Examining the Association Between Activities of Daily Living (ADLs), Demographics and Food Security of Older Adults Attending Fulton County Senior Centers.

Examining the Association Between Activities of Daily Living (ADLs), Demographics and Food Security of Older Adults Attending Fulton County Senior Centers.

by

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ABSTRACT

Food security amongst community-dwelling older adults attending senior centers is not often examined. It is an integral determinant of health because of its impact on multiple health conditions. This study examined the relationship between food security, activities of daily living, and demographic variables of older adults attending senior centers in Georgia served by nutrition provider Open Hand Atlanta (OHA). One hundred sixty-five senior center attendees were recruited from ten senior centers in Fulton County Georgia. Food security was measured by the USDA 6-item module. Bivariate associations were tested between food security and ADLs and iADLs (instrumental ADLs) measured by a 15-item list. Results showed that food security differed based on race/ethnicity X^2 (n=165) = 8.94 (df=2), p = .011 and type of insurance X^2 (n=100) = 5.95, (df=1) p = 0.015). Public/Govt insurance holders experience a higher proportion of food insecurity compared to those under private insurance (p=.015).

INDEX WORDS: Food Security, Older Adults, Activities of Daily Living, Fulton County, Senior Center, Disability.

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DEDICATION

To the Lord Almighty, the one who made it possible for me to be at this point of my life, who never leaves nor forsake me. For the grace to complete this program despite the difficulties and challenges, and for always making a way. Blessed be your name.

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LIST OF ABBREVIATIONS

FS	Food Security
ADLs	Activities of Daily Living
iADLs	Instrumental Activities of Daily Living

1 INTRODUCTION

1.1 **Background of Study**

Food security is a fundamental human right and a critical predictor of well-being (U.S. Department of Agriculture Economic Research Service, 2020). It is described as the circumstance in which individuals consistently access safe, adequate, and nutritious food to suit their dietary needs and preferences for an active and healthy life (Peng & Berry, 2018). In contrast, food insecurity, a significant public health concern in the United States, can be described as "a household-level economic and social condition of limited or uncertain access to adequate food" (U.S. Department of Agriculture Economic Research Service, 2012) or having inconsistent physical, social, and economic ability to access and secure sufficient, safe and nutritious food (Definitions of Food Security 2016). These explanations reveal how intricate food insecurity is, highlighting its multifaceted impact on the well-being of individuals and communities. According to Shepard et al. (2011), the estimated cost of healthcare in 2010 resulting from food insecurity-related health concerns was a staggering $130.5 billion. This financial burden illustrates the profound implications of food insecurity on the healthcare system, emphasizing the urgent need for targeted interventions and policies to mitigate its adverse effects.

Ensuring food security for all Americans is a pressing concern in the US, with the older adult population being among those in urgent need. Addressing food security among older adults becomes more critical as the nation undergoes a significant demographic shift marked by an aging population (U.S. Census Bureau, 2014). Fulton County, Georgia, a diverse and populous region, is particularly affected by this shift due to the migration of older Americans from the Northwestern and Midwestern regions of the US to the Southern region (Mateyka & He, 2022).

The U.S. Census Bureau (2019) projects that by 2030, all baby boomers will have reached age 65, leading to a substantial increase in Fulton County's aging population. Senior centers have grown in significance as a means of meeting the varied needs of the aging population. As a result, Fulton County senior centers face challenges such as the inadequate capacity to accommodate more members brought on by the population shift (Brookshire, 2015).

Previous studies have primarily compared senior center users and non-users, looking at socioeconomic and demographic variables associated with participation (Somerville, et al.,2020; Pardasani, 2012). Another study by (Fitzpatrick et al. (2006) investigated those factors influencing the perception of the social and health advantages of senior center membership. The outcomes showed a substantial correlation between regular engagement in senior center activities and enhanced social networks, more significant mental health, and easier access to resources for health. Additionally, Giunta et al. (2012) looked at the disparities in attributes between seniors who visit more homogeneous centers and those who attend racially and ethnically varied centers. These findings suggest that while senior center participants may demonstrate similar health and quality-of-life outcomes, those from diverse centers may face a greater risk of social isolation, receive less family support, and be more likely to seek medical care from hospitals or community clinics. However, there is a gap in the existing literature about the food security of senior center attendees, hence the importance of this study. Since older adults participate in congregate meals at senior centers up to three days a week, senior centers are thus an ideal and essential setting to measure food security levels and their association with ADLs.

According to Katz et al. (1963), the term "activities of daily living" (ADLs) refers to basic self-care activities that are required for daily life. These activities include eating, bathing, dressing, toileting, and transferring. The more complicated activities known as instrumental

activities of daily living (iADLs), on the other hand, enable a person to live freely within a community and include duties like food preparation, money management, shopping, and prescription administration (Lawton & Brody, 1969). Seniors' capability to efficiently access and manage food resources is closely associated with their ability to carry out ADLs and iADLs. Given the significant impact that food security has on chronic illness and poor health, there is reason to think that dietary changes may impact ability and limitations (Alvarez et al., 2015; Seligman et al., 2010).

Food security for seniors encompasses more than just food availability; it also refers to the quality, safety, and accessibility of the food they require to sustain their health and well-being. Seniors who have trouble with ADLs or iADLs may experience more difficulties locating and preparing nourishing meals, which might limit nutritional intake and increase the risk of malnutrition and associated health issues (Lee & Frongillo, 2001). Food insecurity among older adults can lead to malnutrition, exacerbation of health issues, and reduced quality of life (Jess & Sarah, 2020). Several factors, including transportation, financial constraints, declining health, cognitive decline, lack of social support, lack of knowledge, stigma, gentrification, and rising costs that disproportionately impact older adults, may also be correlated to food insecurity or increased food insecurity among older adults. Limited mobility and transportation can hinder access to grocery stores or food distribution centers (Rajasooriar & Soma, 2022). Financial constraints, especially for those on fixed incomes, can lead to a lack of resources for adequate food and maintaining good health (Ke & Ford, 2015). Declining health can affect older adults' ability to perform ADLs, impacting their food procurement and preparation (Heuvel et al., 2019). Among the myriad challenges faced by older adults, those related to ADLs and iADLs play pivotal roles in their ability to access and consume nutritious meals.

Older adults' ability to perform ADLs and iADLs is closely linked to their food security, as difficulties in these areas can hinder their capacity to obtain, prepare, and consume nutritious food (Stuff et al., 2004). Age-related cognitive decline may impair iADLs, making tasks like meal planning and budgeting difficult (Cipriani et al., 2020). Limited social support, lack of knowledge about available resources, stigma, gentrification, and rising costs can exacerbate these challenges (Mezzina et al., 2022).

Given the unique needs of this population, it is crucial to understand their levels of food security and their ability to perform daily activities necessary for independent living and to meet specific components of food security within this regional context. Understanding these complexities, it becomes essential to delve into how food security impacts the daily functional abilities of older adults, particularly in maintaining independence and quality of life within their specific regional context.

1.2 Significance of the Study

As the global population ages, the significance of ensuring adequate food access and nutrition for older adults becomes increasingly prominent. According to the United States Census Bureau (2023), the percentage of people 65 and over in Fulton County is 12.8%. This is less than the national average of 16.04% (Fulton County population by age, 2023). Research by Santos and Jarmin (2022) reveals that, from 2015 to 2019, the South experienced the most significant net migration gain of older adults, with an annual increase of approximately 72,900 people aged 65 and over. The county's older population is around 12%, with the number of older adults increasing by three to four percent since 2010 (Cobbs, 2023). This significant demographic shift underscores the importance of understanding regional differences in the needs and challenges older adults face, particularly in the context of food security and activities of

daily living. Food insecurity and limited access to healthy, fresh food are two issues that older persons in Fulton County, Georgia, may encounter regarding food access. Recognizing and addressing these regional challenges is crucial for ensuring the well-being and food security of older adults in Fulton County, Georgia.

Despite the crucial significance of food security for older adults, there is a noticeable gap in the existing literature that focuses on the food security status of senior centers and its connection to ADLs and iADLs. Despite abundant research on food security among older people, studies examining the complex links between food security, ADLs, iADLs, and the specific environment of senior facilities in Fulton County are surprisingly limited. Most existing research concentrates on issues around food security for older persons as a whole or in the context of aging in place. While this study has significantly advanced our knowledge of senior food insecurity, it does not detail the unique challenges senior center participants face for those who frequently rely on these facilities for their daily meals and support services due to social or health issues. As a result, the exceptional circumstances, demands, and potential barriers to food security within this population are yet to be adequately studied.

To enhance the lives of seniors, senior centers have developed into significant hubs of support in this neighborhood (Aday, 2003). Senior centers are essential to the well-being of older adults. These facilities offer various services and programs to promote active aging, care, and independence. Fulton County's community senior centers support the Congregate Meal Program by serving healthy meals in a group setting and providing life enrichment talks, health education, and exercise activities. These facilities serve as a social hub for older adults to receive essential resources such as transportation, care management, and support with in-home services. Furthermore, organizations such as Senior Services North Fulton operate several senior

centers in the area, providing nutritional meals, transportation, and various social activities to support the older population within the county. Thus, considering the significance of senior centers in the lives of older adults, it is imperative to understand how food security, ADLs, and iADLs interact in the setting of these establishments.

This study aims to close the gap in the literature by investigating the unique challenges and factors that impact food security among senior participants in Fulton County, Georgia. The data generated from this study will inspire future research and play a crucial role in shaping future legislative proposals. By providing informative data, this study has the potential to significantly boost the wellness and food security of older adults in senior centers, making a substantial contribution to the field of gerontology and nutrition.

Older adult's holistic well-being is also impacted by food insecurity, which can result in social isolation, depression, and a lower quality of life, making it difficult for them to participate fully in their communities and enjoy their later years (Mesbah et al., 2020). With limited access to nutrient-dense meals necessary for managing chronic health disorders like diabetes and hypertension, older adults who experience food insecurity are more likely to experience these conditions. Furthermore, it can burden healthcare systems because of a rise in hospital admissions and the need for medical interventions to manage the adverse health effects of inadequate nutrition and related stressors (Berkowitz et al., 2018; Seligman & Schillinger, 2010). It is therefore imperative to address food insecurity in this population to improve community well-being, lower healthcare costs, and improve individual health outcomes.

Furthermore, by highlighting older adults' particular needs and challenges, this research proposes contributing to the larger social objective of building more inclusive and supportive communities. Finally, focusing on Fulton County offers a local perspective on the problem,

enabling customized solutions that effectively address food insecurity and support the functional needs of older adults in this community.

2 LITERATURE REVIEW

2.1 An Overview of Food Insecurity

For older adults, food insecurity has become a recurring public health concern (Aday et al., 2023) According to nationally representative data from 2019, 2.6% (1.9 million) of older adults (60 and over) were classified as having very low food security, and 5.2 million (7.1%) were food insecure (Ziliak & Gundersen, 2021). Based on this report, two-thirds of senior households served by the Feeding America network, a nationwide network of food banks and food rescue organizations, were forced to choose between food, housing, and medical care. This highlights the severe trade-offs many senior households must navigate, underscoring the urgency of addressing food insecurity among older adults to ensure they do not sacrifice essential needs.

2.2 Food Security and Functional Limitations in Older Adults

For older adults, daily activities and food security are crucial to their overall well-being. The inability to carry out everyday tasks independently can have serious repercussions. It may result in diminished quality of life, a rise in the chance of impairment, and a loss of independence (Petersen et al., (2019) Moreover, food security is essential in guaranteeing older adults' access to sufficient and nourishing food to fulfill their nutritional requirements. Research has shown that older adults who experience food insecurity are more likely to have limitations in activities of daily living compared to those who do not experience food insecurity (Szanton et al., 2017). This highlights the interconnectedness between food security and the ability to engage in

activities of daily living. The ability to use food is essential in maintaining adequate food use in older adults, including food preparation and more complex meal activities. Understanding and supporting these capabilities can help mitigate food insecurity's impacts, enhancing the independence and quality of life for this population.

According to Hickman (2018), having multiple functional limitations is linked to increased chances of food insecurity and poor diet quality in older adults from low-income households. The study examined data on low-income adults aged 65 and older from the National Health and Nutrition Examination Surveys conducted between 2007 and 2012. The two key outcomes that were measured were poor diet quality and food insecurity.

A study led by Brewer (2010) found that weight-related disability and obesity may be risk factors for food insecurity among older adults participating in the Older American Act (OAA) congregate meal-site program. The group studied how physical limitations contribute to food insecurity and the obesity paradox in older adults at senior centers in Georgia. The results indicated that weight-related disability and severe obesity could increase the risk of food insecurity in this population, suggesting the importance of disability and obesity when evaluating the need for food assistance among older adults.

2.3 Food Security and Demographics of Older Adults

The issue of food insecurity among older females with disabilities is urgent and has to be addressed with intervention. According to a systematic review, older adults with disabilities—especially women—are more likely than older adults without disabilities to experience food insecurity. Reduced financial resources, fewer educational options, and growing healthcare expenditures are further factors contributing to this susceptibility (Petersen et al., 2019).

Furthermore, a robust association has been observed between food insecurity and the development of a disability in the older adults population, progressing from a chronic illness to functional limitations (Petersen et al., 2019). Moreover, compared to older women with disabilities living in urban areas, food insecurity rates are considerably greater for those living in rural regions (Illescas-Mogrovejo et al., 2022).

In addition, older females with disabilities are more vulnerable to food insecurity due to the intersectionality of race/ethnicity and education level (Lee & Frongillo (2001). This issue is particularly concerning because food insecurity has been associated with poor dietary outcomes, such as low fruit and vegetable intake and overall nutritional quality (Caspi et al., 2016). Thus, addressing these dietary deficiencies is critical for improving health outcomes and preventing chronic diseases among older adults.

According to Walker (2021), food insecurity in the US increased from 9% to 18% between 2005 and 2012, with differences observed in age, racial/ethnicity, sex, and income. Higher levels of food insecurity were associated with lower incomes, and individuals in specific demographics, such as females, non-Hispanic Blacks, those over 65, and Hispanics, had a higher probability of being food insecure. These differences underline the need for specialized intervention by highlighting the relationship between socioeconomic level, demographics, and food insecurity. It is crucial to comprehend the particular difficulties faced by these disadvantaged populations in order to create policies that effectively address food insecurity and enhance general well-being.

Food insecurity in older individuals is linked to functional impairments, restricted food affordability, availability, and accessibility, as well as altered food use, according to a meta-

analysis by Lee & Frongillo (2001). There has been an attempt to identify and prevent food insecurity; poor income, being a member of a minority, and social isolation are all strongly associated with food insecurity. Food insecurity among older adults is largely characterized by functional deficits, according to research findings, which are unaffected by sociodemographic or economic circumstances. These results highlight the important role those functional impairments—which go beyond sociodemographic and economic factors—play in older adults' food insecurity. This emphasizes how critical it is to treat mental and physical disabilities in order to fight food insecurity in this community.

Lower-income adults' diet quality is inversely correlated with food insecurity, according to research by Leung et al. (2014). In a study that looked at the relationship between food insecurity and diet quality in persons with lower incomes, it was discovered that those who experience food insecurity tend to eat more items high in fat and high in appeal, which results in a worse quality diet and a higher risk of chronic illnesses. This study shows that eating unhealthy, high-fat foods is correlated with having limited access to food, which has a negative effect on dietary choices. As a result, there is an urgent need for nutritional support and intervention in low-income groups, as these eating patterns raise the frequency of chronic diseases among those who are food insecure.

2.4 Food Security and Health of Older Adults

Food insecurity has been connected to several harmful health outcomes and health disparities, including obesity, cardiovascular disease, poor metabolic control, and mobility limitations (Berkowitz et al., 2013; Bishop & Wang, 2018; Lee & Frongillo, 2001a; Lee & Frongillo, 2001b; Leung et al., 2020; Seligman et al., 2010). Due to its common correlation with poor eating habits, such as consuming high amounts of sugar and little else, missing meals, and

consuming low amounts of food categories and nutrients, food insecurity has a negative impact on health (Bhattacharya et al., 2004). Furthermore, Cindy Leung's (2020) study looked at the connection between food insecurity, several chronic conditions, and the self-reported health status of older adults. A low self-reported state of health and a higher incidence of chronic diseases were associated with food insecurity, according to a nationally representative study of older adults in their 50s to 80s. This shows a connection between poor eating habits and food insecurity in older adults and highlights serious health risks related to undernutrition. With all these in mind, this study aims to answer the following questions:

RQ1: Is there a significant relationship between food security and iADLs of senior center participants?

H1: There is a significant relationship between food security and ADLs/iADLs of senior center participants.

H0: There is no significant relationship between food security and ADLs/iADLs of senior center participants.

RQ2: Is there a significant relationship between food security and demographics (age, gender, race/ethnicity, income, educational level, and insurance type) of senior center participants?

H1: There is a significant relationship between food security and demographics (age, gender, race/ethnicity, income, educational level, and insurance type) of senior center participants.

H0: There is no significant relationship between food security and the demographics (age, race/ethnicity, gender, income, educational level, and insurance type) of senior center participants.

3 RESEARCH METHODOLOGY

The association between ADLs, demographics, and food security in senior center participants has been relatively understudied. Food insecurity focuses on limited or uncertain food affordability, accessibility, and availability due to a lack of resources. (Lee & Frongillo, 2001) Previous research showed that food insecurity is related to sociodemographic and economic conditions limiting household resources available for food acquisition (Alaimo et al., 1998; Campbell, 1991; Hamilton et al., 1997; Nord et al., 1999). This association underscores the broader context of food insecurity, highlighting how limited household resources and challenging sociodemographic and economic conditions contribute to inadequate food access. Addressing these underlying factors is crucial for developing effective strategies to alleviate food insecurity and improve the well-being of affected populations.

3.1 Participants

The Institutional Review Board (IRB) at Georgia State University reviewed and approved this study with study no H23372. All participants provided informed consent before they participated in the study. This study used secondary data collected in a Robert Wood Johnson Foundation-funded project titled *The Impact of Structural Racism on the Food Environment of Seniors Served by Open Hand Atlanta*. The collaboration is between the Nutrition Department of GSU and Open Hand Atlanta. Open Hand Atlanta is a meal servicer for Fulton County Senior Centers, a not-for-profit organization and one of the largest community-based providers of home-delivered meals and nutrition services in the U.S. All services are free to clients as more than 90% of them are from historically marginalized backgrounds, and 75% of those living at or below the federal poverty line. Participants were recruited using convenient sampling methods from ten senior centers in the county, namely Milton, Auburn, Milton, Camp Truitt, Dogwood,

Hapeville, Bethlehem, New Horizon, Palmetto, Roswell, and Southeast senior centers, using fliers to advertise the study and shared with senior center directors. All older adults recruited are aged 55 and above and are registered members of the senior center.

3.2 Data Analysis

A quantitative method was employed in this research, which used an intercept survey. Survey research collects information from a sample of individuals through their responses to questions (Check & Schutt, 2012). The project used a mixed method for data collection through intercept surveys, photo-elicitation/focus group discussion, and geospatial mapping. For the sake of this study only, the data collected through the intercept survey was utilized. A consent form was used to collect detailed information on senior center participants. It provided all the information a prospective participant requires to make an informed consent to participate in the study. Intercept surveys were administered to participants at ten senior centers in Fulton County. The centers were Auburn, Bethlehem, Camp Truitt, Dogwood, Hapeville, Milton, Palmetto, New Horizons, Roswell, and Southeast Senior Centers. A total of 166 participants were recruited from the ten senior centers. Eighty-seven questions were asked to collect information on demographics, food security, dietary patterns, transportation, income, ADLs and iADLs, shopping patterns, food preferences, social factors, loneliness, sleep behavior, and health conditions. For this study, only the data collected on demographics, food security, education, insurance type, income, ADLs, and iADLs was used. Please see Figure 2 to identify each location on a countywide map.

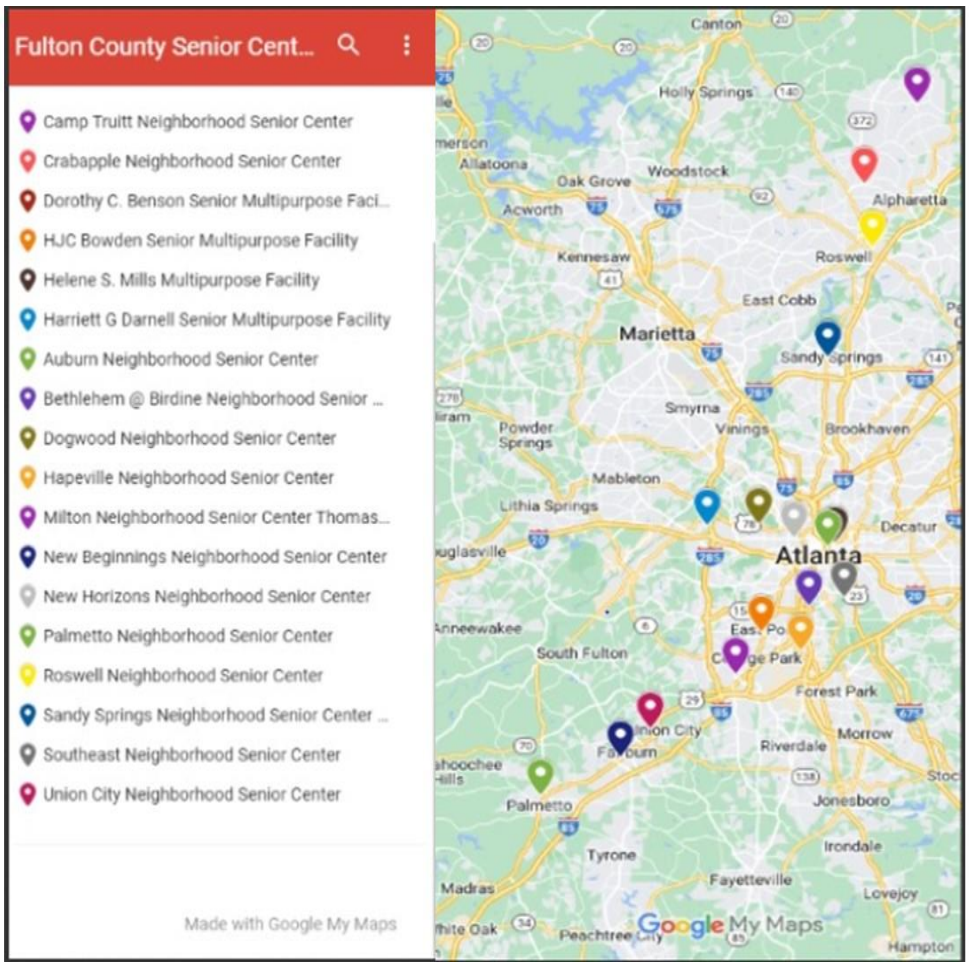

Figure 1. A map of senior centers in Fulton County, Georgia.
Source: Google map

A descriptive analysis was conducted to better understand the demographics. Chi-square analyses were conducted to determine whether there was an association between demographics, food security, and ADLs/ADLs. Bivariate analysis was conducted between the dependent and independent variables. Bivariate analysis refers to the analysis of two variables to determine the relationships between them (Sandilands, 2014) Frequencies were determined for demographic variables of interest, including age, gender, income, race/ethnicity, income, education, and insurance type. Frequencies were also determined for each category of ADLs/iADLs. (See table 2)

3.3 Instrument/Measurement

3.3.1 Food security

Food security was measured using the six-item food security module to measure participants' food security levels. Researchers at the National Center for Health Statistics developed the six-item short form of the survey module and the associated scale in collaboration with Abt Associates Inc (Six-item Short Form Food Security Survey Module- USDA ERS.2012). The first two food security questions: (1 “The food that we bought just did not last,” and 2, we did not have money to get more, we could not afford to eat balanced meals. Respondents were asked to report whether the statement was often true, sometimes true, or never true for (you/your household) in the past 12 months. Similarly, three items (3. “Did you ever cut the size of your meals or skip meals because there was not enough money for food”? 4. “did you ever eat less than you felt you should because there was not enough money for food”? 5. “hungry but didn't eat because there wasn't enough money for food”?) required a yes/no response. Another item inquired 3a. “how often do you cut the size of your meals or skip meals because there was not enough money for food required almost every month, some months but not every month, or in only 1 or 2 months' response? Affirmative (yes) responses are those that begin with "often" or "sometimes" on questions 1 and 2, and "yes" on questions 3 through 5. The responses "some months but not every month" and "almost every month" on 3a are categorized as positive (yes). The household's raw score on the scale is the total of the affirmative answers to the six questions. Food security status is assigned as follows: raw score 0-1—high or marginal food security (raw score 1 may be considered marginal food security, but a large proportion of households that would be measured as having marginal food security using the household or adult scale will have

a raw score of zero on the six-item scale); raw score 2-4—low food security; raw score 5-6—very low food security.

3.3.2 Functional Limitation

Disability in the performance of daily activity was measured using the combined module of ADLs and iADLs. Participants were asked to rate their level of difficulty in executing tasks excluding difficulties they expect to last less than three months. The activities included preparing meals, taking medications, managing money such as writing checks and keeping track of bills, shopping for groceries, performing light housework such as doing dishes, light vacuuming or dusting, using a telephone, walking across the room, walking one block, dressing including putting on shoes and socks, bathing or showering, eating such as cutting up your food, getting in or out of bed, using the toilet, driving a car during the day and driving a car during the night. (Graf, 2009).

Response categories included no difficulty (0), some difficulty (1), much difficulty (2), unable to do (3), and does not apply (6). All positive responses were summed to get the total number of activities they experienced difficulty performing. Participants were grouped into three: experienced no difficulty (0), experienced difficulty at any level in 1 to 3 activities (1), and experienced difficulty at any level 4 or more activities (2).

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4 RESULTS

4.1 Descriptive Analysis

4.1.1 Demographic Variables

Table 1 reports frequencies for the demographic variables of age, gender identity, race/ethnicity, educational attainment, annual income, and insurance type. Almost 86% identified as female, while approximately 12.7% identified as male. One participant identified as gender non-conforming and two chose not to answer the question. Most of the participants (83.1%) were 70 and over. Thirteen percent (13.3) were between the ages of 50-69. Over half of the population identified as Black (78.9%0. Over half (54.8%) of the participants reported having public or government-sponsored health insurance. Less than half of the sample (29%) reported a monthly income level under $2084, while over half of the sample (59%) did not respond to the question. (See table 1).

Table 1. Demographic distribution of participants

Demographic	Count	Percentage
Gender		
Female	143	86.1
Male	22	13.3
Missing	1	0.6
Age		
<75 years	59	35.5
75 and older	101	60.8
Missing	6	3.6
Race/Ethnicity		
Black	131	78.9
White	26	15.7
Hispanic/other	9	4.8
No response	1	0.6
Education		
< Highschool	14	8.4
Highschool/GED	41	24.7
Tech/Bachelor	43	25.9

No response	98	41.0
Income		
Up to $1249	25	15.1
$1250-2083	23	13.9
$2084+	20	12.0
No response	98	59.0
Insurance Type		
Public	91	54.8
Private	9	5.4
No response	66	39.8

4.1.2 Participants Health Condition

Figure 2 below displays the frequencies and the health conditions of participants in the survey. A substantial number of the participants (71.6%) reported having hypertension, a condition that can significantly impact daily activities. Approximately half (43.3%) reported high cholesterol, a risk factor for heart disease, and arthritis (46.3%), a condition that can affect mobility and independence. Almost 20% (19.4%) had heart disease, 7.5% stroke, and approximately 6% cancer. Additionally, 11.9% of the participants reported being obese, a condition that can lead to various health issues, and 10.4% experienced depression, a mental health condition that can affect daily functioning.

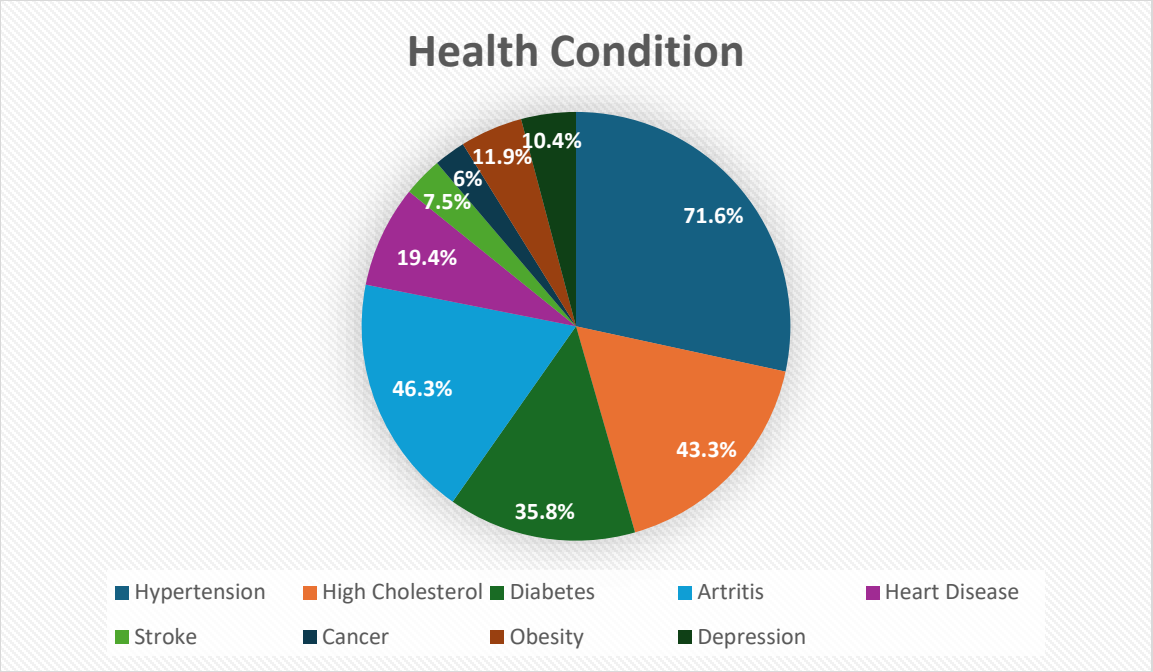

Figure 2. Reported health conditions of participants.

4.1.3 Food Security

Table 2 shows the frequencies and valid percentages of the responses from the six-item food security questions. Most respondents (76%) reported often having insufficient food and lacking the finances to get more food in the past 12 months. 122 respondents (75.3%) reported that they often could not afford to eat balanced meals in the last 12 months. Additionally, 142 respondents (87.1%) responded that they never had to cut down the size of their meals because there was not enough money for food in the last 12 months, while 21 respondents (12.9%) responded to the affirmative. A follow-up question asked how often, and 47.6% of the respondents reported that it happened almost every month, another 47.6% reported it happened some months but not every month, and 6.7% reported it happened only 0ne or two months. The next question asked if respondents, In the last 12 months, ate less than they felt they should because there was not enough money for food. Most respondents (93.4%) answered non-

affirmative, while the remaining (6.4%) replied affirmatively. Lastly, respondents were asked if, In the last 12 months, they were ever hungry but did not eat because there was not enough money for food. Ninety-six percent of the respondents reported non-affirmative, while 6.4% reported the opposite.

Table 2. Frequencies of responses from the six-item short form food security survey module

Q1: During the last 12 months, how often was this statement true: The food that we bought just didn't last and we didn't have money to get more.		
	Frequency	**%**
Often	125	76.2
Sometimes	35	21.3
Never	4	3.1
Q2: During the last 12 months, how often was this statement true: We couldn't afford to eat balanced meals.		
	Frequency	**%**
Often	122	75.3
Sometimes	35	21.6
Never	5	3.1
Q3: in the last 12 months, did you or other adults in your household ever cut the size of your meals because there wasn't enough money for food?		
	Frequency	**%**
No	142	87.1
Yes	21	12.9
Q4: if yes, how often did this happen?		
	Frequency	**%**
Almost every month	10	47.6
Some months but not every month	10	47.6
Only 1 or 2 months	1	6.7
Q5: In the last 12 months, did you eat less than you felt you should because there wasn't enough money for food?		
	Frequency	**%**
No	154	93.4
Yes	11	6.7
Q6: In the last 12 months, were you ever hungry but didn't eat because there wasn't enough money for food?		
	Frequency	**%**
No	158	96.3
Yes	6	3.7

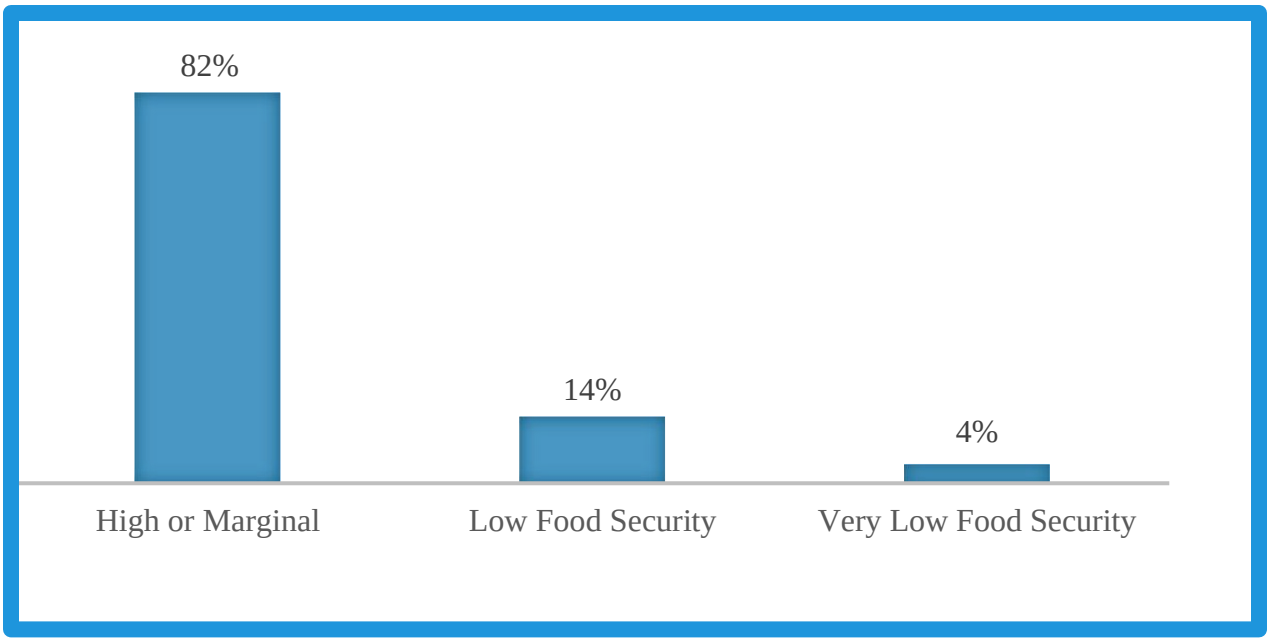

Figure 3. Percentage of high or marginal. low and very low food security

As described in the methods section, food security was measured using a 3-level variable (high or marginal FS, low FS, and very low FS). Figure 4 above displays the results, which show that less than 5% reported experiencing very low food security, 14.5% low food security, and 80.6% high/marginal food security.

4.1.4 Functional Limitations in Performing ADLs

Table 2 below reports the frequency of the responses collected from participants about what activities they find easy or difficult. More than one-third (38.4%) reported having difficulty performing 1 to 3 tasks, and 33.6% expressed difficulty in performing 4 or more tasks

Table 3: Frequencies of responses from the combined module of ADLs and iADLs

Activity	Count	Percentage
Preparing meals		
No difficulty (0)	110	66.3
Some difficulty (1)	26	15.7
Much difficulty (2)	3	1.8
Unable to do (3)	5	3.0
Does not apply (6)	0	0
No response	22	13.3
Taking medication		
No difficulty (0)	133	80.1
Some difficulty (1)	9	5.4
Much difficulty (2)	0	0.0
Unable to do (3)	0	0.0
Does not apply (6)	1	0.6
No response	23	13.9
Money management		
No difficulty (0)	128	77.1
Some difficulty (1)	11	6.6
Much difficulty (2)	2	1.2
Unable to do (3)	2	1.2
Does not apply (6)	2	1.2
No response	21	12.7
Grocery shopping		
No difficulty (0)	112	67.5
Some difficulty (1)	24	14.5
Much difficulty (2)	4	2.4
Unable to do (3)	5	3.0
Does not apply (6)	1	0.6
No response	20	12.0
Performing light chores:		
No difficulty (0)	107	64.5
Some difficulty (1)	27	16.3
Much difficulty (2)	7	4.2
Unable to do (3)	5	3.0
Does not apply (6)	0	0
No response	20	12.0
Using telephone:		
No difficulty (0)	136	81.9
Some difficulty (1)	9	5.4
Much difficulty (2)	0	0

Unable to do (3)	0	0
Does not apply (6)	0	0
No response	21	12.7
Walking short distance:		
No difficulty (0)	115	69.3
Some difficulty (1)	26	15.7
Much difficulty (2)	1	0.6
Unable to do (3)	4	2.4
Does not apply (6)	0	0
No response	20	12.0
Walking long distance:		
No difficulty (0)	97	58.4
Some difficulty (1)	28	16.9
Much difficulty (2)	12	7.2
Unable to do (3)	7	4.2
Does not apply (6)	0	0
	22	13.3
Dressing up:		
No difficulty (0)	118	71.1
Some difficulty (1)	23	13.9
Much difficulty (2)	1	0.6
Unable to do (3)	1	0.6
Does not apply (6)	0	0
No response	23	13.9
Bathing:		
No difficulty (0)	126	75.9
Some difficulty (1)	16	9.6
Much difficulty (2)	3	1.8
Unable to do (3)	1	0.6
Does not apply (6)	0	0
No response	20	12.0
Eating:		
No difficulty (0)	137	82.5
Some difficulty (1)	8	4.8
Much difficulty (2)	0	0
Unable to do (3)	0	0
Does not apply (6)	0	0
No response	21	12.7
Getting out of bed:		
No difficulty (0)	134	80.7
Some difficulty (1)	11	6.6
Much difficulty (2)	0	0
Unable to do (3)	0	0

Does not apply (6)	0	0
No response	21	12.7
Using the toilet:		
No difficulty (0)	128	77.1
Some difficulty (1)	17	10.2
Much difficulty (2)	0	0
Unable to do (3)	0	0
Does not apply (6)	0	0
	21	12.7
Driving during the day:		
No difficulty (0)	80	48.2
Some difficulty (1)	5	3.0
Much difficulty (2)	3	1.8
Unable to do (3)	43	25.9
Does not apply (6)	9	5.4
No response	26	15.7
Driving at night:		
No difficulty (0)	43	25.9
Some difficulty (1)	25	15.1
Much difficulty (2)	9	5.4
Unable to do (3)	52	31.3
Does not apply (6)	9	5.4
No response	28	16.9

4.2 Results from bivariate analysis

Table 3 below provides the results of the Chi-Square tests conducted between demographics and food security using Pearson's Chi-Square value, degrees of freedom (df), and the p-value for each item. The result shows that a significant relationship between race/ethnicity and food insecurity at X^2 (n=165) = 8.94 (df=2), p = .011. It also shows a relationship between insurance type have a significant relationship with food security X^2 (n=100) = 5.95 (df=1), p = 0.015. The p-value of .015 indicates a statistically significant difference in food security status based on the type of insurance. The table also reported that almost half of the participants (49) reported experiencing limitations in performing 4 or more activities of daily living.

Table 4: Bivariate analysis of independent variables (age, race/ethnicity, education, income, gender, insurance type & ADLs/iADLs)

Demographic Factor	Food Insecurity (%)	Food Security (%)	Pearson's χ^2 Value	df	P-value
Limitation in performing ADLs (n)			3.16	2	0.206
None (41)	14.6	85.4			
1 to 3 (56)	14.3	85.7			
4 or more (49)	26.5	73.5			
Age (n)			2.96	1	0.085
<75 (59)	27.1	72.9			
75+ (101)	15.8	84.2			
Race/Ethnicity (n)			8.94	2	0.011
Black (131)	20.6	79.4			
White (26)	3.8	96.2			
Hispanic/other (8)	50.0	50.0			
Education (n)			3.19	2	0.202
<High School (14)	28.6	71.4			
High School or GED (41)	17.1	82.9			
Some tech/College/Bachelor (43)	9.3	90.7			
Income (n)			2.19	2	0.334
<$1249 (25)	20.0	80.0			
$1250 - $2083 (23)	17.4	82.6			
$2084 + (20)	5.0	95.0			
Gender (n)			0.54	1	0.463
Female (143)	20.3	79.7			
Male (22)	13.6	86.4			
Insurance type (n)			5.94	1	0.015
Public (91)	13.2	44.4			
Through employer (9)	86.8	55.6			

5 DISCUSSION AND CONCLUSION

The primary objective of this study was to examine the association between food security, demographics, and activities of daily living (ADLs) among older adults attending senior centers in Fulton County, Georgia. The research questions focus on the relationship between food security and ADLs/iADLs (RQ1) and the relationship between food security and various demographic factors (RQ2).

5.1 Descriptive Statistics.

A significant majority of the sample (85.5%) identified as female, with a smaller proportion identifying as male (12.7%), gender non-conforming (0.6%), or not responding (1.2%). The predominance of female participants may reflect the demographic composition of senior center attendees or broader population trends in the older adult demographic. This gender imbalance could influence the findings, as previous research indicates that food security and ADLs can be affected by gender-specific factors. Our findings also show that over 83.1% of participants were aged 70 and above, with 13.3% aged between 50-69. The high proportion of older participants underscores the relevance of studying food security and ADLs in this age group. Age is a critical factor, as older adults are more likely to experience food insecurity and difficulties with ADLs (Ziliak & Gundersen, 2020), additionally, over half of the participants (78.9%) identified as Black. This demographic detail is significant, as race/ethnicity can impact food security and ADLs due to socioeconomic disparities, access to resources, and health outcomes (Satia, 2003). It is essential to consider how racial/ethnic identity might mediate the relationship between food security and ADLs. Regarding health insurance status, approximately 54.8% of participants reported having public or government-sponsored health insurance. Access to health insurance is a crucial factor in managing food security and maintaining functional

independence. Public or government-sponsored insurance might provide some protection against food insecurity, but gaps in coverage or benefits could still pose challenges (Gundersen & Ziliak, 2015) Less than half of the sample reported a monthly income under $2,084, with a significant portion (59.0%) not responding to the income question. The high non-response rate on income questions suggests potential discomfort or stigma around disclosing financial information, which could skew the data.

The demographic findings indicate that gender, age, race/ethnicity, health insurance status, and income are critical factors that may influence the relationship between food security and ADLs. For instance, older females and Black participants might experience unique challenges related to food security that affect their ADLs differently compared to other groups. The diverse demographic composition of the sample provides a rich context for exploring how food security varies across different subgroups. Understanding these variations can help identify targeted interventions to improve food security and support functional independence among specific demographic groups.

The participants' disclosed health conditions offer significant insights into the possible obstacles and susceptibilities to food security among the older population residing in Fulton County, Georgia's senior centers. It is imperative to comprehend their prevalence to contextualize the impact of these health conditions on food security and the ability to perform activities of daily living (ADLs). The relationship between food security and chronic health issues emphasizes the need for all-encompassing, multifaceted strategies to promote older adults' well-being. Improving their access to wholesome foods is essential, but so is taking into account the additional social and health issues they deal with. To create focused interventions that might

effectively support older adults ' independence and health, our study underscores the need to continue to examine these intricate relationships.

The result from the 6-item food security module indicates that older adults at senior centers in Fulton County are not only food insecure at twice the state level at 18%. This makes it an important area that needs intervention by the government and nutrition providers. Additionally, results from this study also show that a minority of older adults in the sample experience severe food insecurity, as indicated by the small percentage (5%) of participants who reported very low food security. Due to a lack of resources, eating habits are disturbed, and food intake is decreased at this stage of food insecurity. Very low food security places a person at risk for several health problems, such as malnutrition, impaired immune systems, and an elevated risk of developing chronic illnesses Choi et al., (2022). Their independence and quality of life may negatively impact their inability to execute ADLs. A significant number of participants (14.5%) indicated that their food security was low, indicating that while they may have some problems with food access, they are not as severe as those with extremely low food security. These people could still be able to access food, but they may have difficulties obtaining enough food that meets their nutritional needs. The majority's high/marginal food security indicates that these older adults will probably continue to be in better health and have higher functional status. This group is expected to perform ADLs more efficiently to promote their independence and involvement in daily activities.

Concerning their ability to perform ADLs, over one-third of the participants (38.4%) reported having difficulty completing one to three activities. This suggests a moderate degree of impairment in iADLs, which may comprise tasks like budgeting, traveling, shopping, and housekeeping. Even though they may still be somewhat independent, participants who struggle

with one to three tasks may become more dependent if their functional status deteriorates. This challenge could be linked to the early phases of cognitive or physical decline, and prompt treatments could support their continued independence. Additionally, 33.6% of participants reported that performing four or more activities was challenging, suggesting a higher level of impairment. This group is likely experiencing substantial challenges in managing their daily lives independently. Given how challenging it is for them to do many ADLs, they may need more intense support and services to maintain their quality of life. This degree of functional impairment is frequently linked to aging, long-term medical issues, and maybe higher levels of food insecurity, all of which can make functional and health matters worse.

5.2 Results from Bivariate Analysis

The bivariate analysis explores the relationship between food security and specific demographic variables, namely race/ethnicity and type of insurance, among older adults attending Fulton County, Georgia, senior centers. Understanding these relationships helps identify which demographic factors significantly influence food security status.

Although no significant relationship was found between older adults' ADLs and food security, the chi-square test result for the relationship between food security and race/ethnicity is X^2 (n=165) = 8.94 (df=2), p = .011. The p-value of .011 indicates a statistically significant difference in food security status based on race/ethnicity. The chi-square value of 8.94 with 2 degrees of freedom suggests that the observed distribution of food security levels among different racial/ethnic groups differs from what would be expected by chance. This significant relationship implies that certain racial/ethnic groups may be more vulnerable to food insecurity. This is consistent with previous research examining factors associated with food insecurity among older adults in the US (Lee & Frongillo, 2001). Potential factors contributing to these

disparities could include socioeconomic status, access to resources, historical inequities, and cultural differences in food practices. Understanding these dynamics is crucial for developing targeted interventions to address food insecurity among specific racial/ethnic groups.

The chi-square test result for the relationship between food security and type of insurance is X^2 (n=100) = 5.95 (df=1), p = 0.015. The p-value of .015 indicates a statistically significant difference in food security status based on the type of insurance. The chi-square value of 5.95 with 1 degree of freedom suggests a meaningful association between having public/government-sponsored insurance versus private insurance and food security levels. This finding suggests that the type of insurance an older adult has is related to their food security status. Public or government-sponsored insurance may not provide adequate support to ensure food security, possibly due to lower income levels or additional barriers faced by older adults relying on such insurance. Enhancing the benefits and support systems within public insurance programs could be essential in improving food security among these individuals.

Broader social and economic inequalities are probably reflected in the notable differences in food security between racial/ethnic groupings. Due to factors like poorer income, restricted access to nutrient-dense food, and systematic inequalities, Black and other minority groups may have higher rates of food insecurity. Targeted programs that address the unique needs of various racial/ethnic communities are necessary to address these inequities. Reducing food insecurity requires culturally aware interventions and expanding resource access in marginalized populations.

This type of insurance might substitute for financial stability and availability of medical services. People with public insurance may be more food insecure because they have less access to healthcare services and a lower economic standing. It is recommended that policymakers

contemplate augmenting the assistance offered by public insurance schemes to ensure that the dietary requirements of older adults are suitably met. One way to do this would be to combine public insurance-funded healthcare services with food assistance programs.

In conclusion, the bivariate analysis reveals significant relationships between food security, race/ethnicity, and type of insurance among older adults. These findings underscore the importance of considering demographic factors when addressing food security among senior center participants and older adults in general. Targeted interventions and policy adjustments are necessary to mitigate food insecurity and promote the health and well-being of older adults, particularly those from minority racial/ethnic groups and those reliant on public insurance. Further research should continue to explore these associations to inform effective strategies and interventions.

5.3 Study Limitations and Strengths

Self-reported data can be subject to recall bias, social desirability bias, and inaccuracies (Althubaiti, 2016). A sizable portion of the sample did not respond to specific questions, such as income (59% non-response). Missing data can introduce bias and affect the reliability of the findings. The analysis may not fully capture the relationship between income and food security, potentially skewing the results.

The sample also shows demographic imbalances, with most participants identifying as Black (78.9%) and a high percentage of female participants (85.5%). While these traits are essential to understanding subgroups, they can make the conclusions less applicable to a community with a more balanced demographic makeup. The results might not fairly represent the experiences of participants who were male or of other racial or ethnic groups. The food

security study by insurance type is based on a limited sample (n=100); the results' statistical power and robustness may be impacted.

Future research could aim to overcome these limitations by employing longitudinal designs, more extensive and more diverse samples, and more comprehensive data collection methods. Additionally, integrating qualitative approaches could provide deeper insights into individual experiences and contextual factors. Collaborating with multidisciplinary teams could enhance the study's robustness and applicability. Advanced statistical techniques may also allow for a more nuanced understanding of the complex relationship between variables. Finally, ensuring community engagement and stakeholder involvement throughout the research process can improve relevance and impact.

In terms of strength, the study addresses a significant issue in Fulton County, particularly in the post-pandemic context. Older adults account for approximately 9% of the food-insecure population in the country, and the result from the 6-item food security module reported that 18% of the participants are experiencing low and very low food insecurity. These results show the critical need for targeted interventions that address the difficulties older persons in Fulton County experience, emphasizing the value of community-based approaches and legislative initiatives to enhance food security and general well-being in this population.

Based on the county's geographic diversity, a more thorough understanding of food insecurity among older adults across all its areas is ensured, capturing a variety of socioeconomic origins and regional difficulties. As a result, the study's findings can inform policies and interventions specifically designed to meet the needs of different regions within Fulton County.

5.4 Conclusion

The intricate relationship between food security, demography, and activities of daily living (ADLs) among older adults attending Fulton County, Georgia, senior centers are explored in great detail in this study. The results highlight the impact of socioeconomic and demographic factors on food access and functional capacities by showing substantial relationships between food security and both types of insurance and race/ethnicity. While most respondents reported high levels of food security, a significant proportion still reported low or very low food security, which has been associated with difficulty executing ADLs. These findings emphasize the necessity of focused interventions and policies to combat food insecurity, especially for vulnerable populations like people who depend on public insurance and racial/ethnic minorities.

Thus, based on the results from the bivariate analysis of the study, the decision is:

reject H1 and accept H0, i.e., there is no significant relationship between food security and ADLs/iADLS of senior center participants for the RQ1.

Reject H1 for age, gender, education, and income. There is no significant relationship between food security and the age, gender, and income of Fulton County Senior Center participants for RQ2.

Accept H0 for race/ethnicity and insurance type. That is, there is a significant relationship between food security and race/ethnicity and insurance type of Fulton County Senior Center participants for RQ2

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APPENDICES

Appendix A: Survey questionnaire

Georgia
State
University
Informed Consent - Surveys

Title: The Impact of Structural Racism on the Food Environment of Seniors Served by Open Hand Atlanta

Principal Investigator: Kellie Mayfield, PhD M.ENVS

Co-Investigator: Miranda Cook, PhD MPH

Sponsor: The Robert Wood Johnson Foundation & The Urban Institute

Contact Information

You can contact Dr. Kellie Mayfield at (404) 413-1080 and Dr. Miranda Cook at (404) 419-3340.

- If you have questions about the study or your part in it
- If you have questions, concerns, or complaints about the study

The IRB at Georgia State University reviews all research that involves human participants. You can contact the IRB if you would like to speak to someone who is notinvolved directly with the study. You can contact the IRB for questions, concerns, problems, information, input, or questions about your rights as a research participant.Contact the IRB at 404-413-3500 or irb@gsu.edu.

Consent

We will give you a copy of this Informed Consent Form to keep.

If you are willing to be in this research study, please sign below.

_____

Printed Name of Participant

_____ _____

Signature of Participant Date

_____ _____

Principal Investigator or Researcher Obtaining Consent Date

Demographics, background, & household information

1. What is your age? _____

2. What is your current gender identity?
   - ◯ Female
   - ◯ Male
   - ◯ Gender non-confirming/Non-binary
   - ◯ Trans female/Trans woman (Male-to-Female)
   - ◯ Trans male/Trans man (Female-to-Male)
   - ◯ Two Spirit
   - ◯ Genderqueer
   - ◯ I use a different term
     - ◯ Please indicate the term(s) you use to describe your current genderidentity: _____
   - ◯ Other: _____
   - ◯ Prefer not to answer

3. What sex were you assigned at birth, on your original birth certificate?
   - ◯ Female
   - ◯ Male
   - ◯ Intersex
   - ◯ Prefer not to answer

4. How would you describe your current sexual orientation? (Check all that apply)
   - ◯ Straight/Heterosexual
   - ◯ Asexual
   - ◯ Bisexual
   - ◯ Gay
   - ◯ Lesbian
   - ◯ Queer
   - ◯ Questioning
   - ◯ Two Spirit
   - ◯ I use a different term
     - ◯ Please indicate the term(s) you use to describe your current sexual orientation: _____
   - ◯ Prefer not to answer

Demographics, background, & household information

5. What is your home street address?

_____

_____

GA, Zip Code: _____

Why are we asking for address?

We use this information to compare senior center participants to census data availablefor their surrounding neighborhoods. We will not use your address for anything else. If you prefer, a staff member can look up a more anonymous code that provides the sameinformation without giving your full address on the survey. If you are still uncomfortable, please skip this question and continue to the next question below!

6. How long have you lived in Georgia? Please list the number of years:

7. What is your race? (Check all that apply)

- ❑ American Indian or Alaska Native
- ❑ Asian
- ❑ Black or African American
- ❑ Native Hawaiian or Pacific Islander
- ❑ White
- ❑ Other: _____

8. Are you of Hispanic, Latino, or Spanish origin?

- ❑ Yes
- ❑ No

Demographics, background, & household information

9. How many people **(counting yourself)** live in your household? (This may include non-relatives who live with you).

- ◯ 1
- ◯ 2
- ◯ 3
- ◯ 4
- ◯ 5+

10. During the past year, did you have any grandchildren under the age of 18 living in your house or apartment?

- ◯ Yes
- ◯ No

11. During the past year, were you responsible for most of the basic needs for any grandchildren under the age of 18 living in the house or apartment with you?

- ◯ Yes
- ◯ No

12. During the past year, did you provide regular care or assistance to a friend or family member who has a long-term health problem or disability?

- ◯ Yes
- ◯ No

12a. If you provide regular care or assistance, how frequently?

- ◯ Everyday
- ◯ Weekly
- ◯ Monthly
- ◯ Other: _____

- ◯ I do not provide regular care or assistance

Demographics, background, & household information

13. What is the highest grade or year of school you completed? (Pick one)

- ◯ Less than 6th grade
- ◯ 6th to 8th grade
- ◯ 9th to 11th grade
- ◯ High school diploma
- ◯ GED certificate
- ◯ Technical degree
- ◯ Some college or technical school but have not graduated
- ◯ Associate's degree
- ◯ Bachelor's degree
- ◯ Master's degree
- ◯ Doctoral degree
- ◯ Other: _____

14. What is your employment status? (check all that apply)

- ❑ Working full-time
- ❑ Working part-time
- ❑ Retired
- ❑ Student
- ❑ Not employed/homemaker
- ❑ On disability
- ❑ Other (please specify): _____

15. What is your health insurance status? (check all that apply)

- ❑ Uninsured
- ❑ Insured, Medicaid, Medicare or other public insurance
- ❑ Insured, through employer
- ❑ Insured, private insurance
- ❑ Other (please specify): _____

Demographics, background, & household information

16. Have you or anyone that lives with you participated in any of the following programs in the last year? (check all that apply)

- ❑ Food Stamps (SNAP)
- ❑ Senior Farmers Market Nutrition Program
- ❑ Food Pantry, Food Bank, or Church Food Pantry
- ❑ Meals on Wheels, Mom's Meals, or Similar Program
- ❑ Supplemental Nutrition Program for Women, Infants, and Children (WIC)
- ❑ Free or reduced-price school breakfast or lunch program
- ❑ Free summer meals
- ❑ Head Start
- ❑ No one in my house participated in any of these programs in the last year
- ❑ Other (please specify): _____

17. Please select your monthly household or family income from all sources after taxes?(pick one)

- ◯ Less than $833
- ◯ $833- $1,249
- ◯ $1,250 - $2083
- ◯ $2,084 - $2,916
- ◯ $2,917 - $4,166
- ◯ $4167 - $6,249
- ◯ $6,250 - $8,333
- ◯ $8,334 – $12,499
- ◯ $12,500 – $16,666
- ◯ More than $16,666
- ◯ I don't know
- ◯ I prefer not to answer
- ◯ Other: _____

18. Do you consider yourself to have a condition or an impairment that limits yourmovement, senses, or activities? Please check all that apply.

- ❑ Visual impairment
- ❑ Hearing impairment
- ❑ Mobility issues
- ❑ Emotional issues
- ❑ Mental issues
- ❑ Other (please list): _____
- ❑ I do not have any of the above conditions or impairments

We are interested in what activities are easy or difficult for you. **Please indicate thelevel of difficulty you experience completing the following activities** and please exclude any difficulties that you expect to last less than three months.

Activity	No Difficulty	Some Difficulty	Much Difficulty	Unable to Do
19. Preparing meals	□	□	□	□
20. Taking your medications	□	□	□	□
21. Managing your money such as writing checks and keeping track ofbills	□	□	□	□
22. Shopping for groceries	□	□	□	□
23. Performing light housework such as dishes, light vacuuming, ordusting	□	□	□	□
24. Using a telephone	□	□	□	□
25. Walking across the room	□	□	□	□
26. Walking one block	□	□	□	□
27. Dressing including putting on shoes and socks	□	□	□	□
28. Bathing or showering	□	□	□	□
29. Eating such a cutting up your food	□	□	□	□
30. Getting in or out of bed	□	□	□	□
31. Using the toilet, including getting up and down	□	□	□	□
32. Driving a car during the day	□	□	□	□
33. Driving a car during the night	□	□	□	□

34. Do you have any of the following health conditions?Please check all that apply.

- ❑ Diabetes *(type 1 or type 2)*
- ❑ High blood pressure
- ❑ High cholesterol
- ❑ Arthritis
- ❑ Depression
- ❑ Alzheimer's disease or Dementia
- ❑ Stroke or cerebrovascular disease
- ❑ Heart Disease *(heart failure, coronary artery disease, orcardiomyopathy)*
- ❑ Chronic Lung Disease *(COPD, Asthma, Interstitial lung disease, Cystic Fibrosis, or Pulmonary Hypertension)*
- ❑ Kidney Disease
- ❑ Liver Disease
- ❑ Overweight or obese
- ❑ Sickle cell disease or thalassemia
- ❑ Immunocompromised state *(weakened immune system)*
- ❑ HIV or AIDS
- ❑ Cancer (please specify type):_____
- ❑ Other (please specify): _____

Food Security

For the following questions, please check the box that best fits the way you

feel about the food eaten in your household over the last 12 months.

	Often	Sometimes	Never
35. During the **last 12 months**, howoften was this statement true: *The food that we bought just didn't last, and we didn't have money to get more.*	☐	☐	☐
36. During the **last 12 months**, howoften was this statement true: *We couldn't afford to eat balanced meals.*	☐	☐	☐

	Yes	No
37. In the **last 12 months**, did you or other adultsin your household *ever cut the size of your meals* because there wasn't enough money for food?	☐	☐
37a. **If yes**, how often did this happen?	❑ Almost every month ❑ Some months but not every month ❑ Only 1 or 2 months	
38. In the **last 12 months**, did you ever *eat less than you felt you should* because there wasn't enough money for food?	☐	☐
39. In the **last 12 months**, were you ever hungrybut didn't eat because there wasn't enough money for food?	☐	☐

Where you shop & eat

40. Where are most of your groceries purchased?

- ◯ Retail supermarket (Walmart, Publix, Kroger, Target, Aldi)
- ◯ Variety chain store (Family Dollar, Dollar Tree)
- ◯ Neighborhood/"Mom-and-Pop" store
- ◯ Farmers' market or roadside stand
- ◯ Convenience store or gas station
- ◯ No one in my house purchases groceries

41. Who in your household does most of the cooking?

- ◯ Self
- ◯ Other

41a. If other, who? _____

42. Who in your household does most of the grocery shopping?

- ◯ Self
- ◯ Other

42a. If other, who? _____

The following questions will ask about where you source & eat your meals in a typical week.

	0	1	2	3	4	5	6
43. How many **meals per week** do you eat **at (or from) the senior center**?	□	□	□	□	□	□	□
44. How many **meals per week** do you eatat home that were **prepared by you or someone you know**?	□	□	□	□	□	□	□
45. How many **meals per week** do you eat **at (or from) sit-down or fast-food restaurants**?	□	□	□	□	□	□	□

Food preferences

Please answer the following questions based on your **typical eating and shopping behaviors over the last 7 days.** There are no "right" or "wrong" answers. **Pleaseanswer the questions for yourself only.**

46. Do you eat more than one kindof **fruit** each day?

- ◯ No
- ◯ Yes, sometimes
- ◯ Yes, often
- ◯ Yes, always

47. Do you eat more than one kind of **vegetable** each day?

- ◯ No
- ◯ Yes, sometimes
- ◯ Yes, often
- ◯ Yes, always

48. **Fruit:** How much do you eat each day?

☐ none ☐ ½ cup ☐ 1 cup ☐ 1 ½ cups ☐ 2 cups ☐ 2 ½ cups ☐ 3 cups or more

Food preferences

49. **Vegetables:** How much do you eat each day?

☐ none ☐ ½ cup ☐ 1 cup ☐ 1 ½ cups ☐ 2 cups ☐ 2 ½ cups ☐ 3 cups or more

Please answer the following questions based on your **typical eating and shopping behaviors over the last 7 days.** There are no "right" or "wrong" answers. **Pleaseanswer the questions for yourself only.**

50. Do you drink fruit drinks, sports drinks, sweet tea or punch?

- ◯ No
- ◯ Yes, sometimes
- ◯ Yes, often
- ◯ Yes, always

51. Do you drink regular soda?

- ◯ No
- ◯ Yes, sometimes
- ◯ Yes, often
- ◯ Yes, always

52. Do you drink diet sodas, unsweetened teas, or other beverages without added sugars?

- ◯ No
- ◯ Yes, sometimes
- ◯ Yes, often
- ◯ Yes, always

Food preferences

53. Do you drink water? Count tap, bottled, and sparkling water.

- ◯ No
- ◯ Yes, sometimes
- ◯ Yes, often
- ◯ Yes, always

54. Do you have dietary restrictions such as those related to a health condition orreligious or cultural practice? If so, please describe:

55. What changes would you like to see made to the foods offered at your senior center?

56. What are your favorite restaurants to eat at or order food from?

Food preferences

57. What are your favorite dishes or recipes?

_____

_____

_____

_____

58. Do you have a lactose intolerance or other issues drinking cow-based milks or dairy products?

- ◯ Yes
- ◯ No

59. Would you be interested in trying plant-based milks or dairy products at your senior center?

- ◯ Yes
- ◯ No

Sleep

A number of statements which people use to describe their sleeping habits are given below.Read each statement and then check the appropriate box (one per row) to the right of the statements to indicate how you **generally feel**. There are no right or wrong answers. Do not spend too much time on anyone.

	Never	Rarely	Sometimes	Frequently	Always
60. I take daytime naps lasting two or more hours.	□	□	□	□	□
61. I go to bed at different times from day to day.	□	□	□	□	□
62. I get out of bed at different times from day to day.	□	□	□	□	□
63. I exercise to the point of sweating within 1 hr of going to bed.	□	□	□	□	□
64. I stay in bed longer than I should two to three times a week.	□	□	□	□	□
65. I use alcohol, tobacco, or caffeine within 4 hrs of going to bedor after going to bed.	□	□	□	□	□
66. I do something that may wake me up before bedtime (for example: play video games, use the internet, or clean).	□	□	□	□	□
67. I go to bed feeling stressed, angry, upset, or nervous.	□	□	□	□	□
68. I use my bed for things other than sleeping (for example: watch television, read, eat, or study).	□	□	□	□	□
69. I sleep on an uncomfortable bed (for example: poor mattress or pillow, too much or not enough blankets).	□	□	□	□	□

Sleep

A number of statements which people use to describe their sleeping habits are given below.Read each statement and then check the appropriate box (one per row) to the right of the statements to indicate how you **generally feel**. There are no right or wrong answers. Do not spend too much time on anyone.

	Never	Rarely	Sometimes	Frequently	Always
70. I sleep in an uncomfortable bedroom (for example: too bright, too stuffy, too hot, too cold, or toonoisy).	□	□	□	□	□
71. I do important work before bedtime (for example: pay bills, schedule, or study).	□	□	□	□	□
72. I think, plan, or worry when I am in bed.	□	□	□	□	□

Transportation methods

73. What are the main forms of transportation you typically use to get to the **senior center**? (Check all that apply)

- ❑ Senior center transportation or TransDev
- ❑ MARTA/public transportation
- ❑ Drive my own car
- ❑ Ride from someone else
- ❑ Walking
- ❑ Taxi/Uber
- ❑ Other:_____

74. What are the main forms of transportation you typically use to get to the **grocery store**? (Check all that apply)

- ❑ MARTA/public transportation
- ❑ Drive my own car
- ❑ Ride from someone else
- ❑ Walking
- ❑ Taxi/Uber
- ❑ Other:_____
- ❑ I do not travel to the grocery store

Social factors

75. How often do you feel that you lack companionship?

- ◯ Hardly ever
- ◯ Some of the time
- ◯ Often
- ◯ I don't know, or I'd rather not say

76. How often do you feel left out?

- ◯ Hardly ever
- ◯ Some of the time
- ◯ Often
- ◯ I don't know, or I'd rather not say

77. How often do you feel isolated from others?

- ◯ Hardly ever
- ◯ Some of the time
- ◯ Often
- ◯ I don't know, or I'd rather not say

Attitudes & Interests

How often are the following statements true for you?

	Never	Sometimes	Always
78. Fresh fruits and vegetables are easy to find in my neighborhood.	□	□	□
79. I can afford fresh fruits and vegetables.	□	□	□
80. I am willing to try new foods.	□	□	□
81. I like to eat vegetables.	□	□	□
82. I like to eat fruits.	□	□	□
83. I like to garden.	□	□	□

Social factors

84. I have access to space for gardening at my home or in my community.	☐	☐	☐
85. I would be interested in garden-related events at my senior center.	☐	☐	☐

86. If you are interested in gardening events, what types of items would you beinterested in growing?

_____

_____

_____

_____

Survey Administration

87. Did a staff member or volunteer help to administer the survey?

◯ Yes

87a. If yes, who helped? _____

◯ No

Center: _____

Today's Date: _____

Time: _____

Thank you!