Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
https://foodsystemsjournal.org

Are we meeting student needs? Developing a measure for college food pantry satisfaction

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Submitted November 10, 2023 / Revised January 12, March 4, and April 22, 2024 /
Accepted April 22, 2024 / Published online June 12, 2024

Citation: Gardiner, K. D., & Harvey, S. P. (2024). Are we meeting student needs? Developing a measure for college food pantry satisfaction. *Journal of Agriculture, Food Systems, and Community Development*, *13*(3), 165–176. https://doi.org/10.5304/jafscd.2024.133.027

Abstract

Food insecurity is a growing concern in higher education. As universities adapt to meet the growing need of college students to access adequate amounts of healthy food, food pantries are among the most widely implemented food security supports. However, little has been done to measure whether this resource is meeting the needs of students. This study aims to fill gaps in the existing literature by using a cross-sectional design to develop a novel satisfaction survey and measure overall satisfaction, use of resources, and additional support needs of students utilizing an on-campus food pantry. A convenience sample of 100 student on-campus pantry users participated. The survey consisted of a ten-item, investigator-designed satisfaction scale, which demonstrated a high measure of reliability (Cronbach's alpha = .849). Based on a five-point Likert scale (1 = strongly

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Author Note

This project was the doctoral dissertation of Kelsey Gardiner (previously Kelsey Fortin; Fortin, 2022). Dr. Harvey was the faculty advisor to Kelsey Gardiner as a graduate student at the time of this project.

Funding Disclosure

This project received funding through a summer research scholarship from the Office of Graduate Studies at the University of Kansas.

Statement of Ethical Conduct

This study was approved by the University of Kansas Human Subjects Committee.

Disclosures

The authors have no conflicts of interest to disclose.

disagree to 5 = strongly agree), overall student satisfaction was high [$\bar{x}$ = 3.8]. Students reported the highest level of satisfaction with friendliness of staff volunteers [$\bar{x}$ = 4.55], location of the pantry [$\bar{x}$ = 4.26], and availability of shelf stable food items [$\bar{x}$ = 4.11]. Students reported lowest satisfaction with the selection of fresh fruits [$\bar{x}$ = 3.18] and fresh vegetables [$\bar{x}$ = 3.21], and the selection of dairy products [$\bar{x}$ = 3.59]. Most indicated a need for additional support from the pantry site, including school supplies (*n* = 48), hygiene and toiletry supplies (*n* = 47), cooking utensils (*n* = 47), information on other emergency resources (*n* = 28), financial resources (*n* = 25), and recipes (*n* = 25). More research is needed to better understand pantry-site satisfaction, identify potential additional desired supports, and the impacts of on-campus food pantries. This study is the first of a multiphase project that will continue to explore on-campus food pantries as an intervention strategy, the student experience of utilizing food pantries, and their potential impact on students.

Keywords
food insecurity, college students, food pantries, student supports, college student basic needs

Introduction

Roughly 11% of U.S. households were food insecure in 2020 (Coleman-Jensen et al., 2021). According to the U.S. Department of Agriculture Economic Research Service, "Food insecurity is the limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways" (USDA ERS, 2023a). The USDA has a set of validated survey measures to assess food security status, ranging from high food security (no access or nutritional issues related to food) to very low (disrupted eating patterns and reduced food intake due to lack of resources). Assessment can be done with three modules: the Household Food Security Survey Module (18 items), the Adult Food Security Survey Module (ten items), and the Six-Item Short Form Food Security Survey Module (USDA ERS, 2023a; 2023b).

Rates of food insecurity among college students have shown varying results in the literature. A recent scoping review of 51 studies found that the percentage ranged between 13% and 50%, depending on the study and which instrument was used (USDA 6-item vs. USDA 18-item), with an average food insecurity rate of 41% (Nikolaus et al., 2020). Some recent critiques have noted a high prevalence among college students, especially when compared to the general population, and have called for a validated measure for college students specifically (Ellison et al., 2021). Though further research is needed regarding measuring student food insecurity prevalence, there is still a case to be made for intervention among this population.

Charitable food networks play an important role in the food system and have the potential to be a change agent, acting as an intervention space for food insecurity and diet quality (Schwartz & Caspi, 2023). Food distribution sites such as food pantries provide food to those in need at no cost, through organizations that are stand-alone meal distribution sites (e.g., food pantries) or established community organizations such as schools, churches, or shelters (CDC, 2020). Historically, food distribution sites have served the important role in the food system of providing a safety net within the social service sector, often serving individuals considered to be the working poor that fall between the cracks of the social service safety net. These individuals earn too much to qualify for federal food assistance, but not enough to pay for basic needs like food (Oxfam America & Feeding America, 2014). They experience healthy food access issues based on proximity to food, and availability and affordability of healthy food (Cooksey-Stowers et al., 2017; C. King, 2017).

College students often fall into this category. as they face unique factors that place them at greater risk of food insecurity than the general population, including increased financial strain and limited buying power (e.g. limited disposable income, lack of budgeting skill) (Camelo & Elliott, 2019; Nikolaus et al., 2019; Owens et al., 2020). Changing college student demographics compounded by rising tuition costs, decreases in Pell Grant funding, and the COVID-19 pandemic has created new challenges in acquiring basic needs (Freudenberg et al., 2019; Henry, 2017; The Hope Center for College

Community and Justice, 2021). College students may also inherently be at risk for experiencing greater inequities associated with food access due to their specific position in society (Darby et al., 2023), transitioning from adolescence to adulthood with frequently more responsibility for the first time for basic needs (e.g. food, shelter), financial independence, and self-management (budgeting, cooking). Financial instability and increased population-specific eligibility criteria for federal food assistance programs, e.g. the Supplemental Nutrition Assistance Program (SNAP), are contributing factors to these inequities in the student population. Traditional college student demographics have changed, with greater numbers of enrolled students identifying as low-income, first-generation, and financially independent from their parents (Johnson & Johnson, 2019).

The U.S. Government Accountability Office reported in 2018 that 7.3 million college students had household income levels qualifying them for SNAP benefits, but of them, only 31% were actually enrolled in the program (Freudenberg et al., 2019; Laska et al., 2021). This low rate can be associated with a strict and cumbersome SNAP application process that creates barriers for college students, which include lack of knowledge about SNAP and how to apply, administrative barriers (e.g., long wait times), and meeting the work requirement (20 hours per week). There also remains social stigma connected to applying for and using SNAP benefits among college students, emerging from factors such as feelings of individual failure, perceptions of who should be using social welfare programs (stereotyping), and shame/embarrassment about utilizing assistance programs (Dickinson, 2022; Freudenberg et al., 2019; Laska et al., 2021; Owens et al., 2020). This low rate demonstrates the importance of advocating for policy changes that reduce barriers to accessing federally funded nutrition programs and providing on-campus resources targeting students facing food insecurity, such as food pantries.

Universities are beginning to recognize food insecurity as an issue among their students. There has been an increase in offering potential interventions strategies like on-campus food pantries. The College and University Food Bank Alliance (CUFBA) reported a growth from 450 campus food pantries in 2017 to over 900 in 2019 (Henry, 2017; Laska et al., 2021). Other solutions include Swipe Out Hunger, a nonprofit program that allows students to donate extra meals from their meal plans to students in need; meal voucher programs that resemble the free and reduced-cost lunches in public schools; improving dissemination of SNAP information and petitioning for SNAP to expand student eligibility; farmers market-based food boxes; and campus garden programs (Freudenberg et al., 2019; Henry, 2017; Laska et al., 2021).

Although a variety of program offerings is becoming available to address student food insecurity, there is limited information for measuring effectiveness of current program offerings (Davis, et al., 2020). Scholars have identified opportunities for researchers and practitioners to develop targeted interventions and measurements for evidence-based programming to address campus food insecurity (Davis et al., 2020). Recent efforts have aimed to start the process through a case study evaluation of student-led initiatives addressing food waste and food insecurity (OoNorasak et al., 2022), and a community-based participatory research approach (CBPR) in resource identification and through asset mapping (Shisler et al., 2023). However, there remains a gap in the literature specific to the use, satisfaction, and additional support needs among on-campus student pantry users. Considering the growth in food pantries as an intervention strategy, this study will begin to explore this gap by understanding more about on-campus food pantries as a food insecurity resource from the perspective of students who utilize these services. This study also aims to contribute to the larger body of research to support institutions in measuring on-campus food pantry satisfaction and additional areas of need for student support at pantry sites.

Methods

Because of both the lack of evaluation data related to the experience of student on-campus pantry users and of tools to measure how on-campus food pantries are meeting the needs of students, the purpose of this study was to develop a reliable pantry satisfaction scale and measure the overall satisfac-

tion, use of resources, and additional support needs of pantry users. Three research questions were assessed: What is the reliability of a ten-item investigator-designed on-campus food pantry instrument to measure student satisfaction? (2) What is the overall satisfaction of students with pantry services? (3) What types of additional supports are needed?

The study used a quantitative cross-sectional survey study. Participants were college students at the University of Kansas (KU), a large mid-western university, that were current and returning users of the on-site campus food pantry. This excludes pantry users visiting for the first time. All participants were required to have the ability to read and write English. The study used convenience sampling to recruit participants through on-site personal appeals. During the required pantry client check-in process, pantry staff or a member of the research team recruited clients directly to participate in the study. Oral- informed consent was obtained prior to data collection to ensure all participants were willing to complete the survey, informed of the purpose and potential risks (e.g. psychological discomfort with survey questions) of the study, were returning pantry users, and had not already completed a survey. Paper surveys were completed on-site, in a private room adjacent to the pantry, and placed in a secure lock box to maintain confidentiality. Participation in the study was incentivized by giving two additional pantry points to be used during their pantry shopping visit.

Measures

Data collection was conducted using a novel investigator-designed survey instrument, developed using the current study's research questions, a comprehensive literature review, and the consultation of a team of academic and professional staff working on issues relating to college food insecurity. Instrument development used a participatory evaluation approach, with key stakeholder input that included the on-campus food pantry staff and on-campus food insecurity committee to contribute to instrument development and data collection procedures (Fawcett et al., 2003). The instrument consisted of ten items. They represent constructs in on-campus food pantry use that are interrelated and when grouped together create an overall measure for pantry satisfaction. The items were presented as statements to the participants and they were asked to rate their level of agreement on a five-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree). Additional information about the items, constructs, and associated scholarly sources is in Table 1. The five-point Likert scale is the basis for statistical analyses, both in this study (measuring mean scores and an overall satisfaction score–composite score) and for use in future studies (e.g., comparison of satisfaction between pantries, relationships between satisfaction, and other variables).

Instrument Development

The on-campus Food Insecurity Committee identified evaluation of on-campus food pantry efforts as a need and a priority area. The Assessment & Evaluation Subcommittee was charged with the development of an instrument and the dissemination of the survey. The Subcommittee is led by a faculty member in the Department of Health, Sport and Exercise Sciences and included members of various department stakeholders: the Financial Aid Office, Center for Service Learning (CSL), The Campus Cupboard (on-campus food pantry), the Center for Community Outreach (CCO), and student representatives. The Subcommittee met four times in the Fall 2020 and Spring 2021 semesters for instrument development and edits. Following the finalized draft submitted from the Subcommittee, the director of the on-campus food pantry reviewed the instrument and dissemination protocol for any additional feedback.

The final survey consisted of 30 questions, organized into three sections:

- Food Pantry Operations: This section asked students to provide feedback about current pantry operations, including location, hours of operation, the shopping point system, pantry volunteer experience, food selection and item availability, pantry visit frequency, and how they learned about the on-campus pantry. One open-ended question requesting further feedback on pantry improve-

ments was included. This section was used as a scale to measure overall pantry satisfaction.

- Current Food Habits and Additional Resources: This section asked students to reflect on current food habits, such as how long their groceries last, if they know how to prepare a variety of meals, if they use federally funded food safety net programs, and if they have dietary restrictions. Students were asked to indicate what additional resources might be beneficial (e.g., recipes, information on finances, hygiene products, school supplies, housing assistance information, etc.).
- Demographic Information: This section included general demographic questions such as gender and race, with added college demographic questions such as residency status (in-state, out-of-state, international), year/position status (e.g., graduate student, staff, faculty), and residence status (on-campus, off-campus with roommates, etc.).

As this is a survey specially designed for the purpose of this study, no previous validity or reliability properties of the survey existed. However, the development of the instrument does support a high degree of internal validity through the participation of experts and engaged community stakeholders, and a comprehensive literature review. The results indicate a high degree of scale reliability when measured in the current study. The overall satisfaction measures were guided by best practices in health, social, and behavioral research scale development as an overarching framework (Boateng et al., 2018), while also integrating elements of participatory evaluation through stakeholder engagement (Fawcett et al., 2003), and literature examining student food access issues. (Table 1).

Table 1. Ten-item Satisfaction Scale Instrumentation Conception

Scale Item	Construct	Citation
1. The Campus Cupboard is located at a convenient location.	Resource accessibility	Aragon, Armstrong Shultz, Bush-Kaufman, & Barale, 2019; El Zein, Mathews, House, & Shelnutt, 2018; Fortin, Harvey, & Swearingen White, 2020; J. A. King, 2017
2. The CC's hours are at convenient times for me.	Resource accessibility	Aragon et al., 2019; El Zein et al., 2018; Fortin et al., 2020; Ginsburg et al., 2019; J. A. King, 2017
3. The point system allows me to get enough food to sustain me through the week.	Program structure	Aragon et al., 2019; El Zein et al., 2018; Fortin et al., 2020; Ginsburg et al., 2019; J. A. King, 2017
4. The staff and volunteers at the CC are friendly and helpful to me.	Program structure	Aragon et al., 2019; El Zein et al., 2018; Fortin et al., 2020; Ginsburg et al., 2019; J. A. King, 2017
5. I am generally satisfied with the fresh fruit selections the CC has to offer.	Food availability & Acceptability	Aragon et al., 2019; Caspi et al., 2021; Ginsburg et al., 2019; Kihlstrom, Long, & Himmelgreen, 2019
6. I am generally satisfied with the fresh vegetable selections the CC has to offer.	Food availability & Acceptability	Aragon et al., 2019; Caspi et al., 2021; Ginsburg et al., 2019; Kihlstrom et al., 2019
7. I am generally satisfied with the dairy selection (milk, cheese, yogurt) the CC has to offer.	Food availability & Acceptability	Aragon et al., 2019; Caspi et al., 2021; Ginsburg et al., 2019
8. I am generally satisfied with the protein selections (meat, eggs, nuts, beans) the CC has to offer.	Food availability & Acceptability	Aragon et al., 2019; Caspi et al., 2021; Ginsburg et al., 2019
9. I am generally satisfied with the shelf stable food items (canned goods, rice, pasta, spices, flour, sugar, oils) the CC has to offer.	Food availability & Acceptability	Aragon et al., 2019; Caspi et al., 2021; Ginsburg et al., 2019
10. I am generally satisfied with the variety of food that is available at CC.	Food availability & Acceptability	Aragon et al., 2019; Caspi et al., 2021; Ginsburg et al., 2019; Kihlstrom et al., 2019

Table 1 outlines the ten items. including a rationale for the item and applicable citations. The rationale consisted of three major categories: (a) Resource Accessibility: if students are satisfied with pantry accessibility (e.g., hours, location); (b) Program Structure: if students are satisfied with how the pantry operations are delivered; (c) Food Availability & Acceptability: if students are satisfied with the types of food offered.

Analysis of Data

Analysis was conducted based on the three established study research questions. For the first question, Cronbach's alpha measured scale reliability of the pantry satisfaction scale. This measure provides the amount of internal consistency between the ten items established in the instrument, showing how closely related they are as a group of that measures overall pantry satisfaction. Cronbach's alpha is represented as a score between 0 and 1. Acceptable scores for high reliability range from 0.70 to 0.95; higher scores, closer to 1, demonstrate better interrelatedness between the items (Tavakol & Dennick, 2011). For the second research question, responses and mean scores were reported as an overall satisfaction score. For the third research question, descriptive statistics were used to report frequency data of participant responses.

Results

We analyzed the data using the procedures above and provide descriptive statistics.

Sample Population

The study included 100 on-campus food pantry student users. Roughly half identified as international students (54%) and the majority reported undergraduate student status (63%). Half reported living off-campus in an apartment or house with roommates, with one student reporting irregular/unstable housing conditions. More than half of the participants identified as female (59%), 4% identified as nonbinary, and 12% identified as bisexual or gay. Students identifying as Asian/Pacific Islander (36%) had the highest level of participation, followed closely by Hispanic or Latinx (25%), white (23%), and Black or African American (17%). Table 2 presents the full demographic data.

Table 2. Participant Demographic Characteristics

Demographic Category	*n*	%
Residency Status		
In-State Student	32	32%
Out-of-State Student	14	14%
International Student	54	54%
Class Status		
First-Year	7	7%
Second-Year	22	22%
Third-Year	12	12%
Fourth-Year	20	20%
Fifth-Year	1	1%
Masters	37	37%
Living Situation		
On-campus residence hall	5	5%
On-campus scholarship hall	1	1%
On-campus apartment	8	8%
Off-campus apartment or house (alone)	23	23%
Off-campus apartment or house (with roommates)	49	49%
Off-campus apartment or house (with spouse/partner and/or children)	9	9%
With parent or family members outside of college town	1	1%
No Stable/Regular Housing	1	1%
Gender		
Female	59	59%
Male	36	36%
Non-binary	4	4%
Other	1	1%
Sexual Orientation		
Heterosexual	74	74%
Bisexual	9	9%
Homosexual	3	3%
Prefer not to answer	11	11%
Race		
Asian/Pacific Islander	36	36%
Black/African American	17	17%
Hispanic/Latinx	25	25%
Native American/Indian American	3	3%
White	23	23%
Other: Eastern European, Ethiopian, Human Being, North African	5	5%

Findings

For the first research question, the results demonstrate good reliability or internal consistency between all ten items with a Cronbach's alpha of 0.849. This indicates that the pantry satisfaction scale items are strongly related items as a group measure.

The second research question aimed to evaluate the overall satisfaction of students with services received at the food pantry, using a five-point Likert scale Students reported being generally satisfied with services received at the pantry, with an overall mean score of 3.8 out of 5.0 using the ten-item satisfaction scale. A summary of individual scale items including frequency of student responses and mean scores is provided in Table 3. Students reported the highest level of satisfaction with the friendliness of staff volunteers [$\bar{x}$ = 4.55], the location of the pantry [$\bar{x}$ = 4.26], and shelf-stable food items [$\bar{x}$ = 4.11]. Students reported lowest overall satisfactions with the selection of fresh fruits [$\bar{x}$ = 3.18] and fresh vegetables [$\bar{x}$ = 3.21] and the selection of dairy products [$\bar{x}$ = 3.59].

The third research question asked students to identify additional supports needed to supplement the food pantry. Table 4 summarizes additional support needs reported by students. The most needed included school supplies (48%), hygiene and toiletry supplies (47%), cooking utensils (47%), information on other emergency resources (28%), financial resources (25%), and recipes (25%).

Table 3. Student Response Summary: Ten-item Overall Pantry Satisfaction Scale

Scale	Item (*N* = 100)	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree	($\bar{x}$ = 3.8162)
1.	The Campus Cupboard is located at a convenient location.	3% (3)	3% (3)	8% (8)	37% (37)	49% (49)	4.26
2.	The Campus Cupboard's hours are at convenient times for me.	1% (1)	4% (4)	7% (7)	60% (60)	28% (28)	4.10
3.	The point system allows me to get enough food to sustain me through the week.	3% (3)	7% (7)	24% (24)	46% (46)	20% (20)	3.73
4.	The staff and volunteers at the Cupboard are friendly and helpful to me.	1% (1)	0% (0)	4% (4)	33% (33)	62% (62)	4.55
5.	I am generally satisfied with the fresh fruit selections the campus Cupboard has to offer.	4% (4)	28% (28)	26% (26)	30% (30)	12% (12)	3.18
6.	I am generally satisfied with the fresh vegetable selections the Campus Cupboard has to offer.	4% (4)	26% (26)	25% (25)	35% (35)	10% (10)	3.21
7.	I am generally satisfied with the dairy selection (milk, cheese, yogurt) the Campus cupboard has to offer.	5% (5)	14% (14)	19% (19)	41% (41)	21% (21)	3.59
8.	I am generally satisfied with the protein selections (meat, eggs, nuts, beans) the campus Cupboard has to offer.	3% (3)	10% (10)	14% (14)	56% (56)	17% (17)	3.74
9.	I am generally satisfied with the shelf stable food items (canned goods, rice, pasta, spices, flour, sugar, oils) the Campus Cupboard has to offer.	2% (2)	3% (3)	10% (10)	52% (52)	33% (33)	4.11
10.	I am generally satisfied with the variety of food that is available at Campus Cupboard.	2% (2)	12% (12)	21% (21)	46% (46)	19% (19)	3.68

* Note: The question prompt preceding each item on the scale stated: "Using the following rating scale, please indicate your level of agreement with each of the following statements."

Discussion

Food insecurity among college students is a growing public health issue ((GAO, 2018; Nikolaus et al., 2020). Changing student demographics compounded by rising tuition costs, decreases in Pell Grant funding, and the COVID-19 pandemic has created new challenges to fulfilling their basic needs (Freudenberg et al., 2019; Henry, 2017; The Hope Center for College Community and Justice, 2021). In response, universities have seen growth in on-campus food pantries as a support to assist students with food insecurity (Henry, 2017; Laska et al., 2021). Despite the growth observed, little research has been conducted evaluating if the support is meeting the needs of students. There is a renewed emphasis on scholarship focusing on college student food insecurity through call-to-action studies of existing and new equity-based, student-informed approaches to address student food insecurity (Budowle et al., 2023; Davis et al., 2020).

Table 4. Student Reported Additional Support Needs

Support Category (*N* = 100)	n	%
School supplies (e.g. notebooks, paper, pens, pencils)	48	48%
Hygiene and toiletry supplies	47	47%
Cooking utensils (e.g. pots, pans, utensils)	47	47%
Information on other emergency assistance programs	28	28%
Recipes	25	25%
financial resources	25	25%
Healthcare Resources	22	22%
General nutrition information	18	18%
Cooking classes	13	13%
Housing assistance information	10	10%
Pet food	9	9%
Diapers	6	6%
Baby formula	2	2%

Though some studies have been done to measure barriers to pantry use, including stigma, lack of knowledge, and perceived insufficient need (Brito-Silva et al., 2022; El Zein et al., 2022; Idehai et al., 2024) they have aimed at understanding low use, rather than the actual experience of pantry student users. In addition, concepts around addressing food waste and resource identification to address food insecurity (OoNorasak et al., 2022; Shisler et al., 2023), and projections for changes in nutrients (Mitchell & Prescott, 2023), have also begun to explore food acquisition and nutritional quality of on-campus pantries, but still lack student perceptions of the pantry as a resource. A recent study did measure pantry satisfaction as a component of a comprehensive analysis of food pantry use, but did analyze the reliability of the developed measure (Mitchell & Prescott, 2022). This study is unique in its aims to measure and also scrutinize the reliability of an overall satisfaction scale. The development and use of this instrument to begin exploring how we are meeting the needs of student food pantry users is novel, and has implications for future research to evaluate on-campus food pantries. More research is needed regarding the experience of on-campus food pantry, if the support is meeting basic needs, and what additional supports might be needed.

The most needed supports reported by all students included school supplies (48%), hygiene and toiletry supplies (47%), cooking utensils (47%), information on other emergency resources (n = 28, 28%), financial resources (25%), and recipes (25%). Basic needs of college students such as rent, food, transportation, and books, are rarely covered by financial aid (Freudenberg et al., 2019; Henry, 2017), which along with their likelihood to experience complex social conditions such as housing insecurity and unemployment put them at increased risk of experiencing food insecurity (Freudenberg et al., 2019; Gaines et al., 2014). College students may not qualify for non-educational federal and state assistance programs due to circumstances such as dependent status and employment, or may experience barriers in accessing resources due to lack of awareness, social stigma, and administrative barriers (Freudenberg et al., 2019; Laska et al., 2021; Owens et al., 2020). These, combined with increased financial constraints, highlight the importance of basic need supports. The findings from the current study support the literature highlighting that college students have basic needs beyond foods that universities may be in a position to address, such as school supplies, cooking supports, and financial and emergency assistance.

Based on these findings, the need for supports outside of food within an on-campus food pantry setting supports a more holistic approach to addressing basic needs.

Though not explored in this this study, it is worth noting that a large majority of students lived off-campus (94%), over one-third (37%) identified as graduate students, and 16% as members of the LGBTQIA+ community. These groups have been identified in the literature as high-risk for food insecurity (Henry et al., 2023; Riddle et al., 2020; Soldavini et al., 2019; Willis, 2019). Due to their identification as pantry users in this study, additional research exploring these groups and their unique experience with on-campus food pantries warrants attention from research and higher education communities.

Limitations

The present study is not without its limitations. There are limitations in generalizability as this study was conducted with only one sample of 100 students at a large Midwestern university. Despite a good level of internal reliability having been, the tool hasn't been tested outside of this study. Participant self-reporting may introduce potential sources of survey error. It should be acknowledged that while the students did report lower levels of satisfaction with the fresh fruit and vegetable selection, the times of year that the survey responses were collected were outside of the Midwest growing season, limiting availability of fresh, local, produce in the charitable food system and potentially impacting participant responses.

Conclusions

Food insecurity among college students and on-campus interventions to address and support basic needs among a diversifying student population is a growing concern within the higher education community. This study aimed to explore these concepts further by measuring the overall satisfaction, additional support needs, and the development of a ten-item on-campus food pantry satisfaction scale. Results of the study highlight the establishment of a reliable scale that can be used by other institutions to measure overall student pantry services. Overall satisfaction was high among student users, with the lowest satisfaction rate for fruit and vegetable availability, indicating a desire for fresh produce at the pantry. This may be particularly important considering the relationship between fruit and vegetable consumption, diet quality, and chronic disease. Beyond this, the importance of food pantries filling a social service gap and food system need within the college student demographic was highlighted through students reporting the desire for additional support needs offered at the pantry, such as financial resources and information on other emergency resources. Due to the high number of students identifying with certain demographic markers who are on-campus pantry users, exploring differences in food insecurity interventions and support needs based on demographic characteristics (e.g., residency status, graduate student status, LGBTQIA+, etc.) warrants research attention to better address high-risk communities. More research is needed not only to measure satisfaction, but additional supports and impacts of on-campus food pantries. This study is the first of a multiphase project that will continue to explore on-campus food pantries as an intervention strategy, satisfaction and support needs based on and comparing demographic subgroups, the student experience utilizing food pantries, and their potential impact on students.

Acknowledgments

The authors would like to thank the Office of Graduate Studies at the University of Kansas for funding this project work and the group of faculty mentors that served on the dissertation committee to advise this project.

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