yes. But the meals are good." f. "Yes… well, there's more of a variety of what I get from Meals on Wings… I don't go use my food stamps because I'm afraid to go out." g. "No." h. "Oh, yeah, I guess it has… It's hard for me to get around. I don't drive or anything. It's really a convenience for me to have to leave." i. "Yes, it would be nutrition. I try not to worry but people will do whatever they want." j. "Yes… because there is no meat."	

References

1. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77-101. doi:10.1191/1478088706qp063oa
2. Older Adults and COVID-19. Centers for Disease Control and Prevention. https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/older-adults.html. Published September 11, 2020. Accessed October 25, 2020.
3. Ziliak JP, Gundersen C. *The State of Senior Hunger in America in 2018*.; 2020.
4. Rinehart SW, Folliard JN, Raimondi MP. Building a Connection between Senior Hunger and Health Outcomes. *J Acad Nutr Diet*. 2016;116(5):759-760. doi:10.1016/j.jand.2016.02.009
5. Decker D, Flynn M. *Food Insecurity and Chronic Disease: Addressing Food Access as a Healthcare Issue*. Rhode Island; 2018.
6. Food Recovery Program. Florida Department of Agriculture & Consumer Services. https://www.fdacs.gov/Food-Nutrition/Nutrition-Programs/Food-Recovery-Program. Accessed October 15, 2020.
7. FAQ. Meals on Wheels People. https://www.mowp.org/faq/. Published 2020. Accessed November 17, 2020.
8. Find Meals. Meals on Wheels of America. https://www.mealsonwheelsamerica.org/find-meals. Accessed October 17, 2020.
9. Huang DL, Rosenberg DE, Simonovich SD, Belza B. Food access patterns and barriers among midlife and older adults with mobility disabilities. *J Aging Res*. 2012;2012. doi:10.1155/2012/231489
10. Loneliness and Social Isolation Linked to Serious Health Conditions. Centers for Disease

Control and Prevention. https://www.cdc.gov/aging/publications/features/lonely-older-adults.html. Published May 26, 2020. Accessed October 25, 2020.

11. Position of the Academy of Nutrition and Dietetics and the Society for Nutrition Education and Behavior: Food and Nutrition Programs for Community-Residing Older Adults. *J Acad Nutr Diet*. 2019;119(7):1188-1204. doi:10.1016/j.jand.2019.03.011

12. Zhu H, An R. Impact of home-delivered meal programs on diet and nutrition among older adults: A review. *Nutr Health*. 2013;22(2):89-103. doi:10.1177/0260106014537146

13. Campbell AD, Godfryd A, Buys DR, Locher JL. Does Participation in Home-Delivered Meals Programs Improve Outcomes for Older Adults? Results of a Systematic Review. *J Nutr Gerontol Geriatr*. 2015;34(2):124-167. doi:10.1080/21551197.2015.1038463

14. Wright L, Vance L, Sudduth C, Epps JB. The Impact of a Home-Delivered Meal Program on Nutritional Risk, Dietary Intake, Food Security, Loneliness, and Social Well-Being. *J Nutr Gerontol Geriatr*. 2015;34(2):218-227. doi:10.1080/21551197.2015.1022681

15. Wolfe WS, Frongillo EA, Valois P. Understanding the experience of food insecurity by elders suggests ways to improve its measurement. *J Nutr*. 2003;133(9):2762-2769. doi:10.1093/jn/133.9.2762

16. Starr KNP, Lee JS, Hausman D, Johnson MA. Physical Limitations Contribute to Food Insecurity and the Food Insecurity-Obesity Paradox in Older Adults at Senior Centers in Georgia Sarcopenic Obesity View project. 2016. doi:10.1080/01639361003772343

17. Shim JE, Hwang JY, Kim K. Objective and perceived food environment and household economic resources related to food insecurity in older adults living alone in rural areas. *BMC Geriatr*. 2019;19(1). doi:10.1186/s12877-019-1231-y

18. Fernandes SG, Rodrigues AM, Nunes C, et al. Food Insecurity in Older Adults: Results

From the Epidemiology of Chronic Diseases Cohort Study 3. *Front Med*. 2018;5(JUL):203. doi:10.3389/fmed.2018.00203

19. Brostow DP, Gunzburger E, Abbate LM, Brenner LA, Thomas KS. Mental Illness, Not Obesity Status, is Associated with Food Insecurity Among the Elderly in the Health and Retirement Study. *J Nutr Gerontol Geriatr*. 2019;38(2):149. doi:10.1080/21551197.2019.1565901
20. Shanks CB, Hingle MD, Parks CA, Yaroch AL. The COVID-19 Pandemic: A Watershed Moment to Strengthen Food Security Across the US Food System. *Am J Public Health*. 2020;110(8):1133-1134. doi:10.2105/AJPH.2020.305760
21. Gunderson C, Hake M, Dewey A, et al. *The Impact of the Coronavirus on Food Insecurity in 2020*.; 2020.
22. Wolfson JA, Leung CW, Kullgren JT. Food as a Critical Social Determinant of Health Among Older Adults During the Coronavirus Disease 2019 (COVID-19) Pandemic. *JAMA Heal Forum*. 2020;1(7):e200925. doi:10.1001/jamahealthforum.2020.0925
23. Lloyd J. *Hunger in Older Adults: Challenges and Opportunities for the Aging Services Network*.; 2017.
24. Shan M, Gutman R, Dosa D, et al. A New Data Resource to Examine Meals on Wheels Clients' Health Care Utilization and Costs. *Med Care*. 2019;57(3):E15-E21. doi:10.1097/MLR.0000000000000951
25. Klemm S. Special Nutrient Needs of Older Adults. Eat Right Academy of Nutrition and Dietetics. https://www.eatright.org/health/wellness/healthy-aging/special-nutrient-needs-of-older-adults. Published May 21, 2020. Accessed November 7, 2020.
26. Krok-Schoen JL, Archdeacon Price A, Luo M, Kelly OJ, Taylor CA. Low Dietary Protein

Intakes and Associated Dietary Patterns and Functional Limitations in an Aging Population: A NHANES Analysis. *J Nutr Heal Aging*. 2019;23(4):338-347. doi:10.1007/s12603-019-1174-1

27. The “Loneliness Epidemic.” Health Resources & Services Administration. https://www.hrsa.gov/enews/past-issues/2019/january-17/loneliness-epidemic. Published January 2019. Accessed November 1, 2020.
28. Holt-Lunstad J. The Potential Public Health Relevance of Social Isolation and Loneliness: Prevalence, Epidemiology, and Risk Factors. *Public Policy Aging Rep*. 2017;27(4):127-130. doi:10.1093/ppar/prx030
29. Jung SE, Bishop AJ, Kim M, Hermann J, Kim G, Lawrence J. Nutritional Status of Rural Older Adults Is Linked to Physical and Emotional Health. *J Acad Nutr Diet*. 2017;117(6):851-858. doi:10.1016/j.jand.2017.01.013
30. Wu B. Social isolation and loneliness among older adults in the context of COVID-19: a global challenge. *Glob Heal Res Policy*. 2020;5(1):27. doi:10.1186/s41256-020-00154-3
31. Assistance for Seniors. USDA-FNS. https://www.fns.usda.gov/program/assistance-seniors. Accessed October 17, 2020.
32. *Seniors Farmers’ Market Nutrition Program Factsheet*.; 2018. https://www.fns.usda.gov/sfmnp/sfmnp-contacts. Accessed October 17, 2020.
33. SNAP Special Rules for the Elderly or Disabled. USDA-FNS. https://www.fns.usda.gov/snap/eligibility/elderly-disabled-special-rules#What are the SNAP income limits? Published October 1, 2020. Accessed October 17, 2020.
34. *Commodity Supplemental Food Program Factsheet*.; 2019. http://www.fns.usda.gov/csfp. Accessed October 17, 2020.

35. Child and Adult Care Food Program. USDA-FNS. https://www.fns.usda.gov/fns-101-cacfp. Published October 2018. Accessed October 17, 2020.

36. Nutrition Services. Administration for Community Living. https://acl.gov/programs/health-wellness/nutrition-services. Published May 10, 2020. Accessed October 17, 2020.

37. Simard J, Volicer L. Loneliness and Isolation in Long-term Care and the COVID-19 Pandemic. *J Am Med Dir Assoc*. 2020;21:966-967. doi:10.1016/j.jamda.2020.05.006

38. Waite T. What's the difference between a food bank and food pantry? Feeding America. https://www.feedingamerica.org/hunger-blog/what-difference-between-food-bank-and-food-pantry. Published February 20, 2019. Accessed November 17, 2020.

39. Hunger & Poverty in the United States | Map the Meal Gap. Feeding America. https://map.feedingamerica.org/. Accessed April 16, 2020.

40. An R, Wang J, Liu J, Shen J, Loehmer E, McCaffrey J. A systematic review of food pantry-based interventions in the USA. *Public Health Nutr*. 2019;22(9):1704-1716. doi:10.1017/S1368980019000144

41. Ginsburg ZA, Bryan AD, Rubinstein EB, et al. Unreliable and Difficult-to-Access Food for Those in Need: A Qualitative and Quantitative Study of Urban Food Pantries. *J Community Health*. 2019;44(1):16-31. doi:10.1007/s10900-018-0549-2

42. Coronavirus Food Assistance Program (CFAP). United States Department of Agriculture. https://www.usda.gov/coronavirus/food-assistance. Published 2020. Accessed November 17, 2020.

43. Food and Nutrition Service Responds to COVID-19. United States Department of Agriculture Food and Nutrition Services. https://www.fns.usda.gov/coronavirus#flex.

Published 2020. Accessed November 7, 2020.

44. Gleaning 2020. Food Recovery Network. https://www.foodrecoverynetwork.org/gleaning-2020. Published 2017. Accessed November 7, 2020.

45. The Campus Kitchens Project: Using Food as a Tool to Strengthen Communities . Universities Fighting World Hunger. http://wp.auburn.edu/ufwh/2016/03/23/the-campus-kitchens-project-using-food-as-a-tool-to-strengthen-communities/. Published March 23, 2016. Accessed November 17, 2020.

46. *Liability Protection for Food Donation*. St. Paul, Minnesota; 2013. www.publichealthlawcenter.org651.290.7506. Accessed November 7, 2020.

47. Bierma TJ, Jin G, Bazan CN. Food Donation and Food Safety: Challenges, Current Practices, and the Road Ahead. *J Environ Health*. 2019;81(10):16-21. https://search.ebscohost.com/login.aspx?direct=true&AuthType=shib&db=rzh&AN=136742510&site=ehost-live&scope=site&custid=s6281220.

48. Coronavirus Disease | Nursing Homes & Long-Term Care Facilities. Centers for Disease Control and Prevention. https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-in-nursing-homes.html. Published September 11, 2020. Accessed November 7, 2020.

49. Berkowitz SA, Terranova J, Hill C, et al. Meal delivery programs reduce the use of costly health care in dually eligible medicare and medicaid beneficiaries. *Health Aff*. 2018;37(4):535-542. doi:10.1377/hlthaff.2017.0999

50. SNAP Benefit Increase Takes Effect. United States Department of Agriculture Food and Nutrition Service. https://www.fns.usda.gov/news-item/fns-001420. Published October 1, 2020. Accessed November 8, 2020.

51. FNS Launches the Online Purchasing Pilot. United States Department of Agriculture Food and Nutrition Services. https://www.fns.usda.gov/snap/online-purchasing-pilot. Published October 7, 2020. Accessed November 8, 2020.

52. Peek STM, Luijkx KG, Rijnaard MD, et al. Older Adults' Reasons for Using Technology while Aging in Place. *Gerontology*. 2016;62(2):226-237. doi:10.1159/000430949

53. Grant JS, Elliott TR, Weaver M, Bartolucci AA, Giger JN. Telephone intervention with family caregivers of stroke survivors after rehabilitation. *Stroke*. 2002;33(8):2060-2065. doi:10.1161/01.STR.0000020711.38824.E3

54. Getz L. Meals on Wheels Making an Impact. Today's Dietitian. https://www.todaysdietitian.com/news/exclusive0517.shtml. Accessed December 10, 2020.

55. Survey Tools. USDA Economic Research Service. https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/survey-tools/. Published September 9, 2020. Accessed December 10, 2020.

56. *A Guide to Completing the Mini Nutritional Assessment-Short Form (MNA®-SF)*.

57. Powers BW, Rinefort S, Jain SH. Nonemergency medical transportation delivering care in the era of lyft and uber. *JAMA - J Am Med Assoc*. 2016;316(9):921-922. doi:10.1001/jama.2016.9970

58. Morris AM, Engelberg JK, Schmitthenner B, et al. Leveraging Home-Delivered Meal Programs to Address Unmet Needs for At-Risk Older Adults: Preliminary Data. *J Am Geriatr Soc*. 2019;67(9):1946-1952. doi:10.1111/jgs.16013