Original Article

nutrition and health

Nutrition and Health
1–8

DOI: 10.1177/02601060231170248
journals.sagepub.com/home/nah
SAGE

Investigation of the multidimensional determinants of negative nutrition coping strategies and tradeoffs in adults accessing food relief: A secondary data analysis

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Abstract

Background: Multidimensional determinants influence negative nutrition coping strategies and tradeoffs in households accessing food relief. **Aims:** This study examined coping strategies and tradeoffs at different levels of food insecurity from individuals accessing food relief and how these behaviors relate to experience-based food insecurity dimensions and subpopulations at risk. **Methods:** A secondary analysis of cross-sectional data from the Sunshine State Hunger Survey (SSHS) was conducted. The SSHS was a paper-based, 48-question survey, including questions about coping strategies and tradeoffs, use of food assistance programs, and food security. **Results:** Out of 616 respondents who completed the survey, 73.9% identified as food insecure while 19.1%, as food secure. The average age of participants was 59.6 years and 62.6% were female. One-way analysis of variance indicated increases in negative nutrition coping strategies and tradeoffs with increasing levels of food insecurity status. The most common coping strategy reported by those with very low food security was "Eating less so children or others have enough food," while the most common tradeoff was "Trading off *medicine or medical* care for food." Two-step cluster analysis identified homogeneous subgroups by behavior and demographic characteristics: (1) late adult worriers, (2) middle adult traders, and (3) middle/late adult copers. **Conclusion:** Identifying coping strategies and tradeoffs used by participants accessing food relief is a multidimensional approach to addressing determinants of food insecurity. Future research on conceptual pathways is warranted to see if experience-based food insecurity variables help to understand relationships across a continuum, including barriers and influencers.

Keywords

Food insecurity, nutrition, coping strategies, tradeoffs, multidimensional, two-step cluster analysis

Introduction

Food insecurity is increasingly recognized as a major public health issue (Murthy, 2016). Food insecurity is the limited or uncertain ability to acquire acceptable foods in socially acceptable ways (Coleman-Jensen et al., 2017). In 2021, 10.2% of U.S. households were food insecure, including 5.1 million households with very low food security status (Economic Research Service, 2022a). Florida's food insecurity rate tends to be higher than the nation, at 12.0% in 2019 (Feeding America, 2019).

The most common measure of food insecurity is the U.S. Household Food Security Survey modules (HFSSM). The HFSSM measures are based on a household's economic ability to afford food (Economic Research Service, 2022b). The cyclic nature of food insecurity and the influence of coping strategies and tradeoff utilization by households on current HFSSM measurements are elusive, complex, and extend beyond food affordability (Seligman and Berkowitz, 2019). Research suggests the need for further exploration of the experience of food insecurity and underlying contributors through an experience-based food insecurity approach (Jones et al., 2013; Leroy et al., 2015). Experience-based food insecurity determinants include domains of worry, utilization,

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accessibility, availability, and stability of food and their impacts (Leroy et al., 2015; Peng et al., 2018).

A natural reaction to concerns about insufficient food availability involves survival mechanisms of coping strategies and tradeoffs (Maxwell, 1996). Households start to restructure their hierarchy of needs in ways that influence food availability and access. The four categories of coping strategies typical of food insecure households include (1) changes in diet to cheaper foods; (2) short-term strategies to increase foods that are not sustainable over the long term; (3) decrease in the number of individuals consuming food by sending them elsewhere to eat, and (4) food rationing (Maxwell, 2008). Feeding America's Hunger in America 2014 study (Weinfield et al., 2014) found that 55% of food insecure households use more than three food-extending coping strategies annually.

Coping strategies and tradeoffs may positively or negatively impact diet quality. Research finds additional coping strategies are used in households with children, such as adults reducing portions of foods or sacrificing their own nutrition needs to shield disruptions in food (Barfield and Collins, 2017; Hanson and Connor, 2014). Concurrently, the parents' efforts to counterbalance adequate food results in changes in diet quality resulting in over or underconsumption of nutritionally inadequate calories (Hanson and Connor, 2014). Households with elderly members employ negative nutrition coping strategies such as food rationing and increased consumption of less nutrient-dense foods, which contribute to the worsening of chronic health conditions, poor health, and functional decline (Lloyd, 2017). Understanding the range of household coping strategies informs initiatives and strategies to improve dietary behaviors that impact diet quality to reduce negative nutritional outcomes (Anater et al., 2011; Hanson and Connor, 2014).

A large amount of research identifies adverse nutrition outcomes of food insecurity; however, there is less research on the use of nutrition coping strategies and tradeoffs at different food insecurity levels (Caouette et al., 2020). A better understanding of coping strategies can inform nutrition interventions. As well, current research suggests further investigation is necessary to understand how social environmental factors contribute to nutrition and food insecurity (Andress, 2017). The present study aims to examine the use of negative nutrition coping strategies and tradeoffs at different levels of food insecurity among individuals accessing food relief and investigate how these behaviors relate to experience-based food insecurity dimensions and subpopulations at risk.

Methods

Study design

A secondary analysis of cross-sectional data from the Sunshine State Hunger Survey (SSHS) was conducted. The SSHS investigated respondents' personal experiences regarding food security. The 48-question, paper-based survey included questions on the following areas: (1) food security status, as measured by the validated U.S. Adult Food Security Survey Module-10 Item (HFSSM) (Coleman-Jensen et al., 2019); (2) depression, as measured by the validated WHO-5 Well Being Index (WHO, 1998); (3) anxiety, as measured by the validated GAD-7 Generalized Anxiety Disorder tool (Spitzer et al., 2006); (4) demographics; (5) coping strategies used; (6) tradeoffs used; (7) medical health issues experienced; and (8) utilization of food assistance programs (Spitzer et al., 2006). The SSHS was administered at food relief agencies in Tampa Bay and Jacksonville, Florida by graduate students who were trained by the principal investigator. Recruitment of potential survey respondents was facilitated by food relief agencies. Individuals willing to participate completed a signed consent form and were interviewed privately. Institutional Review Board approval was obtained prior to the start of data collection.

Conceptual model

A multidimensional model of food insecurity was utilized for this research. The model uses the socioecological model (SEM) (McLeroy et al., 1988) and experience-based food insecurity dimensions to explore negative nutrition coping strategies, tradeoffs, and impacts on food security levels and quality of life outcomes (Figure 1). In addition, the model illustrates the reciprocal ecosystem to understand the determinants of food insecurity and the socioecological environmental influence of coping strategies and tradeoffs and food insecurity levels.

Data analysis

We classified reported coping strategies and tradeoffs as "positive" or "negative" based on their impact on nutritional health. The SSHS included 12 negative nutrition coping strategies and tradeoffs: (1) eating food past the expiration date, (2) pawning/selling personal property, (3) purchasing food in dented or damaged packages, (4) purchasing inexpensive, unhealthy food, (5) watering down food or drinks, (6) eating less so children or others have enough food, (7) trading off medicine, (8) trading off utilities, (9) trading off housing, (10) trading off transportation, (11) trading off education, and (12) trading off saving meals to eat later (Anater et al., 2011; Wood et al., 2006). Positive nutrition coping survey questions included strategies such as growing food in a garden, receiving help from family and friends, and participating in food assistance programs but these are not addressed in this paper later (Anater et al., 2011; Wood et al., 2006). The dependent variables, coping strategies, and tradeoffs were explored based on the number of affirmative responses. Crosstabulation procedure and chi-square tests tested for independence investigated the relationship between United States Department of Agriculture (USDA) HFSSM food security level and negative nutrition coping strategies and tradeoffs. Due to small cell size, food secure and marginal food secure responses

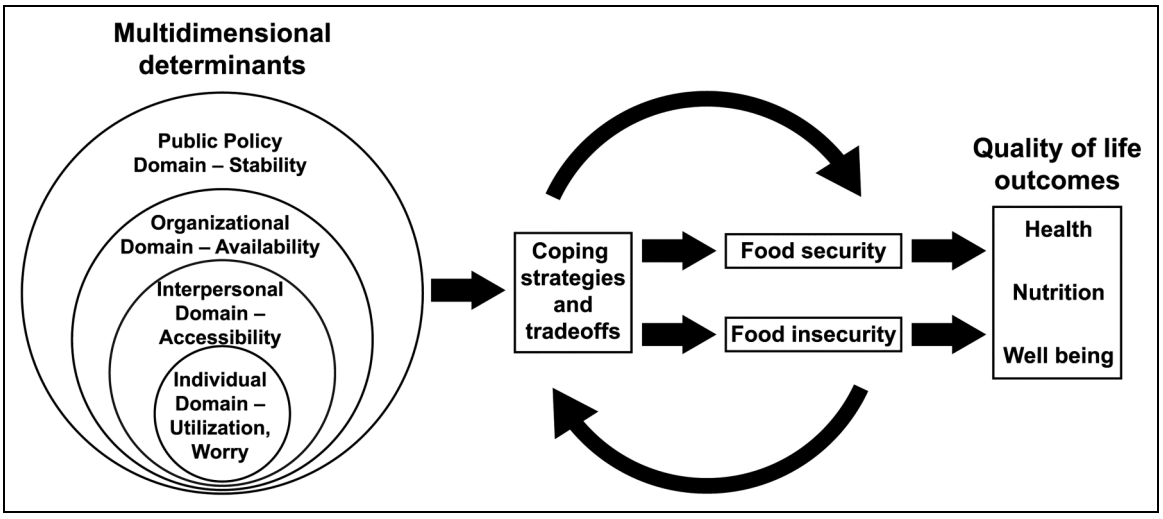

Figure 1. Multidimensional model of food insecurity.

were combined. A Bonferroni correction of *P*-values to .002 was used, based on 18 cells examined for both negative coping strategies and tradeoffs. A one-way analysis of variance (ANOVA) with an alpha of .05 was used to examine whether the number of negative nutrition coping strategies and tradeoffs used varied as a function of food insecurity status (1, food secure/marginal food secure; 2, low food secure; 3, very low food secure).

Survey responses were recoded into experience-based food insecurity domains of worry, utilization, access, and availability. A two-step cluster analysis was used to identify how participants cluster into distinct groups by their use of negative nutrition coping strategies and tradeoffs and experience-based food insecurity domains to view the population through a multidimensional lens (Howard and Hoffman, 2018). Two-step cluster analysis was used to explore emergent homogenous subgroups of the survey population based on select demographic characteristics such as age, age groups (early/middle/late adulthood), and USDA HFSSM levels of very low, low, marginal, and high food security. The Schwarz Bayesian Criteria were used to automatically determine the best clusters based on the relative distance between clusters (Kent et al., 2014). Two-step cluster analysis then uses the log-likelihood measure for the probability distribution of the variables. In this manner, a cluster analysis allows for groups of individuals that are similar on specific variables to be identified. In this study, groups were examined by investigating participant age, coping strategies, and reported levels of food insecurity.

Results

A total of 616 respondents completed the SSHS at 18 food assistance program sites between June and August 2018. Most households (73.9%) identified as food insecure (very low 52.8% or low food security 21.1%), with 7% scoring as marginally food secure and 19.1% as food secure. Participants' ages ranged from 18 to 100 years old, with an average age of 59.6 years. Respondents were primarily female (female 62.6%, male 37.4%), Caucasian (42.8%), and African American (34.3%), with a high school diploma/GED or more 81.9% (high school diploma/GED 42.3%, trade school 7.0%, some college 20.1%, and bachelors or more 12.5%). A total of 57.4% of participants participated in at least one food assistance program, those most common being Meals on Wheels (46.9%), school meal program (44.2%), and SNAP (35.2%). Table 1 lists the demographic characteristics of the families surveyed.

Survey participants responded to questions on coping strategies and tradeoffs they used to make food last longer. The most reported negative coping strategies utilized were purchasing inexpensive or unhealthy foods, eating less so children or others have enough food, eating food past the expiration date, and purchasing food in dented or damaged packages (Table 2). Participants were also asked about the tradeoffs they made between purchasing food and other items. Survey respondents reported that in the past 12 months, they had to choose between paying for food and paying for other expenses, including medicine or medical care, splitting meals/saving some of the meal to eat as a later meal, utilities, housing, transportation, and education. Chi-square analyses indicated a significant association between food security levels and the use of both negative nutrition coping strategies and tradeoffs, except watering down food or drinks and pawning or selling personal property (Table 2). Additionally, the one-way ANOVA test indicated that the effect of the level of food security status on the number of negative nutrition coping strategies and tradeoffs used was significant with more negative coping strategies reported with decreasing levels of food security, $F(2483) = 102.4$, $p < .001$ (Table 3).

Survey responses were recoded into experience-based food insecurity domains of worry, utilization, access, and availability. The HFSSM responses were scaled based on the frequency and severity of occurrence. The scale varied by the number of questions per domain. For example, the Worry Domain and Utilization Domain each had one HFSSM question so the scale for these domains was 0–1, with "0" meaning the experience did not occur and was not severe and "1" meaning the experience occurred frequently and was severe. The Access Domain had 4 questions so the scale for this domain was 0–4, with "0" meaning the experience did not occur and was not severe and "4" meaning the experience occurred most frequently and was most severe (Table 4).

The Availability Domain had 2 questions so the scale for this domain was 0–3, with "0" meaning the experience did

Table 1. Descriptive analysis of the sunshine state hunger survey.

Variables	*n*	%
Level of food security ($n = 598$, 18 missing)		
Very low food security	316	52.8
Low food security	126	21.1
Marginal food security	42	7.0
Food security	114	19.1
Gender ($n = 610$, 6 missing)		
Male	228	37.4
Female	382	62.6
Race/ethnicity ($n = 6106$ missing)		
White non-Hispanic	261	42.8
African American	209	34.3
Hispanic-White	113	18.5
Other	27	4.4
Highest education level ($n = 601$, 15 missing)		
Less than high school	109	18.1
High school diploma/GED	254	42.3
Business, trade/technical license, certificate, degree beyond high school	42	7.0
Some college beyond high school or a 2-year college degree	121	20.1
Four-year college degree or higher	75	12.5
Participation in food assistance programs	354	57.4

Table 3. Descriptive statistics for the number of negative nutrition coping strategies and tradeoffs at different levels of perceived food insecurity.

Variable	*N*	Mean no. of negative nutrition coping strategies and tradeoffs used	Std. Deviation
Food secure/ marginal food secure	107	0.61	1.34
Low food secure	114	2.47	2.47
Very low food secure	265	4.45	2.71
Total	486	3.14	2.88

Table 2. Use of negative nutrition coping strategies and tradeoffs by USDA HFSSM food security level.

Variables	Food secure/ marginal food security	Low food security	Very low food security	Total yes responses	Pearson chi-square	Contingency coefficient	*P*
Negative nutrition coping strategies							
Purchasing inexpensive or unhealthy foods.	4.3% (6)	18.7% (26)	77.0% (107)	139	45.8	.290	<.001
Eating less so children or others have enough food.	2.2% (2)	14.6% (13)	83.1% (74)	89	38.8	.268	<.001
Eating food past expiration date.	7.2% (6)	16.9% (14)	75.9% (63)	83	19.7	.195	<.001
Purchasing food in dented or damaged packages.	3.7% (3)	24.4% (20)	72.0% (59)	82	20.0	.197	<.001
Watering down food or drinks.	9.5% (4)	23.8% (10)	66.7% (28)	42	4.38	.093	.112*
Selling or pawning personal property.	9.8% (4)	9.8% (4)	80.5% (33)	41	11.8	.152	0.05*
Tradeoffs for food							
Trading off *utilities* for food.	5.8% (13)	17.9% (40)	76.3% (171)	224	95.4	.372	<.001
Trading off *transportation* for food.	4.9% (11)	18.8% (42)	76.3% (171)	224	100.2	.380	<.001
Splitting meals/saving some of the meals to eat as a later meal.	5.6% (12)	15.5% (33)	78.9% (168)	213	98.2	.377	<.001
Trading off *housing* for food.	3.6% (7)	18.0% (35)	78.4% (152)	194	92.0	.366	<.001
Trading off *medicine or medical* care for food.	3.1% (6)	15.2% (29)	81.7% (156)	191	105.6	.388	<.001
Trading off *education* for food.	8.2% (9)	17.3% (19)	74.5% (82)	110	30.0	.223	<.001

USDA: United States Department of Agriculture; HFSSM: Household Food Security Survey modules.
*Association not statistically significant. *P*-value adjusted to .002 based on Bonferroni correction

Table 4. Experience-based food insecurity domains are categorized from HFSSM responses.

		Frequency of occurrence and severity scale				
Experience-based food insecurity domain	*N* (mean)	0 (least frequent and least severe)	1	2	3	4 (most frequent and severe)
Domain: Worry HFSSM question: "worrying about running out of food before there is money to buy more"	578	186 (32.2%)	392 (67.8%)*			
Domain: Utilization HFSSM question: "You and other household members couldn't afford to eat balanced meals"	583	169 (29%)	414 (71%)*			
Domain: Access HFSSM questions: "You ate less than you felt you should;" "You or other adults in your household cut size of meals or skipped meals;" and "You were hungry but did not eat"	567	158 (27.9%)	49 (8.6%)	35 (6.2%)	87 (15.3%)	238 (42%)*
Domain: Availability HFSSM questions: "Food you and other household members bought didn't last and there wasn't any money to get more" and "You or other adults in your household did not eat for whole day"	547	170 (31.1%)	138 (25.2%)	92 (16.8%)*		

HFSSM: Household Food Security Survey modules.
*Indicates the highest frequency and severity for this domain.

Table 5. Variable cluster distribution for coping strategies, tradeoffs, and experienced-based food insecurity dimension variables.

		N	% of combined	% of total
Cluster	1	133	30.6%	21.6
	2	147	33.8%	23.9
	3	155	35.6%	25.2
	Combined	435	100.0%	70.6
Excluded cases		181		29.4
Total		616		100.0

not occur and was not severe and "3" meaning the experience occurred most frequently and was most severe.

Two-step cluster analysis was then used to identify subgroups using the number of coping strategies, tradeoffs, and experience-based food insecurity domains acknowledged by the participant. The analysis revealed three clusters for 435 survey respondents, excluding 181 for incomplete data. Cluster distribution for Cluster 1, $n = 133$, 30.6%; Cluster 2, $n = 147$, 33.8%, and Cluster 3, $n = 155$, 35.6% (see Tables 5 and 6). Cluster 1 was predominantly late adults who utilized coping strategies less frequently but exhibited worry about food availability; as a result, this cluster was characterized as "late adult worriers." Cluster 2 was more likely to tradeoff basic household needs for food and was predominantly middle adults; as a result, this cluster was characterized as "middle adult traders." Cluster 3 prioritized coping strategies versus tradeoffs and was distributed across middle and late adulthood; as a result, this cluster was characterized as "middle/late copers."

Discussion

This study is the first to explore the relationships between negative nutrition coping strategies, experience-based food insecurity domains, and the Social Ecological Model. The most frequently used negative coping strategies were purchasing inexpensive or unhealthy food, eating less so others have enough food, eating foods past the expiration date, and purchasing food-damaged packages. Similar findings in the literature suggest individuals and households use negative coping strategies to reduce the negative impacts of hunger (Anater et al., 2011; Wood et al., 2006). The negative nutrition coping strategies and tradeoffs identified in this research are important findings as they may adversely impact the nutritional status of individuals within households at multiple levels of food security status (Wetherill et al., 2018). Interestingly, in this study, participants frequently reported purchasing inexpensive or unhealthy foods and eating less so children or others have enough food to cope with reduced food access. Both behaviors directly and negatively impact the nutrient quality of the diet (Kinsey et al., 2019). Our results align with well-documented research identifying food-extending behaviors where parents sacrifice their own dietary and nutritional health so children have enough food (Bartfield and Collins, 2017). The most common tradeoffs employed were between paying for food and paying for medicine or medical care, utilities, housing, transportation, and education. Lack of utilities and transportation can negatively impact the ability to prepare, store and purchase nutritious

Table 6. Frequency of variables by cluster and variables of importance.

Variables × descending by importance of cluster membership	Cluster 1 late adult, worriers	Cluster 2 middle adult, traders	Cluster 3 middle, late adult copers
Domain—availability (HFSSM Q2, 8, 9)—enough food scores (0, low concern – 3, high concern)	0.2	2.2	1.8
Domain—access (HFSSM Q4, 5, 6, 7) —no food scores (0, low concerns – 4, high concern)	0.6	3.4	3.1
Trading off *housing* for food (% yes)	0.6%	88.1%	11.3%
Domain—utilization (HFSSM Q3)—cheap food	2.8%	46.4%	50.9%
Trading off *transportation* for food (% yes)	2.7%	76.0%	21.3%
Domain—worry (HFSSM Q1)	6.7%	46.0%	47.3%
Trading off *utilities* for food	5.0%	74.6%	20.4%
Trading off *education* for food	3.1%	93.8%	3.1%
Trading off *medicine or medical* care for food	1.9%	71.2%	26.9%
Splitting meals/saving some of the meal to eat a later	4.7%	65.1%	30.2%
Eating less so children/others have enough food	1.3%	57.7%	41.0%
Purchasing inexpensive or unhealthy foods	11.6%	51.2%	37.2%
Receiving help from others, family/friends	13.2%	39.7%	47.1%
Selling or pawning personal property	8.1%	64.9%	27.0%
Growing food	5.0%	20.0%	75.0%
Eating food past expiration date	14.1%	50.7%	35.2%
Purchasing food in dented or damaged packages	12.5%	47.2%	40.3%
Watering down food or drinks	13.2%	55.3%	31.6%
Factors			
Age (mean years)	67.5 (*SD* 22.3)	53.1 (*SD* 16.5)	53.3 (*SD* 18.6)
Age category (early, middle, and late adulthood) frequency	Late	Middle	Middle/late
HFSSM food security status—frequency (food secure, marginal, low, and very low)	Secure	Very low	Low/very low

HFSSM: Household Food Security Survey modules; *SD*: standard deviation.

food, compounding the challenges and consequences of food insecurity (Kinsey et al., 2019).

Understanding negative nutrition coping behaviors and tradeoff behaviors within the SEM provides a reference for public health and nutrition practitioners to consider not only individual change strategies but also how social and environmental influences impact food and nutrient availability (Andress, 2017). When exploring the relationship between food security level and the use of negative nutrition coping strategies and tradeoffs, a negative association was demonstrated. Furthermore, a dose effect was confirmed with the mean number of negative nutrition coping strategies and tradeoffs used increasing with increasing food insecurity with very low food secure households reporting almost seven times the number of negative nutrition coping strategies as compared to those identifying as food secure or marginally food secure.

The current study took a person-centered approach to examine patterns within the sample. As compared to variable-centered approaches most commonly used. The SSHS provided an opportunity to further explore the multidimensional domains of experience-based food insecurity by examining how people were grouped together based on their answers to questions related to coping, tradeoffs, and experience-based food insecurity domains and are consistent recent research that used a lifespan approach to assessing protective strategies for countering food insecurity (Nicholson et al., 2022). Exploring the population heterogeneity of households accessing food relief provides a view into understanding "who" are the households and "what" hunger coping behaviors cluster together within the socioecological model and experience-based hunger domains. The most influential behavioral domains for the "late adult worriers" were poor food utilization (poor food quality/variety) and worrying about whether the food would run out. These results are consistent with similar findings in older SNAP participants from Andress (2017), who found that these behaviors contributed to the exacerbation of chronic health conditions, poor health, and functional decline in older adults. The most frequent coping strategy among "late adult worriers" aligned at the organizational and community level of the SEM and was food assistance programs. Using the experiences of "late adult worriers" participating in food assistance programs provides data to help programs such as SNAP, congregate and home-delivered meals, community gardens, senior centers, seniors farmers market programs, and food relief agencies to continue to reduce the underlying factors contributing to vulnerability. Using these experiences of food relief agency participants provides data to help programs such as SNAP, congregate and home-delivered meals, community gardens, senior centers, seniors farmers market

programs, and food relief agencies to continue to reduce the underlying factors contributing to vulnerability (Lloyd, 2017). The "middle adult traders" more frequently reported that access to food was the predominant experience-based food insecurity dimension along with trading off the fundamental necessities. Research by Bartfeld and Collins (2017) in households with children suggests that financial adaptations contribute to nutrition coping strategies, such as adults reducing portions of foods or sacrificing their own nutrition needs to shield disruptions in food for children (Bartfield and Collins, 2017; Hanson and Connor, 2014). Coping strategies seen in the "middle adult traders" fell in the interpersonal level of the SEM which is similar to results found by Peng et al. (2018). Social programs that reduce tradeoffs for essential factors for human livelihood such as housing, education, utilities, transportation, and medicine provide opportunities to use financial resources toward nutritious food (Bartfield and Collins, 2017). The "middle/late adult copers" more frequently identify with the experience-based food insecurity domain of access to food, managing this through negative nutrition coping behaviors, and were more frequently in the low to very low food security category status. The coping strategies utilized by this group were at the individual level of the SEM and included using fewer tradeoffs and working to extend money. Food insecurity literature identifies the use of coping strategies as a common way households acquire and manage food to impact adequate food supplies and prevent hunger (Kinsey et al., 2019; Seligman and Schillinger, 2010). However, continual use of food insecurity coping behaviors at the individual level impacts chronic disease prevention and management (Seligman et al., 2011), influences healthcare costs (Berkowitz et al., 2018), and impacts households' position in the food insecurity cycle (Seligman and Berkowitz, 2019).

This study has a few limitations. First, the convenience sampling for the SSHS lacks randomization and utilizes self-reported data, both of which may incur bias and limit generalizability to the more extensive food insecure population. Although the cross-sectional design of the SSHS provides a detailed perspective of the study's participants' recent experiences regarding food insecurity (Seligman and Berkowitz, 2019), it does limit the causal interpretation of the data. Finally, survey respondents were limited to those who accessed food assistance programs in Florida, decreasing generalizability.

Categorizing behaviors and experiences by examining interrelationships and relating them to existing theoretical perspectives help guide care and formulate recommendations (Kempson et al., 2003). Interventions for "worriers" focus on consistent access to food assistance programs. Our results are an important indicator of food relief agencies' role in helping households manage hunger. Understanding experience-based dimensions of food relief participation provides data to support programs such as SNAP, congregate, and delivered meals to continue reducing the underlying factors contributing to worry and feelings of vulnerability (Lloyd, 2017). Interventions for "traders" include adequate food relief, consistent access to nutritious food through government and not-for-profit programs, improved access to resources that reduce financial tradeoffs with improved financial stability in the household, and improve shopping, purchasing, and cooking with the goal of improving the nutrient density of foods consumed (Wright et al., 2018). Interventions for "copers" should focus on messages targeted at highlighting the impact of food quality on nutrition, utilizing positive coping strategies such as growing food and receiving help from family and friends, and increasing the food supply to prevent insufficient food intake.

Conclusion

Understanding the multidimensional nature of determinants of food insecurity is more beneficial than the traditional classification of food insecurity. Future research on conceptual pathways is warranted to see if experience-based food insecurity variables would help to understand relationships across a continuum, including barriers and influencers. Identifying negative nutrition coping strategies and tradeoffs is important to understand the impact on diet quality.

Author contributions

The final manuscript has been seen and approved by all authors and the authors have all made significant contributions to the manuscript. We consent to publication.

Availability of data and materials

Data is available upon request from the corresponding author.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical statements

Ethical approval was obtained from the University of North Florida Ethical Review Board.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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