Research Article

Campus Food Pantry Use Addresses a Gap Among California Public University Students

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ABSTRACT

Objective: To identify factors associated with campus food pantry (CFP) visits and evaluate outreach strategies.

Design: Cross-sectional.

Setting: Ten University of California campuses.

Participants: University of California CFP student users (n = 1,513) completed a survey in 2019.

Variables measured: Students reported reasons for CFP visits, how they heard about the CFP, monthly CFP visits, and food security status. Sociodemographic information was obtained through institutional records.

Analysis: Poisson regression for associations of monthly CFP visits (dependent) with sociodemographic variables (Model 1), reasons for CFP visits (Model 2), and outreach strategies (Model 3). Logistic regression for associations between reasons for CFP visits and food security status (dependent; Model 4).

Results: On average, students made 3.66 (SD, 4.75) CFP visits in the past month. Factors associated with more CFP visits included being first-generation to attend college, Filipino/Pacific Islanders, homeless, older, and male (Model 1). Not wanting to run out of food and hearing about the CFP through basic needs staff were associated with more CFP visits (Models 2 and 3). Students who visited the CFP because of financial insecurity had higher odds of food insecurity (Model 4).

Conclusions and Implications: Findings suggest that CFPs provide critical emergency food assistance for students at risk of food insecurity.

Key Words: food insecurity, food pantry, food assistance, college students, higher education (*J Nutr Educ Behav.* 2021;53:921−930.)

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INTRODUCTION

Food insecurity, defined by the US Department of Agriculture (USDA) as "limited or uncertain access to adequate food," is a growing concern among postsecondary institutions.[1] Systematic reviews reported that more than 40% of higher education students reported experiencing food insecurity, a higher prevalence than US households.[2−4] Among University of California (UC) students, a study identified that 47% of undergraduate students experienced food insecurity in 2018.[5] The high prevalence observed among students in higher education may be due to the changing profile of the postsecondary students, concurrent with the rising cost of college attendance.[6−11] Historically underrepresented groups, including students from households with low income, first-generation students (the first in the family to pursue higher education), and Black and Latino(a) students, make up an increasing share of the US postsecondary student population.[7,8,12] These shifting demographics are visible in the UC system; in 2019, 36% of incoming students received a Pell Grant—a federal grant reserved for students from families with low income—and 40% were first-generation students.[13] The Pell Grant's purchasing power has declined as public college tuition has increased, which likely contributes to student experiences of food insecurity.[9,14]

Despite increased college accessibility, inequity on campuses persists, such that some students are at higher risk of food insecurity than their peers. Students who are experiencing housing problems, from families with low income, with a childhood history of food insecurity, and/or first-generation, and from some racial/ethnic backgrounds are at increased risk of food insecurity.[4,15−23] Student food insecurity is associated with poor health outcomes and worse academic performance.[17−19,23−29]

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Federal food assistance programs do not prioritize students experiencing food insecurity. By law, students are categorically ineligible for the federal *Supplemental Nutrition Assistance Program* unless stringent exceptions are met.[30,31] To address this urgent need, college campuses around the nation have taken action to reduce student food insecurity by establishing campus food pantries (CFPs) that distribute food donations to students in need of food. The College and University Food Pantry Association, a national organization of CFPs, currently has more than 700 registered campus members.[32]

The 10-campus UC system, the setting of the present study, has implemented comprehensive systemwide programs to address student food insecurity. In 2014, UC President Janet Napolitano launched the UC Global Food Initiative with the goal of solving student food insecurity.[33] In 2017, the state legislature approved funding to address student basic needs insecurity, starting with food assistance at California public universities and community colleges.[33,34] The UC system used the state funds to establish CFPs at each campus, and later, basic needs services that offer a wide range of resources.[33]

In the last several years, CFPs have proliferated across college campuses and remain understudied.[32] A few peer-reviewed studies examined students' use of CFPs.[19,35–40] Factors studied included the demographics of food pantry users, reasons for CFP visits, students' awareness of existing CFPs, and barriers to the use of CFPs.[19,35–39] A mixed-methods study at the University of Florida found that students experiencing food insecurity had higher odds of using the CFP than food secure students.[36] Students with loans, need-based financial aid, or international status also had higher odds of CFP visits than the general student population.[36] Similarly, a study from the University of Alberta identified that international, older, and graduate students were more likely to visit the CFP.[37] Several identified social stigma or feeling embarrassed to be seen at the CFP as a barrier to its use.[36,38–40] A study at Wright State University in Ohio identified that food pantry users were more likely to be Black, female, and/or unemployed than the general campus population.[35] Of the few studies on CFP, only 1 used student-level data from multiple campuses, which examined Pearson chi-square associations between pantry use and food security status.[19] Multicampus studies on CFP visits are warranted to better understand the reasons for student food pantry use and effective outreach strategies so that CFP programs can better serve students.

Given that CFPs are understudied but widely implemented, comprehensive analyses of students' use of CFPs are necessary to inform basic needs programs in postsecondary education. The objectives of this study were to (1) identify sociodemographic factors associated with frequent CFP visits, (2) examine the relationship between the reasons for using the CFP and outreach strategies with the frequency of its use, and (3) examine the associations between reasons for CFP visits and food security status.

METHODS

Design

This cross-sectional study used data from undergraduate and graduate students who completed a UC Basic Needs survey. In the summer of 2019, research participants were contacted via their basic needs coordinators at each UC campus. One coordinator at each of the 10 campuses sent the survey link to students on their campus's Basic Needs Center listserv, using an invitation letter and marketing materials. Students were eligible to participate in the survey if they were aged ≥ 18 years, currently enrolled at a UC, and had used their CFP or were enrolled in CalFresh. The students completed an online informed consent form before starting the survey. After completion of the survey, student demographic information was integrated using institutional records, obtained through a partnership with the UC Institutional Research and Academic Planning Office. Participants were invited to opt-in to an opportunity drawing for a $10 gift card, and 50 gift cards were distributed per campus. The study was approved by the Institutional Review Board at UC Irvine.

Participants

A total of 1,855 undergraduate and graduate students completed the survey. Nondegree students (n = 7), and students missing graduate/undergraduate status (n = 21) were excluded from the analysis. The final analytic sample included 1,513 students after excluding observations with missing data on age, gender, or ethnicity (n = 297) and/or outcome data (n = 17). A subanalysis (n = 1,205) excluded those with missing food security data (n = 308).

Dependent Variables

Monthly CFP visits. Participants were asked to report how many times they usually visited the CFP per week and how many weeks they visited per month. Monthly CFP visits were computed by multiplying these responses.

Food security status. Participants' food security status in the last academic term (semester or quarter) was assessed using the USDA 6-item Adult Food Security Survey Module.[41] The module includes questions on experiences of stress or anxiety about running out of food, diminished food quality or variety, and being unable to afford food. The sum of affirmative responses to the food insecurity questions generated a raw score of 0–1 (high or marginal food secure), 2–4 (low food secure), or 5–6 (very low food secure; per USDA's coding).[41] Using USDA's reporting categories 0–1 affirmative responses (high or marginal food security) were coded as food secure, and 2–6 (low or very low food security) were coded as food insecure.[41]

Independent Variables

Sociodemographic information. Institutional records, based on financial aid and college application forms, were used to extract student university information on age, gender, family dependency status, and academic year. Students self-reported their

first-generation status and their current housing, which was categorized as on-campus in a residence hall, other on-campus housing, off-campus, and unstable situation/unhoused (including temporary living with a friend, temporarily living in a hotel or Airbnb, transitional or halfway house, in a homeless shelter in an outdoor area not meant for habitation). Race/ethnicity was categorized as Latino(a), Black, Filipino/Pacific Islander, American Native, White, or Asian. Reported ethnicity in institutional records of Korean, Japanese, Chinese, Pakistani/East Indian, or other Asian was recoded as Asian. Latino/Latina and Chicano/Chicana in institutional records were collapsed into the category of Latino(a). Students who reported receipt of a Pell Grant, Cal Grant, or federal loan were considered to have received need-based financial aid.

Reasons for CFP visits. Participants were asked, "Which of the following are reasons for your food pantry visit(s)?" and were asked to check each reason that applied them. Selecting > 1 reason was permitted. Each reason for CFP use was treated as a separate binary variable. The reasons listed were as follows: (1) I did not want to run out of food, (2) I ran out of food and did not have any money to buy more, (3) I ran out of food and was worried to spend money to buy more, (4) I ran out of foods that are available at the food pantry, (5) I ran out of food and did not have transportation to buy food/groceries, (6) I ran out of food and did not have time to buy food/groceries, (7) I did not have time to prepare food, and (8) I used the food pantry to supplement my nutritional needs because I did not have enough money to cover all the food that I need.

Outreach strategies. Participants were asked to indicate how they heard about the CFP by selecting from a list of options. Selecting multiple outreach methods was permitted. Each outreach strategy was treated as a separate binary variable. Options listed were as follows: (1) friend/fellow student, (2) student peer advisor/CalFresh advisor, (3) referral from another campus service, (4) food pantry/basic needs staff, (5) faculty, (6) social media, (7) print media, and (8) workshop or presentation attended.

Statistical Methods

Three multilevel Poisson models were performed to estimate incidence rate ratios, each adjusted for the campus in which the student was enrolled at the time of survey completion as a random effect. Model 1 examined the following sociodemographic factors as independent variables associated with monthly CFP visits (dependent variable): age, sex, race/ethnicity, family dependency status, housing, first-generation status, receipt of need-based financial aid, and academic level. Model 2 examined reasons for CFP visits as the independent variable and monthly CFP visits as the dependent variable. Model 3 examined outreach strategies as the independent variable and monthly CFP visits as the dependent variable. In Models 1–3, the dependent variable was a discrete count of the number of CFP visits in the past month. Because count data follows a Poisson distribution, a Poisson model was used to ensure accurate standard errors. A subanalysis (Model 4) used a multilevel logistic regression model to estimate odds ratios for the association of reasons for food pantry use (independent variable) with food security status (dependent) on a subset who completed the food security module. Significant sociodemographic factors identified in Model 1 were controlled for in Models 2–4. Differences in demographic variables and CFP monthly visits were compared between (1) those with complete and missing covariate and/or outcome data and (2) those with complete and missing food security data using Pearson chi-square test of independence and t tests.

RESULTS

Descriptive statistics for the sample are summarized in Table 1. Students frequented the CFP on average 3 times per month. The study sample was primarily female, more than one third were Latino(a), and most received need-based financial aid. Nearly half of the sample reported experiencing food insecurity. The most frequently reported reason for using the CFP was running out of food and was worried about spending money to buy more, followed by not wanting to run out of food. The most frequently reported means of hearing about the CFP was through a friend or peer.

Students who had missing covariate or outcome data compared with those with complete data were significantly more likely to be White but less likely to Latino(a), less likely to have had independent status, and more likely to be a graduate student (data not shown). Students missing food security data compared with those with food security data were significantly more likely to be Asian but less likely to be White and visited the food pantry about 1 time fewer per month (data not shown).

Model 1: Sociodemographic Factors and Frequency of CFP Visits

Students who had received need-based financial aid were male, older, or first-generation were significantly more likely to have more frequent CFP visits. Filipino/Pacific Islanders visited the food pantry significantly more times than White students. Students who lived on-campus visited the food pantry significantly fewer times than off-campus students. Students without stable housing were more likely to have more frequent CFP visits than students who resided off-campus. Graduate students visited the CFP significantly fewer times per month than undergraduates.

Model 2: Reasons for Use and Outreach Strategies

Several reasons for using the CFP were associated with greater frequency of CFP visits after controlling for age, academic year, gender, first-generation, ethnicity, receipt of financial aid, and housing location as fixed effects and campus enrollment as a random effect (Figure 1; Supplementary Table 1).

Table 1. Sample Characteristics of the University of California Campus Food Pantry (CFP) Survey Respondents (n = 1,513), 2019

Sociodemographic Variables	Total
Visits to CFP in last month, mean (median) ± SD	3.7 (2) ± 4.8
Female (%)	1,178 (78)
Race/Ethnicity (%)	
American Native	20 (1)
Asian	564 (37)
Black	67 (4)
Filipino/Pacific Islander	76 (5)
Latino(a)	574 (38)
White	212 (14)
Experienced food insecurity[a] (%)	741 (49)
Received need-based financial aid (%)	1,195 (79)
Age, y, mean (median) ± SD	21.9 (21.1) ± 3.64
Academic level (%)	
First year	262 (17)
Second year	417 (28)
Third year	484 (32)
Fourth year	282 (19)
Graduate	68 (5)
First-generation (%)	896 (59)
Financially independent (%)	106 (7)
Housing (%)	
On-campus	441 (29)
Off-campus	1,051 (70)
Unstable situation/unhoused	21 (1)
Reasons for CFP visits[b] (%)	
I did not want to run out of food	718 (48)
I ran out of food, and did not have any money to buy more	361 (24)
I ran out of food, and was worried to spend money to buy more	740 (49)
I ran out of foods that are available at the food pantry	235 (16)
I ran out of food and did not have time to buy food/groceries	601 (40)
I did not have time to prepare food	544 (36)
I use food pantry to supplement my nutritional needs because I do not have enough money to cover all the food that I need	553 (37)
I ran out of food and did not have transportation to buy food/groceries	329 (22)
Total reasons for CFP visits, mean (median) ± SD	2.7 (2) ± 1.8
How student learned about the CFP[a] (%)	
Friend/fellow student	1,044 (69)
Student peer advisor/student CalFresh advisor	252 (17)
Referral from another campus service	80 (5)
Food Pantry/basic needs staff	417 (28)
Faculty	169 (11)
Social media	463 (31)
Print or other media	181 (12)
Workshop or presentation attended	169 (11)
Total reported ways student learned about the CFP, mean (median) ± SD	1.83 (1) ± 1.8

[a]Food security status data were missing for 308 participants; [b]Participants could select multiple options from the following: Reasons for CFP visits and how students learned about the CFP, so total percentages for each exceed 100%.

Students who used the CFP because of not wanting to run out of food were more likely to visit with greater frequency. Students who reported visiting for financial reasons were also more likely to visit with greater frequency. These financial reasons for visiting the CFP included supplementing their nutrition because of lack of money for food and running out of food, and being worried about not having money to buy food. Other reasons significantly associated with greater frequency of visits included running out of food available at the food pantry and not having time to prepare food.

Model 3: Outreach Strategies and Monthly CFP Visits

Of the 8 outreach strategies, hearing about the CFP through CFP or

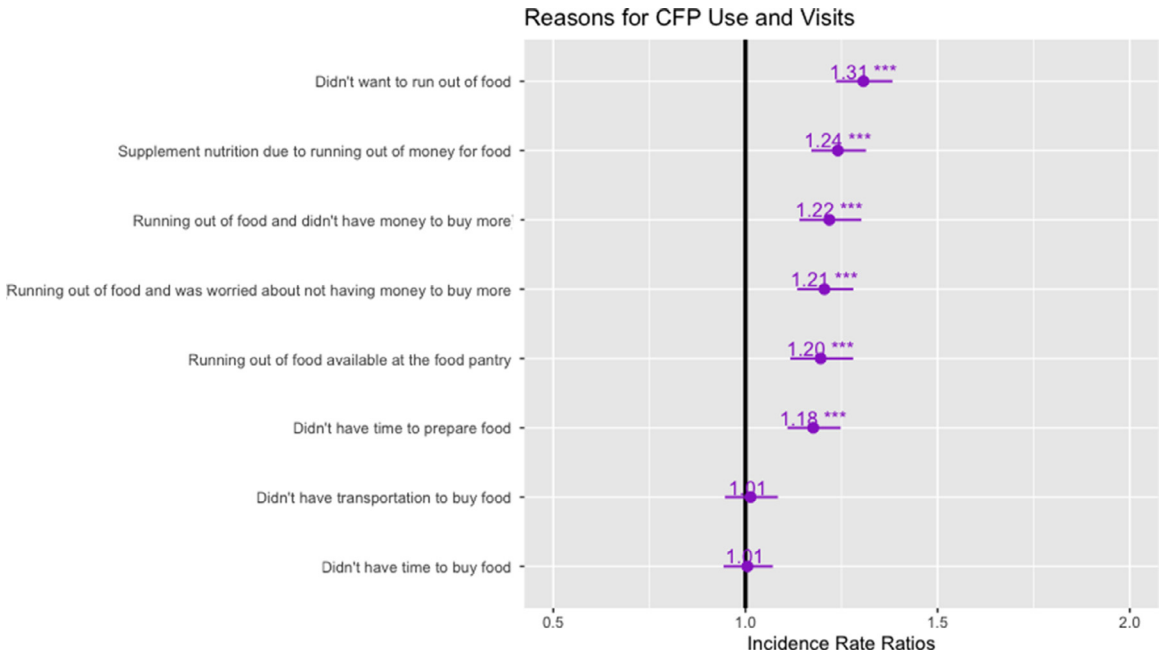

Figure 1. Multilevel Poisson regression (Model 2) of the associations between reasons for campus food pantry (CFP) visits and monthly CFP visits. Data were adjusted for campus enrollment as a random effect and age, academic level, race/ethnicity, on- and off-campus housing, first-generation status, independent status, and gender as fixed effects. Coefficients are incidence rates ratios. *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

other basic needs staff was significantly related to CFP visits (Figure 1; Supplementary Table 2) after controlling for the same covariates as in Model 2.

Model 4: Reasons for CFP Visits and Food Security Status

Among the subset with complete food security data (Table 3), students who reported visiting the CFP because they were "running out of food and did not have money to buy more" had the highest magnitude of an association with food insecurity, followed by "running out of food and was worried to spend money to buy more", and "supplementing nutrition because of lack of money for food" (Table 3). Students who reported that they did not have time to buy food had lower odds of experiencing food insecurity than their counterparts (Table 3). The model controlled for the same covariates as in Model 2.

DISCUSSION

The purpose of this study was to gain a better understanding of factors related to CFP visits and effective strategies for outreach among college students who were food pantry users, to better inform campus programs serving students who experience food insecurity. The high frequency of CFP use among students highlights the importance of CFPs for students at risk of experiencing food insecurity. In addition, this study provides nuanced insights into the factors, such as financial and housing insecurity, contributing to food insecurity experiences that necessitate CFP visits. These findings on factors motivating students' CFP visits and effective outreach strategies can inform student basic needs programming and policy.

This study found that being first-generation, housing insecure or unhoused, and receiving need-based financial aid were related to more frequent CFP visits among students; these factors have also been associated with food insecurity.[15,19,20] As more of today's college students are first-generation, Black/Latino(a), and from low-income families, they are more diverse than previous generations, and these characteristics also have been identified as risk factors for food insecurity in prior studies.[6,8,12,15,16,18,19] Furthermore, the shifting demographic of today's student and the differential associations of CFP visits among some subgroups (eg, students who were first-generation, older, and from low-income families) suggest that more work is needed to end the persistent student inequalities in higher education that require some students, particularly those marginalized at multiple intersections, to visit the CFP more frequently than others.

In addition, the data indicate that graduate students made fewer CFP visits, despite the high prevalence of food insecurity among graduate students (Table 2).[33,42] Given that 42% of the graduate students in this study experienced food insecurity (data not

shown), many graduate students in this sample were in need of CFP resources. Other studies revealed that graduate students have a hard time meeting their basic needs because of limited funding opportunities and child care costs among students with children.[42,43] A study also reported that graduate students experienced difficulty accessing basic needs services, as the location and hours of CFP were often inaccessible to graduate students whose schedules and locale varied from those of undergraduates.[43]

These findings support that frequent CFP visits may be motivated by multidimensional basic needs challenges. Basic needs in higher education have recently been defined by students as a multifaceted "ecosystem that supports financial stability by ensuring equitable access" to safe and secure housing, sufficient and healthy food, transportation, health care, resources for personal hygiene care, and child care for students with dependents.[43,44] Experiences of food insecurity can be compounded by not having these basic needs met, especially housing.[38,43,45] In the current study, students who experienced housing insecurity or were unhoused had more frequent CFP visits, indicating the interconnectedness of food and housing insecurity. This finding is consistent with prior research, which showed that food insecurity among students is often a consequence of students prioritizing having to pay unaffordable/high rent.[43] Although in this study only a total of 21 (1%) students lived in unstable housing or were unhoused, many more students experience houselessness in the UC system (n = 2,259 undergraduates, 4% in 2018) and the California State University system (n = 2,661 undergraduates and graduates, 11% in 2018).[5,46] Off-campus students visited the CFP significantly more times than students on-campus, which may be related to the meal plans common in on-campus housing. Meal plans, often compulsory for first years living in on-campus residence halls, are often considered to be conducive to food security, and therefore, mitigate the need for CFP resources. A related study identified that college students in housing without a food provision, such as a meal plan, ate fewer fruits and vegetables than those with a food provision.[47] However, other research showed that some students subscribed to the least expensive meal plan (11 meals per week) and skipped meals as a coping mechanism.[43]

Furthermore, this study found that not having time to prepare or buy food and not having transportation to buy food were highly prevalent among students. Similarly, other studies found that unreliable transportation and limited-time challenge students' abilities to access affordable food consistently.[38,43,45,48] Disadvantaged students may be likely to work long hours to afford basic needs expenses in addition to being full-time students, which leaves less time to buy or prepare food.[38,43,45] The high frequency of students reporting these reasons suggests that students' experiences of the interrelated basic needs trade-offs (eg, working in addition to being a full-time student) motivated CFP visits, indicating a need for comprehensive basic needs programming to address these multidimensional basic needs challenges.

The study found that financial insecurity (eg, running out of money) was associated with food insecurity and more frequent CFP

Table 2. Poisson Regression (Model 1) of Sociodemographic Factors Associated With Frequent Campus Food Pantry (CFP) Visits Among Survey Respondents (n = 1,513)[a]

	Monthly CFP Visits		
Sociodemographic Variables	**IRR**	**95% CI**	***P*[b]**
Male	1.33	1.26–1.41	<0.001
Received need-based financial aid	1.11	1.03–1.19	0.008
Age, y	1.02	1.01–1.03	<0.001
Academic level (Ref first year)			
Second year	0.96	0.88–1.05	0.39
Third year	1.01	0.93–1.11	0.79
Fourth year	1.00	0.91–1.11	0.94
Graduate	0.51	0.35–0.74	<0.001
First-generation	1.09	1.02–1.16	0.007
Independent status	0.90	0.79–1.04	0.15
Race/Ethnicity (Ref White)			
African American	1.06	0.92–1.22	0.39
American Native	1.22	0.99–1.50	0.06
Asian	0.99	0.91–1.07	0.75
Filipino/Pacific Islander	1.34	1.18–1.52	<0.001
Latino(a)	0.94	0.86–1.03	0.21
Housing status (Ref off-campus)			
On-campus	0.87	0.82–0.94	<0.001
Unstable housing/unhoused	1.35	1.11–1.63	0.002

CI indicates confidence interval; IRR, incidence rate ratio; Ref, reference.
[a]Model 1 adjusted for campus enrollment as a random effect; [b]Significant at $P < 0.05$.

Table 3. Logistic Regression (Model 4) of Reasons for Campus Food Pantry (CFP) Use With Food Security Status Among Survey Respondents (n = 1,205)[a]

	Monthly CFP visits		
Reasons for CFP Visits[b]	**OR**	**95% CI**	***P***[c]
I did not want to run out of food	1.20	0.90–1.61	0.22
I ran out of food and did not have any money to buy more	10.09	5.87–17.32	<0.001
I ran out of food, and was worried to spend money to buy more	3.98	2.90–5.46	<0.001
I ran out of food available at the pantry	0.77	0.52–1.15	0.20
I did not have time to buy food	0.70	0.49–0.99	0.04
I did not have time to prepare food	0.99	0.72–1.36	0.96
I use food pantry to supplement my nutritional needs because I do not have enough money to cover all the food that I need	2.96	2.16–4.06	<0.001
I ran out of food and did not have transportation to buy food/groceries	1.12	0.76–1.65	0.58

CI indicates confidence interval; OR, odds ratio.
[a]Model 4 adjusted for campus enrollment as a random effect and age, academic level, race/ethnicity, on- and off-campus housing, first-generation status, need-based financial aid, and sex as fixed effects; [b]Participants could select multiple reasons for CFP visits. Each reason was treated as a separate binary variable in the model; [c]Significant at $P < 0.05$.

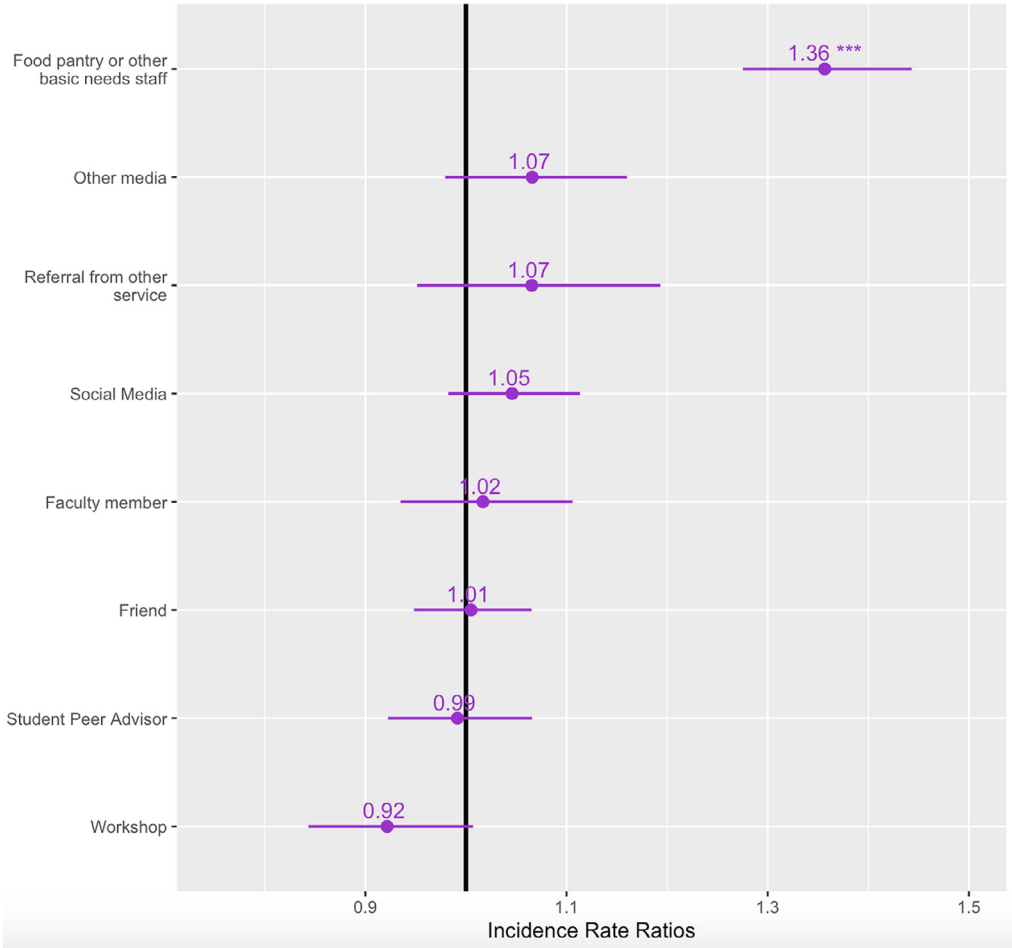

Figure 2. Multilevel Poisson regression (Model 3) of the relationship between outreach strategies and monthly campus food pantry visits. Data were adjusted for campus enrollment as a random effect and age, academic level, race/ethnicity, on- and off-campus housing, first-generation status, independent status, and gender as fixed effects. Coefficients are incidence rates ratios. *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

visits. These findings suggest that the CFP reached some students with an immediate need for food assistance. Students who visited the CFP because of financial insecurity visited with significantly greater frequency, and such students had significantly higher odds of food insecurity. Twill et al[35] similarly identified economic reasons for CFP visits, including being unable to afford food, running out of money because of trouble budgeting, and financial aid not covering costs. The current findings support that the CFPs begin to fill a gap when students' finances are overextended by the high cost of college attendance. For undergraduate students enrolled at 4-year public universities, housing, food, and living expenses account for nearly 60% of the cost of attendance.[49] It has also been well established that the purchasing power of the Federal Pell Grant program is at an all-time low, which today covers tuition and fees but used to cover the total cost of attendance.[9,10] By providing free food to students, the CFP may allow students to prioritize other basic needs such as housing.[43,45]

The CFP was used by students experiencing a spectrum of basic needs insecurity. In the current study, approximately half of students experienced food insecurity, which is likely related to the high average frequency of monthly CFP visits. Running out of food and running out of food available at the food pantry were significantly associated with food pantry visits but not associated with food insecurity; therefore, the CFP appears to be used by students who may be food secure. In these cases, students may use the CFP to proactively fortify their basic needs security. This diversity of CFP visitors across a spectrum of food insecurity implies that the CFP serves a range of needs, from providing immediate relief to serving as a buffer to prevent experiences of food insecurity.

Finally, the findings suggest that campus basic needs staff are critical to CFP outreach. Students who heard about the CFP from campus basic needs staff were more likely to visit the CFP frequently. This finding highlights that basic needs staff serve as front-line responders to student basic needs insecurity and their critical role in connecting students with the CFP resources. Although most students heard about the CFP from a friend, hearing about the CFP from basic needs staff or food pantry staff members was the most significant outreach strategy associated with CFP visits. A potential mechanism of this association may be that basic needs staff are more likely to provide accurate and comprehensive information to students, which is conducive to frequent CFP visits. Other studies found that barriers to CFP included insufficient information on CFP and social stigma.[36,38,40,45] Expanding basic needs staffing may reduce these informational barriers to CFP use. The UC system has made great strides in conceptualizing and developing the area of student basic needs, which includes a student-informed definition, CFPs with monthly systemwide basic needs staff meetings, and quarterly retreats (in-person before coronavirus disease 2019) for staff to discuss emergent strategies for alleviating food insecurity. Furthermore, some staff are student workers, which may help to reduce social stigma. Future research could examine the role of basic needs staff working to reduce student food insecurity.

This study has several limitations. As a cross-sectional study, the study cannot establish causal relationships for which longitudinal studies are necessary. Data, mostly on demographics, were missing from nearly 20% of the sample. It is possible that data were not missing at random, given the observed significant differences in several covariates between those with missing data and complete data. However, missing data were evenly distributed across all 10 campuses and were primarily missing from institutional records of graduate students for whom demographic data are not always complete. The study used a sample of students who had accessed their respective campus basic needs, who responded to the online survey invitation. As such, the results are not widely generalizable beyond the 10 UC campuses. This study included one state university system, which also limits generalizability to the national population of students. More studies of CFP use in other student populations, such as community colleges, are warranted. In addition, the study sample was 78% female, which may limit the generalizability of the results to male students. Despite these limitations, this study provides nuanced insights into the reasons motivating student CFP use, its relationship to food security, and outreach strategies. This study begins to fill a gap in the literature on student food insecurity by exploring the factors related to frequent CFP visits among students in a large state university system. Only a few studies have examined student-level factors driving CFP visits, most of which had small sample sizes.[19,35–40]

IMPLICATIONS FOR RESEARCH AND PRACTICE

There are numerous implications for practice and policy based on the present study. Campus food pantries provide critical emergency relief for college students at risk of or experiencing food insecurity. Federal policy limits students' access to the *Supplemental Nutrition Assistance Program*, a primary source of food assistance for US adults. Campuses address this gap in federal food assistance by providing short-term emergency assistance. This study found that many students visit the food pantry at least 2 times a week, indicating its use as a regular source of sustenance. To address the high prevalence of hunger on college campuses, changing federal food assistance policies to be inclusive of college students is warranted. In the meantime, given the interconnectedness of basic needs factors (eg, food, housing, and transportation), it is important that students, staff, administrators, and policymakers continue to support and advocate for funding to improve and sustain CFPs to meet the needs of all students at risk of or experiencing food insecurity until better policies are created.

In terms of implications for research, and based on the findings that graduate students made fewer CFP visits, future studies could

examine the barriers to graduate students receiving basic needs services. Further understanding of the barriers to CFP visits among graduate students is necessary to guide outreach and improve CFP accessibility for graduate students. Although few students in our study lived in unstable environments, more research with greater representation of housing insecure or unhoused students is warranted. In addition, we found that basic needs staff are critical. While we have no data to evaluate this, a potential mechanism of this association may be that basic needs staff are more likely to provide accurate and comprehensive information to students, which is conducive to frequent CFP visits. Of course to widen the representativeness of our work, more studies of CFP use in other student populations, such as community colleges, are warranted.

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SUPPLEMENTARY DATA

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jneb.2021.06.005.

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