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## ABSTRACT

Food insecurity affects approximately 8% of older adults in the U.S. and may be connected to social isolation. This study aimed to understand how loneliness and social support associated with food insecurity among older adults in Tampa Bay, Florida. We conducted surveys among 236 older adults in three healthcare clinics. Surveys included demographic questions, the Six-Item Short Form U.S. Household Food Security Survey, the de Jong Gierveld 11-item Loneliness scale, and the Multidimensional Scale of Perceived Social Support. Unadjusted logistic regression indicated that loneliness ($p < 0.001$, OR = 0.738) and lack of social support ($p = 0.001$, OR = 1.754) were significantly associated with higher odds of being food insecure. In the adjusted logistic regression model, loneliness ($p = 0.005$, OR = 1.356) and being divorced ($p = 0.008$, OR = 0.208) significantly predicted increased odds of food insecurity. As expected, food insecurity also associated with participation in the Supplemental Nutrition Assistance Program ($p = 0.003$, OR = 4.765). These results show food insecurity involves many underlying determinants including psychosocial factors.

## Introduction

Food insecurity refers to having inconsistent and inadequate access to safe and nutritious foods to sustain a healthy and active life.[1] Relative to economic wealth and food abundance in the United States (U.S.), the prevalence of food insecurity is high. Approximately 11.8% of households in the U.S. experience food insecurity, and 8% of households with older adults (65+ years) are food insecure.[2] Previous research shows food insecurity rates are higher among female, Hispanic, and African American older adults and those with low income, less education, grandchildren living in the home, who rent, who never married, and suffer from depression.[3–5] Ziliak and Gundersen, however, noted that more than half of food-insecure adults over 40 have incomes 200%

above the poverty threshold and more than two-thirds self-identify as white, arguing food insecurity affects older adults from various demographics.[3] Studies show that older adults experience unique barriers to food security such as social and physical isolation, health problems that limit mobility, the ability to drive a vehicle, consumption, and money for food, and limited incomes.[4–8]

Food insecurity among older adults can have detrimental effects on health. It is associated with malnutrition, diabetes mellitus, hypertension, pulmonary diseases, and depression among older adults.[4,9,10] Thus, to design effective food security and healthcare programs for the increasing U.S. older adult population, it is necessary to fully understand the social, health, and psychological factors that may increase the risk of food insecurity and poor health, as well as those factors that encourage or discourage older adults from participating in various interventions to improve food security and social interactions.

In the U.S., there are programs such as the Congregate Nutrition Program and the Home-Delivered Nutrition Program that provide balanced meals to older adults who are low income, minorities, live in rural communities, speak limited English, or are at risk for institutional care.[11] In addition, the Supplemental Nutrition Assistance Program, currently the largest hunger safety net in the U.S., provides monthly benefits to eligible low-income individuals and families to assist in the purchasing of food items at eligible retail stores and farmers' markets.[12] Households with older adults receive an average of $124/month in benefits.[13] SNAP eligibility includes both income and asset limits. For a household of two, gross monthly income must be less than $1,784.[14] While many older adults live on a low, fixed monthly incomes that may limit their ability to purchase food, having countable resources (e.g., cash, savings or retirement accounts) of more than $3,250 would result in ineligibility for SNAP participation.[14] As a result, many food-insecure older adults may not be eligible for SNAP assistance.

While the aforementioned initiatives are intended to address the food access needs of older adults, they do not reach all those who are eligible or in need. Only 41% of eligible older adults are enrolled in the SNAP program.[13] In addition, congregate and home-delivered meal programs assist only 5% of eligible older adults in the U.S.[15] There are several program characteristics, as well as other social, economic, biological, and psychological factors, that might explain low program participation and ultimately high food insecurity rates among older adults. Common barriers to senior SNAP participation include lack of awareness of the program, confusion about eligibility requirements, difficulty with the application and re-application process, and stigma relative to the program.[16] Limited funding, reliance on volunteers, and long waiting lists may also reduce utilization and access to food delivery and assistance programs.[15]

Attitudes and beliefs related to one's independence and autonomy can also impact program utilization. Shopping offers a sense of choice, and cooking one's own meals provides a level of independence among older adults.[7,17,18] The fear of losing this independence and autonomy may keep older adults from accepting meal services or food assistance.

Loneliness and social isolation can also limit older adults' access to food, especially if they have no way of getting food without the assistance of companions, family, or a social support network. In addition, eating is perceived as a social activity for many. Studies show that eating with others as well as living with others is associated with less food insecurity and better nutrition.[18–21] Thus, not having company to prepare or consume meals with can lead to reduced pleasure previously associated with food and eating.[20] Loneliness and social isolation can also lead to depression, which can result in poor eating habits and ultimately food insecurity.[22,23] These circumstances help to explain the associations between marital status/living partner, loneliness, and food insecurity, where older adults who are widowed or unmarried experience more loneliness and higher rates of food insecurity compared to those with partners.[8,24–26]

While social and economic factors play an important role in food insecurity, there are also physiological factors that increase the risk among older adults. Approximately 80% of U.S. older adults suffer from chronic diseases, such as type 2 diabetes, cardiovascular disease, or cancer.[27] According to the Center for Disease Control, three in four older adults have multiple chronic conditions.[28] Adults with ill-health may experience more financial strain due to associated health care costs as well as limited mobility that can make it hard to get food and prepare meals.[29] Disorders that affect metabolism (e.g. insulin resistance), digestion, or dental health, as well as those associated with throat conditions, can make it difficult to consume food. Feeling unwell due to poor physical and mental conditions is also associated with decreased appetite and increased risk for food insecurity.[29,30]

To improve health among populations of older adults, it is necessary to understand the role of food insecurity within the risks and exacerbation of conditions. This includes a better understanding of the social and emotional determinants of food insecurity and ultimately health. Our goal was to explore loneliness, as defined by "the feeling of missing an intimate relationship (emotional loneliness) or missing a wider social network (social loneliness)"[31], and lack of social support as potential determinants of food insecurity among older adults in Tampa Bay, Florida. In this paper, we present the statistical associations between food insecurity, loneliness, social support, and demographics such as ethnicity, marital status, income, and SNAP participation.

## Methods and Materials

### Procedure

This study was approved by the Institutional Review Board and conducted under the compliance of the Health Insurance Portability and Accountability Act of 1996 (HIPAA).

During June and July of 2017, adults 65 years of age and older were recruited in the waiting rooms of three primary care clinics in Tampa Bay, Florida. After their exam, participants completed a survey. The survey was administered privately in a semi-structured interview format and included questions regarding demographics, physical and mental health, food security, loneliness, social support, diet, and factors influencing dietary choices and eating habits. Study staff members input survey answers into an iPad and recorded open-ended questions with an audio recorder. The qualitative open-ended findings will be submitted in another paper. Participants were provided a $10 grocery store gift card for participation, as well as a local food pantry resource packet.

### Measures

#### Demographics

Personal and household demographics included age, gender, ethnicity, marital status, education, employment status, household income, and participation in government-funded assistance programs (e.g., SNAP).

#### Food Insecurity

Food insecurity was measured using the U.S. Household Food Security Survey Module: Six-Item Short Form.[32] The USDA food security survey has been validated as a reliable tool for measuring household food security. It has been used in numerous studies[33] and confirmed among U.S. older adults.[34] The survey provides continuous scores for individuals based on their access to adequate amounts of safe and nutritious foods within the past 12 months.[35] Households who answered affirmatively to one or fewer questions were categorized as having high/marginal food security, defined as having one or less indication of food access issues.[32] A household with high/marginal food security is considered to be food secure. Households that answered affirmatively to two to four questions were classified as having low food security. Low food security is defined as reporting reduced quality, variety, or desirability of diet but little to no reduced food intake. Lastly, those who answered affirmatively to four or more questions were considered to have very low food security, meaning they experience disrupted eating patterns and/or reduced food intake.[1] For quantitative analyses and this paper, participants who had low and very low food security were grouped into one food insecure group.

## Loneliness

A modified Rasch-based de Jong Gierveld (DJ) 11-item loneliness scale was used to score participants on loneliness. The de Jong Gierveld short scales have been validated among older adults.[31] The loneliness scale measures the number of social relationships considered desirable as well as situations in which one has experienced emotional loneliness.[36] For this study, response options were modified from *Yes/More or less/No* to *Yes/No* to reduce confusion and survey length. To obtain the emotional loneliness score, affirmative answers for negatively formulated items are counted (e.g., "I miss having people around me").[31] To obtain the score for social loneliness, negative answers for positively formulated items were counted (e.g., "There are enough people I feel close to").[31] For the total loneliness score, the two scores were summed to determine the degree of loneliness a person experiences with 0 being least lonely and 11 being most lonely.[36] Categories for loneliness include least lonely (total score = 0–3), moderately lonely (total score = 4–8), and most lonely (score of 9 or more).

## Social Support

Social support was measured with the Multidimensional Scale of Perceived Social Support (MSPSS). This scale provides a score based on the level of perceived social support one receives from family, friends, or a significant other.[37] The scale has been validated in various countries and among different age populations.[38] The MSPSS consisted of 12 statements and corresponding Likert-like responses (i.e., 1 – very strongly disagree to 7 – very strongly agree). The average of the 12 responses reflected the total social support score for each respondent.[37] Participants were categorized into three groups by their mean scores. Mean scores of 1 to 2.9 were considered to have low social support; mean scores of 3 to 5 had moderate social support; and mean scores of 5.1 to 7 had high social support.[37]

## Analysis

Quantitative analyses were conducted using IBM SPSS Statistics for Windows (24.0). Exploratory analyses were used to understand frequency distributions, establish normality, and check for outliers.

Descriptive statistics measured counts, percentages, and averages of demographic variables. Bivariate comparisons (i.e., Student's t-tests) identified demographic variables associated with food insecurity, loneliness, and social support, and compared levels of loneliness and social support between food secure and food insecure groups. Non-parametric two-tailed Spearman's Rho Correlation assessed the correlations between food insecurity and loneliness, as well as correlations between food insecurity and social support. Partial correlations were used to control for marital status and ethnicity. Multiple logistic regression models measured the associations between food insecurity, loneliness, and social

support and included SNAP participation, marital status, and ethnicity as covariates. The alpha level was set at 0.05 for all analyses.

## Results

### *Demographics*

Table 1 presents the summary statistics for the sample demographics. The total sample included 236 patient participants, all 65 years of age or older. The mean age of participants was 75.15 years (SD = 8.95). A large percentage of participants were retired and had a total household income of less than $25,000 per year; 22.5% of participants participated in the Supplemental Nutrition Assistance Program (SNAP).

### *Food Insecurity*

Nearly 20% of the sample was food insecure, with 12% of participants reporting low food security and 8% of participants reporting the more severe condition: *very low food security*[32]. There were no significant differences in mean household food security scores among income, gender, or ethnic groups. However, SNAP

**Table 1.** Demographic characteristics.

| Characteristics | n | Mean ± SD or % |
|---|---|---|
| Age | 236 | 75.15 ± 8.95 |
| Gender | | |
| Female | 143 | 60.59% |
| Male | 93 | 39.41% |
| Ethnicity | | |
| African American | 25 | 10.59% |
| Hispanic/Latino | 98 | 41.53% |
| White/Caucasian | 101 | 42.80% |
| Other | 12 | 5% |
| Marital Status | | |
| Divorced | 41 | 17.37% |
| Married | 115 | 48.73% |
| Never Married | 11 | 4.66% |
| Widowed | 69 | 29.24% |
| Education | | |
| Certificate/Technical | 11 | 4.66% |
| College/Post-college Degree | 43 | 18.22% |
| High School Diploma | 74 | 31.36% |
| Less than High School | 68 | 28.81% |
| Employment Status | | |
| Not Employed | 18 | 7.63% |
| Retired | 201 | 85.17% |
| Working | 17 | 7.20% |
| Income | | |
| Less than $25,000 | 138 | 58.47% |
| $25,000–$49,000 | 65 | 27.54% |
| $50,000–$74,000 | 12 | 5.08% |
| $75,000+ | 10 | 4.24% |
| SNAP Participation | | |
| Yes | 53 | 22.5% |

SD, standard deviation; SNAP, Supplemental Nutrition Assistance Program.

participants had a significantly higher mean food insecurity score compared to non-SNAP recipients ($p < 0.001$; Table 3). In addition, divorced patients were more food insecure than both the married ($p < 0.001$) and widowed ($p = 0.003$) groups (Table 3).

## Loneliness

Nearly one-third of participants were considered moderately lonely or most lonely (Table 2). Hispanic, divorced, and food-insecure patients were significantly lonelier than their counterparts (Table 3). SNAP recipients were also significantly lonelier than non-SNAP recipients ($p = 0.004$). After controlling for marital status and ethnicity, food insecurity was significantly positively correlated with loneliness ($p < 0.001$, r = 0.404).

## Social Support

The average social support score was 5.767, indicating high social support (Table 2). Divorced and food-insecure patients had significantly less social support compared to married or food-secure patients (Table 3). SNAP recipients

**Table 2.** Summary statistics for food security, loneliness, and social support.

| Characteristics | n | % |
|---|---|---|
| Loneliness | | |
|   Least Lonely | 162 | 68.64% |
|   Moderately Lonely | 65 | 27.54% |
|   Most Lonely | <10 | <4.23% |
| Social Support | | |
|   High Social Support | 196 | 83.04% |
|   Moderate Social Support | 35 | 14.89% |
|   Low Social Support | <10 | <4.25% |
| Food Security | | |
|   Food Secure | 189 | 80.08% |
|   Food Insecure | 47 | 19.92% |

**Table 3.** Mean differences in loneliness, social support, and food insecurity among categorical characteristics.

| Characteristics | Loneliness | | Social Support | | Food Security | |
|---|---|---|---|---|---|---|
| | Mean Difference | p-value | Mean Difference | p-value | Mean Difference | p-value |
| Ethnicity | | | | | | |
|   Hispanic | – | – | – | – | – | – |
|   White/Caucasian | 1.34 | 0.024 | 0.43 | 0.108 | 0.19 | 0.999 |
| Marital Status | | | | | | |
|   Divorced | – | – | – | – | – | – |
|   Married | 1.33 | 0.05 | 0.61 | 0.013 | 1.99 | <0.001 |
|   Widowed | | | | | 2.03 | 0.003 |
| Food Secure | – | – | – | – | – | – |
|   Food Insecure | 2.43 | <0.001 | 0.86 | <0.001 | | |
| SNAP Participation | | | | | | |
|   Yes | – | – | – | – | – | – |
|   No | 1.42 | 0.004 | 0.51 | 0.005 | 1.88 | <0.001 |

SNAP, Supplemental Nutrition Assistance Program; Student's t-test, equal variances not assumed.

also reported significantly less social support than non-SNAP users ($p = 0.005$). After controlling for marital status, there was a significant negative correlation between food insecurity and social support ($p < 0.001$, r = −0.338).

## Unadjusted Models

Binary logistic regression further supported the associations between food insecurity and loneliness, as well as food insecurity and social support. Food insecurity was coded as 1 and food security coded as 0. Therefore, positive beta values (slope of the relationship) represented an increased probability of food insecurity and negative beta values represented a decreased probability of food insecurity; and odds ratios were described in terms of food insecurity.

Model 1 (Table 4) measured the odds of food insecurity based on loneliness and predicted 83.3% of the cases. There was a significant relationship between food insecurity status and DJ loneliness scores. The odds of food insecurity were 1.36 times larger for every one unit increase in mean DJ loneliness score ($p < 0.001$, OR = 1.355).

Model 2 (Table 4) measured the odds of food insecurity based on social support and predicted 83.3% of the cases. There was a significant relationship between food insecurity status and MSPSS scores. The odds of food insecurity were 57% smaller for every one unit increase in mean MSPSS score ($p = 0.001$, OR = 0.570).

## Adjusted Models

Because SNAP participation, marital status, and ethnicity were associated with either food insecurity, loneliness, or social support, these variables were included in a third logistic regression model to account for their influence

**Table 4.** Odds of food insecurity: Models 1, 2, and 3.

| Factors | B | Lower | Odds Ratio | Upper |
|---|---|---|---|---|
| **Model 1** | | | | |
| Loneliness | 0.304*** | 1.184 | 1.355 | 1.551 |
| **Model 2** | | | | |
| Social Support | −0.562** | 0.415 | 0.570 | 0.783 |
| **Model 3** | | | | |
| SNAP Participation | 1.557*** | 1.948 | 4.745 | 11.558 |
| Married | −1.186* | 0.115 | 0.305 | 0.812 |
| Never Married | −0.780 | 0.080 | 0.459 | 2.644 |
| Widowed | −1.855** | 0.052 | 0.156 | 0.474 |
| Hispanic | −1.756** | 0.045 | 0.173 | 0.661 |
| Other | −0.105 | 0.137 | 0.901 | 5.903 |
| White | −0.160 | 0.249 | 0.847 | 2.877 |
| Loneliness | 0.293** | 1.110 | 1.341 | 1.619 |
| Social Support | −0.348 | 0.440 | 0.706 | 1.135 |

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$ Comparison group: SNAP Participation, non-participation; Marital Status, divorced; Ethnicity, African American.

and understand how all variables related to food insecurity. Gender was also included to account for uneven distribution among the sample.

Model 3 (Table 4) predicted 84.7% of the cases. SNAP participation, marital status, ethnicity, and DJ loneliness scores significantly predicted the odds of food insecurity despite the influence of other variables. SNAP participants were 4.745 times as likely to be food insecure compared to non-SNAP users ($p = 0.001$, OR = 4.745). Individuals who were married were 30.5% less likely to be food insecure when compared to those who were divorced ($p = 0.017$, OR = 0.305), and those who were widowed were 15.6% less likely to be food insecure compared to divorced patients ($p = 0.001$, OR = 0.156). Hispanic patients had 17.3% lower odds of being food insecure compared to African Americans ($p = 0.01$, OR = 0.173). Lastly, the odds of food insecurity were 34.1% greater for every one unit increase in DJ loneliness scores ($p = 0.002$, OR = 1.341).

## Discussion

The aim of this study was to measure the associations between food insecurity, loneliness, and social support among older adults. We found that both loneliness and low social support increased the likelihood of being food insecure for this sample. Being divorced also increased the odds of food insecurity. In addition, SNAP participants were more likely to be food insecure, which was expected since food insecure individuals are the most likely to utilize SNAP benefits. These findings show that having a well-established social support system and companionship may reduce the risk of food insecurity among older adults.

The prevalence of food insecurity among this sample of older adults was approximately 20%. This is considerably higher than the national statistic for food insecurity among older adult households (8%).[2] However, this high prevalence of food insecurity in an outpatient clinic population is consistent with findings from another study.[39] In addition, there is evidence that chronic physical and mental conditions increase the risk for food insecurity among adults.[29] The findings suggest the correlation between food insecurity and chronic disease may drive food insecure individuals to require more healthcare utilization than those without similar social drivers of poor health.

Food insecurity is a complex multifaceted issue that involves a variety of social, economic, biological, and psychological factors. SNAP participation, marital status, loneliness, and social support were associated with food insecurity. When all three variables were included in the adjusted model, social support no longer predicted the odds of food security. Therefore, loneliness and marital status may be better indicators of food security than social support for this sample.

These relationships are supported in previous studies. Having a partner in older adulthood has been shown to protect against food insecurity,[8,26,40] as well as loneliness.[24,25] Previous research has reported that formerly married participants associate emotional and social loneliness with loss of companionship and rejection.[24] Unmarried respondents show higher levels of loneliness than those who are married and are more positively affected by interactions with others when compared to married adults.[25] It is of interest, though, that being widowed was associated with a stronger likelihood of food security for this sample. This contradicts previous studies that have found barriers to food security among widowers such as loss of social networks and poor health.[41] It may be the case that widowed participants in this sample have strong social support systems, receive retirement income and/or supplemental income from their deceased partners, or live/eat with others such as children or grand-children. A similar conclusion was drawn from a recent study that found older widowed men did not experience high rates of food vulnerability due to their consistent food routines, social support, and retirement income that allowed them to purchase nutritional diets.[42]

SNAP participants were more likely to be food insecure, experience higher levels of loneliness, and have less social support. Considering the strong influence that loneliness and marital status have on food security among older adults,[8,9] these connections are likely interrelated with the finding that most SNAP participants in this sample were divorced or lived alone (data not shown). Furthermore, a recent study by Leung and colleagues found significant associations between depression and food insecurity among SNAP users.[23] Since loneliness and social isolation are connected to depression[21], depression may be an additional underlying factor behind higher food insecurity odds among SNAP participants in this sample.

These findings suggest two important factors. First, for older adults who are living with *very low food security*, SNAP participation alone may not be enough to mitigate food insecurity. In addition, SNAP benefits received by older adults may be insufficient to meet the needs of those who are also dealing with high healthcare costs, reduced or fixed income, and low social support. Second, the higher rates of food insecurity in our sample of SNAP recipients suggests that the individuals who are experiencing more severe impacts of food insecurity are the ones who are overcoming SNAP application barriers. Other recent studies have also found that SNAP recipients remain food insecure.[43,44] In the U.S., 50% of households that have received SNAP benefits in 2016 continue to report consistent food insecurity (i.e., over the period of one year)[2] and continue to rely on the emergency food system.[45]

Social isolation is intertwined with food insecurity, marital status, loneliness, and poor health. Our study found that low levels of social support associated with food insecurity, living alone, and SNAP participation. Poor mental or emotional health stemming from living alone and/or reduced social support

can result in lost interest in cooking or eating and ultimately reduce food intake.[19,22,46–48] Being homebound due to a disability, illness, injury, and/or inability to drive can result in reduced access to food, poor appetite, and difficulty preparing meals.[10,30,46] Moreover, without a social support network such as friends and family to help home-bound older adults retrieve and prepare meals, access to food becomes severely diminished, especially among those who cannot afford or do not qualify for home-delivered meals or groceries. All these circumstances can further increase one's feelings of loneliness, social isolation, depression, and unwellness.[10,30,46]

Food insecurity may also exacerbate social isolation, as older adults may feel embarrassed or ashamed of their hardship. Thus, the connection between food insecurity and social isolation is syndemic and can lead to increased health risks and consequences.[10,46] Syndemics theory refers to the intensification and reinforcement of health consequences when two or more poor-health conditions coexist.[49,50] Since social isolation not only decreases food access but is also associated with poor mental and physical health, it can lead to reduced food intake due to physical barriers or socioeconomic limitations such as healthcare costs and losing the pleasure of eating. Consequently, food insecurity among older adults leads to poor nutrition and ultimately associates with increased infection rates, extended healing times, greater risk for chronic disease, increased hospital admissions, stress, poor appetite, multimorbidity, and even fatality.[9,51,52]

Various studies show that social support, networking, and community involvement help to protect older adults from food insecurity and reduce the risks of physical and mental illness.[25,51–54] Thus, food insecurity interventions that include social involvement and interaction are likely to be most effective among older adults, such as those in this study.

## Limitations

Major limitations to this study include the sample size and use of convenience sampling. In addition, the study was cross-sectional and therefore only captured lived experiences at the time of the interviews. These limitations prohibit any type of causal inference between the variables. Although we found SNAP participation, marital status and loneliness to be significantly associated with food security there may be additional factors, not measured by our data, driving this relationship. Future research on this topic that includes an appropriate comparison group or randomized study design is needed to better understand the mechanism by which various ecological factors impact food security. Furthermore, questions surrounding food insecurity, loneliness, and social support are sensitive and may result in subject respondent bias. Participants may not have answered the sensitive questions honestly for fear of judgment or consequence. Lastly, our findings reflect data from select clinics in Tampa Bay, Florida and may not be generalizable to the broader population.

## Conclusion

Food insecurity among older adults involves complex, interrelated social, economic, biological, and psychological factors. If programs and policies are to effectively reduce food insecurity among older adults, loneliness and social support must also be considered when designing interventions. A large proportion of food-insecure older adults is simply falling through the cracks of the safety net system. Approximately 60% of eligible older adults are not participating in SNAP, and only 5% utilize home-delivered meals and grocery services.[13,15] This shows that initiatives need to better understand the barriers keeping older adults from food assistance participation and better target older adults who face these limitations. It is clear that food insecurity and loneliness associate with poor health.[4,9,10,22,23,48,51–53] Thus, health care centers provide an opportunity to identify individuals experiencing food insecurity and loneliness and address these issues. Health care providers and staff should be educated on the issue of food insecurity among older adults and its relation to health and social isolation, and incorporate assessments of household food insecurity, loneliness, and social support during their patient visits. Furthermore, local organizations such as senior centers and churches should be encouraged to look for at-risk older adults and trained in programs to respond. In all locations, employees and caretakers should provide information on food assistance and local social support services for those in need or at risk. On a larger scale, better public education of food assistance options, particularly regarding SNAP, needs to be distributed in a way that targets vulnerable older adults. Lastly, policies need to account for the increasing older adult population and the psychosocial and physiological burdens they face such as social isolation, loneliness, and chronic disease. The high rates of chronic disorders among older adults infers that those on limited income face further income constraints due to medical costs. SNAP eligibility criteria consider only income and assets, but not the out-of-pocket medical costs and other expenses incurred by older adults.[55] Thus, SNAP eligibility requirements and allotments do not accurately account for the costs associated with being an older adult in the U.S, leaving older adults who are ineligible for SNAP with the tough choice of paying for medical services, including prescriptions, or food.[43,44,56] As our healthcare sector strives to improve health outcomes and reduce the cost of care for older adults[57–59], it is vital to work across sectors to better understand the challenges faced by the most vulnerable and for policies and programs that provide better solutions to food insecurity and social isolation among older adults.

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## Declaration of Interest Statement

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## Statement on Publishing

This paper has not been submitted simultaneously for publication elsewhere.

## Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author, MB. The data are not publicly available due to their containing information that could compromise the privacy of research participants.

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