



Basic Needs Insecurities Are Associated with Anxiety, Depression, and Poor Health Among University Students in the State of New Mexico

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Abstract

Basic needs insecurities affect university students disproportionately and may impact health and academic performance. This study examined associations between food insecurity (FI), housing insecurity (HI) and a novel basic needs insecurity score, and mental and physical health among university students. Eight-thousand undergraduate and postgraduate students at a large university in the southwestern U.S. were selected via stratified random sampling to complete an online cross-sectional survey in April 2021. The survey included the USDA 10-item food security module, a 9-item housing insecurity measure, the Generalized Anxiety Disorder-2 screener (GAD-2), the Patient Health Questionnaire-2 (PHQ-2) assessing depression, and self-rated health. Sociodemographics were self-reported and integrated from the university's enterprise system. Multiple logistic regression was utilized to examine odds of depression, anxiety, and fair/poor health by food and housing security status. Multiple linear regression was utilized to examine predictors of food insecurity score (range = 0–10), housing insecurity score (range = 0–9), and an overall basic needs insecurity score (range = 0–19). Eight-hundred thirty-three students participated (response rate = 10.4%; mean age = 28.3 years, 66% female, 40% Hispanic, 60% undergraduates). Nearly 26% were food insecure in the past month and 44% were housing insecure in the past year. Basic needs insecurities significantly increased odds of anxiety (FI aOR = 4.35, HI aOR = 3.43), depression (FI aOR = 3.18, HI aOR = 3.16), and fair/poor health (FI aOR = 2.84, HI aOR = 2.81). GAD-2 score explained the most variance in food (r -squared = 0.14), housing (r -squared = 0.12), and basic needs insecurity scores (r -squared = 0.16). Basic needs insecurities remain concerns among university students due to associations with mental and physical health, prompting a critical need for multifaceted interventions.

Keywords Food insecurity · Housing insecurity · College students · Anxiety · Depression

Introduction

Basic, physiological needs including food and shelter are largely recognized as human rights [1, 2]. Disparities in acquiring and maintaining basic needs such as nutritious food and housing are, however, apparent across the world and in the United States. College and university students may traditionally be considered a more privileged population, but recent evidence suggests basic needs insecurities still affect students disproportionately [3].

Most of the literature on basic needs insecurities among college and university students focuses on food insecurity, defined by the United States Department of Agriculture (USDA) as a household-level economic and social condition of limited or uncertain access to adequate food [4]. Using standardized measurement tools, the USDA further defines categories of severity: high food security, marginal

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food security, low food security, and very low food security. Low food security is characterized by reduced quality, variety, or desirability of diet while very low food security includes reports of disrupted eating patterns and reduced food intake. Households experiencing low or very low food security are classified as food insecure. In the United States, large multi-institutional studies show college and university students experience marked food insecurity [3, 5]. Food insecurity does not affect students uniformly; community college students, underrepresented racial and ethnic groups, students who identify as genders other than man or woman, students who are not heterosexual, and students with disabilities are particularly affected [5–9].

Unsurprisingly, food insecurity has negative impacts on students' academic performance and increases the risk of dropping out of school [9–12]. Food insecurity is also associated with worse physical and mental health including eating disorders, obesity, stress, poor sleep, anxiety, and depression [5, 8, 10, 11, 13–17]. Interestingly, food insecurity may actually worsen for some students as they progress through their academic career [18]. Experiencing food insecurity and its acute health consequences increase the risk of chronic diseases like obesity, type 2 diabetes, and hypertension and hyperlipidemia [19]. Relationships are likely bidirectional with food insecurity increasing the risk for poor health, and poor health increasing the likelihood of experiencing food insecurity due to difficulties affording and obtaining food [20].

More recently, the need to expand basic needs research beyond food insecurity among college students has been recognized [11, 21]. A small qualitative study of college students in California found students define basic needs as including food, housing, mental health, sleep hygiene, and transportation [22]. Relationships between housing security and health are not as well established, perhaps due to the lack of uniformity in defining housing insecurity, and the difficulty in finding solutions to improve housing insecurity. Large, multi-institutional studies of college and university students in the United States suggest 45–50% may experience housing insecurity [3, 23] and housing instability may also be associated with worse mental and physical health. Since both food and housing insecurity are associated with poor health, students experiencing multiple insecurities may be particularly at risk [11]. There is a clear need to evaluate the combined effects of basic needs insecurities on health and wellbeing in college and university students.

The aim of this study was to assess food and housing insecurity in a sample of undergraduate and postgraduate students attending a large, urban university in the southwest United States, and to examine associations with anxiety, depression, and general health. A secondary aim was to examine which sociodemographic and health variables

predicted a novel basic needs insecurity score, based on food and housing insecurity severity.

Methods

A stratified random sample of 8000 students enrolled at a large, public university in the southwest United States during the Spring 2021 semester was generated by the university's Office of Institutional Analytics (OIA). The university is a Minority and a Hispanic Serving Institution and students enrolled at the main campus and all branch campuses were eligible for selection into the study sample. The survey was administered in April 2021 while the university remained primarily remote due to the COVID-19 pandemic. The first 1000 students to complete the survey received a \$10 Amazon electronic gift card as a participation incentive. All students provided consent to participate by starting the survey. The study was approved by the university's Institutional Review Board.

Participants

To generate the study sample, OIA queried data on all students enrolled during the spring 2021 term by level of study, gender, ethnicity, and low-income status derived from students' Free Application for Federal Student Aid (FAFSA) data for the 2020–2021 academic year. SAS version 9.4 was utilized to generate a stratified random sample of 8000 students, mirroring the sociodemographic composition of the university. Selected students received a recruitment email inviting participation in the study. The email also included a link to the online survey, administered via Opinio, the university's online survey administration platform. In addition to self-reported data collected through the online survey, OIA linked the following data for students who provided consent and participated: age, level of study (associates, undergraduate, or postgraduate), race and ethnicity, and low-income status (Expected Family Contribution of \$5576 or less for the 2020–2021 academic year). The online survey also included the following measures.

Food Security Status

Food insecurity in the past 30 days was measured using the 10-item USDA U.S. Adult Food Security Survey Module [24]. The module includes three screening questions followed by seven questions asked only of respondents who responded affirmatively ('Always true' or 'Sometimes true') to at least one screening question. The total number of affirmative responses are summed to categorize respondents into high food security (0 affirmative responses), marginal food security (1–2 affirmatives), low food security (3–5

affirmatives), or very low food security (6–10 total affirmatives). Together, high and marginal food security constitute the category of “food secure” while low and very low food security constitute the category “food insecure”. A food insecurity raw score was also considered by adding the total number of affirmative responses to the 10 questions (range 0–10). Students who did not respond affirmatively to any of the three screening questions were automatically assigned a food insecurity score of 0.

Students also reported utilization of food assistance programs in the past 30 days (yes or no) including the Supplemental Nutrition Assistance Program (SNAP); the Special Supplemental Assistance Program for Women, Infants and Children (WIC); food banks or food pantries; or the Temporary Assistance for Needy Families (TANF) program.

Housing Security Status

Housing security in the past year was measured using a nine-question instrument developed and recommended by the Hope Center for College, Community, and Justice [25]. The measure assesses indicators of housing insecurity including difficulty paying rent or mortgage; receiving a summons to appear in housing court; not paying the full amount of a gas, oil, or electricity bill; and moving in with other people, even for a little while, because of financial problems. In accordance with Hope Center practice, students were coded as housing insecure if they responded affirmatively to at least one of the nine items. A housing insecurity raw score was also calculated by summing the number of affirmatives to the nine indicators (range 0–9).

Mental and Physical Health Measures

Symptoms of anxiety and depression over the past two weeks were assessed using the Generalized Anxiety Disorder Screener-2 (GAD-2) and the Patient Health Questionnaire-2 (PHQ-2), respectively. The GAD-2 assesses frequency of “feeling nervous, anxious, or on edge” and “not being able to stop or control worrying” over the past two weeks (0 = not at all, 1 = several days, 2 = more than half the days, 3 = nearly every day) [26]. Higher scores indicate more severe anxiety symptoms and a score of 3 or greater indicates the potential for an anxiety disorder. The PHQ-2 assesses frequency of having “little interest or pleasure in doing things” and “feeling down, depressed, or hopeless” in the past 2 weeks (0 = not at all, 1 = several days, 2 = more than half the days, 3 = nearly every day) [27]. Higher scores indicate more severe symptoms of depression, and a score of 3 or greater indicates the potential presence of depression.

Next, the Centers for Disease Control and Prevention (CDC) four-item Healthy Days Core Module was utilized to assess students’ self-reported health [28]. First,

students indicated if their health in general was excellent, very good, good, fair, or poor. Response options of “I don’t know”, and “I do not want to answer this question” were also provided. For analysis, response options of excellent, very good, and good were combined to indicate “good” health and responses options of fair, poor, and I don’t know were combined to indicate “fair/poor” health. Students then answered how many days out of the past 30 their physical health was not good and how many days out of the past 30 their mental health was not good. Finally, students indicate how many days out of the past 30 poor physical or mental health kept them from doing usual activities such as self-care, work, or recreation.

Statistical Analysis

Categorical variables are presented as frequency and percentage. Continuous variables are presented as mean and standard deviation. Chi-square tests were utilized to examine differences in screening positive for anxiety and depression by food security status (food secure vs food insecure) and housing security status (housing secure vs housing insecure).

Multiple logistic regression was then utilized, adjusting for age, gender, sexuality, race/ethnicity, and low-income status, to examine associations between food security status and housing security status and anxiety, depression, and fair/poor health. In logistic regression models, food security status was examined as a two-category predictor (food insecure vs food secure) and as a four-category predictor (very low, low, and marginal vs high food security). Housing security was examined as a two-category predictor only (housing insecure vs housing secure). Logistic regression model outcomes included anxiety (GAD-2 score ≥ 3 indicating anxiety coded as 1 vs GAD-2 score < 3 indicating no anxiety coded as 0), depression (PHQ-2 score ≥ 3 indicating depression coded as 1 vs PHQ-2 score < 3 indicating no depression coded as 0), and self-rated health (fair/poor health coded as 1 vs good health coded as 0).

Finally, multiple linear regression was utilized to examine predictors of food insecurity score, housing insecurity score, and an overall basic needs insecurity score. The basic needs insecurity score was created by adding affirmative responses to all food insecurity ($n = 10$) and housing insecurity ($n = 9$) indicators and ranged from 0–19 with higher scores indicating more severe basic needs insecurity. To further examine magnitude and direction of associations between predictors and basic needs insecurity scores, unadjusted linear and logistic regression were utilized. All analyses were conducted using SAS software, Version 9.4 of the SAS System for Windows.

Results

Of the 8000 students sent recruitment emails, 833 participated in the survey yielding a response rate of 10.4%. Data were missing for housing security status and mental health indicators for 16 and 17 participants, respectively, and are reported as such.

Table 1 shows the demographic makeup of the study sample. The average age was 28.3 years (SD = 10.0), and 45.7% ($n = 381$) were 26 years or older. The majority of participants' self-reported gender was female ($n = 535$, 65.8%) and most were Hispanic ($n = 333$, 40.0%) or White ($n = 310$, 37.2%). Most participants reported straight/heterosexual ($n = 603$, 74.4%) as their sexual orientation. Most participants were undergraduate students, 530 (64.4%) were employed, 661 (79.4%) had no child or adult dependents, and 356 (42.7%) were considered low-income.

Food and Housing Security Status

In this sample, 25.6% were classified as food insecure in the past 30 days and of those, 125 (15.0%) experienced very low food security. Housing insecurity was more prevalent with 356 students (43.6%) experiencing housing insecurity in the past year. Among all students, nearly half ($n = 404$, 49.5%) experienced food or housing insecurity, while 160 (19.6%) experienced the double burden of both food and housing insecurity. Thirteen percent ($n = 108$) of participants reported using SNAP in the past 30 days; fewer reported using a food bank or food pantry ($n = 45$, 5.4%), WIC ($n = 16$, 1.9%) or TANF ($n = 2$, 0.2%).

General Health Status

The majority of students rated their general health as good ($n = 304$, 37.4%); however, 166 (20.4%) rated their health as fair and 45 (5.5%) rated their health as poor. On average, students reported their physical health was not good on 4.2 days (SD = 6.9) over the past month and that their mental health was not good on 11.2 days (SD = 9.9) over the past month. In addition, students were kept from usual activities such as self-care, work, or recreation due to poor physical or mental health on an average of 7.2 days (SD = 8.1) over the past month.

Mental Health Status

In the full sample, mean GAD-2 score was 2.76 (SD = 2.06) and mean PHQ-2 score was 2.16 (SD = 1.97). Among the 816 participants who provided health data, 395 (48.4%) screened positive for anxiety based on a GAD-2 score of 3

Table 1 Demographic characteristics of undergraduate and postgraduate student participants ($n = 833$)

	<i>n</i>	%
Age category (mean = 28.3, SD = 10.0 years)		
18–20	179	21.5
21–25	273	32.8
≥ 26	381	45.7
Gender identity ^a		
Female	535	65.8
Male	246	30.3
Transgender, gender fluid, or other gender	32	3.8
Race and ethnicity		
American Indian/native American	57	6.8
Asian	39	4.7
Hispanic	333	40.0
International student	45	5.4
White	310	37.2
Other or more than one race/ethnicity	49	5.9
Sexual orientation ^b		
Bisexual	115	14.2
Gay or lesbian	44	5.4
Straight/heterosexual	603	74.4
Not sure or other	49	6.0
Student status		
Associates	55	6.6
Undergraduate	499	59.9
Graduate or professional	279	33.5
Employment status ^c		
Employed	530	64.4
Not employed, looking for work	128	15.6
Not employed, not looking for work	122	14.8
Not allowed to work	43	5.2
Dependents		
No dependents	661	79.4
One or more child dependents	117	14.1
One or more adult dependents	36	4.3
Child and adult dependents	19	2.3
Pell grant eligibility		
Yes	356	42.7
No	234	28.1
Not applicable	243	29.2
Food security status (mean score = 1.77, SD = 2.76)		
Food secure	620	74.4
High food security	490	58.8
Marginal food security	130	15.6
Food insecure	213	25.6
Low food security	88	10.6
Very low food security	125	15.0
Housing security status (mean score = 0.89, SD = 1.32)		
Housing secure	461	56.4
Housing insecure	356	43.6

^a20 missing responses for gender

^b22 responses missing for sexual orientation

^c10 responses missing for employment

or higher, and 278 (34.1%) screened positive for depression based on a PHQ-2 score of 3 or higher. Among all students, 423 (51.8%) screened positive for either anxiety or depression, and 250 (30.6%) screened positive for both anxiety and depression.

Food and Housing Insecurity and Health

Seventy-five percent of food insecure students screened positive for anxiety ($n = 156$) compared to 39.3% ($n = 239$) of food secure students ($p < 0.001$). Fifty-six percent ($n = 116$) of food insecure students screened positive for depression compared to 26.6% ($n = 162$) of food secure students ($p < 0.001$). Students who were housing insecure also had higher degrees of GAD-2 and PHQ-2 scores indicating anxiety and depression. Nearly two-thirds of housing insecure students screened positive for anxiety ($n = 233$, 65.5%) compared to 35.2% ($n = 162$) of housing secure students ($p < 0.001$). Similarly, 49.2% ($n = 175$) of housing insecure students screened positive for depression compared to just 22.4% ($n = 103$) of housing secure students ($p < 0.001$).

Shown in Table 2, multiple logistic regression analyses, adjusting for age, gender, sexuality, race and ethnicity, and low-income status revealed strong associations between food and housing insecurity and anxiety, depression, and fair/poor health. Food insecure students had 4.35 (95% CI 2.99, 6.34) times the odds of screening positive for anxiety, 3.18 (95% CI 2.25, 4.50) times the odds of screening positive for depression, and 2.84 (95% CI 1.99, 4.04) times the odds of reporting fair/poor health than food secure students. Similarly, housing insecure students had 3.43 (95% CI 2.50, 4.69) times the odds of anxiety, 3.16 (95% CI 2.29, 4.35) times the odds of depression, and 2.81 (95% CI 2.00,

3.96) times the odds of fair/poor health compared to housing secure students. Compared to students with high food security, those with very low food security had the highest odds of anxiety, depression, and fair/poor health. Even students with marginal food security, classified as food secure despite some degree of worry about food, had significantly higher odds of anxiety, depression, and fair/poor health than students with high food security.

Predictors of Basic Needs Insecurities

Table 3 shows results of exploratory multiple regression analyses. A full model with all predictors [GAD-2 raw score, PHQ-2 raw score, age, gender, sexuality, race and ethnicity, dependents, low-income status, employment status, program (undergraduate vs postgraduate), self-rated health, and SNAP use] explained 24.9% of the variability in raw food insecurity score. After removing non-significant predictors ($p > 0.10$), GAD-2 score, PHQ-2 score, age, race/ethnicity, low-income status, employment status, program, and self-rated health explained 23.6% of variability in food insecurity score. Full models predicted 26.8% of variability in housing insecurity score and 30.7% of variability in the basic needs insecurity score. The reduced model predicting basic needs insecurity score included GAD-2 score, PHQ-2 score, age, sexuality, race and ethnicity, dependents, low-income status, employment status, self-rated health, and SNAP use (r -square = 0.303). Across all models, F -values revealed GAD-2 scores, age and SNAP use were the strongest predictors of food, housing, and basic needs insecurity severity. Interestingly, SNAP use was not associated with food insecurity score, but was among the strongest predictors of housing insecurity score.

Table 2 Multiple logistic regression analyses examining food and housing security status as predictors of anxiety, depression, and fair/poor health

	Anxiety ^a		Depression ^b		Fair/poor health ^c	
	aOR	95% CI	aOR	95% CI	aOR	95% CI
Food security status						
High	Ref		Ref		Ref	
Marginal	2.03	1.34, 3.09	1.89	1.23, 2.91	1.79	1.12, 2.83
Low	3.84	2.27, 6.49	2.22	1.35, 3.64	2.18	1.30, 3.66
Very low	6.38	3.89, 10.47	5.41	3.47, 8.44	4.34	2.78, 6.77
Food security status						
Food secure	Ref		Ref		Ref	
Food insecure	4.35	2.99, 6.34	3.18	2.25, 4.50	2.84	1.99, 4.04
Housing security status						
Housing secure	Ref		Ref		Ref	
Housing insecure	3.43	2.50, 4.69	3.16	2.29, 4.35	2.81	2.00, 3.96

aOR adjusted for age, gender, sexuality, race/ethnicity, and Pell grant eligibility

^aGAD-2 score ≥ 3

^bPHQ-2 score ≥ 3

^cHealth rated as “Poor”, “Fair” or “I don’t know”

Table 3 Exploratory multiple regression models predicting food insecurity score, housing insecurity score, and a basic needs insecurity score

	Food insecurity score (0–10)				Housing insecurity score (0–9)				Basic needs insecurity score (0–19)			
	Full (n = 807)		Reduced (n = 812)		Full (n = 807)		Reduced (n = 807)		Full (n = 807)		Reduced (n = 807)	
	F value	p-value	F value	p-value	F value	p-value	F value	p-value	F value	p-value	F value	p-value
GAD-2 score	12.95	0.0003	14.77	0.0001	12.73	0.0004	14.51	0.0002	17.42	<0.0001	17.38	<0.0001
PHQ-2 score	4.47	0.0347	5.20	0.0229	4.81	0.0285	4.65	0.0313	6.20	0.0130	6.54	0.0107
Age	8.03	0.0047	5.62	0.0180	11.18	0.0009	10.17	0.0015	12.15	0.0005	9.99	0.0016
Gender	0.60	0.5505			1.71	0.1822			0.68	0.5094		
Sexuality	1.70	0.1664			3.91	0.0087	5.70	0.0007	2.89	0.0346	3.38	0.0178
Race/ethnicity	3.29	0.0060	3.42	0.0046	2.13	0.0601	1.89	0.0946	3.62	0.0030	3.59	0.0032
Dependents	1.79	0.1484			3.57	0.0138	3.37	0.0180	2.71	0.0438	2.56	0.0542
Pell eligibility	3.81	0.0225	5.24	0.0055	1.83	0.1605			3.74	0.0241	3.80	0.0227
Employment	4.96	0.0020	5.19	0.0015	9.46	<0.0001	9.47	<0.0001	8.30	<0.0001	7.89	<0.0001
Program	3.03	0.0823	3.40	0.0654	0.46	0.4962			2.65	0.1039		
Self-rated health	4.35	0.0007	4.62	0.0004	5.44	<0.0001	5.89	<0.0001	5.34	<0.0001	5.60	<0.0001
SNAP use	4.47	0.0349			11.99	0.0006	15.64	<0.0001	8.77	0.0032	9.19	0.0025
R-square	0.249		0.236		0.268		0.261		0.307		0.303	
Coeff var	137.29		138.17		129.94		130.14		115.95		116.03	
Root MSE	2.44		2.45		1.15		1.16		3.09		3.10	

Unadjusted linear regression models were then utilized to examine the magnitude and directionality of associations between basic needs insecurity scores and GAD-2 scores reflecting anxiety symptom severity and age. GAD-2 score was significantly and positively associated with food insecurity score ($\beta = 0.492$, r -square = 0.135, $p < 0.0001$), housing insecurity score ($\beta = 0.21824$, r -square = 0.116, $p < 0.0001$), and the combined basic needs insecurity score ($\beta = 0.71047$, r -square = 0.161, $p < 0.0001$), suggesting more severe anxiety symptoms were associated with more severe insecurities. Age was not associated with food insecurity score or basic needs insecurity score but was significantly and positively associated with housing insecurity score ($\beta = 0.01144$, r -square = 0.0074, $p = 0.01$). Unadjusted logistic regression models were utilized to examine the magnitude and directionality of the association between SNAP use as a binary predictor (yes vs no) and food security and housing security status as binary outcomes. Students who reported using SNAP had significantly higher odds of food insecurity (OR = 2.26, 95% CI 1.49, 3.45) and housing insecurity (OR = 2.86, 95% CI 1.87, 4.37) compared to non-SNAP users.

Discussion

Food and housing insecurity continue to burden college and university students in the United States. In this sample of undergraduate and postgraduate students, 25.6% were food insecure, 43.6% were housing insecure, and 19.6%

were both food and housing insecure in spring 2021. Basic needs insecurities were strongly associated with worse physical and mental health, particularly anxiety. Even students with marginal food security had higher odds of anxiety, depression, and rating health as fair or poor compared to students with high food security. A novel basic needs insecurity score, including 19 indicators of food and housing insecurities, revealed GAD-2 score, a measure of anxiety symptom severity, was the strongest predictor, explaining approximately 16% of variability.

Estimates of the burden of basic needs insecurities among college and university students vary widely across studies and our finding that just over one in four students was food insecure is lower than national estimates [3, 5, 21]. Discrepancies could be due to differences food insecurity measurement, differences in populations studied, and displacement of students due to the COVID-19 pandemic. Students may have been utilizing other strategies to acquire food such as living and eating with parents or family members or had pandemic-related increases in SNAP and unemployment benefits. The most vulnerable students may have dropped out of school completely since food insecurity is associated with dropping out of school, particularly among underrepresented minority students [12]. Interestingly, students who reported using SNAP had higher odds of both food and housing insecurity than students who did not use SNAP. Targeted interventions providing comprehensive basic needs assistance to SNAP users may be a good starting point for universities and community organizations.

Associations between food and housing insecurity and health outcomes found in this study are consistent with the current basic needs literature [3, 5, 8, 10, 11, 14, 29–33]. Food insecure students have higher odds of poor sleep quality [5, 10], high stress [10, 14], anxiety symptoms [11, 14, 29, 33], depression symptoms [8, 11, 14, 29, 32, 33], fair or poor self-rated health [3, 11, 18], more days with poor mental health [5], more days with poor physical health [5], and disordered eating behaviors [10].

Just two studies have examined impacts of housing insecurity on health-related outcomes, finding housing insecure students have higher odds of anxiety symptoms [11], depression symptoms [11], and fair or poor self-rated health [3, 11]. It is important to note that most studies examine food and housing security as binary variables; however, this study and a qualitative study of college students on the west coast of the United States found even students with marginal food security reported stress and anxiety related to the inability to eat healthy foods and future health issues [30]. Marginal food security is classified as “food secure”, yet students may still experience mental health impacts from the stress and worry of acquiring meals. In this study, marginal food security also significantly increased odds of depression and fair to poor self-rated health compared to high food security.

Impacts of food insecurity, housing insecurity, and multiple basic needs insecurities on health are critical to consider since these effects may actually drive relationships between insecurities and poor academic performance [31]. A single study has examined the impacts of multiple basic needs insecurities (food, housing, and financial insecurities), finding experiencing all three significantly increased anxiety and depression, fair or poor health, and lower GPA, adjusting for students’ sociodemographic characteristics [11]. The inclusion of a basic needs insecurity score in this study is a novel approach. Assessing basic needs insecurity as a continuous variable with multiple components provides insight into severity of insecurities, rather than the traditional binary approach (food secure vs food insecure and housing secure vs housing insecure). We recommend developing and fully validating a comprehensive basic needs insecurity scale, including variables previously identified by students such as food, housing, mental health, sleep hygiene, and transportation [22]. Access to healthcare and other social risk factors may also be important components of a comprehensive basic needs insecurity scale [34].

Considering the COVID-19 Pandemic

The COVID-19 pandemic has affected food insecurity and housing stability pronouncedly, especially among underrepresented groups and college and university students [35–38]. The pandemic has also undoubtedly affected young adults’ mental health [39]. Changes in housing and employment

status due to the closure of college campuses and non-essential business may have even resulted in students becoming newly food insecure [36]. Food and housing insecurity due to COVID-19 may actually be the strongest predictors of anxiety and depression among university students [40]. The combination of pandemic-related housing displacement, loss of income or employment, and mental stress likely contribute to food and housing insecurity, which in turn, could exacerbate mental health concerns. While undoubtedly acutely helpful, it appears increases in SNAP and other federal assistance programs during COVID-19 may not have provided a complete safety net since students using SNAP had higher odds of both food and housing insecurity in this sample.

Limitations

Limitations of this study must be acknowledged. Data were collected cross-sectionally in April 2021 at a single university, thus results may not be generalizable to all university students. Directionality of associations between food and housing insecurity and health also cannot be assumed. Students were selected to participate in the study through stratified random sampling; however, participants could have submitted multiple or false responses to the online survey. The sample did, however, represent the university’s demographic composition in spring 2021 well. Response bias and impacts of the COVID-19 pandemic must also be considered. Students experiencing more severe food and housing insecurity, or more severe mental health concerns, may have been less likely to participate, due to stigma or lack of time or ability to complete the survey. The university was primarily remote during the spring 2021 semester and students may have been living with family off-campus, potentially decreasing food and housing insecurities. Finally, while the examination of a basic needs insecurity score was novel, the score has not been validated or used in any other studies. Moreover, the basic needs insecurity score combined the USDA 10-item food security measure which assessed food security in the past 30 days, while the 9-item housing security measure assessed indicators of housing instability in the past year. Consistent measurement periods should be used in future investigations of comprehensive basic needs insecurities. Despite limitations, results still strongly suggest a public health crisis among university students in the United States.

Future research must include the development of interventions, with student, faculty, and university administration input, and longitudinal analyses of impacts. Cross-sectional data are helpful to establish the magnitude of concern and associations with health, but multi-institutional cohort studies and randomized controlled trials are needed to understand how to best implement solutions and determine impacts of basic needs insecurities on dietary

quality, mental and physical health indicators, and academic achievement. Relying on traditional “solutions” like food assistance programs, food banks, and on-campus food pantries is likely not enough to eliminate food insecurity considering the insufficient amounts of nutrient dense foods available [41]. Interventions addressing housing insecurity and homelessness among students have yet to be widely studied.

Conclusion

The growing crisis of basic needs insecurities among college and university students warrants the immediate development and implementation of solutions. On and off-campus food assistance programs including food pantries, educational initiatives on academic and health impacts, and destigmatizing food and housing insecurity are immediate solutions every institution should adopt while more comprehensive, multifaceted interventions are developed [7, 11, 42]. Student health centers may consider implementing short food and housing insecurity screeners alongside assessments of students’ mental and physical health. A two-item food security screener has been developed and validated for clinical practice [43]. Brief housing security and homelessness measures must also be developed and validated in student populations. If widespread screening is implemented, however, effective short- and long-term solutions to basic needs insecurities must also be ready for implementation. Food and housing insecurities can no longer be deemed “rites of passage” and must be considered physiological basic needs for every student at every college and university.

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Data Availability The data that support the findings of this study are available from the corresponding author upon request.

Code Availability Not applicable.

Declarations

Conflict of Interest The authors have no relevant financial or non-financial interests to disclose.

Ethical Approval This study was approved by the University of New Mexico Institutional Review Board (Approval #22619).

Consent to participate All participants provided consent to participate by starting the survey. The study received a waiver of consent documentation.

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