Assessment Among Adults Experiencing Sheltered Homelessness: Nutrition and Food Safety Knowledge and Potential Barriers to Attending a Culinary Training Program

Temperance Joseph
Jesus Morales Cruz
Kareli Tobias
Jonathan Cruz
Anairany Zapata
Rhea Vikas
Daphne C. Hernandez, Ph.D., MSEd, FAAHB, FSBM[c]

Abstract

Restaurants are the largest private sector employers in Texas, yet only 48% of Texas restaurants have enough employees to support existing demand. The shortage of restaurant employees is an opportunity to develop culinary training programs for individuals that need employment, such as adults experiencing sheltered homelessness. Prior to program development it is important to understand their baseline knowledge of nutrition and food safety and potential attendance barriers. A cross-sectional survey was conducted among adults experiencing sheltered homelessness in Houston, Tx (October 16, 2024-November 13, 2024). Among 91 participants, on average, adults were 42 years old (SD = 12.98), 67% female, and 60% Black. Nutrition knowledge was low on 2 survey items (12% and 34% correct) and moderate on another 2 items (64% and 66% correct). Regarding food safety, 93% of the participants were able to answer 1 of the 5 items correctly. In terms of potential barriers, 82% of the sample experienced food insecurity. Seventy-seven percent of participants that had a car expressed not having money for gasoline *and* not making repairs to their car because of the expense. Forty-seven percent of the participants had children under the age of 18 and 44% of them needed childcare assistance in order to attend a program. Curriculum associated with the culinary training program must include nutrition and food safety education. To address potential attendance barriers (food, transportation, childcare), it may be necessary to partner with community organizations that aim to reduce economic instability prior to developing and implementing the program.

Corresponding author may be reached at: Daphne.Hernandez@uth.tmc.edu, Phone: 713-500-2052

Keywords: childcare, food insecurity, health promotion program, homeless, transportation hardship, workforce development

Introduction

Housing instability is a multidimensional concept that describes the inter-related financial hardships associated with residential difficulties, such as paying utilities and/or rent/mortgage, frequent relocations, living in overcrowded residences, poor housing conditions, or forced to live with friends or relatives due to financial strain (Healthy People 2030, n.d.; Hock et al., 2023). Persistent housing instability can result in homelessness (Shukla et al., 2023). In Houston, Texas, job loss and reduction in hours are prominent reasons for experiencing housing instability and homelessness (Coalition for the Homeless, 2024). This coincides with prior research that

indicates employment insecurity co-occurs with housing instability (Desmond & Gershenson, 2016).

Workforce development programs provide essential job training, resources and support to help individuals secure and maintain employment. Culinary training programs are a specific type of workforce development program geared towards preparing low-income adults for entry-level food service positions. These programs follow a prevocational training model designed to *teach* basic culinary skills and cooking techniques in a professional kitchen *prior* to *gaining employment* (i.e. *train-and-place model*). These programs vary in training duration (i.e. 9-12 weeks) and in the additional resources that they provide trainees. The additional resources that have been included have been financial literacy, employment skill development (e.g., resume and interview preparation), and supportive services (e.g., transportation assistance, and job placement services) (Central Texas Food Bank, n.d.; Kitchen of Champions, n.d.; J. Salinas, oral communication, October, 2024). Two food banks in Texas have been leaders in this area. The culinary program through the Central Texas Food Bank (Austin, Texas) partnered with the Jacques Pepin Foundation reports 75% of students of the program found employment and remained in the workforce for at least six months (Fernandez, 2025). The Houston Food Bank had a small program where it graduated 32 trainees, where 84% graduated and of those that graduated, 80% gained employment (J. Salinas, oral communication, October, 2024). While these programs focused on their trainees gaining employment, their programs were not designed as an employment intervention for adults living in a shelter housing facility.

Employment interventions for adults experiencing homelessness are in their early stage of development (Marshall et al., 2022) Kitchen of Champions culinary training program, followed a prevocational training model, partnered with St. Vincent de Paul of Alameda County, an emergency shelter. Kitchen of Champions has graduated 35 cohorts (where 25 trainees are included in a cohort); yet, there is no outcome data available on program completion, nor the percentage that gained employment (Kitchen of Champions, n.d.). Yet other employment interventions for youth and adults experiencing homelessness have not followed a train and place model and instead followed a supported employment model (i.e. *place-and-train model*: place in a job while obtaining employment support) (Burns et al., 2007) or a social enterprise intervention model (i.e. *train-while-place model*: train while developing a business) (Ferguson, 2007). Employment interventions designed for youth and adults experiencing homelessness that have applied these models have either found no effect on employment (Ferguson, 2018; Poremski et al., 2017), mixed findings (Ferguson, 2018; Ferguson et al., 2012), or greater participation in employment but statistical significance was not reported (Jennings Mayo-Wilson et al., 2020). These models (i.e. supported employment model and social enterprise intervention model) have not been applied to a culinary training program designed for adults experiencing homelessness.

Albert Bandura's Social Cognitive Theory (SCT) states that the concept of learning occurs in a social setting with reciprocal interactions from the person, environment, and behavior, (Bandura, 2004). It is perceived that learning occurs through an individual's actions, and the observation of the actions of others and the corresponding results of those actions (Conner & Norman, 2015). Culinary training aligns with aspects that are reinforced by SCT (Hollywood et al., 2018), and the theory is commonly implemented in cooking interventions (Gordillo & Prescott, 2023). A review of

cooking and food skills interventions that have applied SCT indicate that three constructs are widely used in culinary interventions: behavioral capability, observational learning, and self-efficacy (Gordillo & Prescott, 2023). *Behavioral capability* is the ability to perform a behavior, such as dicing an onion. *Observation learning* is a critical construct to culinary training, as actions are modeled by trained chefs, observed by trainees, and later reinforced through practical application. Actions include, but are not limited to, observing how to use a knife, seasoning food properly, and sauteing. *Self-efficacy* is critical to feeling comfortable in a professional kitchen to execute the actions. Self-efficacy is the belief that one can complete a designated task. Self-efficacy-based approaches focus on improving an individual's confidence that they have control over their actions and their actions will produce desired outcomes (Bandura, 2004; Benight & Bandura, 2004). Prior research indicates that culinary programs increase self-efficacy for meal planning and cooking (Sharma et al., 2021). Self-efficacy is an associated protective factor against suicide ideation among sheltered homeless adults (Kim et al., 2019). Further, the training that occurs in a professional kitchen with others enhances teamwork. Teamwork is required to complete culinary tasks in an efficient manner, such as preparing and plating several meals in a limited amount of time. The collaborative effort in the kitchen can perpetuate social connectedness to the training program. Social connectedness has been associated with being a protective factor against psychological distress and the co-occurrence of depressive and substance use disorders among homeless youth (Begun et al., 2018; Dang, 2014).

While research on culinary training programs have been found to be successful in providing adults who experience developmental disabilities with skills for employment (Nugent, 2019), culinary training programs have not partnered with sheltered housing organizations as a mechanism to reduce housing and employment instability. Prior to developing a culinary training program for adults experiencing sheltered homelessness it is important to assess the interest and background of the targeted population in relation to culinary training, nutrition knowledge, and food safety. In 2021 a quarter of adolescents worked in food service industry (Kelso, 2021), and most fast-food industry workers were between 20 and 30 years of age (Oysterlink, n.d.). Therefore, it is reasonable to assume that some members of the target population already possess at least a basic level of food safety knowledge. Assessing nutrition knowledge and food safety informs the research team of the appropriate starting point for each lesson. This ensures the content is tailored to the target audience's existing knowledge.

Culinary training programs could also serve as a mechanism to improve mental health. Mental health could be improved in the short-term through the social connectedness associated with the training (e.g., Begun et al., 2018; Dang, 2014); mental health could improve in the long-term with the reduction in housing and employment instability. (e.g., Burgard & Seelye, 2017; Hatem et al., 2020; Jin et al., 2024; Kang, 2022; Singh et al., 2019; Suglia et al., 2011; Wilson et al., 2020). Yet, poor mental health can be a barrier to participating in community programming (Baxter et al., 2022). Thus, it is important to assess potential mental health barriers to attending the program. Potential attendance barriers are also intertwined with economic hardship. For instance, prior research has indicated that transportation is a barrier to reemployment programs and social services, such as programs designed to reduce food insecurity (Freedman et al.,

2016; Haynes-Maslow et al., 2015; Hernandez et al., 2021; Madigan & Bonney, 2021; Oemichen & Smith, 2016; Ritter et al., 2019). Additionally, childcare access and affordability is also a barrier to training and employment (Landivar et al., 2022; Madigan & Bonney, 2021; Ruppanner et al., 2021). Assessing potential barriers may help lessen a common limitation among interventions focused on youth and adults experiencing homelessness: small sample sizes and high attrition rates, which reduce statistical power (Ferguson, 2018; Ferguson et al., 2012; Jennings Mayo-Wilson et al., 2020; Slesnick et al., 2009).

The purpose of this study is to assess the interest and background of adults living in sheltered housing, their prior culinary training, nutrition and food safety knowledge, and potential attendance barriers. The information gathered in the survey will be used to create a tailored culinary training program that may be effective in helping adults who experience sheltered homelessness gain employment, which may reduce their economic hardship and improve their mental health.

Methods

Sample

Recruitment and data collection occurred at a sheltered housing facility that follows a housing plus services model for adults experiencing homelessness in Houston, Texas (October 16, 2024-November 13, 2024). A housing plus service model provides individuals with limited incomes affordable housing and support services, including case management and access to health and wellness programs, education, and social services (New Hope Housing, 2024). Recruitment flyers were delivered to residents' rooms by staff, and research assistants recruited potential participants in courtyards and meetings spaces (i.e. kitchen, computer room). Potential participants were eligible to participate if they were 18 years or older, resident of the sheltered homeless facility where recruitment and data collection were occurring and spoke and read either English or Spanish. All potential participants were explained the purpose of the study, associated compensation, and provided time to ask questions.

Interviewer-administered surveys were conducted. Interviewer-administered surveys reduced limited and low literacy burdens, and prior studies that have used this method have found that participants expressed that they felt heard (Hodgman et al., 2022). Data was collected on tablets using REDCap software (Harris et al., 2019; Harris et al., 2009). Participants were compensated for their time with a $25 Visa gift card. This study was approved by the University of Texas Health Science Center – Houston's Institutional Review Board (HSC-SN-24-0880), which granted a waiver of informed consent.

Measures

Sociodemographic Characteristics

Sociodemographic information collected included age (years), gender (female, male), race/ethnicity (White, Hispanic, Black, and Asian), education (Less than high school degree, high school degree, some college, college), employment status (unemployed, part-time, full-time, unemployment compensation/disability, pension/retirement), income ($0, >$0 - ≤ $14,999, $15,000-$24,999, $25,000 - $34,999, ≥ $35,000), health insurance (no health insurance, Medicaid, Obamacare (Marketplace), Private), marital status (married or cohabitating, single), and household structure (# of children, # of adults).

Culinary Training Program Interest

Participants were asked if they were interested in participating in a culinary

training program (1 = yes; 0 = no), if they had prior culinary experience (1 = yes; 0 = no), and had previously participated in a culinary course (1 = yes; 0 = no).

Nutrition and Food Safety Knowledge

Participants were asked a series of questions to understand prior knowledge related to nutrition and food safety. The first set of questions focused on nutrition guidelines. Participants were asked four questions related to MyPlate: "How much of the plate should be filled with fruits and vegetables?", "How many food groups are represented on MyPlate?", "Which food group on MyPlate should make up the smallest on your plate?", and "Drinking sugar beverages is a behavior that is not recommended by MyPlate?". Percent calculations reflect correct answers.

Participants were followed by a series of five food safety questions commonly found in a foodservice setting. Participants were asked the following true or false questions: "Washing meat helps reduce the spread of foodborne illness" or (1 = false; 0 = true) , "It is not safe to partially cook food ahead of time and finish cooking it later?" or (1 = false; 0 = true) , and "It is important to use separate cutting boards for raw meat and fresh produce?" (1 = true; 0 = false). The last two questions within the series were focused on time and temperature control, including "How long can perishable food be safely left out at room temperature?" and "What is the recommended minimum internal temperature for cooking ground poultry?" Percent calculations on the last two items reflect correct answers.

Potential Attendance Barriers

To measure potential attendance barriers several different items were measured. *Prior experience with homelessness*. Participants were asked whether they had ever experienced homelessness as a child or adult (1 = yes; 0 = no). *Children.* For participants that affirmatively responded to having children, they were asked follow-up questions as to whether the children were under the age of 18 (1 = yes; 0 = no) and if they needed childcare assistance to participate in the program (1 = yes; 0 = no).

Car access and Transportation hardship. Participants were asked whether they had access to a car (1 = yes; 0 = no). For participants that affirmatively responded to having access to a car, they were asked 5 follow-up questions about potential transportation hardship. Participants affirmatively responded (1 = yes; 0 = no) to: "In the past 12 months has there been a time when you or someone in your household: (1) needed to go somewhere but did not have money for gasoline? (2) neglected necessary car repairs because they were too expensive? (3) let car insurance lapse because the payments were too high? (4) missed a car payment? or (5) had a vehicle repossessed?" (Fletcher et al., 2005). *Transportation assistance.* Participants were asked whether they would be willing to take an Uber to the training program location if paid by the housing organization (1 = yes; 0 = no).

Other forms of hardship. To gain an idea of other forms of hardship that may prevent program attendance, participants were asked about food and medical hardship. Food insecurity was measured using the 2-item food insecurity screener (Gundersen et al., 2017; Hager et al., 2010). The 2-item screener asks participants to affirmatively respond to whether in the past 12 months a) they worried whether food would run out before getting money to buy more and b) the food that was bought did not last and they did not have money to get more. An affirmative response on either item categorized participants as food insecure. Medical hardship was measured using 1-item. Participants affirmatively responded if they

Table 1.
Sociodemographic Characteristics of the Sample, N=91

	#	% or Mean	SD	Range
Age		42.37	12.98	18-67
Sex				
Female	61	67.03%		
Male	30	32.97%		
Race/Ethnicity				
White	11	12.79%		
Hispanic	17	19.77%		
Black	52	60.47%		
Asian	2	2.33%		
Education				
Less than High School Degree	10	11.24%		
High School Degree	37	41.57%		
Some College	33	37.08%		
College	9	10.11%		
Employment Status				
Unemployed	46	50.55%		
Part-time	13	14.29%		
Full-time	16	17.58%		
Unemployment compensation/Disability	11	12.09%		
Pension/Retirement	2	2.20%		
Income				
$0	24	26.37%		
More than $0 But Less Than $14,999	34	37.36%		
$15,000 - $24,999	14	15.38%		
$25,000 - $34,999	7	7.69%		
>= $35,000	4	4.40%		
Health Insurance				
No Health Insurance	20	21.98%		
Medicaid	34	37.36%		
Obamacare (Marketplace)	20	21.98%		
Private	6	6.59%		
Marital Status				
Married or Cohabitating	13	14.44%		
Single	78	85.71%		
Household Structure				
# of children		1.09	1.39	0-5
# of adults		0.53	0.81	0-4

or anyone in their household had unpaid medical or hospital bills (1 = yes; 0 = no).

Table 2.
Interest in Attending a Culinary Training Program, N=91

	n	%
Interested in participating	79	86.81%
Prior culinary experience	48	52.74%
Prior participation in culinary course	21	23.08%

Mental Health. Anxiety was measured using the 2-item General Anxiety Disorder Screener-2 (GAD-2) (Plummer et al., 2016). Each item has response options that range from 0 = *not at all* to 3 = *nearly every day*. Items are summed and a score of 3 or higher suggests further diagnostic evaluation for generalized anxiety disorder is warranted. Depression was measured using the 8-item Patient Health Questionnaire (PHQ-8) (Kroenke et al., 2009). Each item has response options that range from 0 = *not at all* to 3 = *nearly every day*. Items are summed and a score of 10 or higher suggests moderate depression.

Data Analysis

Descriptive statistics were calculated for all variables of interest. Percentages were calculated for dichotomous and categorical variables. Means, standard deviations, and ranges were calculated for continuous variables. All descriptive statistics were conducted using Stata version 16 (College Station, Tx: StataCorp LLC).

Results

A total of 91 adults participated in the survey. On average, the age of adults was 42 years (SD=12.98), with 67% identifying as female and 60% as Black (Table 1). In terms of education, participants reported either having a high school degree or some college (42% and 37% respectively). Approximately 50% were unemployed. The majority of the sample made less than $14,999 (64%) and were single (86%).

Interest in attending a culinary training program was assessed with 87% of respondents expressing interest (Table 2). Additionally, 53% reported prior culinary experience in a kitchen setting including roles as line cooks in banquets and fast-food settings and experience with catering services (results not shown).

Knowledge of nutrition and food safety was low on 2 survey items (12% and 34% correct) and moderate on another 2 items (64% and 66% correct) (Table 3). The majority of the participants (93%) were able to answer 1 of the 5 food safety items correctly. There was limited knowledge related to time and temperature control with only 49% and 37% answering the respective items correctly.

Results showed that 77% of participants had previously experienced homelessness (Table 4). Of the 47% of adults with children under the age of 18 (n=43), 44% required childcare assistance to participate in the program. In relation to transportation, 49% of adults had access to a car at least some of the time. Among adults who experienced transportation hardships in the past 12 months, 76% reported the cost for gas and car repairs as significant barriers, closely followed by expense of car insurance being too high (69%). The majority of participants (97%) indicated a willingness to take Uber as a means of transportation if provided by the program. Additional forms of hardships surveyed included food insecurity, medical hardship and mental health. Within the last 12 months, 82% of adults reported experiencing food insecurity, 66% of adults experienced anxiety, and 64% indicated experiencing

Table 3.
Nutrition and Food Safety Knowledge, N=91

	n	% Correct
Nutrition Knowledge		
How Much of Plate with Fruits & Vegetables [a]	31	34.07%
# of Food Groups Represented on MyPlate [b]	11	12.09%
Which Food Group on MyPlate Should be the Smallest [c]	58	63.74%
Drinking Sugar Beverages is a Behaviors That is Not Recommended by MyPlate as Part of a Healthy Eating Pattern.	60	65.93%
Food Safety		
Washing Meat Helps Reduce Spread of Foodborne Illnesses [d]	22	24.18%
It is not Safe to Partially Cook Food Ahead of Time and Finish Cooking it Later [e]	60	65.93%
It is Important to use Separate Cutting Boards for Raw Meat and Fresh Produce [f]	85	93.41%
How Long Can Perishable Food be Safely Left out at Room Temperature [g]	45	49.45%
What is the Recommended Minimum Internal Temperature for Cooking Ground Poultry [h]	34	37.36%

Nutrition Knowledge = [a] ½ of the plate, [b] Five groups, [c] Fats
Food Safety = [d] False, [e] True, [f] True, [g] Perishable foods can be left out at room temperature for up to 2 hours maximum, [h] Minimal internal cooking temperature for pork is 165 °F

major depressive symptoms over a two-week period.

Discussion

The survey revealed there is interest in a culinary workforce development program, with some individuals having prior experience as a line cook, in a catering service, or in a fast-food setting. The survey also indicated the need to incorporate nutrition and food safety education into the culinary training program. When developing programming that includes nutrition and food safety education it would be important to keep objectives to three or less and to incorporate theories, videos, and lessons to be interactive (Clifford et al., 2009; Marshall et al., 2024; Murimi et al., 2017; Rustad & Smith, 2013). To deliver nutrition and food safety education, it would be important to partner with individuals that are trained in nutrition, preferably in dietetics. Partnering with universities that have an accredited dietetic program set by the Accreditation Council for Education in Nutrition and Dietetics, or a community health worker program are viable solutions.

Several barriers were indicated through the survey: the need for childcare, transportation, and assistance to reduce food insecurity, medical hardships, and mental health challenges. Childcare is a common barrier to employment (Landivar et al., 2022; Madigan & Bonney, 2021; Ruppanner et al., 2021). Partnering with faith-based non-profit charitable organizations or non-profit organizations that provide tuition-free childcare (e.g., Bezos Academy) may potentially meet the needs of program attendees. However, for these partnerships to be effective, culinary programming would need to occur during business hours rather than in the evening or over the weekend as

Table 4.
Individual and Programmatic Barriers and Support To Attending a Culinary Training Program, N=91

	n	%
Individual Barriers		
Prior Experience with Homelessness	67	77.01%
Has Children Under Age 18	43	47.25%
Need Childcare Assistance to Participate in Program	19	44.19%
Car access (at least some of the time)	45	49.45%
Transportation Hardship [a]		
Needed Money for Gas	34	75.56%
Car Repairs too Expensive	34	75.56%
Car Insurance too Expensive	31	68.89%
Missed Car Payment	23	51.11%
Car Repossessed	12	26.67%
Other Form of Hardships		
Food Insecurity	75	82.42%
Medical Hardship	44	48.35%
Mental Health		
Anxiety	60	65.93%
Major Depression	58	63.74%
Programmatic Support		
Willing to take Uber to program	88	96.70%

[a] *Among those with car access some of the time (n=45)*

most childcare facilities are not open for 24-hours. Transportation is also a significant barrier. Almost half of the respondents indicated having a car available, yet the findings also indicated various accessibility challenges. To reduce transportation barriers, potential solutions include providing trainees passes for public transportation, partnering with faith-based organizations that have access to passenger vans or buses and are regulated by the federal motor carrier safety administration (Federal Motor Carrier Safety Administration, 2019) or contracting with a ride-hailing service that facilitates on-demand transportation (e.g., Uber or Lyft). When transportation barriers have been reduced for afterschool programming for youth and posthospitalization appointment among low-income adults, attendance improved (Hoffman et al., 2022; Patel et al., 2021).

Additional forms of hardships that were prominent included food and medical hardships and mental health challenges related to depression and anxiety. Food distribution programs associated with a "produce prescription" or a "food is medicine" program have demonstrated a reduction in food insecurity experiences (Aiyer et al., 2019; Cook et al., 2021; Fischer et al., 2022; Little et al., 2022; Sharma & Sharma, 2024). Partnering with a local food bank to provide consistent food packages during culinary training could alleviate concerns about food insecurity among program participants. Working with a case manager may assist with the challenges associated with unpaid medical/hospital bills. Further, unemployment and job insecurity can negatively impact mental health, suggesting improvement in employment quality may alleviate some of these burdens.

Integrating methods to increase self-efficacy could translate to positive trends in overall mental and physical health wellbeing of culinary program participants. Exposure to culinary fundamentals and applied culinary experiences equips individuals with skills to succeed within foodservice. When the primary and applied culinary training is paired with employment coaching (i.e. coach assists client meets his/her own goals via a client-driven approach; (Theodos et al., 2015)), self-efficacy may improve, benefiting mental health, better preparing program participants for long term employment. Thus, a culinary training program needs to be multi-faceted to address the barriers that may prevent participants from being successful.

Although this was a small study, a couple of limitations were noted. For instance, the survey sample size was 91 participants, which is small but appropriate for learning about the needs of adults who experience shelter housing. The survey included various hardship measures but excluded measures that should be considered in future development of the program. For example, the survey lacked measures of alcohol or drug misuse and abuse, physical or chronic illnesses that may prevent fast-food employment, fear of leaving a familiar environment (i.e. sheltered housing) (Farrell, 2010), and fear of being discriminated by restaurant employers for living in sheltered housing or having a criminal record. However, linking culinary training program participants with second chance employers may reduce discrimination concerns. In addition, some of the participants had difficulties understanding the survey items due to lack of item clarity. Moving forward it will be important to pilot the survey items prior to data collection beginning. This will help strengthen the quality of the data being collected.

These results underscore the challenges that adults experiencing shelter homelessness may face when attending a culinary training program. To be effective, a multi-faceted program must be created with these challenges in mind. By acknowledging the challenges, programs can strategically partner with community-based organizations that have expertise in addressing education, economic, and health barriers.

Implications for Health Behavior Research and Practice

The information gathered from the survey and the recommendations made may serve as future guidance to early career scholars. By considering the challenges, early career scholars who are interesting in conducting research among adults experiencing sheltered homelessness may start to consider which community-based partnerships need to be established/maintained. The manuscript also serves as example of how experiential learning in a community setting can serve as introduction to research for clinical dietetic students enrolled in a supervised practice program (dietetic internship), which prepares them to be Registered Dietitians (RD). Such exposure provides an example of how RDs can simultaneously contribute to dietetics practice and research.

Discussion Questions

In a climate where costs are rising and federal funding is being cut, how can university researchers and community organizations work together to develop and sustain workforce development programs? What is the benefit of having community organizations help researchers with their program, *and* what is the benefit of having university researchers assist community organizations?

The original design of this study was a cross-sectional design; thus, challenges with long-term planned engagement and retention procedures were not discussed above. What retention and engagement procedures could be considered when conducting research among adults who experience sheltered homelessness?

Author Contributions: Conceptualization, DCH; Writing – Original Draft, TJ, DCH Writing – Review & Editing, TJ, JMC, KT, JC, AZ, RV, DCH, Data Collection, TJ, JMC, KT, JC, AZ, RV, DCH, Data Analyses, DCH; Funding Acquisition, DCH; Supervision, DCH

Acknowledgments: As a part of the *Health Behavior Research* mentorship issue, we describe the mentoring collaboration that occurred. Dr. Hernandez mentored all undergraduate and graduate research assistants. The first author (Ms. Joseph) completed this research in partial fulfillment of the requirements for a master's degree in public health under the mentorship of Dr. Hernandez.

Funding: This work was supported by the Research and Extension Experiential Learning for Undergraduate (REEU) Program of the National Institute of Food and Agriculture, USDA, Grant #2022-68018-36607.

Conflicts of Interest: The authors do not have conflicts of interest to disclose at this time.

References

Aiyer, J. N., Raber, M., Bello, R. S., Brewster, A., Caballero, E., Chennisi, C., Durand, C., Galindez, M., Oestman, K., & Saifuddin, M. (2019). A pilot food prescription program promotes produce intake and decreases food insecurity. *Translational Behavioral Medicine*, *9*(5), 922-930. https://doi.org/10.1093/tbm/ibz112

Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior*, *31*(2), 143-164. https://doi.org/10.1177/109019810426366 0

Baxter, L., Burton, A., & Fancourt, D. (2022). Community and cultural engagement for people with lived experience of mental health conditions: What are the barriers and enablers? *BMC Psychology*, *10*(1), 71. https://doi.org/10.1186/s40359-022-00775-y

Begun, S., Bender, K. A., Brown, S. M., Barman-Adhikari, A., & Ferguson, K. (2018). Social connectedness, self-efficacy, and mental health outcomes among homeless youth: Prioritizing approaches to service provision in a time of limited agency resources. *Youth & Society*, *50*(7), 989-1014. https://doi.org/10.1177/0044118X166504 59

Benight, C. C., & Bandura, A. (2004). Social cognitive theory of posttraumatic recovery: The role of perceived self-efficacy. *Behaviour Research and Therapy*, *42*(10), 1129-1148. https://doi.org/10.1016/j.brat.2003.08.008

Burgard, S. A., & Seelye, S. (2017). Histories of perceived job insecurity and psychological distress among older US adults. *Society and Mental Health*, *7*(1), 21-35. https://doi.org/10.1177/21568693166794 6

Burns, T., Catty, J., Becker, T., Drake, R. E., Fioritti, A., Knapp, M., Lauber, C., Rössler, W., Tomov, T., van Busschbach, J., White, S., & Wiersma, D. (2007). The effectiveness of supported employment for people with severe mental illness: A randomised controlled trial. *The Lancet*,

370(9593), 1146-1152. https://doi.org/10.1016/s0140-6736(07)61516-5

Central Texas Food Bank. (n.d.). *Central Texas Food Bank's Culinary Training Program*. Central Texas Food Bank. Retrieved March 4, 2025 from https://www.centraltexasfoodbank.org/kitchen

Clifford, D., Anderson, J., Auld, G., & Champ, J. (2009). Good Grubbin': Impact of a TV cooking show for college students living off campus. *Journal of Nutrition Education and Behavior*, *41*(3), 194-200. https://doi.org/10.1016/j.jneb.2008.01.006

Coalition for the Homeless. (2024). *2024 The Way Home Continuum of Care: Analysis of the Point-in-Time Count & Survey of People Experiencing Homelessness*. https://irp.cdn-website.com/2d521d2c/files/uploaded/Homeless_Count_2024_final.pdf

Conner, M., & Norman, P. (2015). *Predicting and changing health behaviour: Research and practice with social cognition models*. McGraw-Hill education (UK).

Cook, M., Ward, R., Newman, T., Berney, S., Slagel, N., Bussey-Jones, J., Schmidt, S., Lee, J. S., & Webb-Girard, A. (2021). Food security and clinical outcomes of the 2017 *Georgia Fruit and Vegetable Prescription* program. *Journal of Nutrition Education and Behavior*, *53*(9), 770-778. https://doi.org/10.1016/j.jneb.2021.06.010

Dang, M. T. (2014). Social connectedness and self-esteem: Predictors of resilience in mental health among maltreated homeless youth. *Issues in Mental Health Nursing*, *35*(3), 212-219. https://doi.org/10.3109/01612840.2013.860647

Desmond, M., & Gershenson, C. (2016). Housing and employment insecurity among the working poor. *Social Problems*, *63*(1), 46-67. https://doi.org/10.1093/socpro/spv025

Farrell, D. C. (2010). The paradox of chronic homelessness: The conscious desire to leave homelessness and the unconscious familiarity of the street life. *Journal of Human Behavior in the Social Environment*, *20*(2), 239-254. https://doi.org/10.1080/10911350903269872

Federal Motor Carrier Safety Administration. (2019). *Faith based organization-related transportation*. United States Department of Transportation. https://www.fmcsa.dot.gov/regulations/faith-based-organization-related-transportation

Ferguson, K. M. (2007). Implementing a social enterprise intervention with homeless, street-living youths in Los Angeles. *Social Work*, *52*(2), 103-112. https://doi.org/10.1093/sw/52.2.103

Ferguson, K. M. (2018). Employment outcomes from a randomized controlled trial of two employment interventions with homeless youth. *Journal of the Society for Social Work and Research*, *9*(1), 1-21. https://doi.org/10.1086/696372

Ferguson, K. M., Xie, B., & Glynn, S. (2012). Adapting the individual placement and support model with homeless young adults. *Child & Youth Care Forum*, *41*(3), 277-294. https://doi.org/10.1007/s10566-011-9163-5

Fernandez, M. (2025). *Cooking up careers: Texas culinary program offers fresh start for job seekers.* https://www.kvue.com/article/news/local/free-cooking-program-central-texas-food-bank/269-f82f7467-9ffe-488a-8a81-edd30d0b6e77

Fischer, L., Bodrick, N., Mackey, E. R., McClenny, A., Dazelle, W., McCarron, K., Mork, T., Farmer, N., Haemer, M., &

Essel, K. (2022). Feasibility of a home-delivery produce prescription program to address food insecurity and diet quality in adults and children. *Nutrients*, *14*(10), 2006. https://doi.org/10.3390/nu14102006

Fletcher, C. N., Garasky, S. B., & Nielsen, R. B. (2005). Transportation hardship: Are you better off with a car? *Journal of Family and Economic Issues*, *26*(3), 323-343. https://doi.org/10.1007/s10834-005-5901-x

Freedman, D. A., Vaudrin, N., Schneider, C., Trapl, E., Ohri-Vachaspati, P., Taggart, M., Ariel Cascio, M., Walsh, C., & Flocke, S. (2016). Systematic review of factors influencing farmers' market use overall and among low-income populations. *Journal of the Academy of Nutrition and Dietetics*, *116*(7), 1136-1155. https://doi.org/10.1016/j.jand.2016.02.010

Gordillo, P., & Prescott, M. P. (2023). Assessing the use of social cognitive theory components in cooking and food skills interventions. *Nutrients*, *15*(5). https://doi.org/10.3390/nu15051287

Gundersen, C., Engelhard, E. E., Crumbaugh, A. S., & Seligman, H. K. (2017). Brief assessment of food insecurity accurately identifies high-risk US adults. *Public Health Nutrition*, *20*(8), 1367-1371. https://doi.org/10.1017/s1368980017000180

Hager, E. R., Quigg, A. M., Black, M. M., Coleman, S. M., Heeren, T., Rose-Jacobs, R., Cook, J. T., Ettinger de Cuba, S. A., Casey, P. H., Chilton, M., Cutts, D. B., Meyers, A. F., & Frank, D. A. (2010). Development and validity of a 2-item screen to identify families at risk for food insecurity. *Pediatrics*, *126*(1), e26-32. https://doi.org/10.1542/peds.2009-3146

Harris, P. A., Taylor, R., Minor, B. L., Elliott, V., Fernandez, M., O'Neal, L., McLeod, L., Delacqua, G., Delacqua, F., & Kirby, J. (2019). The REDCap consortium: Building an international community of software platform partners. *Journal of Biomedical Informatics*, *95*, 103208. https://doi.org/10.1016/j.jbi.2019.103208

Harris, P. A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde, J. G. (2009). A metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Informatics*, *42*(2), 377-381. https://doi.org/10.1016/j.jbi.2008.08.010

Hatem, C., Lee, C. Y., Zhao, X., Reesor-Oyer, L., Lopez, T., & Hernandez, D. C. (2020). Food insecurity and housing instability during early childhood as predictors of adolescent mental health. *Journal of Family Psychology*, *34*(6), 721-730. https://doi.org/10.1037/fam0000651

Haynes-Maslow, L., Auvergne, L., Mark, B., Ammerman, A., & Weiner, B. J. (2015). Low-income individuals' perceptions about fruit and vegetable access programs: A qualitative study. *Journal of Nutrition Education and Behavior*, *47*(4), 317-324.e311. https://doi.org/10.1016/j.jneb.2015.03.005

Healthy People 2030. (n.d.). *Housing Instability*. Office of Disease Prevention and Health Promotion,. Retrieved March 4, 2025 from https://odphp.health.gov/healthypeople/priority-areas/social-determinants-health/literature-summaries/housing-instability

Hernandez, D. C., Daundasekara, S. S., Walton, Q. L., Eigege, C. Y., & Marshall, A. N. (2021). Feasibility of delivering an on-campus food distribution program in a community college setting: A mixed methods sequential explanatory investigation. *International Journal of Environmental Research and Public*

Health, *18*(22). https://doi.org/10.3390/ijerph182212106

Hock, E., Blank, L., Fairbrother, H., Clowes, M., Cuevas, D. C., Booth, A., & Goyder, E. (2023). Exploring the impact of housing insecurity on the health and well-being of children and young people: A systematic review. *Public Health Research*, *11*(13), 1-71. https://doi.org/10.3310/twwl4501

Hodgman, C. F., LaVoy, E. C., Johnston, C., Obasi, E., Murillo, R., Yan, S., O'Connor, D. P., McNeill, L., Reitzel, L. R., & Hernandez, D. C. (2022). Measuring pro- and anti-inflammatory biomarkers among low-income Hispanic adults: A feasibility and pilot assessment. *Health Behavior Research*, *5*(3), 12. https://doi.org/10.4148/2572-1836.1143

Hoffman, S. C., Buczkowski, A. S., Mallory, L., McGovern, L. B., Cappen, S. M., Douglass, A. S., Correia, R., Longnecker, L., Taylor, C. S., & Holmes, R. (2022). Addressing transportation insecurity improves attendance at posthospitalization appointments. *Pediatrics*, *149*(1), e2020032862. https://doi.org/10.1542/peds.2020-032862

Hollywood, L., Surgenor, D., Reicks, M., McGowan, L., Lavelle, F., Spence, M., Raats, M., McCloat, A., Mooney, E., Caraher, M., & Dean, M. (2018). Critical review of behaviour change techniques applied in intervention studies to improve cooking skills and food skills among adults. *Critical Reviews in Food Science and Nutrition*, *58*(17), 2882-2895. https://doi.org/10.1080/10408398.2017.1344613

Jennings Mayo-Wilson, L., Coleman, J., Timbo, F., Ssewamala, F. M., Linnemayr, S., Yi, G. T., Kang, B. A., Johnson, M. W., Yenokyan, G., Dodge, B., & Glass, N. E. (2020). Microenterprise intervention to reduce sexual risk behaviors and increase employment and HIV preventive practices among economically-vulnerable African-American young adults (EMERGE): A feasibility randomized clinical trial. *AIDS and Behavior*, *24*(12), 3545-3561. https://doi.org/10.1007/s10461-020-02931-0

Jin, H., Lee, W. J., Maupin, D., & Lee, J. O. (2024). Within-person relationship between employment insecurity and mental health: A longitudinal analysis of the Understanding America Study. *Journal of Epidemiology and Community Health*, Published Online First November 12, 2024. https://doi.org/10.1136/jech-2023-221452

Kang, S. (2022). The cumulative relationship between housing instability and mental health: Findings from the panel study of income dynamics. *Journal of Social Distress and Homelessness*, *31*(2), 191-203. https://doi.org/10.1080/10530789.2021.1925038

Kelso, A. (2021). *Study: Teens make up nearly a quarter of limited-service restaurant workforce* Industry Dive. Retrieved October 25, 2025 from https://www.restaurantdive.com/news/study-teens-make-up-nearly-a-quarter-of-limited-service-restaurant-workfor/610830/

Kim, Y. J., Boyas, J. F., Lee, K. H., & Jun, J. S. (2019). Suicidality among homeless people: Testing the mediating effects of self-efficacy and depression. *Journal of Human Behavior in the Social Environment*, *29*(7), 922-936. https://doi.org/10.1080/10911359.2019.1639579

Kitchen of Champions. (n.d.). *Kitchen of Champions at St. Vincent de Paul*. WordPress.com. Retrieved March 4, 2025 from https://kitchenofchampions.wordpress.com/

Kroenke, K., Strine, T. W., Spitzer, R. L., Williams, J. B. W., Berry, J. T., & Mokdad, A. H. (2009). The PHQ-8 as a measure of current depression in the general population. *Journal of Affective Disorders*, *114*(1), 163-173. https://doi.org/10.1016/j.jad.2008.06.026

Landivar, L. C., Scarborough, W. J., Collins, C., & Ruppanner, L. (2022). Do high childcare costs and low access to Head Start and childcare subsidies limit mothers' employment? A state-level analysis. *Social Science Research*, *102*, 102627. https://doi.org/10.1016/j.ssresearch.2021.102627

Little, M., Rosa, E., Heasley, C., Asif, A., Dodd, W., & Richter, A. (2022). Promoting healthy food access and nutrition in primary care: A systematic scoping review of food prescription programs. *American Journal of Health Promotion*, *36*(3), 518-536. https://doi.org/10.1177/08901171211056584

Madigan, D., & Bonney, T. (2021). Reemployment needs and barriers of users of workforce development programs: A mixed-methods study. *Workplace Health & Safety*, *69*(11), 494-505. https://doi.org/10.1177/21650799211016244

Marshall, A. N., Jenkins, K. M., Fuentes, C. G., Tran, D., Mejia, K. N., Djukic, M., Mungia, R., Testa, A., Alvarado, F., & Hernandez, D. C. (2024). Nourishing Smiles: Challenges and lessons learned from implementing an interprofessional school-based oral health and nutrition literacy program for adolescents. *Health Behavior Research*, *7*(4), 1. https://doi.org/10.4148/2572-1836.1255

Marshall, C. A., Boland, L., Westover, L. A., Goldszmidt, R., Bengall, J., Aryobi, S., Isard, R., Easton, C., & Gewurtz, R. (2022). Effectiveness of employment-based interventions for persons experiencing homelessness: A systematic review. *Health & Social Care in the Community*, *30*(6), 2142-2169. https://doi.org/10.1111/hsc.13892

Murimi, M. W., Kanyi, M., Mupfudze, T., Amin, M. R., Mbogori, T., & Aldubayan, K. (2017). Factors influencing efficacy of nutrition education interventions: A systematic review. *Journal of Nutrition Education and Behavior*, *49*(2), 142-165.e141. https://doi.org/10.1016/j.jneb.2016.09.003

New Hope Housing. (2024). *New Hope Housing Community Report*. Retrieved October 25, 2025 from https://heyzine.com/flip-book/acb47b29de.html1

Nugent, J. A. (2019). A better slice of life: The culinary training program creating a pathway to employment for adults with developmental disabilities. *Journal on Developmental Disabilities*, *24*(1), 43-48.

Oemichen, M., & Smith, C. (2016). Investigation of the food choice, promoters and barriers to food access issues, and food insecurity among low-income, free-living Minnesotan seniors. *Journal of Nutrition Education and Behavior*, *48*(6), 397-404.e391. https://doi.org/10.1016/j.jneb.2016.02.010

Oysterlink. (n.d.). *Fast-food worker demographics and statistics in the US - 2025*. Retrieved October 25, 2025 from https://oysterlink.com/career/fast-food-worker/demographics/

Patel, H. H., Messiah, S. E., Hansen, E., & D'Agostino, E. M. (2021). The relationship between transportation vulnerability, school attendance, and free transportation to an afterschool program for youth. *Transportation*, *48*(5), 2315-2333. https://doi.org/10.1007/s11116-020-10131-x

Plummer, F., Manea, L., Trepel, D., & McMillan, D. (2016). Screening for anxiety disorders with the GAD-7 and GAD-2: A systematic review and diagnostic metaanalysis. *General Hospital Psychiatry*, *39*, 24-31. https://doi.org/10.1016/j.genhosppsych.2015.11.005

Poremski, D., Rabouin, D., & Latimer, E. (2017). A randomised controlled trial of evidence based supported employment for people who have recently been homeless and have a mental illness. *Administration and Policy in Mental Health*, *44*(2), 217-224. https://doi.org/10.1007/s10488-015-0713-2

Ritter, G., Walkinshaw, L. P., Quinn, E. L., Ickes, S., & Johnson, D. B. (2019). An assessment of perceived barriers to farmers' market access. *Journal of Nutrition Education and Behavior*, *51*(1), 48-56. https://doi.org/10.1016/j.jneb.2018.07.020

Ruppanner, L., Collins, C., Landivar, L. C., & Scarborough, W. J. (2021). How do gender norms and childcare costs affect maternal employment across US states? *Gender & Society*, *35*(6), 910-939. https://doi.org/10.1177/08912432211046988

Rustad, C., & Smith, C. (2013). Nutrition knowledge and associated behavior changes in a holistic, short-term nutrition education intervention with low-income women. *Journal of Nutrition Education and Behavior*, *45*(6), 490-498. https://doi.org/10.1016/j.jneb.2013.06.009

Sharma, S. V., McWhorter, J. W., Chow, J., Danho, M. P., Weston, S. R., Chavez, F., Moore, L. S., Almohamad, M., Gonzalez, J., Liew, E., LaRue, D. M., Galvan, E., Hoelscher, D. M., & Tseng, K. C. (2021). Impact of a virtual culinary medicine curriculum on biometric outcomes, dietary habits, and related psychosocial factors among patients with diabetes participating in a food prescription program. *Nutrients*, *13*(12). https://doi.org/10.3390/nu13124492

Sharma, V., & Sharma, R. (2024). Food is Medicine initiative for mitigating food insecurity in the United States. *Journal of Preventive Medicine & Public Health*, *57*(2), 96-107. https://doi.org/10.3961/jpmph.23.505

Shukla, D. M., Walsh, W. E., & Grande, S. W. (2023). Barriers to housing in a grass-roots support group of individuals experiencing housing instability and homelessness. *Housing and Society*, *50*(1), 138-156. https://doi.org/10.1080/08882746.2021.1952388

Singh, A., Daniel, L., Baker, E., & Bentley, R. (2019). Housing disadvantage and poor mental health: A systematic review. *American Journal of Preventive Medicine*, *57*(2), 262-272. https://doi.org/10.1016/j.amepre.2019.03.018

Slesnick, N., Dashora, P., Letcher, A., Erdem, G., & Serovich, J. (2009). A review of services and interventions for runaway and homeless youth: Moving forward. *Children and Youth Services Review*, *31*(7), 732-742. https://doi.org/10.1016/j.childyouth.2009.01.006

Suglia, S. F., Duarte, C. S., & Sandel, M. T. (2011). Housing quality, housing instability, and maternal mental health. *Journal of Urban Health*, *88*, 1105-1116. https://doi.org/10.1007/s11524-011-9587-0

Theodos, B., Simms, M., Treskon, M., Stacy, C., Brash, R., Emam, D., Daniels, R., & Collazos, J. (2015). *An evaluation of the impacts and implementation approaches of financial coaching programs*. https://view.ckcest.cn/AllFiles/ZKBG/Pa

ges/556/2000448-an-evaluation-of-the-impacts-and-implementation-approaches-of-financial-coaching-programs.pdf

Wilson, J. M., Lee, J., Fitzgerald, H. N., Oosterhoff, B., Sevi, B., & Shook, N. J. (2020). Job insecurity and financial concern during the COVID-19 pandemic are associated with worse mental health. *Journal of Occupational and Environmental Medicine*, *62*(9), 686-691. https://doi.org/10.1097/JOM.0000000000001962