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Prevalence and Correlates of Food Insecurity Among Students Attending a Midsize Rural University in Oregon

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Prevalence and correlates of food insecurity among students attending a midsize rural university in Oregon

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Prevalence and correlates of food insecurity among students attending a midsize rural university in Oregon

ABSTRACT

Objective: To examine the prevalence and identify correlates of food insecurity among students attending a rural university in Oregon.

Methods: Cross-sectional non-probability survey of 354 students attending a midsize rural university in Oregon during May 2011. Main outcome was food insecurity measured using the USDA Household Food Security Survey Module: Six-Item Short Form. Socioeconomic and demographic variables were included in multivariate logistic regression models.

Results: Over half of students (59%) were food insecure at some point during the previous year. Having fair/poor health (OR: 2.08, 95%CI: 1.07 – 4.63), being employed (OR: 1.73, 95%CI: 1.04 – 2.88) and with incomes below $15,000 per year (OR: 2.23, 95% CI: 1.07 – 4.63) was associated with food insecurity. In turn, good academic performance (GPA 3.1 or higher) was inversely associated with food insecurity.

Conclusions: Food insecurity seems to be a significant issue for college students. It is necessary to expand research on different campus settings, and further strengthen support systems to increase access to nutritious foods for this population.

Key words: Food insecurity, college students, rural, Oregon.

Abstract word count: 164 words.

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INTRODUCTION

Household food insecurity is defined as the limited or uncertain availability of nutritionally adequate and safe foods, and limited or uncertain ability to acquire acceptable foods in socially acceptable ways.[1] As measured by the U.S. Department of Agriculture (USDA) Household Food Security Module,[2] food insecurity is a marker of economic hardship as it assesses the adequacy and stability of a household's food supply over the preceding 12 months for active, healthy living of all household members. The most recent national data in 2011 indicate that 14.9% of all households (17.9 million) were food insecure.[3] Furthermore, low-income households with incomes below 185% of the poverty threshold (34.5%), and households with children (20.6%) were higher than the national average.[3]

Previous research has observed that food insecurity can disrupt optimal development throughout the life cycle, from prenatal period on into elder years.[4-9] A growing body of literature has documented the effects of food insecurity on cognitive, academic, and psychosocial development among school age and teenage students. These studies consistently observe that food insecurity is associated with lower academic performance, poor health, and decreased psychosocial function.[4,10,11]

Among college students, financial hardship can translate into budget demands that compete with food dollars (e.g. tuition, text books, housing, utilities, health care).[12,13] Over the last 30 years, the price of higher education has steadily outpaced inflation, cost of living, and medical expenses.[14] Recent changes to federal loan policies regarding the amount and duration of

federal aid received as well as how soon interest will begin to accrue after college may exacerbate the financial challenges students face.[15] Food insecurity, as a potential consequence of the increasing cost of higher education, and its likely impact on student health, learning and social outcomes should not be considered an accepted aspect of the impoverished student experience, but a major student health priority.[16]

College students face life-changing milestones during their transition to adulthood which may have long lasting effects.[17,18] Food insecurity during these years can potentially impact college students' cognitive, academic, and psychosocial development.[4] However, little research has addressed this issue. Studies addressing food insecurity among college students suggest a higher prevalence of food insecurity compared with the general population.[19,20] A study in Hawai'i found that 45% of students were food insecure or at risk of food insecurity[20] while another study in Australia found that almost 72% of students were food insecure.[19] No such studies have been conducted in the continental United States or in rural areas. The purpose of the present study is to address this gap in the literature by analyzing the prevalence and identifying correlates of food insecurity among students attending a rural university in Oregon.

METHODS

Design and Participants

A cross-sectional non-probability web-based 40-item survey was distributed via e-mail to all students (N=5,438) attending a midsize rural university in western Oregon during May 2011. A total of 354 students completed the survey (7% response rate). The email contained an informed consent form and provided a link to the survey where participants confirmed consent prior to beginning the survey. The study was part of a broader effort to increase access to food among

students on campus. The online survey was open for a two-week period during which weekly reminders were sent.[21,22] The study protocol was approved by the Institutional Review Board at this university.

Theoretical Framework

Based on previous research,[2,3,19,20,23] relevant factors associated with food insecurity among university students were included. Questions regarding credit card debt[24], employment[25], and financial aid[26] were also added. The correlates used in this model are shown in Table 1.

Food insecurity

The *U.S. Household Food Security Survey Module: Six-Item Short Form* was used to measure food insecurity status.[2] The 6-item scale has been shown to have reasonably high specificity and sensitivity and minimal bias with respect to the 18-item measure.[27] The six items of the food security scale were reduced to two categories: 0 = food secure, 1= food insecure.[27] The internal consistency of the scale (Cronbach's alpha = 0.83) was similar to a previous study that used the same six-item scale.[28]

Statistical analysis

Summary statistics were calculated for all variables included in this study. Chi-square goodness-of-fit tests were used to compare the fit of our sample with selected campus-wide demographic characteristics provided by the university's registrar office. A two-step multivariate logistic regression model was built to evaluate the association between correlates and food insecurity status (step 1), adjusting for socio-demographic factors (step 2). All analyses were conducted

using Stata 11 (StataCorp, College Station, TX, 2009). The Hosmer-Lemeshow test[29] was performed to assess model fit using the `lfit` command.

RESULTS

Table 2 presents the summary statistics for all variables included in the study. The sample was representative of the student population at this university for full-time ($\chi^2_{\text{goodness of fit}} = 0.10$, $p = 0.75$), undergraduate ($\chi^2_{\text{goodness of fit}} = 1.98$, $p = 0.16$) and Latino students ($\chi^2_{\text{goodness of fit}} = 1.29$, $p = 0.26$), but overrepresented female students ($\chi^2_{\text{goodness of fit}} = 24.5$, $p = 0.00$). Less than a third of the sample reported residing on–campus (29%). Those who reported residing off–campus either live with roommates (35%); or have other arrangements (36%), such as living by themselves (18%), or with their parents (4%). Half of the students (50.3%) said they had a job in addition to attending college. Those who reported the number of hours worked (n=164) worked an average of 18.2 hours per week (*sd*=9.3). The majority (79%) of students reported having health insurance, which was obtained primarily from their parents (67%) or the university (22%). Very few students (12%) reported having no credit card debt. The majority of participants were female (73%), single (73%), and 18-24 years old (72%). Eight-percent reported being Hispanic or Latino.

Food insecurity affected 59% of students. Participation in food assistance programs (Emergency food from a church, food pantry/bank, or emergency kitchen; WIC; SNAP /food stamps; private organizations) reached 27% of the sample. Most of these were SNAP recipients (n=67, 70%). Table 3 presents the results of the final multivariate logistic regression model. The p-value (0.74) for the Hosmer-Lemeshow test indicates good model fit. Income less than $15,000 was the strongest correlate of food insecurity among this sample of students (OR: 2.23, 95% CI:

1.07 – 4.63). Similarly, students reporting fair/poor health were more likely to be food insecure (OR: 2.08, 95%CI: 1.07 – 4.63). Employed students and those participating in food assistance programs were also more likely to be food insecure (OR: 1.73, 95%CI: 1.04 – 2.88; OR: 1.91, 95%CI: 1.05 – 3.45, respectively). However, students with a GPA of 3.1 or higher were 60% less likely to be food insecure (OR: 0.40, 95%CI: 0.22 – 0.69). No significant associations were found with living arrangement, health insurance status, physical activity, enrollment status or demographic factors.

DISCUSSION

The present study found that the prevalence of food insecurity (59%) among a sample of college students attending a midsize rural university in Oregon was higher than the general population (15%), or even other college student populations (e.g. 39% among students at City University of New York;[30] 45% among students at University of Hawai'i at Manoa[20]). Food insecurity is an indicator of economic hardship that college students are facing. A recent story on *The Atlantic* pointed out that across the country, stretching financial aid dollars or wages from part-time work has become more challenging for college students during the great recession, partly because "parents have fewer resources to help out, there is greater competition for work-study jobs, and many schools have increased tuition to cover their expenses."[31] Without parent's safety nets students are often forced to work many hours, some even working fulltime while completing their college degrees. In this study, students reported working an average of 18 hours, ranging from 4 to 42 hours per week. Students who were employed were almost twice as likely to report experiences with food insecurity, suggesting that financial assistance and employment are falling

short of meeting financial demands of attending a university. Time spent working many hours and lack of adequate food may affect students' academic success.[19,25] Previous studies have observed a relationship between lower academic performance and food insecurity.[4,7,11,32] Likewise, the results of this study suggest that students who report experiencing food insecurity are less likely to report a GPA of 3.1 or higher.

Educational attainment is one of the most important contributors for upward social mobility.[18] It is also an important marker in the transition to adulthood,[17] and a reflection of cumulative advantages and disadvantages.[33] Food insecurity among college students may signal previous trajectories of disadvantages and shape future trajectories into adulthood. Although students from middle/upper-middle class families may experience short-term episodes of food insecurity, they are likely to have reliable sources of support (e.g. parents, extended family). For low-income students, however, food insecurity is likely an outcome of their disadvantaged trajectories, which can make them more vulnerable to living in poverty and not completing higher education. Even worse, not only are they facing food insecurity but they may also be jeopardizing their potential for academic success and future earnings. Addressing food insecurity should be one of the considerations for policy makers in the context of promoting higher education as a stepping-stone to the middle-class. At this stage of transition into adulthood, more robust support systems might lead to successful educational attainment and social mobility.[17]

Limitations

The present study findings have several limitations. First, it was a cross-sectional study that relied on students' self-report. Second, the non-probability, low-response rate sample may have

143 increased the likelihood of sampling error and non-response bias.[34] However, the sample was
144 representative of the university population for full-time, undergraduate and Latino students; and
145 overrepresented female students at this university. Third, the study used the short form of the
146 USDA food security scale. Unlike the full 18-item scale, the short form scale does not directly
147 measure children's food insecurity, and doesn't capture the most severe adult food insecurity (in
148 which children's food intake is likely jeopardized).
149
150 **IMPLICATIONS FOR RESEARCH AND PRACTICE**
151
152 The present study contributes to our understanding of food insecurity among young adults in
153 higher education and its associated challenges. A key finding is that food insecurity is a
154 significant issue for more than half of college students surveyed. To have a better picture of the
155 food insecurity situation across the country, it is necessary to expand the focus on college
156 students' risk behaviors[35,36] to include social and economic factors influencing a student's health,
157 including income, employment, debt, housing costs, and food insecurity. Future research should
158 also explore food insecurity among college student families with children; and assess not only
159 eating behaviors but the campus nutrition environment.[37] Moreover, longitudinal and qualitative
160 studies should also be considered to monitor the persistence of food insecurity throughout the
161 college years.
162 It is also necessary to expand research on different campus settings, and further
163 strengthen support systems to increase access to nutritious foods for this population. When faced
164 with food insecurity, people use a variety of coping mechanisms such as utilizing federal
165 nutrition assistance programs, receiving food from other family members, and seeking

emergency food boxes from food banks.[38-40] In this context, on-campus food banks and gardens may be valuable interventions.[20] A number of institutions across the country have or are in the process of implementing these initiatives.[31] The Oregon Food Bank, for instance, has produced a manual about how to establish a campus food pantry.[41] Also, SNAP eligibility requirements for college students could be revised. However, food assistance initiatives have shown only limited ameliorative effect,[42,43] which point to the need for broader food system, right-based approaches to food security.[43,44]

Therefore, it is necessary to consider other initiatives and policies to increase access to nutritious foods, and more broadly, improve students' economic stability (i.e. are they able to address their basic needs, including food, so that they can focus on their education).[26,45] In other words, the promise of higher education as a tool for a better future needs to be met with adequate financial and other social supports for college students (particularly low-income, first generation, and minorities[45]) to succeed.

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Table 1. Description of correlates of food insecurity among students at a midsize rural university, Oregon, USA.

Correlate	Question	Level	Values
Self-reported health	*How would you rate your overall health?*	Discrete	0 = Excellent, Very Good, Good 1 = Fair, Poor
Moderate physical activity	*How often do you participate in at least moderate physical activity? (Examples of moderate physical activity: walking, water aerobics, bicycling slower than 10 miles per hour, tennis (doubles), ballroom dancing, general gardening)*	Discrete	0 = 0-2 days a week 1 = 3 or more days a week
Having health insurance	*Do you currently have health insurance?*	Discrete	0 = No 1 = Yes
Having a campus meal plan	*Do you have a campus meal plan?*	Discrete	0 = No 1 = Yes
Participating in food assistance programs	*Have you ever participated in any of the following food assistance programs such as emergency food from a church, food pantry/bank, or emergency kitchen, WIC (Women, Infants, and Children), SNAP (Supplemental Nutrition Assistance Program, formerly known as Food Stamps), private organizations, other? Please select all that apply*	Discrete	0 = No participation 1 = Participation in any food assistance program
Living arrangement	*Where do you currently live?*	Discrete	0 = Lives off campus (with roommates, other) 1 = Lives on campus
Credit card debt	*How much credit card debt do you currently have?*	Discrete	0 = $499 or less, $500 or more 1 = None
Undergraduate student	*At Western, are you a?*	Discrete	0 = Graduate student, other 1 = Undergraduate student
Full-time student	*Do you attend Western as a full-time or part-time student?*	Discrete	0 = Part-time student 1 = Full-time student
GPA (3.1 or higher)	*What is your GPA (Grade Point Average)?*	Discrete	0 = Lower than 3.1 1 = 3.1 or higher
Receives financial aid	*Do you currently receive financial aid (including scholarships, private and federal loans, and/or grants?*	Discrete	0 = No 1 = Yes
Employed	*Besides attending college, do you have a job?*	Discrete	0 = No 1 = Yes
Income	*What is your annual income?*	Discrete	0 = $15,000 or more 1 = Less than $15,000
Sex	*What is your sex?*	Discrete	0 = Male 1 = Female
Single	*What is your marital status*	Discrete	0 = Married, living with a partner 1 = Never married (single)
Latino	*Are you Hispanic or Latino*	Discrete	0 = No 1 = Yes
Age	*What is your age (in years)?*	Discrete	0 = 25 or older 1 = 18 – 24

Table 2. Summary statistics among students at a midsize rural university, Oregon, USA, (n=354).

Variables	n (%)
Outcome variable	
Food insecure	208 (58.8)
Correlates	
Fair/poor health	66 (18.6)
Moderate physical activity (3 or more days a week)	270 (70.6)
Has health insurance	279 (78.8)
Has a campus meal plan	92 (26.0)
Participates in food assistance programs	96 (27.1)
Living arrangement	
On campus	104 (29.4)
Off campus with roommates	123 (34.8)
Off campus other	127 (35.9)
Credit card debt	
None	41 (11.58)
$499 or less	252 (71.2)
$500 or more	61 (17.2)
Undergraduate student	306 (86.4)
Full-time student	310 (87.6)
GPA (3.1 or higher)	230 (65.0)
Receives financial aid	268 (75.7)
Employed	178 (50.3)
Income (less than $15,000)	278 (78.5)
Female	258 (72.9)
Single	259 (73.2)
Latino	29 (8.2)
Age	
18 – 24	255 (72.0)
25 or older	99 (28.0)

Table 3. Multivariate logistic regression of factors associated with food insecurity among students at a midsize rural university (n=354).

	B	*P* value	OR	95% CI		
Fair/poor health	0.73	0.026	2.08	1.09	-	3.95
MPA (3 or more days a week)	-0.42	0.123	0.66	0.39	-	1.12
Has health insurance	-0.34	0.350	0.71	0.35	-	1.44
Has a campus meal plan	0.70	0.088	2.02	0.90	-	4.52
Participates in FAP	0.65	0.033	1.91	1.05	-	3.45
Lives on campus	0.17	0.670	1.19	0.54	-	2.63
Has no credit card debt	-0.89	0.093	0.41	0.15	-	1.16
Undergraduate student	-0.22	0.688	0.81	0.28	-	2.31
Full-time student	0.04	0.946	1.04	0.31	-	3.51
GPA (3.1 or higher)	-0.93	0.001	0.40	0.22	-	0.69
Receives financial aid	0.13	0.684	1.14	0.60	-	2.16
Employed	0.55	0.035	1.73	1.04	-	2.88
Income (less than $15,000)	0.80	0.032	2.23	1.07	-	4.63
Female	-0.04	0.897	0.96	0.52	-	1.78
Single	-0.57	0.105	0.56	0.28	-	1.13
Latino	-0.02	0.956	0.98	0.40	-	2.36
Age (18 - 24)	0.38	0.291	1.46	0.72	-	2.96
Intercept	0.46	0.399	1.59			

The non-significant Hosmer-Lemeshow test (χ^2=5.13, p=0.74) indicates a good model fit.
MPA: moderate physical activity (per CDC guidelines).
FAP: Food Assistance Programs (emergency food from a church, food pantry/bank, or emergency kitchen, WIC, SNAP, private organizations).