



The Effect of COVID-19 on Students Food Security and Eating Habits at California State University, Fresno



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Submission: September 22, 2021; **Published:** November 29, 2021

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Abstract

Introduction: Studies consistently demonstrate that college students have higher levels of food insecurity compare to other US households. Fresno and Bakersfield, two of the biggest cities in Central Valley of California, are among the nations' top urban cities reporting the highest amounts of hunger. Food insecurity has been linked with lower dietary quality, poor mental health, and lower academic performance among students. It is well established that many college students experience food insecurity and this condition is exacerbated due to the COVID-19 pandemic, yet, the literature is limited regarding how food insecurity specifically impacts college students' eating habits and food accessibility. The objective of this study was to assess the effect of COVID-19 on student's food security and eating habits at California State University, Fresno (Fresno State).

Method: A self-administered questionnaire was developed and sent to Fresno State students. A total of 406 students completed the survey. Upon completion of the consent process online, each student was asked to complete 30 questions. Including sociodemographic questions, US Department of Agriculture modified version of the six-item Food Security questions, and questions regarding intake from protein, whole grain foods, water, fruits, vegetables, Sugar-Sweetened Beverages (SSB), and energy drinks. All questions have been set at two different timelines: February 2020 (before the Stay-at-home Order) and Spring 2021.

Results: Data were analyzed using IBM SPSS Statistics 26 and SmartPLS 3.0 Partial Least Square software. Overall, 55.7% of students showed food security in February 2020 compared to 55.3% in Spring 2021. The average score of food security was compared for February 2020 (score 2.17) to spring 2021 (score 2.28), and no statistically significant changes were observed. The food security construct was confirmed with confirmatory factor analysis (CFA) and a significant correlation was identified between food security and fruits, vegetables, proteins, water, SSBs, and energy drinks for February 2020, and the same pattern was identified for Spring 2021. There were no significant differences between food security and eating habits as of February 2020 compared to Spring 2021.

Discussion: The purpose of this study was to gain a better understanding of the effect of COVID-19 on Fresno State student's food security and eating habits. This study found no significant effects of the COVID-19 on food insecurity nor eating habits.

Conclusion: The present study has enhanced our understanding of the association between food security and eating habits, suggesting the need for further investigation of this relationship.

Keywords: Food Security, California State University, Fresno, Fresno State, Eating Habits, College students

Abbreviation: SBB: Sugar-Sweetened Beverages; CFA: confirmatory factor analysis; COVID-19: Coronavirus; USDA: United States Department of Agriculture; SNAP: Supplemental Nutrition

Introduction

Food Security

Food security, as defined by Gibson, is "regularly having enough food to eat; not just for today or tomorrow, but also next month and next year." [1]. The prevalence of food insecurity, the

opposite of food security, is influenced by many factors including: income, employment status, household structure as well as average wages, housing costs, unemployment, and unemployment insurance, and finally qualification guidelines and access to nutrition assistance programs [2]. The 2019 US Department of

Agriculture, Economic Research Service Report identified a total of 10.6% households in California experienced low food security and 3.9% experienced very low food security from 2016-2018 [2]. In particular in the Central Valley, which is comprised of Fresno, Kern, Kings, Madera, Mariposa, Merced, San Joaquin, Stanislaus, and Tulare counties, and is ironically considered one of the largest agricultural zones in the world [3,4] there is exceptionally low food security [5]. Fresno and Bakersfield were among the nations' top urban cities reporting the highest amounts of hunger [6]. In particular, children, homeless, elderly and college students have higher rates of food insecurity. In fact, Fresno is in the top 10% of all US Counties for food insecurity [6]. Lack of access to food, more specifically fruits and vegetables, placed both individuals and households at a greater risk for negative health outcomes and diet-related health conditions [3].

Several factors contribute to food insecurity in the Central Valley. These include a lack of financial support, food access, and built-in infrastructure. In regard to financial support, many coastal or urban areas with larger populations including Los Angeles and San Francisco, tend to attract a larger percentage of donors or the much sought-after non-profit dollars. Areas with smaller populations have less success in securing funding to help support at risk populations. Furthermore, dollars spent on short-term fixes, have had little effect on overall long term entrenched problems [4,5]. Secondly, the geography of the Central Valley contributes to the lack of access to healthy foods. Many neighborhoods would be considered to be "food deserts", which includes lack of access to affordable healthy foods like fresh produce [5]. The low income neighborhood residents rely on local corner markets, which lack fresh fruits and vegetables at an affordable price [5,6]. Living in more rural areas may be problematic for many families. Travel to grocery stores can be challenging, especially if they have to depend on public transportation. Lastly, most of the food that is grown in the Central Valley is packed and shipped outside of the Central Valley. Little food is retained in this area, making it cost prohibitive for the local residents [3]. The following will discuss the relationship between food security and more specifically college students.

Food Security and College Students

Studies continually demonstrate that college students have higher levels of food insecurity compared to other US households [7-9]. According to the Association of American Colleges & Universities (AAC&U), the majority of college students experience some type of food insecurity [10]. The College and University Basic Needs Insecurity: A National #RealCollege Survey 2019 Report found that more than 60% of college students had experienced some type of food insecurity throughout their college years [11]. Early data collected since the beginning of the COVID-19 pandemic by Owen et al shows an increase in food insecurity, in fact, April 2020 data indicated double the number of food insecure households [4]. The rate of food insecurity

is higher in younger [7,12], Black or Hispanic, low-income, those who receive financial aid, and housing insecure college students [7]. As shown by previous studies, food insecurity has been linked with lower dietary quality, poor mental health, and lower academic performance among students [13-17]. As shown by Alida Espinoza from "resno State, a university located in California's Central Valley, approximately 31% of the students surveyed between 2012 -2013 experienced food insecurity [18]. Based on the Crutchfield and Maguire's report on the Study of Students Basic Needs, in January 2018, 41.6% of California State University Students as a whole, reported food insecurity, of that 20% experienced low food security and 21.6% very low food security. More specifically, Fresno State students reported 43.7% food insecurity, and of those 23.8% experienced low food security and 19.9% very low food security, as respectively [14,19]. This report indicates that college students, especially, Fresno State, are an emerging population of food insecure with far reaching physical and mental health issues [14].

To further explain the implications of food insecurity, the Study of Basic Needs suggested that "students who report food insecurity and homelessness as a pattern scored more adversely on indicators of health, mental health, and days of inactivity." Several students reported that their poor health was associated with an inability to access cooked food, struggle to buy groceries because of insufficient money, decreased accessibility to desirable food, or they were unable to buy and prepare balanced meals [19]. Many college students only buy inexpensive/unhealthy food to feel full and limit feelings of hunger during classes [20]. Additionally, it is well established that college students are not consuming enough of the key nutrients found in foods such as fruits and vegetables; drinking adequate water, and consuming good quality protein rich foods. Too often, as individuals are emerging into adulthood, their eating habits change when they leave home, such as irregular meals (skipping breakfast), and eating more junk food type snacks. This is often a result of time constraints, high cost and, availability of healthy foods [21,22]. At the same time the consumption of sweets, energy drinks [23] and Sugar-Sweetened Beverages (SSB) [24] is relatively high among college students. Results of the Spring 2021 ACHA-National College Health Assessment (ACHA-NCHA) for Fresno State indicated that students were representative of these behaviors. For example, 69.8% of the students who were referred to the Health and Counseling Center reported drinking one or more SSBs in the last seven days; 20.7% of them described consuming at least one energy drink per day in the past thirty days; while only 22.2% of them consumed at least three servings of fruits per day; and only 33.7% of them had at least three servings of vegetables per day over the last seven days [25]. Furthermore, 41.6% of student respondents reported food insecurity (low or very low food security) [19]. The food security responses were calculated based on the US Household Food Security Survey Module: Six-Item Short Form from the USDA Economic Research Service [20].

It is important to note that these data were collected during the COVID-19 pandemic and only reflect the condition of students who were self-referred to the Health and Counseling Center and may not represent an accurate and representative distribution of Fresno State students due to the limited referral and specific criteria of participants.

The following section will discuss food security and COVID-19

Food Security and COVID-19

As of March 2020, the World Health Organization declared that the Coronavirus (COVID-19) is a pandemic. As a result, many changes needed to take place in order to minimize the spread and maximize personalized health. (<https://www.who.int/>). COVID-19 has changed the way individuals and families interact with the outside world. Mandates by the California Governor's office has forced people to shelter in place to prevent the further spread of this novel virus. This has resulted in school closures, increased unemployment rates, and impacted financial security [26,27]. Data collected from earlier reports during the COVID-19 pandemic suggest that food insecurity has accelerated, even prior to pre-pandemic levels [7,28,29]. Indeed, college students are one of the high-risk populations for food insecurity who may be disproportionately impacted by the COVID-19 pandemic [7]. Although, food insecurity levels have decreased slightly from 2017-2018; 2 however, the concern is that given the negative impacts of COVID-19 on the economy, the number of college students experiencing low food security and very low food security is expected to increase as evidence by early investigations [7,29-31].

Furthermore, many students work part-time or full-time in the foodservice and hospitality industries, which has been highly affected by the economic shutdown created by the COVID-19 pandemic [32]. Likewise, many college students may not qualify for federal food assistance programs (Supplemental Nutrition Assistance Program (SNAP; formerly known as food stamps); a program that helps reduce food insecurity. The reason is due to the inability to meet the minimum requirements of 20 hours per week for three or more months prior to becoming eligible for federal food assistance [7]. Given the evidence that strongly links an increased need for food assistance during the COVID-19 pandemic, yet not meeting the basic requirements, places college students at an increased risk for food insecurity and manifestation of negative consequences. Additionally, the COVID-19 pandemic resulted in closures of campus dining halls and cafeterias, and forced students to plan, shop, prepare and cook meals on their own time. Inadequate financial resources coupled with an inability to access safe and healthy foods, will require a closer examination of food insecurity within the college students and the effect of food insecurity on eating habits and food choices.

While it has been well established that many college students experience food insecurity due to the COVID-19 pandemic, yet, the literature is limiting regarding how food insecurity specifically impacts their eating habits and food accessibility.

Therefore, the objectives for this study were as follows:

- a. Compare the prevalence of food insecurity at California State University Fresno in February 2020 (before the COVID-19 lockdown) and Spring 2021 (one year after the onset of the COVID-19 pandemic).
- b. Examine the correlation between the intake of fruits, vegetables, water, proteins, SSBs, and energy drinks with the degree of food insecurity and,
- c. evaluate the changes in dietary habits due to food insecurity in February 2020 (before the COVID-19 lockdown) and Spring 2021 (one year after the onset of the COVID-19 pandemic).

Methodology

Target Population, the Sample size

The California State University Fresno's fall 2020 enrollment census shows a total of about 25,341 students. Therefore, the required sample size for this study was 378 complete surveys to achieve a 95% confidence level with a +/- 5% confidence interval based on similar studies [31,33,34].

Consent and Procedure

A self-administered questionnaire was developed and utilized for this study using Qualtrics: https://fresnostate.co1.qualtrics.com/jfe/form/SV_bwj1Z2wygDV68m1

Upon completion of the consent process online, each student was asked to complete 30 questions. Including four sociodemographic questions, five US Department of Agriculture (USDA) modified version of the six-item Food Security (FSSM) questions, seven ACHA's NCHA survey which included questions for: fruits, vegetables, Sugar-Sweetened Beverages (SSB), and energy drinks. Likewise, questions regarding protein, whole grain foods, and water were included based on the previous studies of low and/or low-quality consumption of stated food groups by college students [14,18,22,35]. All of the questions have been set at two different timelines: February 2020 (before the Stay-at-home Order) and Spring 2021 (see Appendix). [30,31]. Most of the questions used in this survey originally were used by Anna Cahn, as her dissertation project titled "The COVID-19 Pandemic and University of Oregon Students' Food Security and Eating Behaviors" [36] and was prepared based on feedback from key state-level agencies and hunger relief organizations as well as a review of relevant literature [37,38]. The collected data was analyzed and evaluated to estimate eating habits and intakes of food groups-specifically looking at proteins, fruits, vegetables, whole grains, water, SSBs, and energy drinks.

Results

Statistical Analysis

Data were analyzed using IBM SPSS Statistics 26 and SmartPLS 3.0 Partial Least Square software. All sociodemographic variables were converted to contingency tables and summarized with frequencies and proportions. Contingency tables were adapted to descriptive statistics related to the food security level. Correlation coefficients between all variables were calculated to demonstrate the interrelationships of the multivariate analysis. Statistical significance was set at $P < 0.05$.

Sociodemographic characteristic

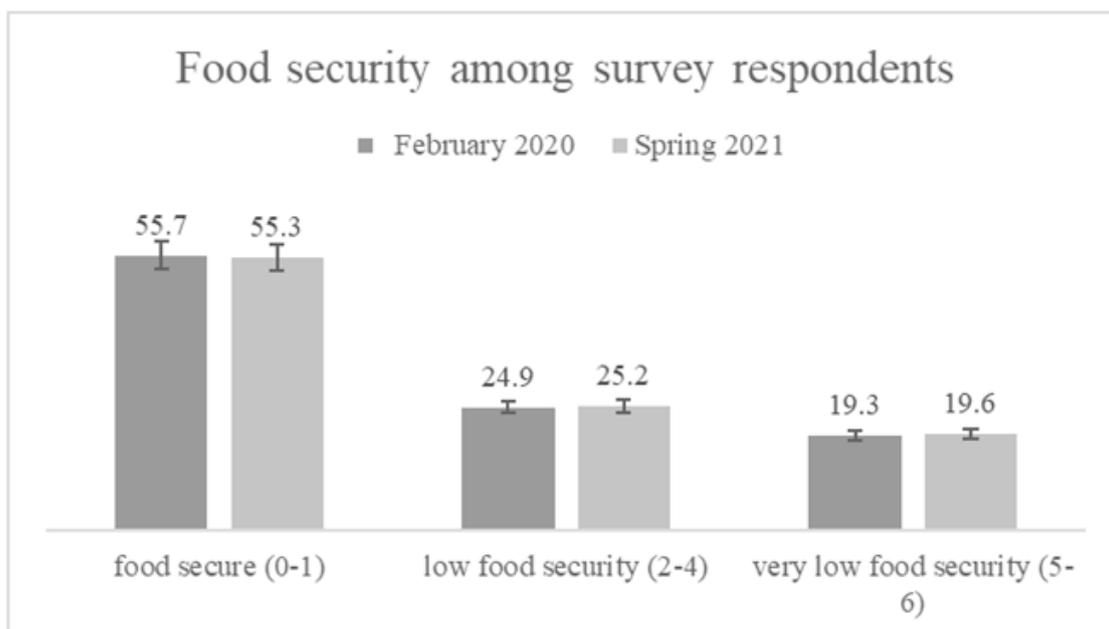
25,341 Fresno State students were eligible to participate in this study. The survey was sent as a central email from the Office of Institutional Effectiveness to 5,000 eligible students. A total of 409 completed surveys were collected. The overall response rate was 8.1%, of those 409 surveys, only three surveys were incomplete. A final number of 406 participants were counted as the sample size, which met the requirements of 378 completed surveys. The sociodemographic and other characteristics of survey respondents are presented in Table 1. Showing most of the participants were Hispanic (54.2%) females (79.6%).

Table 1: Sociodemographic and other characteristics of survey respondents (n=406).

Descriptive Variables	Total survey participants n=406		Total campus n=25,341	
	N	Percentage	N	Percentage
Gender identity				
Male	73	18	10,022	39.5
Female	318	79.6	15,313	60.4
Nonbinary	1	1.7	6	0
Transgender Male	1	0.2	N/A	N/A
Transgender Female	1	0.2	N/A	N/A
Agender	1	0.2	N/A	N/A
Race/ethnicity				
Hispanic	220	54.2	13,912	54.9
Non-Hispanic	186	45.8	11,429	45.1

Overall changes in Food Security

Table 2: Frequency of responses to questions on the 6-Item USDA Food Security Survey Module (n = 406).



The frequency of food security was measured using the USDA 6-items questionnaire (FSSM). Food security categories (high, marginal, low, very low) were assigned matching to the USDA scoring guidelines [39]. The term food insecurity refers to the combined categories of low and very low food security. One of the questions asking about the frequency of cutting the size of meals or skipping meals due to shortage of money (How often did this happen - almost every month, some months, but not every month, or in only 1 or 2 months) was combined into another question as suggested by USDA guideline for self-administration surveys, and responses were scored accordingly [39]. The food security status was assigned as follows: Raw Score 0-1-High or marginal food security, Row score 2-4-Low food security, Raw score 5-6-Very low food security. The results are summarized in Table 2, in general, 55.7% of students showed food security before February 2020 compared to 55.3% in Spring 2021. Among the remaining students, 24.9% of them showed low and 19.3% very low food security in February 2020 compared to 25.2% low and 19.6% very low food insecurity according to the 6-item USDA FSSM. Likewise, the average score of food security was compared for

February 2020 (score 2.17) to spring 2021 (score 2.28), and no statistically significant changes were observed.

Relationship between food security and eating habits

To further investigate the effect of food security on eating habits, a structural equation modeling-partial least squares (Smart-PLS) model was developed using SmartPLS 3.0 software. Smart-PLS is part of the statistical structural model that identifies the relationship between multiple variables [40]. The PLS technique was used over other common covariance based Structural Equation Modeling (SEM) techniques due to the software strength with fewer identification issues [41]. Furthermore, it is possible to determine the standard regression coefficients for the pathways by Smart-PLS modeling [42]. In this model, the USDA six-item food security questionnaire was used as the independent variable, while key nutrient intake variables (those emphasized in the current study's introduction) were utilized as the dependent variables: fruits, proteins, whole grains, vegetables, water, energy drinks, and SSBs. Results of the path model are shown in Figure 1.

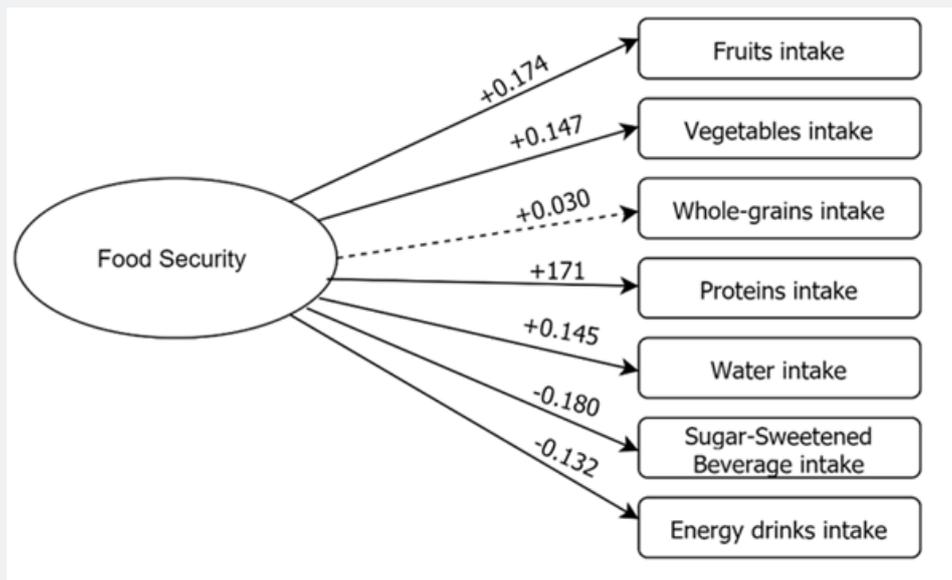


Figure 1: Food Security and Eating Habits.

The food security construct was confirmed with confirmatory factor analysis (CFA) with the help of the SmartPLS 3.0 software [43]. Hair et al. suggested accepting items with minimum loadings of 0.6. Here, the loadings of all six items were greater than 0.6, therefore individual item reliability was accepted [44]. Internal consistency was analyzed by using composite internal scale reliability. The food security construct also fulfilled the requirement of a minimum 0.7 alpha value for internal consistency [44]. Lastly, internal consistency was assessed by evaluating the

average variance extracted (AVE). Results indicate that there was an AVE above 0.5 for all variables, which fulfilled the requirement put forward by Fornell and Larcker [45]. As displayed in Figure 1, the structural model results omitting the influence of the interacting moderator variables. The beta path coefficients were positive for fruits, water, vegetables, proteins and negative for energy drinks and SSBs intakes. All of the P-values were statistically significant ($p < 0.05$) except for whole grains. Food Security had a positive influence on fruits, vegetables, water and

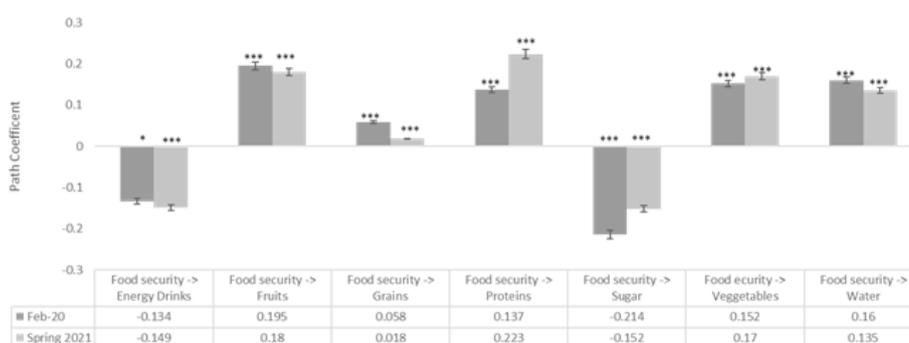
proteins intakes (beta=0.174, 0.147, 0.145, 0.171 respectively). Food security had a negative influence on energy drinks and SSBs intake (beta=0.132, 0.180 respectively).

Multigroup Analysis

A PLS-based multigroup analysis (MGA) was then conducted between two groups on the previous model to determine if these relationships differed for February 2020 and Spring 2021. One group originated prior to the COVID-19 pandemic (February 2020) and the other corresponded to the pandemic (Spring 2021). As shown in Table 3, a significant correlation was identified between food security and fruits, vegetables, proteins,

water, SSBs, and energy drinks in February 2020. Based on our findings when food security is low or very low consumption of fruits, vegetables, water, and protein foods is decreased, and the consumption of energy drinks and SSBs increased significantly. The correlation between whole grain consumption and food security was not significant. Likewise, the same pattern was identified for Spring 2021. As described in Table 4, there were no significant differences between food security and eating habits as of February 2020 compared to Spring 2021. Therefore, the relationship of food security and eating habits did not change during COVID-19 in Fresno State students.

Table 3: The correlation between eating habits and food insecurity before February 2020 and Spring 2021.



*P-value less than 0.05 and *** P-value less than 0.01

Table 4: Multigroup Analysis Results.

	Path Coefficients Differences	P-value
Food Security -> Energy Drinks	-0.012	0.884
Food Security -> Fruit	-0.016	0.807
Food Security -> Grains	-0.042	0.561
Food Security -> Protein	0.089	0.2
Food Security -> SSB	0.059	0.42
Food Security -> Vegetable	0.013	0.852
Food Security -> Water	-0.024	0.72

Discussion

The purpose of this study was to gain a better understanding of the effect of COVID-19 on Fresno State student’s food security and eating habits. Overall, this study tested the frequency of food security in February 2020 (before COVID-19 lockdown) and Spring 2021 (one year after the onset of the COVID-19 pandemic) on the effect of the COVID-19 shelter in place order on Fresno

State student’s food security level using the six-item USDA questionnaire. Based on our findings 55.7% of students were food secure in February 2020 compared to 55.3% in Spring 2021. This study shows 45% of Fresno State students experience food insecurity (low or very low) at any given time, regardless of the COVID-19 pandemic. This rate of food insecurity is ~11% higher than other similar studies when assessing the food insecurity of US college students [7,12,46] and ~23% higher than US households

food insecurity [2, 28, 47-50]. Additionally, the primary outcomes from this study indicated that there were no statistically significant differences in the effect of the COVID-19 pandemic and shelter-in-place order on the effects of food insecurity levels among Fresno State students. Results from this study illustrate that the COVID-19 pandemic and shelter in place order did not significantly affect the food insecurity level among Fresno State students. To date, there are several well-established programs to fight food insecurity at Fresno State, however, when comparing the results with previous studies (just put citation instead of putting 2012 again?), food insecurity continues to increase from 31% in 2012 to 45% in 2021 [18].

The purpose of this study was to gain a better understanding of the effect of COVID-19 on Fresno State student's food security and eating habits. Overall, this study tested the frequency of food security in February 2020 (before COVID-19 lockdown) and Spring 2021 (one year after the onset of the COVID-19 pandemic) to evaluate the effect of COVID-19 shelter in place order on Fresno State student's food security level using the six-item USDA questionnaire. Based on our findings 55.7% of students showed food security in February 2020 compared to 55.3% in Spring 2021. This study shows 45% of Fresno State students experienced food insecurity (low or very low). This rate of food insecurity is ~11% higher than other similar studies looking at the food insecurity in US college students [7, 12, 46] and ~23% higher than US households food insecurity [2,28,47-50]. Results from this study illustrate the COVID-19 pandemic and shelter in place order did not significantly affect the food insecurity level among Fresno State students. – already stated in the above paragraph [18].

Additionally, this study analyzed the relationship between food security and eating habits in February 2020 (before COVID-19 lockdown) and Spring 2021 (one year after the onset of the COVID-19 pandemic) to evaluate the eating habits pattern of Fresno State students and estimate how COVID-19 altered this pattern.

The results of the present study establish that there was a significant negative relationship between food security levels, and consumption of SSBs and energy drinks. Additionally, there was a positive relationship between food security and consumption of protein foods, fruits, water, and vegetables. These findings are in agreement with the recent report from Fresno State Health and Counseling Center [25]. Despite similarities with earlier research in terms of food security and eating habits within college students [14, 51-55] this study found no significant effects of COVID-19 on food insecurity nor eating habits. This finding may be explained by the higher price of fruits, vegetables and protein foods, lack of financial resources, lack of time [56], and higher waste of perishable foods due to transportation restrictions [57-59]. All of

these factors may contribute to a higher rate of SSBs and energy drinks intake and lower amount of fruits, vegetables and protein foods consumption.

This study represents the relationship between food security and eating habits in Fresno State student's for the first time. Likewise, this study highlights that, around 45% of Fresno State students suffer from food insecurity, thereby emphasizing the need for further investigation on other influential factors that contribute to this condition. Recognizing the multifactorial reasoning behind food insecurity is important prior to constructing evidence-based recommendations for practical and user-friendly interventions. Despite these limitations, these results make an important contribution to our understanding of Fresno State student eating habits and food security level. Although, previous studies demonstrate a higher level of food insecurity due to the COVID-19 pandemic [7,28-31,49,60,61] the results of this study clearly reveal that the Fresno State student's food security level was not significantly affected by COVID-19 shelter in place orders. In terms of future research, identifying best practices for improving eating habits and promoting food security among Fresno State students is essential. Suggested strategies may include implementation of cooking classes, grocery store shopping workshops, meal planning, budgeting and overall healthy living courses.

Conclusion

Our study findings for the COVID-19 shelter in place orders did not change the food security frequency in Fresno State students. However, the frequency of low and very low food security in Fresno State students remains at 45%, thereby indicating that almost half of the students surveyed at Fresno State suffer from food insecurity. The need for higher food availability and accessibility on campus remains to be a top priority for the overall health and wellbeing for students. The present study has enhanced our understanding of the relationship between food security and eating habits, stimulating the need for further investigation of factors contributing to this situation.

Acknowledgment

The authors would like to thank Dr. Matthew Zivot, Interim Director and Mr. Chris Hernandez, Senior Survey Research Analyst at Office of Institutional Effectiveness, California State University, Fresno for helping with survey distribution and Dr. Elizabeth Budd for her support and guidance in preparation of the initial survey, of which a version was used for this study. Results of the research project, conclusions, and recommendations written in this article are author's judgment and do not reflect Fresno State administration.

Appendix

Consent Forms

Questionnaire

California State University, Fresno

Informed Consent for Participation as a Subject in “Fresno State Student Food Security, Eating Habits and Nutrients intake during COVID-19” Survey

Introduction: You are invited to participate in a study conducted by Shabnam Pooya, Ph.D. and Lisa Herzig, Ph.D., RD, CDCES from the Food Science and Nutrition Department at California State University, Fresno. We hope to learn how COVID-19 shelter in place has affected your diet quality, access to foods, and food security status.

Purpose of the Study: The purpose of this research is to assess how the COVID-19 pandemic and stay at home order has affected Fresno State students food security (access to affordable, healthy foods), eating behaviors, and grocery store habits.

Description of the Study Procedures: Your participation in this study is voluntary and will include completing a 10-15 minute survey. You can skip any question you are uncomfortable answering or stop participating at any time, but you must complete 80% of the survey in order to be eligible for the gift card drawings. After completing the survey and providing your Fresno State email address (@mail.fresnostate.edu), you will be entered into drawings for up to one of 65 \$20 Walmart gift cards for your participation. Your survey answers will be kept confidential and your name and email address will not be attached to the answers you provide in the survey. If you have any questions about the study, please contact Dr. Pooya, California State University, Fresno, Department of Food Science and Nutrition, 5300 North Campus Drive, MS/FF17, Fresno, CA 93740, shabnampooya@csufresno.edu or Dr. Herzig, lherzig@csufresno.edu. Questions regarding the rights of research subjects may be directed to Dr. Jennifer Randles, Chair, CSU Fresno Committee on the Protection of Human Subjects, (559) 278-24.

Statement of Consent:

To continue, please indicate your consent to participate in this study below:

- i. I have read the consent information and I consent to participate in this study
- ii. I do not consent to be a part of this study

Contact information:

For questions about the research	Dr. Pooya, Dr. Levitt, or Dr. Herzig	559-278-5138 shabnampooya@csufresno.edu lherzig@csufresno.edu jlevitt@mail.fresnostate.edu
For questions about your rights as a research participant	IRB (Institutional Review Board; provides ethics oversight)	(559) 278-2448
For complaints or problems	Dr. Pooya or Dr. Herzig	559-278-5138
	IRB	(559) 278-2448/ marykelly@csufresno.edu

Sociodemographic questions

- i. What is your gender identity (e.g., male, female, transmasculine, transfeminine, gender- nonbinary, agender)? [write in box] (please specify)
- ii. Do you consider yourself to be Hispanic or Latino?
 - No, not Hispanic, Latino, or Latinx
 - Yes, Hispanic, Latino, or Latinx

- iii. What is your sexual orientation?
- Heterosexual
 - Bisexual
 - Pansexual
 - Lesbian
 - Gay
 - Queer
 - Other (please specify)
- iv. Do you have at least one child or other dependents (e.g., sick or elderly parent) who relies on you for care?
- Yes
 - No

On March 19, 2020, issued by Governor Gavin Newsom, issued a stay at home order to protect the health and well-being of all Californians and to establish consistency across the state in order to slow the spread of COVID-19. This executive order closed non-essential businesses like gyms, hair salons and in-person dining (still allowing takeout).

Food Security before the Stay at Home Order

Please select responses to the following 5 items that best match your experience during the month of February 2020 BEFORE the stay at home/shelter in place order.

- i. The food that I bought just didn't last, and I didn't have money to get more.
- Often true
 - Sometimes true
 - Never true
- ii. I couldn't afford to eat balanced meals.
- Often true
 - Sometimes true
 - Never true
- iii. Did you ever cut the size of your meals or skip meals because there wasn't enough money for food?
- Yes, almost every day
 - Yes, some days, but not every day
 - Only 1 or 2 days a month
 - No
- iv. Did you ever eat less than you felt you should because there wasn't enough money for food?
- Yes
 - No
- v. Were you ever hungry but didn't eat because there wasn't enough money for food?
- Yes
 - No

Food Security Currently

Please select responses to the following 5 items that best match your experience in the past month.

- a. The food that I buy just doesn't last, and I don't have money to get more.
 - Often true
 - Sometimes true
 - Never true
- b. I can't afford to eat balanced meals.
 - Often true
 - Sometimes true
 - Never true
- c. Do you ever cut the size of your meals or skip meals because there isn't enough money for food?
 - Yes, almost every day
 - Yes, some days, but not every day
 - Only 1 or 2 days
 - No
- d. Do you ever eat less than you feel you should because there isn't enough money for food?
 - Yes
 - No
- e. Are you ever hungry but don't eat because there isn't enough money for food?
 - Yes
 - No

Eating & Grocery Shopping Behaviors before the Stay at Home Order

Please select responses to the following 7 questions that best match your typical behaviors during the month of February 2020 BEFORE the stay at home/shelter in place order.

- i. How many servings of fruit did you eat on average per day? One serving is a medium piece of fresh fruit; ½ cup of fresh, frozen or canned fruit; ¼ cup of dried fruit; or ¾ cup of 100% fresh fruit juice
 - Drop down with numbers- 0 servings per day then drop down to 6 or more (max) 0 servings per day, 1,2,3,4,5, 6 or more servings per day
- ii. How many servings of vegetables did you eat on average per day? One serving is ½ cup of fresh, frozen or canned vegetables, ¾ cup 100% vegetable juice; or 1 cup salad greens.
 - Drop down with numbers- 0 servings per day then drop down to 6 or more (max) 0 servings per day, 1,2,3,4,5, 6 or more servings per day
- iii. How many servings of whole grain products did you eat on average per day? One serving is one slice of whole grain or whole wheat bread, ½ cup oatmeal, 1/3 cup brown rice, ½ cup whole wheat pasta, do not include regular pasta or white bread.
 - Drop down with numbers- 0 servings per day then drop down to 6 or more (max) 0 servings per day, 1,2,3,4,5, 6 or more servings per day
- iv. How many servings of protein foods did you eat on average per day? One serving is 3 oz (or the size and thickness of a smartphone or deck of cards) of chicken, beef, fish or pork, 2 whole eggs, 1/3 cup cooked beans or lentils, or 4 oz tofu
 - Drop down with numbers- 0 servings per day then drop down to 4 or more (max) 0 servings per day, 1,2,3,4 or more servings per day

v. How many total cups of plain water did you drink on average per day? Plain water includes plain tap water, water from a drinking fountain, water from a water cooler, bottled water and spring water. One serving is 8 oz or 1 cup of fluid water. (drop down of cups of water)

- Drop down with numbers- 0 servings per day then drop down to 9 or more (max) 0 servings per day, 1,2,3,4,5, 6, 7, 8, 9 or more servings per day

vi. How many servings of sugar sweetened beverages did you drink on average per day? One serving is 12 oz of soda; 8 oz of sugar-sweetened, flavored water or sports drink; 6 oz of sugar-sweetened coffee, tea, or juice.

- Drop down with numbers- 0 servings per day then drop down to 6 or more (max) 0 servings per day, 1,2,3,4,5, 6 or more servings per day

vii. In the month of February 2020, how many days did you drink energy drinks or energy shots (for example: Red Bull, Monster, Full Throttle, 5 Hour Energy, Rockstar Energy Shot, or Full Throttle Energy Shot, etc.)

- (drop down with 0-29) 0 days, 1,2,3,4,.... 29 days

Eating & Grocery Shopping Behaviors Currently

Please select responses to the following 7 questions that best match your typical behaviors Currently.

a. How many servings of fruit do you eat on average per day? One serving is a medium piece of fresh fruit; ½ cup of fresh, frozen or canned fruit; ¼ cup of dried fruit; or ¾ cup of 100% fresh fruit juice

- Drop down with numbers- 0 servings per day then drop down to 6 or more (max) 0 servings per day, 1,2,3,4,5, 6 or more servings per day

b. How many servings of vegetables do you eat on average per day? One serving is ½ cup of fresh, frozen or canned vegetables, ¾ cup 100% vegetable juice; or 1 cup salad greens.

- Drop down with numbers- 0 servings per day then drop down to 6 or more (max) 0 servings per day, 1,2,3,4,5, 6 or more servings per day

c. How many servings of whole grain products do you eat on average per day? One serving is one slice of whole grain or whole wheat bread, ½ cup oatmeal, 1/3 cup brown rice, ½ cup whole wheat pasta, do not include regular pasta or white bread.

- Drop down with numbers- 0 servings per day then drop down to 6 or more (max) 0 servings per day, 1,2,3,4,5, 6 or more servings per day

d. How many servings of protein foods do you eat on average per day? One serving is 3 oz (or the size and thickness of a smartphone or deck of cards) of chicken, beef, fish or pork, 2 whole eggs, 1/3 cup cooked beans or lentils, or 4 oz tofu

- Drop down with numbers- 0 servings per day then drop down to 4 or more (max) 0 servings per day, 1,2,3,4 or more servings per day

e. How many total cups of plain water do you drink on average per day? Plain water includes plain tap water, water from a drinking fountain, water from a water cooler, bottled water and spring water. One serving is 8 oz or 1 cup of fluid water. (drop down of cups of water)

- Drop down with numbers- 0 servings per day then drop down to 9 or more (max) 0 servings per day, 1,2,3,4,5, 6, 7, 8, 9 or more servings per day

f. How many servings of sugar sweetened beverages do you drink on average per day? One serving is 12 oz of soda; 8 oz of sugar-sweetened, flavored water or sports drink; 6 oz of sugar-sweetened coffee, tea, or juice.

- Drop down with numbers- 0 servings per day then drop down to 6 or more (max) 0 servings per day, 1,2,3,4,5, 6 or more servings per day

g. In the past 30 days, how many days did you drink energy drinks or energy shots (for example: Red Bull, Monster, Full Throttle, 5 Hour Energy, Rockstar Energy Shot, or Full Throttle Energy Shot, etc.)

- (drop down with 0-30) 0 days, 1,2,3,4,

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DOI: [10.19080/NFSIJ.2021.11.555810](https://doi.org/10.19080/NFSIJ.2021.11.555810)

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