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Factors Affecting the Use of Food Pantries by California State University Students

Beyza Aktepe
California State University - San Bernardino

FACTORS AFFECTING THE USE OF FOOD PANTRIES BY CALIFORNIA STATE UNIVERSITY STUDENTS

A Thesis

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

in

Nutritional Science

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by

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Approved by:

Dr. Dorothy-Chen Maynard, Committee Chair

Department of Health Science and Human Ecology

Dr. Neal Malik, Committee Member

Dr. Marta Sovyanhadi, Committee Member

ABSTRACT

Food insecurity is one of the major public health issues world-wide including the United States. A significant proportion of students within the California State University (CSU) system, approximately 41.6%, experience food insecurity. The purposes of this study was 1) to determine the factors and barriers that affect the use of campus food pantries by university students on seven CSU campuses, 2) to determine the improvements that can be implemented in the on-campus food pantries, 3) to evaluate the effectiveness of the management of food pantries, and 4) to evaluate the effectiveness and utilization of nutrition education services provided in conjunction with food pantry services.

The study aims were evaluated using a combination of quantitative and qualitative methods. Seven CSU campuses were selected for their diverse demographics and varied campus sizes, ranging from large to mid-sized institutions, providing a comprehensive representation for the study. The survey distribution involves reaching out to department professors and management officials across CSU campuses. The collected quantitative data was entered into SPSS Version 28.0.0.0. (190) and subjected to rigorous statistical analysis using SPSS, encompassing descriptive statistics and correlation analysis.

There were 135 valid surveys that we used for data analysis. Of the 135 participants, 110 (81.5%) had knowledge about the presence of the food pantry in their campus. Of the students who are aware of campus food pantry (n=110),

71 (64.6%) were using the campus food pantry either to supplement their regular or as a sole source of food. The 75.0% of those who use the food pantry as a sole food source reported that the food pantry does not meet their nutritional needs, while 60.9% of those who use the food pantry as a supplemental food source said that the food pantry meets their nutritional needs. Of those using the food pantry as a sole or supplemental food source, a large majority indicated that campus food pantry needs improvement. Lack of time to participate, feeling like not deserving or needing, and inconvenient hours of operation were leading barriers that participants believe. Students that believe the presence of barriers on campus pantry use, were less likely to use campus food pantry ($p<0.05$). Students that live in households where relatively more people occupy are less likely to agree that a food pantry adequately meets their nutritional needs $p<0.01$).

Further studies are needed to be conducted on a larger population to comprehensively understand the factors impacting the utilization of food pantries and identify areas for improvement to offer more satisfactory services to students. Additionally, further research is necessary to better understand the management of food pantries, including aspects such as food donations and collaborations, which are crucial for enhancing the effectiveness of these resources in addressing food insecurity among college students.

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Finally, to my beloved Tolga, I cannot fully express my gratitude for your unwavering support. Thank you for your patience, for being my rock through the toughest times, and for standing by me through it all. As I celebrate this milestone, I acknowledge your integral role in this journey. It is time for us to celebrate because you earned this degree alongside me.

DEDICATION

This dissertation is dedicated to the students I worked with in my role as a CalFresh Healthy Living Lead Graduate Intern with the Department of Basic Needs and Student Support at California State University San Bernardino. They inspired me to seek ways to enhance the nutritional status of university students and further contribute to the improvement of students' overall well-being and academic success. Additionally, I want to dedicate it to the students and children suffering from food insecurity in the US and around the world, whose resilience in the face of adversity serves as a constant reminder of the urgency to address this critical issue.

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CHAPTER ONE

INTRODUCTION AND LITERATURE REVIEW

Food Insecurity in the United States

Food insecurity is one of the major public health issues world-wide including the United States. Food insecurity defined by the United States Department of Agriculture (USDA) – Economic Research Service (2023) as "The limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways." In 2022, 44.2 million individuals across the United States were residing in households affected by food insecurity (Food Security Status of U.S. Households in 2022, 2023). In 2022, 17.0 million households in the United States, representing 12.8 percent of the population, encountered food insecurity at some point during the year. The data from 2020 to 2022 demonstrates significant variation in food insecurity rates across states (Food Security Status of U.S. Households in 2022, 2023). Specifically, New Hampshire stands out with the lowest incidence at 6.2%, while Arkansas records the highest rate of food insecurity at 16.6% (Food Security Status of U.S. Households in 2022, 2023). As of February 2024, empirical findings indicate that approximately 21% of households in California, comprising an estimated 2.8 million households, are experiencing food insecurity (Schanzenbach & Fleming, 2024). Moreover, within this demographic subset, a notable 26% of households with dependent children,

constituting roughly 1 million households in the state, are similarly affected by food insecurity (Schanzenbach & Fleming, 2024). The concerning and worrisome data on food insecurity among children is exemplified by the fact that in 2022, more than 13 million children struggled with food insecurity, underscoring a reality where one in five children faces uncertainty about their next meal when the family faces food insecurity (Rabbit et al., 2023).

Prevalence of food insecurity exhibits notable disparities across various demographic groups. Food insecurity is a multifaceted issue shaped by various determinants, including income levels, employment status, racial/ethnic background, and the presence of disabilities (Food Insecurity, Healthy People 2030, 2022). Among the demographic subgroups experiencing food insecurity, university and college students constitute a noteworthy segment. Within the context of higher education institutions throughout the United States, approximately one-third of students are confronted with the challenge of food insecurity (Folts, 2023). The National Center for Education Statistics (NCES) has disseminated findings from a comprehensive study examining the demographic composition of student populations across all 50 states during the period spanning from 2019 to 2020 (McKibben et al., 2023). Their findings reveal that 23% of undergraduates and 12% of graduate students experience food insecurity, collectively impacting more than 4 million students across the US higher education institutions (McKibben et al., 2023). A significant proportion of

students within the California State University (CSU) system, approximately 41.6%, experience food insecurity (Crutchfield R. & Maguire J., 2018).
The challenge of accessing food not only exerts physical repercussions on students by potentially leading to suboptimal dietary quality that can lead to nutrient deficiencies or inadequacies but also exerts psychosocial effects on their overall well-being. Food insecurity may lead students to consume a lower-quality and less nutritious food compared to their food-secured counterparts (Shi et al., 2021). The food security status of students exerts a multifaceted influence, and their academic achievement is one of the aspects that is affected. Empirical evidence from the study highlights that students suffering from food insecurity tend to attain lower grade point averages (GPAs) compared to their more food-secure counterparts (Weaver et al., 2019), (Raskind et al., 2019).

Food insecurity among students puts constraints on their access to nutritious and good quality meals, which are crucial for fostering academic achievement, social and overall well-being. Students experiencing food insecurity have exhibited diminished proficiency in meal preparation and culinary skills, which directly affect the quality of their dietary choices and food allowance (Knol et al., 2019). The underlying and influential factors behind the lack of culinary skills were thought to be not only difficulty in accessing quality food, but also the lack of nutrition education. Implementing interventions targeting these challenges may mitigate the adversities encountered by food-insecure students. Nutrition education and improving cooking skills may alleviate the impacts of food

insecurity on their social and academic spheres and close the gap of disparities between those with food insecurity and their food-secure counterparts. Due to consumption of poor-quality foods that have high nutrient density, overweight and obesity also affect their self-esteem and psychological health.

Solutions to the Food Insecurity

In order to ameliorate the prevalence of food insecurity in the US, federal and state programs are developed to offer assistance to individuals in need of their services. The United States Department of Agriculture (USDA) has established a comprehensive array of 16 Food Nutrition Services (FNS) Programs, which encompass initiatives such as the Supplemental Nutrition Assistance Program (SNAP), the Women, Infants, and Children (WIC) program, National School Lunch Program (NSLP), and Farmers Market Nutrition Program (FNS Nutrition Programs, Food and Nutrition Service, 2024). The USDA attempts to fulfill its mission through the establishment of FNS programs, which aim to enhance food security and mitigate hunger among economically vulnerable segments of the US population. The programs provide resources that enable access to wholesome food, fresh produce, enhancement of dietary quality, and augmentation of nutritional knowledge (FNS Nutrition Programs Food and Nutrition Service, 2024). The utilization of food and nutrition support programs illuminates the coping mechanisms employed by low-income or food-insecure populations to address their situation. In the year 2018, there was a reduction of

30% in the prevalence of food insecurity associated with the implementation of the SNAP program (Wang et al., 2021).

Similar to other assistance programs, eligibility, application process, and acceptance for the Supplemental Nutrition Assistance Program (SNAP) are based on the household income, number of people in a household, financial status, and immigration status in some states. Generally, households with gross incomes at or below 130% of the federal poverty level qualify for SNAP benefits (Rabbit et al., 2023). However, it's important to note that these thresholds may vary among individual states.

Just because a family is at the poverty level does not mean that they face food insecurity. According to the USDA's 2022 report, 53.3% of those who benefit from the SNAP program and whose income remains below the poverty line of 130%, do not experience food insecurity (Rabbit et al., 2023). Similarly, less than half (41.9%) of households with children who have reached school age and who benefit from the NSLP program, who remain below the poverty line of 180%, are experiencing food insecurity (Rabbit et al., 2023). There are similar findings for the WIC program (Rabbit et al., 2023). These findings highlight that a significant proportion of individuals grappling with food insecurity, yet benefitting from federal food and nutrition assistance programs, comprise less than half of the total program beneficiaries across various categories. The data, encompassing individuals who engaged in food support programs up to one year prior to the study, suggest improved food security among beneficiary families, a

trend supported by existing research. Nevertheless, conducting a two-year comparative analysis at the family level could offer more comprehensive insights into and a more nuanced evaluation of the effectiveness of Federal Nutrition Assistance Programs (FNS).

The three main FNS programs that provide food and nutrition assistance were used by approximately 55% of households that were experiencing food insecurity (Rabbit et al., 2023). These data underscore a significant finding: nearly half of those experiencing food insecurity aren't accessing FNS programs (Rabbit et al., 2023). Several factors could contribute to this, including limited awareness of these programs, barriers to applying such as lack of support or information, and social stigma (Rabbit et al., 2023). It is crucial to delve further into these reasons and develop strategies to promote greater participation in Food and Nutrition Support Programs. It is important to note that these initiatives are primarily intended to address chronic and ongoing issues related to food insecurity rather than addressing acute or emergency situations, as their focus is on sustaining the nutritional well-being of individuals and their families.

Role of Nutrition Education in Mitigating Food Insecurity

Nutrition education addressing food insecurity represents a pivotal aspect of comprehensive intervention strategies within the domain of nutritional science. Nutrition education serves as a potent tool for equipping individuals and communities with the knowledge and skills required for making informed,

healthful dietary choices even in the face of economic constraints (Kinderknecht et al., 2023). By fostering an understanding of optimal nutrition practices, including meal planning, preparation, and selection of affordable and nutrient-dense foods, nutrition education empowers individuals to navigate food insecurity challenges more effectively. Imparting nutrition education to low-income housing communities through the promotion of discounted fresh produce has demonstrated a favorable influence on fruit and vegetable consumption patterns (Kinderknecht et al., 2023). The households that received nutrition education exhibited a notable reduction of 22% in the severity of food insecurity levels (Mortazavi et al., 2021).

There are multiple nutrition education initiatives aimed at various demographic groups such as Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and Expanded Food and Nutrition Education Program (EFNEP). Within the broader framework of the Supplemental Nutrition Assistance Program (SNAP), the Supplemental Nutrition Assistance Program Education (SNAP-Ed) operates as a federally funded grant program. Its primary goal is to provide educational resources to individuals, empowering them with the knowledge to effectively utilize SNAP benefits, prepare nutritious meals within budgetary constraints, and incorporate diverse activities into their daily routines to promote physical activity.

CalFresh Healthy Living

The USDA allocates SNAP-Ed funding to states and territories for the execution of initiatives aimed at fostering healthy dietary habits and promoting physical activity. In California, this program is CalFresh Healthy Living (CFHL), which holds the title of the most extensive nutrition education program in the United States. With over a third of Californians qualifying for CFHL, it stands as a significant effort in the realm of public health intervention.

The objectives of the CFHL program are to advance and uphold a state of healthy living by advocating for physical activity, ensuring the provision of nutritionally balanced diets to sustain individuals, and spearheading initiatives for community engagement and policy reform in California; thereby, fostering the establishment of healthier societal frameworks.

Mainly targeting economically disadvantaged Californians, specifically those with incomes at or below 185% of the Federal Poverty Level, which is approximately one in every three individuals in California, comprising roughly 10.7 million people, qualify for access to resources provided by CalFresh Healthy Living.

Supervised by the California Department of Social Services, the CalFresh Healthy Living program engages with four State Implementing Agencies (SIAs) and over 300 Local Implementing Agencies (LIAs) to provide services to eligible Californians. Noteworthy among its implementations are CalFresh Healthy Living initiatives on college and university campuses.

The CFHL program, in partnerships with university departments, primarily Basic Needs, executes its nutrition education curriculum tailored to specific demographics. Additionally, CFHL collaborates with various organizations to augment their nutrition education services and initiatives, with Leah's Pantry being a notable partner. Leah's Pantry, situated in California, specializes in training and establishing partnerships with community-based organizations across the country. Leah's Pantry provides training sessions for community leaders vested in delivering nutrition education services or other assistance pertinent to the requirements of individuals facing food insecurity and unique circumstances, such as those influenced by trauma. Their offerings encompass specific curricula designed for workshops targeting diverse populations, including adults, children, parenting adults, and college students. Their "Food Smart" workshops are tailored to offer nutrition education sessions, incorporating practical cooking skill activities for diverse populations. Additionally, their "Trauma, Resilience, and Nourishment" training endeavors to equip educators and leaders with enhanced comprehension of trauma and effective approaches when addressing individuals with trauma experiences within the context of their nutrition-related educational initiatives. Furthermore, the Nutrition Pantry Programs aid implementers in cultivating a health-promoting environment within food pantry services, integrating a trauma-sensitive approach.

Research findings suggest that students who underwent nutrition education under the CFHL) program, exhibited heightened consumption of fruits

and vegetables in contrast to their counterparts in the control group (Linares et al., 2023). Furthermore, an independent study uncovered an association between engagement in CFHL programs and enhancements in cardiorespiratory fitness, coupled with reductions in individual's BMI (Thompson et al., 2020). Additional studies are necessary to gain a deeper understanding of the effectiveness of CFHL programs among various demographic groups. Furthermore, it plays a vital role in mitigating the nutritional consequences associated with limited access to resources; thereby, contributing to improved dietary quality, overall health, and well-being among food-insecure populations (West et al., 2020). This multifaceted approach underscores the significance of nutrition education as a cornerstone in the amelioration of food insecurity and the promotion of nutritional equity.

Food Banks and Food Pantries as a Solution to Food Insecurity

Food banks and food pantries primarily serve as supplementary food sources for low-income individuals and families. The operational paradigms employed by food banks and their affiliated pantries exhibit regional disparities, yet share fundamental similarities (Byrne & Just, 2021).

Food banks function as central hubs for collecting, distributing, and storing food donated by the food industry and local community food drives. Food banks acquire their food resources through a combination of donations, purchases, or allocations from federal food programs. Food banks may procure items, such as

fresh produce and dairy, which are infrequently donated; therefore, typically purchasing them at significantly lower costs compared to retail prices in grocery stores (Morello, 2021). Food banks derive indispensable financial sustenance from a diverse array of stakeholders including corporations, associations, and individual benefactors. These entities provide vital contributions through monetary assistance, collaborative alliances, and the provision of surplus food donations (Wall, 2022). Corporations, churches, local farmers, and community groups significantly contribute to the operations of food banks through their generous donations (Morello, 2021). Feeding America and analogous initiatives accelerate the collection and distribution of donations. Notably, a significant proportion of food banks in the United States operate within the framework of the Feeding America network, a federal entity responsible for orchestrating and facilitating interconnections among local food bank entities (Byrne & Just, 2021). Concurrently, individual contributions, governmental funding frameworks like TEFAP (The Emergency Food Assistance Program) funded by USDA, and surplus food provisions from retail outlets collectively bolster the operational efficacy of food banks, resulting in waste reduction and enhanced community well-being (Wall, 2022).

Within the national landscape, the collective efforts of food banks and their pantry network stand as a significant force in addressing the needs of households, catering to an estimated population exceeding 50 million individuals as of 2022 (Feeding America, 2022). In the year 2020, it was anticipated that

6.7% of households in the United States would resort to utilizing a food pantry, marking an increase from the 4.4% figure observed in the previous year of 2019 (Coleman-Jensen & Rabbitt, 2021). While food banks are typically promoted for short-term crisis intervention, they have increasingly been utilized by individuals experiencing persistent, long-term food insecurity, a situation that often perpetuates their ongoing vulnerability to food insufficiency (Bazerghi et al., 2016).

This emphasizes the possibility of food banks and food pantries being subject to unintended utilization patterns, highlighting the necessity for the implementation of enduring, efficacious, and comprehensive measures to address the complex issue of food insecurity.

Food Pantries Located in University Campuses

In addition to food pantries located in publicly accessible locations in the local communities, there are also food pantries strategically positioned on college and university campuses, affording students a convenient accessibility to these resources.

The concept of campus-based food pantries emerged as a proactive response to the escalating concern of food insecurity within the college and university student population. This development can be attributed to a confluence of factors, including the upward trajectory of tuition fees, the surging enrollment of financially disadvantaged students, shifting demographic trends, advocacy

campaigns, empirical research outcomes, and grassroots initiatives led by students (Mathews, 2017). These campus food pantries serve a pivotal role in addressing the fundamental dietary needs of students contending with economic hardship, thereby ensuring their access to nourishing sustenance and fostering their holistic well-being during their pursuit of higher education (Mathews, 2017).

Resources and Funding of Campus Food Pantries

Running a Campus Food Pantry Student Government Toolkit (2017) provides valuable resources for operation and management of the campus food pantries including resources of them. Campus food pantries directly acquire food donations from local food banks or individuals, including students, to address a portion of their operational requirements, necessitating supplementary fundraising efforts to bridge remaining gaps. These pantries orchestrate fundraising campaigns aimed at soliciting contributions from diverse stakeholders, including supporters, community members, businesses, and local groups. Moreover, many campus food pantries receive financial assistance or other forms of support from entities such as the student government or various campus departments.

Various funding sources support food pantries situated on campuses. These sources include the campus philanthropic foundation, collaborations with non-profit organizations, hunger-relief agencies, religious institutions, local community food banks, and donation acceptance initiatives. The primary financial support for campus food pantries typically emanates from campus

foundations. However, partnerships with external entities and profit-oriented organizations may necessitate supplementary services from food pantries, such as extending access to the off-campus community (Goldrick-Rab et al., 2018). Nevertheless, the scope of partnerships and collaborative arrangements may be constrained for pantries that are not open to the off-campus community, either due to policy mandates or other imposed limitations (Goldrick-Rab et al., 2018). Such partnership requirements have the potential to curtail the range of services offered by food pantries.

The Factors Affecting the Use of Food Pantries by Students

Nevertheless, the mere existence of food pantries does not guarantee the mitigation of food insecurity among students. Multiple determinants contribute to the utilization of food pantries by students, encompassing factors associated with both physical resources and psychosocial factors. Numerous research inquiries have been undertaken to ascertain these factors and yield substantive findings, culminating in recommendations aimed at enhancing service provision. Several factors impact the demographic makeup of users accessing food pantries on campuses, including socioeconomic status, geographic location, student population diversity, accessibility of resources, awareness, campus policies, and community partnerships. These variables collectively influence the composition of individuals seeking assistance from campus food pantries, highlighting the need for tailored support strategies to address the diverse needs of food-insecure populations within university settings. Within the literature,

various studies have examined campus food pantries, gathered demographic data, and presented diverse findings. Esaryk et al. (2021) reported that the predominant demographic profile of students utilizing food pantries within the University of California (UC) system includes females, freshmen, individuals of Filipino/Pacific Islander descent, those experiencing homelessness, and older students. Another study conducted at Appalachian State University in North Carolina yielded similar findings, indicating that females and juniors were the most prevalent demographic among campus pantry users (McArthur et al., 2019).

Barriers to Use of Campus Food Pantries

Navigating the landscape of campus food pantries can be difficult for students, as various obstacles stand in their way of accessing these crucial resources. Financial constraints, the stigma surrounding food insecurity, and limited awareness about pantry services are key challenges preventing students from fully utilizing these support systems.

Studies conducted among various populations, including those affiliated with Southeastern public universities such as the University of Florida and Rutgers University, have revealed a significant lack of awareness regarding campus-based food pantries among students (Jefferson et al., 2022), (El Zein et al., 2022), (Emmanuel, J. and Reyes, D., 2021). Social stigma, characterized by feelings of embarrassment, fear, and shame, constitutes a prominent barrier inhibiting students from utilizing food pantries (Emmanuel, J. and Reyes, D.,

2021). In addition to social stigma, the quality of services and the availability of produce are also significant factors influencing students' utilization of food pantries (Emmanuel, J. and Reyes, D., 2021), (Byrne et al., 2023), (El Zein et al., 2022).

There are additional visual factors that may impact the utilization of food pantries within the broader population. A study investigating the influence of marketing and branding strategies on food selection within pantries revealed that individuals perceive products bearing the same brands as those found in grocery stores to have lower quality (Barrett, Byrne, & Whitaker, 2021). Furthermore, individuals exhibit increased stigma towards perishable food items when aware of their origin from a food pantry (Barrett, Byrne, & Whitaker, 2021). Given that this study was not conducted among student populations, it is important to recognize that the findings may differ when examining students' perceptions of food pantry offerings specifically tailored to campus environments.

In conclusion, overcoming the barriers to food pantry utilization is crucial to promoting equitable access to food assistance among students in need. To address these challenges effectively, recommendations include initiatives aimed at raising awareness of pantry services through positive and destigmatizing marketing strategies. Moreover, efforts to improve the variety and availability of protein options and fresh produce within food pantries are essential steps towards ensuring that students can access nutritious food options to support their well-being (El Zein et al., 2022).

Nutrition Education and Additional Services Provided by Food Pantries and Their Role in Food Insecurity

The services offered by food pantries play a pivotal role in addressing the multifaceted issue of food insecurity within the realm of nutritional science. These essential programs serve as a vital resource for individuals and families facing economic constraints, often providing them with access to nutritious food items that would otherwise be beyond their reach. Beyond the immediate provision of sustenance, campus food pantries frequently integrate nutrition education initiatives into their services, empowering beneficiaries with knowledge and skills essential for making informed dietary choices (West et al., 2020).

University students that access campus food pantry resources have realized multifaceted benefits, including exposure to comprehensive nutrition education initiatives. Empirical evidence establishes a constructive association between nutrition education and students' culinary proficiency, as well as their inclination towards selecting health-promoting dietary choices. Furthermore, the utilization of food pantry services has yielded demonstrable improvements in students' overall health, academic performance, and a reduction in depressive symptoms, concomitant with an elevated nutrition knowledge base (Martinez et al., 2022), (An et al., 2019).

In summary, the nutrition education rendered by food pantries represent a critical component of the broader strategy for mitigating food insecurity among

students' and for enhancing physical well-being through improved dietary habits and psychosocial behaviors.

Management of Food Pantries

Addressing food pantry management requires a focused examination of the strategies employed to enhance service provision. Understanding the strategies that are employed by food pantry management is crucial in optimizing service quality. Campus food pantries can effectively improve their operations by implementing additional strategies, such as expanding outreach to students, reducing barriers to pantry utilization, and meeting user needs and expectations.

Policies. Different strategies can take a play to improve the quality of the food in the pantries. The complementing national initiatives such as food banks, the implementation of local programs designed to augment the availability of fresh produce within food pantries through collaborations with community gardens, contributing seasonal yields, emerges as a promising strategy for enhancing the nutritional quality of food pantry offerings (Gibson et al., 2022). Collaborating with campus gardens provides an additional avenue for increasing the availability and variety of fresh fruits and vegetables offered to students, potentially impacting their consumption of fresh produce (Staub et al., 2019). Furthermore, integrating campus gardens into the nutrition education initiatives of food pantries can foster active student involvement, thereby facilitating a deeper connection to pantry services. This multifaceted approach not only enriches the

nutritional offerings but also enhances student engagement with and understanding of food pantry resources.

Challenges of Fresh Produce Supply. The effective management of perishable food items to prevent expiration or spoilage represents a salient challenge encountered by food pantries, as highlighted in the research by Hradek (2022). Insufficient storage facilities, notably the absence of adequate refrigeration and freezer capacities, poses a significant challenge for pantries. This limitation may constrain the range and quantity of perishable items that can be accommodated and subsequently distributed through pantry services. Implementing diverse strategies to promote the accessibility of fresh produce within food pantries, such as food sampling initiatives, the provision of recipe kits, and the integration of fresh produce donations, appears effective in mitigating the risk of food waste (Hradek, 2022).

Service Limits to Student. In addition to exploring other pertinent topics, delineating the service boundaries of campus food pantries for visitors is essential, as it significantly impacts student utilization of these resources. Establishing guidelines regarding the frequency of campus visits and the quantity of items permissible for each visit is pivotal for comprehending the various strategies employed by pantry management. This clarification aids in optimizing pantry operations and ensuring fair distribution of resources to students in need. The qualification and restriction of campus food pantry visits require deeper comprehension to effectively discern the factors influencing their utilization.

Given the absence of relevant literature, elucidating these aspects is imperative for understanding the determinants affecting the use of food pantries. By addressing this gap in knowledge, insights can be gained into the barriers and facilitators impacting pantry utilization, thereby informing strategies to enhance access and effectiveness.

It seems like there are required enhancements within food pantry operations that yield several valuable recommendations. Establishing collaborations with local farms and campus gardens emerges as a favorable strategy to improve food quality in food pantries by bolstering the availability of fresh produce. Furthermore, the implementation of nutrition education initiatives by food pantries has been shown to positively influence students' dietary quality, facilitated through diverse means such as food sampling of unfamiliar products, distribution of recipe cards and kits, and the provision of nutrition education classes.

This study aims to determine the factors affecting the use of food pantries by university students on CSU campuses and recommendations for improvements that need to be implemented in food pantries to provide better services by evaluating the management of food pantries and the products offered against challenges that food pantries face. The study aimed to better understand how food pantries serve their services, their limitations and policies for its user, the services provided by food pantries, such as nutrition education, and how they might be linked to students' use of these resources, which hasn't been

extensively explored in existing research. Additionally, it aims to determine students' satisfaction with food pantry services in meeting their nutritional needs, their additional expectations from these facilities, and the barriers preventing them from using food pantries.

CHAPTER TWO

METHODOLOGY

Objectives

The objectives of the study are:

- to determine the factors and barriers that affect the use of food pantries by university students on seven CSU campuses
- to assess the factors and potential barriers that affect the use of food pantries by university students on CSU campuses
- to explore the strength and the weaknesses of food pantries for improvements that can be implanted to provide better services
- to evaluate the effectiveness of the management of food pantries and the products offered by comparing the management strategies and resources used by different CSU campuses in their food pantries such as methods for securing food donations and nutrition education provided
- to evaluate the effectiveness of nutrition education services provided in conjunction with food pantry services in addressing food insecurity among CSU students

This study adopted a quantitative and qualitative research approach to examine the factors influencing the utilization of food pantries by university students on seven CSU campuses. The study has been granted approval by the CSUSB

Institutional Review Board ensuring its adherence to ethical guidelines and standards (Appendix E).

Selection of the Study Areas

Seven CSU campuses were selected for their diverse demographics and varied campus sizes, ranging from large to mid-sized institutions, providing a comprehensive representation for the study.

Selection of Participants

Inclusion criteria for student participants required that they are older than 18 years old and enrolled as a student in one of the California State University campuses. Participants completed a written informed consent (Appendix A), and in recognition of their participation, they were given the opportunity to enter a drawing for a $50 grocery card, contingent on providing contact information at the beginning of the survey.

In the case of staff participants, inclusion criteria necessitated that they work in the food pantries at one of the seven CSU campuses and possess the ability to provide information and data related to the services, products, and guests associated with their food pantry. Staff participants completed a written informed consent (Appendix B). The study aimed to reach out to at least 30 students and 1 food pantry staff member from each of the seven CSU campuses.

Survey Questions

The student survey comprised 38 questions, including select conditional inquiries tailored to individual responses, ensuring personalized survey experiences.

These questions were categorized into three sections: demographic inquiries, nutrition-related queries, and food pantry-related assessments (Appendix C). The staff survey consisted of 16 questions, including 2 conditional questions for personalized responses. These questions were divided into two subcategories: Management and Donation Related Questions, and Food and Nutrition Education Related Inquiries (Appendix D).

Distribution of Surveys

Two fliers have been created to encourage participation in a survey, featuring a QR code that directs participants to the survey page. The student flyer is distributed to the directors of the pantries to display in the shopping area and promoted to participate by student staff working in the pantry. Additionally, the flyer were distributed to professors in the Departments of Health Science, Public Health, and Nutrition Science across all CSU campuses for distribution to their students. The flyer encouraging participation from pantry directors and staff has been sent via email to the directors of the pantries. The survey was created using online Qualtrics survey software.

Statistical Analysis

The collected quantitative data was entered into SPSS Version 28.0.0.0. (190) and subjected to rigorous statistical analysis using SPSS, encompassing descriptive statistics and correlation analysis by this graduate student researcher. This analysis aimed to uncover any significant relationships between factors affecting the behaviors and/or attitudes, expectations, and stigmas of students,

and factors affecting the management of food pantries (i.e. donation sources, adopted nutrition policies, etc.) and the use of food pantries.

The collected qualitative data is meticulously analyzed by investigators, who categorize it into meaningful groups to facilitate a comprehensive understanding and evaluation of the dataset.

Ethical Considerations and Data Confidentiality Measures

Ethical considerations, including obtaining informed consent from participants and ensuring the confidentiality of their responses, was stringently upheld throughout the research process. The data were aggregated, and they are presented without identifying any subjects. All data will remain anonymous, and no names will be associated with any data resulting from this study. The online survey system did not save IP addresses or identifying information. No personal information is collected other than basic demographic descriptors. Only participants who are willing to enter a drawing for a $50 grocery gift card shared their contact information (First Name, Last Name, E-mail Address, Phone Number). Responses are stored in Qualtrics Survey system which can be access through the campus Portal only by the researchers, which requires duo Security for Multi-Factor Authentication (MFA) purposes. Access to data of the study will be limited to only principal investigator, Dorothy Chen-Maynard, and co-principal investigator, Beyza Aktepe. The data will be destroyed after completion of the data analysis and publications. No data will be collected from

participants who choose to ‘opt-out’ during the research process; their data will also be destroyed when the thesis is published.

CHAPTER THREE

RESULTS

Findings of the Study

Of the 182 students involved in the study, 37 surveys were excluded from the results due to extreme values. There were 135 valid surveys that we used for data analysis. Out of the 182 responses, 120 (88.9%) identified as female at birth, 14 (10.4%) was male at birth, and 1 (0.7%) responded as prefer not to answer (Table 1). In the 18-19 age category, there were 17 subjects (12.6%), 27 (36.3%) were ages 20-21, 43 (31.9%) were ages 22-15, 19 (14.1%) were ages 26-29, 18 (13.3%) were ages 30-40, 7 (5.2%) were ages 41-50, and 4 (3.0%) were 51 years of age or older (Table 1). There were 63 (46.7%) participants identified as Hispanic, 26 (19.3%) participants were Asian/Pacific Islander, and 22 (16.3%) participants identified as White (Table 1).

Table 1. Demographic Characteristics of Research Participants

	Description	**Number**	**Percentage**
Gender	Male at birth	14	10.4
	Female at birth	120	88.9
	Prefer not to answer	1	0.7
	Total	**135**	**100.0**
Age in years	18-19	17	12.6

	20-21	27	20.0
	22-25	43	31.9
	26-29	19	14.1
	30-40	18	13.3
	41-50	7	5.2
	51 and above	4	3.0
	Total	**135**	**100.0**
Race/Ethnicity	White	22	16.3
	Black	5	3.7
	Hispanic	63	46.7
	Asian/Pacific Islander	26	19.3
	Multiple Race/Ethnicities	12	8.9
	Other	4	3.0
	Prefer not to answer	3	2.2
	Total	**135**	**100.0**

Of the 135 valid survey, 95 (70.4%) participants were from CSU Campus A; 16 (11.9%) from CSU Campus E; 11 (8.1%) from CSU Campus B; 8 (5.9%) from CSU Campus G; 4 (3.0%) from CSU Campus D; and 1 (0.7%) from CSU Campus F received nutrition education (Table 2). Of 135 participants, 12 (92.6%) were full-time students (Table 2).

Table 2. CSU Campus Enrollment Status among Participants			
	Description	**Number**	**Percentage**
CSU Campus	CSU Campus A	95	70.4
	CSU Campus B	11	8.1
	CSU Campus D	4	3.0
	CSU Campus E	16	11.9
	CSU Campus F	1	0.7
	CSU Campus G	8	5.9
	Total	**135**	**100.0**
Enrollment Status	Full-time	125	92.6
	Part-time	9	6.7
	Prefer not to answer	1	0.7
	Total	**135**	**100.0**

There were 44 (32.6%) participants, who are unemployed, 58 (43.0%) were employed part-time (0-20 hours/week, and 30 (22.2%) were employed full-time (20+ hours/week) (Table 3).

Table 3. Employment Status among Participants			
	Description	**Number**	**Percentage**
Employment Status	None	44	32.6
	Part-time (0-20 hours/week)	58	43.0
	Full-time (21+ hours/week)	30	22.2
	Prefer not to answer	3	2.2
	Total	**135**	**100.0**

There were 128 (94.8%) participants who claimed to be CA residents (Table 4) and 3 (42.9%) participants who were not CA residents were residents of other states, and 4 (57.1%) were international students (Table 4).

Table 4. Residency Status of Participants			
	Description	**Number**	**Percentage**
Residency	California Resident	128	94.8
	Non-California Resident	7	5.2
	Total	**135**	**100.0**
Not-CA Residents	Out of CA State	3	42.9

	International	4	57.1
	Total	**7**	**100.0**

There were 123 (91.1%) participants living off-campus, 11 (8.1%) were living on-campus (Table 5); and 36 (26.7%) of participants were residing in households with four occupants, 29 (21.5%) were in households with three occupants, 20 (14.8%) were in households with five occupants, and 18 (13.3%) were in households with two occupants (Table 5).

Table 5. Participant Living Arrangements

	Description	**Number**	**Percentage**
Living Arrangement	On-campus	11	8.1
	Off-campus	123	91.1
	Prefer not to answer	1	0.7
	Total	**135**	**100.0**
Household Size	0	1	0.7
	1	12	8.9
	2	18	13.3
	3	29	21.5
	4	36	26.7
	5	20	14.8
	6	6	4.4

	7	8	5.9
	8	1	0.7
	9	1	0.7
	10	2	1.5
	10+	1	0.7
	Total	**135**	**100.0**

Out of 135 respondents, 87 (64.4%) participants received financial aid (Table 6). The distribution of the types of financial aid (i.e. Pell Grant, SAIL, Loan recipient, etc.) received by participants are detailed in Table 6.

Table 6. Financial Aid Status and Types among Participants

	Description	**Number**	**Percentage**
Financial Aid	Yes, receiving it	87	64.4
	No, not receiving it	41	30.4
	Prefer not to answer	7	5.2
	Total	**135**	**100.0**
Types of Financial Aid Granted to Students	Pell Grant	55	63.2
	SAIL	1	1.1
	EOP	2	2.3

	Loan Recipient	19	21.8
	Other	9	10.3
	Prefer not to answer	1	1.1
	Total	**87**	**100.0**

Of the 135 respondents, 59 (43.7%) participants were using their earned income as a primary financial source of their food, 29 (21.5%) were using monthly allowance from parents/guardians as a primary food source, 17 (12.6%) were using financial aid, and 13 (9.6%) were using food stamps as their primary financial source of their foods (Table 7).

Table 7. Sources of Food Funding among Participants

	Description	**Number**	**Percentage**
Financial Source of Food	Monthly allowance from parents/guardians	29	21.5
	Earned Income	59	43.7
	Student Loans	8	5.9
	Food Stamps	13	9.6
	Financial Aid	17	12.6
	Meal Plans	4	3.0
	Other	3	2.2
	Prefer not to answer	2	1.5

	Total	**135**	**100.0**

Of the 135 respondents, 101 (74.8%) participants were not receiving food programs while only 30 (22.2%) were receiving some type of food programs (Table 8). Most common reasons why they are not receiving the programs was being not eligible for them (n=47, 46.5%) and being aware of the programs but not knowing their eligibility status (n=27, 26.7%) (Table 8).

Table 8. Participation in Food Programs and Reasons for Non-Participation

	Description	**Number**	**Percentage**
Receiving Food Programs	Yes	30	22.2
	No	101	74.8
	Prefer not to answer	4	3.0
	Total	**135**	**100.0**
The Reason for Not Receiving Food Programs	I am not eligible for any food program	47	46.5
	I am eligible but I did not apply yet	8	7.9
	I am eligible but I do not plan to apply	3	3.0
	I am aware of programs, but I do not know whether I am eligible or not	27	26.7
	I do not know what food programs are and I am not interested in	1	1.0

	I do not know what food programs are, but I am interested in learning more about the programs	11	10.9
	Prefer not to answer	4	4.0
	Total	**101**	**100.0**

Of those receiving financial aid (n=87), 24 (27.6%) were receiving food assistance programs (Table 9).

Table 9. Financial Aid and Food Program Receipt Overview

	Description	**Numbers**	**Percentage**
Food Program Access for Financial Aid Recipients	Receiving food programs	24	27.6
	Not receiving food programs	61	72.4
	Total	**87**	**100.0**

Of those receiving financial aid but not receiving any food program (n=61), 22 (36.1%) were not eligible for any food program, 19 (31.1%) were aware of the programs but don't know their eligibility status, 8 did not know about the food programs and are not interested in applying, 7 was eligible for the food programs

but have not applied yet, and 3 was eligible for the food programs but don't plan to apply (Table 10).

Table 10. Reasons for Non-Receipt of Food Program among Non-Financial Aid Recipients

	Description	**Numbers**	**Percentage**
Reasons for Non-Participation in Food Program	Not eligible for food program	22	36.1
	Aware of food programs but don't know the eligibility status	19	31.1
	Don't know the programs, and not interested in	8	13.1
	Eligible for the food programs but not applied yet	7	11.5
	Eligible for the food programs but do not plan to apply	3	4.9
	Other/Prefer not to answer	2	3.3
	Total	**61**	**100.0**

Almost half of the participants (n=63, 46.7%) were cooking all or most of their meals for themselves (Table 11). Someone else cooks all or most of the meals for 33 (24.4%) participants, and 24 (17.8%) participants were cooking occasionally while supplying their meals from other sources (Table 11). Out of 135 respondents, 131 (97.0%) reported having resources to cook (Table 11).

Table 11. Food Source Categories and Kitchen Supplies Availability			
	Description	**Number**	**Percentage**
The Food Source	I cook all/most of my meals for myself	63	46.7
	Someone cooks all/most of my meals for me	33	24.4
	I cook occasionally, rest from other sources	24	17.8
	Someone cooks for me occasionally	5	3.7
	I only buy ready to eat meals	4	3.0
	I only order outside to pick up the food	2	1.5
	Other	2	1.5
	Prefer not to answer	2	1.5
	Total	**135**	**100.0**
Kitchen/Cooking Supply Resources	Yes, I have resources	131	97.0
	No, I do not have resources	2	1.5
	Do not know	2	1.5
	Total	**135**	**100.0**

There were 118 (87.4%) participants following standard dietary practice/ preferences, which was described as a diet that includes red meat, fish, poultry, eggs, milk, milk products and plant foods (Table 12).

Table 12. Dietary Preferences among Participants

	Description	**Number**	**Percentage**
Dietary Preferences	Vegan	1	0.7
	Vegetarian	6	4.4
	Standard	118	87.4
	Pescetarian	5	3.7
	Other	3	2.2
	Prefer not to answer	2	1.5
	Total	**135**	**100.0**

Of the 135 participants, 96 (71.1%) do not have any food allergy or intolerances while 38 (28.1%) reported having food allergy or intolerance (Table 13).

Table 13. Food Allergies and Intolerances among Participants

	Description	**Number**	**Percentage**

Having Food Allergies or Intolerances	Yes, I have	38	28.1
	No, I do not have	96	71.1
	Prefer not to answer	1	0.7
	Total	**135**	**100.0**

There were 68 (50.4%) participants reported to have received nutrition education, while 65 (48.1%) participants have not received any nutrition education (Table 14). Main source of nutrition education that participants received was nutrition class in school (n=57, 83.8%) (Table 14).

Table 14. Receipt and Sources of Nutrition Education among Participants

	Description	**Number**	**Percentage**
Receiving Nutrition Education	Yes, I did/do receive	68	50.4
	No, I did/do not receive	65	48.1
	Prefer not to answer	2	1.5
	Total	**135**	**100.0**
Source of Nutrition Education	Nutrition class in school	57	83.8
	Education from health care provider	6	8.8
	Other	5	7.4
	Total	**135**	**100.0**

The mean for reported cooking ability of participants was 2.90, which means that the majority consider their cooking ability almost as an intermediate level (Table 15).

Table 15. Cooking Ability Rating of Students			
	Description	**Number**	**Percentage**
Cooking ability	No cooking knowledge/Do not cook (1)	6	4.4
	Beginner (2)	34	25.2
	Intermediate (3)	62	45.9
	Advance (4)	32	23.7
	Prefer not to answer	1	0.7
	Total	**135**	**100.0**
	Mean	***2.9***	

Of the 135 participants, 83 (61.5%) were not attending any nutrition education session or workshops provided by the campus food pantry, while 28 (20.7%) were unaware of the existence of nutrition education sessions provided by campus food pantry (Table 16).

Table 16. Attendance in Food Pantry Nutrition Education Sessions			
	Description	**Number**	**Percentage**

Attendance Status	Yes	23	17.0
	No	83	61.5
	I do not know that they exist	28	20.7
	Prefer not to answer	1	0.7
	Total	**135**	**100.0**

Of the 135 respondents, 111 (82.3%) participants did not attend or do not know the existence of nutrition education sessions or workshops provided by their campus food pantry, but most of them (n=75, 67.6%) expressed interest in participating in nutrition related education activities at the food pantry (Table 17). Interactive-cooking class was the preferred type of educational activity for the 51 (68.0%) students who expressed interest in attending the nutrition related education activities at the food pantry (Table 17).

Table 17. Interest in Food Pantry Nutrition Education and Preferred Activities

	Description	**Number**	**Percentage**
Interest on Food Pantry Nutrition Education	Yes, I am interested in	75	67.6
	No, I am not interested in	27	24.3
	Prefer not to answer	9	8.1
	Total	**111**	**100.0**

Type of Educational Activities for Interested Participants	Lecture-style only	5	6.7
	Cooking-demo only	18	24.0
	Interactive-cooking class	51	68.0
	Prefer not to answer	1	1.3
	Total	**75**	**100.0**

The reported mean for their ability to find the information when needed was 3.30, which means that they considered their ability to locate the information was between intermediate to advanced level (Table 18).

Table 18. Ability to Find the Right Information When There Are Nutrition Related Issues

	Description	**Number**	**Percentage**
Knowledge on Nutrition Information Sources	No knowledge (1)	8	5.9
	Basic Knowledge (2)	25	18.5
	Intermediate Knowledge (3)	41	30.4
	Advance Knowledge (4)	41	30.4
	Expert in Nutrition Related Subjects (5)	20	14.8
	Total	**135**	**100.0**
	Mean	***3.30***	

Of the 135 participants, 70 (51.9%) was already familiar with the USDA MyPlate, but they do not use it, while 38 (28.1%) was familiar with this tool and are using it and 26 (19.3%) were not familiar and not were using the USDA MyPlate (Table 19).

Table 19. Familiarity and Utilization of USDA MyPlate Guidelines

	Description	**Number**	**Percentage**
Familiarity and Use of MyPlate	Yes, I am familiar with the USDA MyPlate, and I use it	38	28.1
	Yes, I am familiar with the USDA MyPlate, but I do not use it	70	51.9
	No, I am not familiar with the USDA MyPlate, and I do not use it	26	19.3
	Prefer not to answer	1	0.7
	Total	**135**	**100.0**

Of the 135 participants, 86 (63.7%) had some knowledge about the recommended number of serving of fruits and vegetables (Table 20).

Table 20. Understanding of Recommended Fruit and Vegetable Servings by the Participants

	Description	**Number**	**Percentage**
Serving Knowledge	Yes, I have the knowledge	86	63.7

	No, I do not have the knowledge	47	34.8
	Prefer not to answer	2	1.5
	Total	**135**	**100.0**

The reported mean for their ability to read and interpret the nutrition labels on food products was 3.76 (± 1.18), which is more than an intermediate level of ability (Table 21).

Table 21. Proficiency in Reading and Interpreting Nutrition Labels

	Mean	**SD**
Nutrition Label Reading Proficiency Score (1: lowest, 5: highest)	3.76	± 1.18

Of the 135 participants, 110 (81.5%) had knowledge about the presence of the food pantry in their campus (Table 22). The sources of the knowledge about campus food pantry were learned at the campus orientation (n=33, 30.0%), friend (n=29, 26.4%), displayed flyers (n=16, 14.5%), social media (n=16,14.5%), professor (n=10, 9.1%), and other sources (n=6,5.5%,) (Table 23).

Table 22. Awareness of Availability of On-Campus Food Pantry			
	Description	**Number**	**Percentage**
Awareness of Pantry Existence	Yes, having knowledge	110	81.5
	No, not having knowledge	21	15.6
	Prefer not to answer	4	3.0
	Total	**135**	**100.0**

Table 23. Information Source for Awareness of Campus Food Pantry			
	Description	**Number**	**Percentage**
Source of Information	Friend	29	26.4
	Campus orientation	33	30.0
	Professor	10	9.1
	Displayed flyers	16	14.5
	Social media	16	14.5
	Other	6	5.5
	Total	**110**	**100.0**

Of the students who are aware of campus food pantry (n=110), 64 (58.2%) were using the campus food pantry to supplement their regular food needs, 37

(33.6%) were not using it, and 7 (6.4%) were using as a sole source of food supply (Table 24).

Table 24. Utilization of Campus Food Pantry among Aware Students

	Description	**Number**	**Percentage**
Pantry Utilization	Yes, I use/used the campus food pantry to supplement regular food need	64	58.2
	Yes, I use/used the campus food pantry as a sole source of food	7	6.4
	No, I have not used the campus food pantry	37	33.6
	Prefer not to answer	2	1.8
	Total	**110**	**100.0**

To ensure meaningful results when conducting a correlation test on different variables, "prefer not to answer" responses and any missing values were eliminated before running the test. Kendall's tau-b correlation was used to determine the relationship between cooking ability and ability to read and interpret nutrition labels on food products. There was a positive correlation, which was statistically significant (T_b = .360, p = <0.001) (Table 25). This means that participants with higher cooking ability are more likely to understand the nutrition fact label and interpret nutrition labels on food products.

Table 25. Correlation between Cooking Proficiency and Nutrition Label Interpretation		
	Kendall's tau-b	**Ability to read and interpret nutrition labels**
Cooking ability	T_b	.360*
	p value	<0.001
**. Correlation is significant at the 0.01 level (2-tailed).*		

A Kendall's tau-b correlation was used to determine the relationship between campus food pantry use and receiving food programs, having resources for kitchen/cooking supplies, dietary preferences, having food allergies, and receiving nutrition education. There was a positive correlation between use of food pantry and receiving food programs, which was statistically significant (Tb = 0.191, p = 0.031) (Table 26). This means that students using food pantries are more likely to receive food programs. However, there was not statistically significant correlation between use of food pantry and receiving financial aid, having resources for kitchen/cooking supplies, dietary preferences, and having food allergies (Table 26).

Table 26. Assessment of Food Pantry Utilization in Relation to Participant Dietary Patterns and Supplementary Resources						
	Kendall' s tau-b	**Financial Aid**	**Food Programs**	**Kitchen Cooking Supplies**	**Dietary Preferences**	**Food Allergy/ Intolerances**
Use of Campus Food Pantry	T_b	.08	.19*	.11	.02	.11
	p value	.39	0.03	.20	0.81	.22
**. Correlation is significant at the 0.05 level (2-tailed).*						

Of those using the food pantry either as a sole or supplemental food source (n=71), 22 participants (30.1%) were also receiving federal food programs. Of those using the food pantry as a sole or supplemental food source, a large majority reported that campus food pantry meets their dietary preferences (Table 27). The 75.0% of those who use the food pantry as a sole food source reported that the food pantry does not meet their nutritional needs, while 60.9% of those who use the food pantry as a supplemental food source said that the food pantry meets their nutritional needs (Table 27). Of those using food pantry as a sole or supplemental food source, a large majority indicated that pantry has healthy food options (Table 27). While 57.81% of those who use the food pantry as a supplemental food source reported that the food pantry led positive changes

in their diet, only 37.5% of those who use the food pantry as a sole food source agree with them (Table 27).

Table 27. Satisfaction with Food Pantry Services among Student Users		
	Use of Food Pantry	
	Sole Source	**Supplemental Source**
Total number	**8**	**64**
Pantry meets my dietary preferences	5	54
Percentage	*62.5*	*84.4*
Pantry does not meet my dietary preferences	3	10
Percentage	*37.5*	*15.6*
Pantry meets nutritional need	2	39
Percentage	*25*	*60.9*
Pantry does not meet nutritional Needs	6	25
Percentage	*75*	*39.1*
Pantry has healthy food options	5	52
Percentage	*62.5*	*81.3*
Pantry does not have healthy food options	3	12
Percentage	*37.5*	*18.8*
Pantry lead positive changes in my diet	3	37

Percentage	*37.5*	*57.8*
Pantry did not lead any positive changes in my diet	4	23
Percentage	*50*	*35.9*
Prefer not to answer	1	4
Percentage	*12.5*	*6.3*

Analysis of the open-ended responses regarding positive dietary changes revealed recurring themes, as summarized in Table 28. Predominantly, respondents reported improvements in dietary habits such as embracing healthier food choices (19.5%), notably increasing their consumption of fruits (29.3%) and vegetables (17.1%) (Table 28). Furthermore, a notable proportion expressed the significance of these changes in fulfilling personal nutritional requirements more effectively (7.3%), alongside a commitment to engaging in more frequent home cooking behaviors (7.3%) (Table 28).

Table 28. Change in The Diet of Participants After Use of Food Pantry

Change in Their Diet	**Number**	**Percentage among Total User Population**
Eating healthier	7	17.1
Less fat consumption	1	2.4

Total	8	19.5
General diet change	2	4.9
Focusing on what food groups I eat more	1	2.4
Different fruits and vegetables given by the pantry encourages me to use them in my cooking. I try new kinds of dishes because of the pantry.	1	2.4
Reading food labels more	1	2.4
Total	5	12.2
Eating more fruit	12	29.3
Eating more vegetables	7	17.1
Eating real meal, instead of snacking	1	2.4
Eating more regularly	1	2.4
N/A	3	7.3
Meeting my diet needs better	2	4.9
Eating more food, and gained healthy weight	1	2.4
Total	3	7.3
Cooking more	3	7.3
Quality of food that I eat	2	4.9
Drinking more milk	1	2.4
Eating more egg	1	2.4
Consuming more fiber	1	2.4

Eating more variety of foods	1	2.4

Of those 72 participants who use campus food pantry, either as a sole of supplemental source, 50 (41.3%) reported that convenience influenced their use, 22 (18.2%) reported lack of access to nutritious food, and 49 (40.5%) reported financial constraints as a factor affecting the use of food pantry (Table 29).

Table 29. Influential Factors on Food Pantry Usage

	Description	**Number**	**Percentage**
Factors	Convenience	50	41.3
	Lack of access to nutritious food	22	18.2
	Financial constraints	49	40.5

Of those using the food pantry as a sole or supplemental food source, a large majority indicated that campus food pantry needs improvement (Table 30).

Table 30. Thoughts on Improvement Necessity in a Pantry

	Use of Food Pantry	
	Sole Source	**Supplemental Source**
Total number	**8**	**64**

Pantry needs improvement	6	49
%	*75.0*	*76.6*
Pantry does not need improvement	2	12
%	*25.0*	*18.7*
Prefer not to answer	0	3
%	*0*	*4.7*

When those who used the food pantry were asked about the food product group, they wanted to see more diverse, fresh fruits (n=46, 63.9%), vegetables (n=41, 56.9%), and ready meals (n=33, 45.8%) were in the majority (Table 31).

Table 31. Requested Diverse Food Product Groups by Pantry Users

	Number	**Percentage of Total Pantry Users (n=72)**
Fresh Fruit	46	63.9
Fresh Vegetables	41	56.9
Snacks	22	30.6
Dried Food	13	18.1
Ready-to-eat Meals	33	45.8
Other	9	12.5

The most preferred suggestions of pantry users (n=72) to campus pantry management were food for family (n=26), feminine hygiene products (n=25), investing in destigmatizing food insecurity (n=19), and more flexibility of access (n=17) (Table 32).

Table 32. Recommendations from Food Pantry Users to Management

Suggestions to Management	**Number**	**Percentage of Total Pantry Users (n=72)**
Food for family	26	36.1
Investing in destigmatizing food insecurity	19	26.4
More flexibility of access	17	23.6
Marketing services food pantry provides to students	15	20.8
No suggestion	7	9.7
Availability of non-perishable items	15	20.8
To clear out expired food	10	13.9
Access to clothing closet	13	18.1
Access to bed sheeting and other home related products	10	13.9
Prefer not to answer	2	2.8

Feminine hygiene products	25	34.7

The number of those who are aware of the presence of food pantry but not using it was 21. Of those 21, 16 (76.2%) were willing to use the pantry, and 4 (19.1%) were not willing to use (Table 33).

Table 33. Interest in Pantry Utilization among Students Unaware of Its Presence

	Description	**Number**	**Percentage**
Interest in Pantry Utilization	Yes, I would use	16	76.2
	No, I would not use	4	19.1
	Prefer not to answer	1	4.7
	Total	**21**	**100.0**

Analysis of open-ended responses regarding expected services of the products by campus food pantry revealed recurring themes, as summarized in Table 34. Predominantly, respondents reported expected food products such as fresh fruit alternatives (61.9%), snacks and snack alternatives (47.6%), fresh vegetables and canned foods (38.1%), and healthy food items (23.8%) (Table 34).

Table 34. Expected Product Preferences among Non-Users of On-Campus Food Pantry		
Items	**Number of the answers**	**Percentage of total answering people**
Snacks	**4**	**19.1**
Cookies	1	4.8
Crackers	1	4.8
Healthy options	3	14.3
Chips	1	4.8
Total	**10**	**47.6**
Fresh Fruit	**11**	**52.4**
Grapes	**1**	4.8
Apples	**1**	4.8
Total	**13**	**61.9**
Canned Foods	**8**	**38.1**
Fresh Vegetables	**8**	**38.1**
Hygiene Items	**1**	**4.8**
Protein sources	**1**	**4.8**
Vegan/vegetarian options	**1**	**4.8**
Healthy food items	3	**14.3**
Less processed	1	4.8
Bars	1	4.8

Total	**5**	**23.8**
Ready-to-eat meals	**1**	**4.8**
Grains	1	**4.8**
Rice	1	4.8
Total	**2**	**9.5**
Dairy products		
Egg	1	4.8
Milk	1	4.8
Total	**2**	**9.5**
Bread	**1**	**4.8**
Non-perishable items	**3**	**14.3**

Of the 135 participants, 53 (39.3%) were not believing the presence of barriers to use campus food pantry and they do not need campus food pantry services, 36 (26.7%) were believing the barriers, and 35 (25.9%) were not believing the barriers and need the services that provided by campus food pantry (Table 35). Lack of time to participate, feeling like not deserving or needing, and inconvenient hours of operation were leading barriers that participants believe (Table 36).

Table 35. Perceptions of Barriers to Food Pantry Use among Participants			
	Description	**Numbers**	**Percentage**
Barriers Presence	Yes, I think there are barriers	36	26.7
	I do not think there are barriers, and I DO NOT NEED the services provided by food pantry	35	25.9
	I do not think there are barriers, and I NEED the services provided by food pantry	53	39.3
	Prefer not to answer	11	8.1
	Total	**135**	**100.0**

Table 36. Frequency of Perceived Barriers		
	Frequencies	**Percentage of Participants Perceiving Barriers (n=36)**

Being a full-time student	6	16.7
Difficulties with transportation	8	22.2
Too embarrassed to be seen in the pantry	8	22.2
Feeling like I do not deserve or need it	10	27.8
Lack of info about the pantry's existence, operation, and eligibility	6	16.7
Lack of time to participate	11	30.6
Poor food quality	3	8.3
Hard to access the food pantry location	4	11.1
Inconvenient hours of operation	9	25
Social stigma of being food insecure	8	22.2

A Kendall's tau-b correlation was used to determine the relationship between campus food pantry use and believing the presence of barriers on campus pantry use. There was a weak, negative correlation, which was statistically significant (Tb = -.193, p = 0.025) (Table 37). This means that students that believe the presence of barriers on campus pantry use, are less likely to use campus food pantry.

Table 37. Analysis of Relationship between Food Pantry Use and Perceived Barriers		
	Kendall's tau-b	**Believing Barriers**
Campus Pantry Use	T_b	-.193*
	p value	<0.025
**. Correlation is significant at the 0.05 level (2-tailed).*		

A Kendall's tau-b correlation was used to determine the relationship between different variables that helps us to correlate. There was no statistically significant correlation between receiving a food program and race/ethnicity, residency status, having resources for kitchen/cooking supplies, ability to cook, and receiving nutrition education ($p>0.05$). There was no statistically significant correlation between ability to cook and dietary preferences, having food allergies, and having resources for kitchen/cooking supplies ($p>0.05$). There was no statistically significant correlation between receiving nutrition education, and ability to cook or ability to find the nutrition info ($p>0.05$).

There was a weak, positive correlation between receiving nutrition education and familiarity and the use of USDA MyPlate, which was statistically significant ($T_b=.196$, $p = 0.019$) (Table 38). This means that students receiving nutrition education are likely to be familiar with USDA MyPlate and to use it. Similar

results were found in the relationship between receiving nutrition education and having knowledge about the recommended number of servings of fruits and vegetables (T_b=.267, p = 0.02) (Table 38). This means that students receiving nutrition education are likely to have more knowledge about the recommended number of servings of fruits and vegetables. But there was not significant correlation between receiving nutrition education and ability to read food labels (p>0.05).

Table 38. Relationship Evaluation: Nutrition Education, USDA MyPlate Use, and Food Label Reading Ability

	Kendall's tau-b	**USDA MyPlate**	**Recommended Number of Servings of Fruits and Vegetables**
Receiving Nutrition Education	***T_b***	.196*	.267**
	p value	0.019	0.02

**. Correlation is significant at the 0.05 level (2-tailed).*

***. Correlation is significant at the 0.01 level (2-tailed).*

Kendall's tau-b correlation was used to determine the relationship between the number of people living in the household and believing the ability of the pantry to meet nutritional needs. There was a weak, negative correlation, which was statistically significant (T_b = -.320, p = 0.002) (Table 39). This means that students that live in households where relatively more people occupy are less likely to agree that a food pantry adequately meets their nutritional needs.

Table 39. Analysis of Household Size and Perception of Pantry's Nutritional Sufficiency

	Kendall's tau-b	**Pantry Meets Nutritional Needs of Users**
Number of People Living in the Household	***T_b***	-.320*
	p value	0.002

**. Correlation is significant at the 0.01 level (2-tailed).*

There was no statistically significant correlation between believing that pantries meet their nutritional needs and residency, having food allergy/intolerances, and dietary preferences (p>0.05). There was not statistically significant correlation

between believing the presence of barriers on campus food pantry use and residency and living arrangement ($p>0.05$).

The staff survey yielded a total of three responses, with two originating from CSU Campus A and one from CSU Campus G. Among the respondents, only one held a managerial position, while the others comprised study staff functioning as a student assistant and a graduate intern. Both campuses collaborated closely with CalFresh Healthy Living, utilizing its resources to provide nutrition education to their student populations.

All respondents noted a restriction on the quantity of items available for pantry use, ranging from 6 to 42 grocery items per visit and limiting snack purchases to 3 to 4 times a week. Various sources were cited for pantry donations, including local farmers (n=1), grocery stores (n=3), community organizations (n=2), food drives (n=2), and non-profit organizations (n=2). Two respondents identified challenges in acquiring nutritious food items through donations, although specifics on these challenges were not provided. Purchasing items from grocery stores emerged as a common strategy endorsed by all participants to incorporate fresh produce, whole grains, lean proteins, and other nutrient-dense foods into the pantry.

Regarding the frequency of foods served in the pantry, responses varied as follows:

- Fresh fruit: once to more than twice a week
- Chronic disease-specific products: once a week

- Fresh veggies: once to more than 2 times a week
- Grains: once to more than 2 times a week
- Dairy: once to more than 2 times a week
- Animal protein sources (egg, red meat, poultry): twice a week to once a year
- Vegan protein sources (Tofu, Nuts and nut butters, dried beans, and peas): once to twice a week
- Fats and oils: once a month to a year
- Spices: once a month to a year
- Condiments: once a week to a month

Evaluation of the nutritional quality and variety of food items offered in the pantry was conducted through two methods: examining nutritional facts on the back of items and labels regularly (n=1) and reviewing data and working with campus nutritionists to assess inventory once a year (n=1).

Due to the limited participation in the staff survey and the lack of meaningful results obtained from the collected answers (n=3), further statistical analysis could not be conducted.

CHAPTER FOUR

DISCUSSION

This study was seeking to answer the following questions:

- “What are the factors that affect the use of food pantry by CSU Students?”,
- “What are the improvements that needed to be made in on-campus food pantries?”,
- “How are campus food pantries managed, including the products and additional services offered?”, and
- “How are nutrition education services incorporated into food pantry services and how is the participation of students into nutrition education activities provided by food pantries?”

This chapter discusses the study’s major findings, reviews limitations of the study, offers suggestions for further research, and provides reflections and final thoughts.

Key Findings

A significant finding from the study indicates that 31.1% of students receiving financial aid, who are not enrolled in any food assistance program, lack awareness of their eligibility status. Notably, it was observed that financial aid recipients are most likely to require additional support, such as food assistance.

Furthermore, the study revealed that 26.7% of participating students are also unaware of their eligibility status for food programs. Given that participation in federal food programs correlates with a reduction in food insecurity rates, it is essential to implement strategies aimed at promoting programs that provide food assistance through the financial aid office (Mortazavi et al., 2021). For the CSU campuses, offering assistance with the program applications through campus resources such as the food pantry, Basic Needs Center, or Student Assistance in Learning (SAIL) Program, Educational Opportunity Program (EOP), etc. can effectively address this issue and help reduce food insecurity among this demographic.

This study reveals a notable correlation between students who utilize campus food pantries and their likelihood of participating in food assistance programs. While this correlation holds significance, particularly in addressing the needs of food-insecure students by leveraging available resources, it warrants nuanced examination. There exists the possibility that reliance solely on food programs may not comprehensively meet students' nutritional requirements. Alternatively, students may adopt a proactive approach, utilizing all available resources to mitigate the risk of food insecurity. However, it is crucial to consider the potential ramifications of this behavior, including the impact on equitable access to food pantry resources and the potential exacerbation of food waste through overstocking. Addressing these complexities, promoting nutrition education initiatives that emphasize meal planning, cooking skills, and budget

management may represent a valuable strategy to support this student population effectively.

Although no significant correlation was observed between participants reporting food allergies/intolerances and the utilization of campus food pantries, noteworthy findings emerged from the study. Specifically, 57.9% of participants with food allergies/intolerances reported using the campus food pantry. This unexpected trend prompts further investigation into the underlying reasons for their utilization of these resources. It is plausible that individuals with specific dietary restrictions, such as those imposed by allergies or intolerances, find the food pantry conducive to their needs due to the availability of items aligning with their anti-allergenic diet. Additionally, the study suggests that individuals facing chronic diseases or allergy-related dietary constraints may encounter challenges in sourcing specialized products, such as gluten-free or lactose-free alternatives, which tend to be more costly compared to conventional food items. Given these preliminary insights, future research endeavors should adopt a comprehensive approach to scrutinize the utilization patterns of food pantries among populations with food allergies/intolerances, thereby shedding light on this understudied area.

A notable observation from the study is that 51.9% of participants reported familiarity with the USDA MyPlate guidelines, yet they do not incorporate them into their dietary practices. This discrepancy may stem from various factors including the perceived complexity of the guidelines, individual preferences for simpler or culturally tailored diets, time limitations, lack of motivation, skepticism

regarding the effectiveness of the guidelines, or dietary restrictions. To gain deeper insights into the underlying rationales for non-adherence, it would be beneficial to direct inquiries towards elucidating the specific reasons behind participants' decision not to utilize the MyPlate guidelines. Such an approach would facilitate a more comprehensive understanding of the complexities surrounding dietary behavior and adherence to nutritional guidelines.

In assessing participants' label reading proficiency to ascertain its correlation with receiving nutrition education, the study overlooked a crucial aspect: it failed to inquire specifically about the elements participants typically scrutinize on food labels. Incorporating such inquiries into the study design would provide valuable insights, enabling a more comprehensive understanding and facilitating the identification of more meaningful correlations between label reading ability and nutrition education receipt.

It was a significant finding that 56.4% of participating students learned about the food pantry during orientation sessions. This finding suggests that orientation programs play a crucial role in informing students about the availability of such resources on campus. It underscores the importance of integrating information about food assistance services into orientation sessions to ensure that students are aware of the support available to them. Additionally, it highlights the potential impact of early exposure to food pantry services in addressing food insecurity among college students. This finding could prompt further exploration into the effectiveness of orientation programs in disseminating

information about essential campus resources and fostering a supportive environment for students in need.

Pantry users were queried regarding whether they utilize the food pantry as their primary or supplementary source of sustenance. However, the study neglected to explore the reasons behind opting for the pantry as a supplementary rather than sole source of food provision. While food insufficiency in campus food pantries might be one factor, financial constraints may lead students to stretch their budget by supplementing with pantry offerings. Additionally, limited variety, quality of products offered, accessibility issues, social stigma, dietary preferences, and the availability of other resources can all influence their decisions (Emmanuel, J. and Reyes, D., 2021), (Byrne et al., 2023), (El Zein et al., 2022). These factors collectively shape students' utilization of the campus food pantry as a supplemental resource.

Furthermore, users who use the food pantry as a supplemental resource perceive that the food pantries are conducive to positive dietary changes, while sole source users do not attribute any such positive impact to the pantry on their dietary habits. The disparity in perceptions regarding the campus food pantry's positive impact on the diet between supplemental and sole source users may result from various factors. Supplemental users, who combine pantry resources with other food sources, appreciate its value in diversifying their diet and stretching their food budget. They find the pantry's variety of options beneficial for supplementing their existing meal and food intake. In contrast, sole source

users, reliant solely on the pantry, may perceive its offerings as limited and inadequate for meeting their dietary needs entirely. These differing perceptions likely stem from variations in access, awareness, and reliance on the pantry among users.

When pantry users were asked about their preferences for diversification within the pantry, a prevailing response indicated a desire for increased availability of fresh fruits and vegetables. Different strategies can be applied to meet these demands effectively. Collaboration between pantry management and local farmers or campus gardens could serve as additional avenues for improving service provision to pantry users without imposing additional costs on the pantry's budget on this matter and increasing the fresh fruit and vegetable consumption of students (Staub et al., 2019), (Linares et al., 2023). Our study corroborates prior findings indicating a negative association between perceived barriers to accessing the campus food pantry and its utilization rates (Emmanuel, J. and Reyes, D., 2021). To ameliorate these barriers, a range of strategic interventions can be implemented, encompassing awareness-raising initiatives, educational programs, enhancements in accessibility and privacy provisions, diversification of food assortments, collaborative partnerships, technological integration, and mechanisms for feedback solicitation. These comprehensive measures aim to ensure equitable access to essential food resources for students grappling with food insecurity.

Provision of nutrition education services enhances the efficacy of food pantry utilization by fostering heightened awareness among users, thereby promoting more informed shopping practices (West et al., 2020). This study reveals that students who have not previously attended any nutrition education services offered by the campus food pantry express a keen interest in participation. Furthermore, there is a notable preference for interactive cooking classes among this demographic. To enhance the nutrition education services provided by campus food pantries and fortify the connection between pantries and students, collaborative efforts between pantry management and nutrition education curriculum developers are imperative. Emphasizing the implementation of interactive cooking classes and actively promoting nutrition education workshops, in collaboration with the Nutrition and Dietetics Program, Campus Foodservice, and Student Health Center, represents a concerted effort by campus pantry management to enhance the accessibility and impact of their services.

A notable finding from the study underscores the perception among participants that an increased number of individuals residing in the household renders the offerings of food pantries inadequate to meet the needs of their families. It is posited that larger numbers of residents in a household may encounter greater need for food, thus the fixed limits on the quantity of produce and products distributed weekly by food pantries to students not considering the size of the household may not adequately cater to their needs. To address this

disparity, providing additional food provisions to households with higher dependency ratios based on the number of occupants may enhance satisfaction levels among food pantry users regarding the adequacy of pantry services. However, the food pantries exist to support the student and not necessarily their household.

Strength and Limitations

We conducted a mixed-methods study to investigate the factors affecting the use of food pantries by university students. Utilizing both quantitative and qualitative surveys, we aimed to gain a comprehensive understanding of students' experiences with pantry products and services. The surveys provided numerical data on pantry utilization rates and demographic characteristics of users, while the qualitative surveys delved deeper into students' attitudes, perceptions, and lived experiences related to pantry use, satisfaction, and expectations. This approach allowed us to triangulate findings from different sources, offering rich insights into the factors influencing pantry use and its impact on student well-being. By combining quantitative and qualitative methodologies, our study provided robust evidence to inform policies and practices aimed at addressing food insecurity among college students. As an integral part of our study's strengths, it's noteworthy to highlight its pioneering aspect. This research marks the first attempt to delve into food pantry utilization across multiple CSU campuses.

It was fortunate that the survey was conducted through the campus online Qualtrics software which made the research accessible throughout the state of California without additional costs. The data were received and processed quickly by the software so that the outcome can be accessed without having to spend additional time entering the data and receipt of surveys. The study was able to access a representative of the target population; and because of the method that the survey was conducted, no additional follow-up was required.

The study faced several limitations that warrant consideration in interpreting the findings. Firstly, sampling bias may have occurred due to the unequal distribution of participants among the CSU campuses, with the majority of participants from Campus A, which has higher rates of food insecurity and low socioeconomic status. This imbalance could skew the results and limit generalizability to other campuses. Moreover, self-reporting bias might have influenced responses, particularly in questions of self-rating the participants' knowledge, skills, and abilities, such as food label reading and cooking skills. Additionally, the limited number of participants and time constraints hindered our ability to collect sufficient data, affecting the generalizability of our findings. We also encountered ethical considerations, as some questions requested sensitive information, leading some participants to choose the "prefer not to answer" option, thus limiting the completeness of our data analysis. These limitations underscore the need for caution when interpreting our study's results and highlight areas for improvement in future research endeavors.

The study faced a challenge due to the limited number of responses from the director/staff for robust data analysis to evaluate the management of food pantries. The number of director/staff respondents falls short of the required sample size necessary to conduct a thorough statistical analysis and to draw meaningful conclusions. This limitation hinders the ability to generalize our findings and may impact the reliability and validity of the study results. Therefore, efforts to recruit additional participants or explore alternative methodologies to mitigate this constraint are warranted to ensure the rigor and credibility of the research outcomes.

The $50 grocery card incentive may likely have boosted participation rates and engagement among students, potentially leading to a larger and more diverse sample size. This could improve the statistical power of our analyses and enhance the quality of our data. However, only participants willing to enter the grocery card drawing provided contact information, introducing potential bias into our sample. Differences between those who provided contact information and those who didn't may impact the representativeness of our findings. Therefore, while the incentive likely improved participation rates, it's important to consider its potential biases in interpreting our results.

CHAPTER FIVE

CONCLUSION AND SUGGESTIONS FOR FUTURE RESEARCH

In this study, we conducted an examination of the factors influencing the utilization of food pantries among CSU students. Our findings revealed that a significant portion of students (43.7%) relied on earned income to finance their food expenses. Moreover, a notable majority (81.5%) of students were aware of the presence of food pantries, with 64.6% utilizing them either as a sole or supplemental source of food. Interestingly, only 30.1% of pantry users were found to be receiving food assistance programs, highlighting a potential gap in access to additional support services. Furthermore, our analysis revealed that a substantial proportion (72.4%) of students receiving financial aid were not benefiting from any food assistance programs. While ineligibility was cited as the primary reason for non-participation, a noteworthy 26.7% expressed a lack of awareness regarding their eligibility status. These findings align with existing literature, underscoring the significance of perceived barriers and knowledge gaps about food pantry services in limiting their utilization among students. Given the potential of promoting food programs to mitigate food insecurity and enhance access to nutritious resources among students, food pantry managers should play a proactive role in advocating for federal and campus food programs. This may include initiatives aimed at raising awareness about the services

offered by campus food pantries and promoting participation in available assistance programs within the campus community.

Our study revealed that students utilizing the food pantry experience positive modifications in their dietary habits, particularly in increased consumption of fruits and vegetables, indicative of a shift towards healthier food choices. Additionally, our findings indicated a desire among pantry users for greater diversity in food offerings, particularly in categories such as fresh fruits, vegetables, ready-to-eat meals, and snacks. Recognizing the specific needs and preferences of the target population served by each pantry could serve as a valuable strategy for enhancing satisfaction rates among students utilizing pantry services. This, in turn, may positively impact the utilization rates of campus food pantries and the overall effectiveness of the services they provide.

In assessing the utilization of nutrition education services provided by campus food pantries among students, we examined both the nutrition education status of students and the extent of participation in these services. Our data analysis revealed that a majority of students (61.5%) did not partake in any nutrition education sessions or workshops offered by the food pantry. Interestingly, among those who did not participate in any nutrition education activities, a significant portion (67.6%) expressed interest in engaging with nutrition education-related initiatives. Notably, interactive cooking classes emerged as the most sought-after educational activity among students. Existing research underscores the positive impact of increased nutrition education on the

overall health outcomes of populations, particularly among those experiencing food insecurity. Hence, integrating nutrition education initiatives, such as culinary skill workshops, dissemination of recipes featuring lesser-known produce and food items, within the framework of campus food pantries, offers a potent strategy to combat food insecurity and optimize the impact of their services.

In conclusion, this study offers significant insights into the multifaceted factors that influence the utilization and efficacy of campus food pantries among students. Our findings elucidate notable correlations between socioeconomic status, awareness of eligibility for food assistance programs, and the utilization of pantry services. Furthermore, perceptions of barriers to pantry use and preferences for nutrition education interventions emerged as pivotal determinants of pantry utilization rates. Strategies aimed at mitigating these barriers and enhancing the accessibility and effectiveness of food pantry services were discussed in detail. This study contributes to the existing literature by providing nuanced insights into the intricate dynamics surrounding food insecurity and pantry utilization among CSU students, underscoring the imperative for comprehensive interventions to address this critical issue. Knowledge regarding campus resources is instrumental in guiding goal setting and planning initiatives aimed at identifying and connecting students with the necessary resources to enhance their educational success and overall well-being. Therefore, it is crucial for CSU food pantry administrators to be cognizant of the awareness levels of the

food pantry, the prevalence of its utilization, and the expectations of students regarding the services offered by the food pantry on their respective campuses. Building upon the findings of this study, several avenues for future research are recommended. Firstly, longitudinal studies tracking pantry utilization patterns over time could provide valuable insights into the long-term effectiveness of pantry interventions and the impact of external factors on pantry utilization rates. Additionally, qualitative studies exploring the lived experiences and perceptions of food insecurity among university students could offer deeper insights into the underlying reasons for pantry utilization and inform the development of more targeted interventions. Furthermore, comparative studies examining the effectiveness of different strategies for addressing barriers to pantry use and enhancing the accessibility of pantry services across diverse institutional contexts would contribute to the development of evidence-based best practices. Collaboration among different campus programs such as Financial Aid, Student Engagement, Orientation and Recruitment Services, Wellness Center, Student Health Center, Campus Foodservice, with the Basic Needs and campus food pantry program may increase students' awareness of the services that are available to students in need of food assistance.

Lastly, exploring the potential synergies between campus food pantries and broader community-based food assistance programs could provide valuable insights into opportunities for collaboration and resource-sharing to better serve the needs of food-insecure college students.

APPENDIX A

STUDENT INFORMED CONSENT FORM

Factors Affecting the Use of Food Pantries by University Students on California State University Campuses

Principal Investigators: Dr. Dorothy Maynard-Chen & Beyza Aktepe

You are invited to participate in a research survey conducted by California State University, San Bernardino. Before you decide to participate, it is important for you to understand the purpose of the study, what your participation will involve, and any potential risks or benefits.

The purpose of this study is to investigate the factors that influence the use of food pantries by university students on 7 CSU campuses. We are particularly interested in understanding your experiences, opinions, and factors that may affect your decision to use or not use food pantry services.

If you agree to participate, you will be asked to complete a survey. The survey will include questions about your demographics, food pantry usage patterns, and factors that influence your decisions. The survey is expected to take approximately 15 minutes to complete.

Participating in this study involves minimal risk. However, you may feel discomfort or inconvenience answering some survey questions. We encourage you to answer all questions to have a successful study. However, if you do not feel comfortable answering any of the questions, you can select the “Prefer not to answer” option. The benefits of this study include contribution to a better

understanding of how food pantries can be improved to better serve university students.

Your responses will be kept confidential to the extent permitted by law. Your name will not be associated with your survey responses, and all data will be stored securely by investigators of the study. Only the research team will have access to the data, and your personal information will not be shared with others.

Your participation in this study is entirely voluntary. You may choose not to participate or withdraw at any time without penalty. Your decision will not affect your current or future relationship with any California State University.

As a token of our appreciation for your time, you will have the opportunity to enter a drawing for a $50 grocery gift card. To be eligible, please provide your contact information at the end of the survey.

If you have any questions or concerns about the study, you may contact beyza.aktepe@csusb.edu. If you have questions about your rights as a research participant, you may contact the Institutional Review Board (IRB) at mgillesp@csusb.edu.

By clicking "I agree" on this form, you indicate that you have read and understood the information provided, that any questions you have about the study have been answered to your satisfaction, and that you voluntarily agree to participate in this research study.

___ I agree to participate in this study.

APPENDIX B

STAFF INFORMED CONSENT FORM

Factors Affecting the Use of Food Pantries by University Students on California State University Campuses

Principal Investigators: Dr. Dorothy Maynard-Chen & Beyza Aktepe

You are invited to participate in a research survey conducted by California State University, San Bernardino. Before you decide to participate, it is important for you to understand the purpose of the study, what your participation will involve, and any potential risks or benefits.

The purpose of this study is to investigate the factors that influence the use of food pantries by university students on 7 CSU campuses. We are particularly interested in understanding your experiences, opinions, and factors that may affect your decision to use or not use food pantry services.

If you agree to participate, you will be asked to complete a survey. The survey will include questions about your demographics, food pantry usage patterns, and factors that influence your decisions. The survey is expected to take approximately 15 minutes to complete.

Participating in this study involves minimal risk. However, you may feel discomfort or inconvenience answering some survey questions. We encourage you to answer all questions to have a successful study. However, if you do not feel comfortable to answer any of the questions, you can select the “Prefer not to answer” option. The benefits of this study include contribution to a better

understanding of how food pantries can be improved to better serve university students.

Your responses will be kept confidential to the extent permitted by law. Your name will not be associated with your survey responses, and all data will be stored securely by investigators of the study. Only the research team will have access to the data, and your personal information will not be shared with others.

Your participation in this study is entirely voluntary. You may choose not to participate or withdraw at any time without penalty. Your decision will not affect your current or future relationship with any California State University.

As a token of our appreciation for your time, you will have the opportunity to enter a drawing for a $50 grocery gift card. To be eligible, please provide your contact information at the end of the survey.

If you have any questions or concerns about the study, you may contact beyza.aktepe@csusb.edu. If you have questions about your rights as a research participant, you may contact the Institutional Review Board (IRB) at mgillesp@csusb.edu.

By clicking "I agree" at the beginning of this form, you indicate that you have read and understood the information provided, that any questions you have about the study have been answered to your satisfaction, and that you voluntarily agree to participate in this research study.

___ I agree to participate in this study.

APPENDIX C

STUDENT SURVEY

DEMOGRAPHIC QUESTIONS

Gender
- Born in male
- Born in female
- Prefer not to answer

Age
- 18-19
- 20-21
- 22-25
- 26-29
- 30-40
- 41-50
- 51 and above
- Prefer not to answer

Race
- White
- Black
- Hispanic
- Asian/Pacific Islander
- Multiple race/ethnicities
- Other
- Prefer not to answer

Which CSU campus are you studying at?
- CSU Campus A
- CSU Campus B
- CSU Campus C
- CSU Campus D
- CSU Campus E
- CSU Campus F
- CSU Campus G
- Prefer not to answer

Enrollment status
- Full-time
- Part-time
- Prefer not to answer

Employment status
- None
- Part-time (0-20 h/w)

Full-time 21+ h/w\
Prefer not to answer

California Resident
Yes
No
Prefer not to answer
No answers only: What is your residency?
Out of state
International
Prefer not to answer

Living arrangement
On campus
Off campus
Prefer not to answer

How many individuals live in your household? (open ended)

Are you granted Financial Aid?
Yes
No
Prefer not to answer
Yes answers only: What type of financial aid are you granted?
Pell Grant
SAIL
EOP
Loan recipients
Other
Prefer not to answer

How do you pay for food?
Monthly allowance from parents/guardians
Earned Income
Student Loans
Food Stamps
Financial Aid
Meal Plans
Other
Prefer not to answer)

Do you receive any food programs such as SNAP/ CalFresh, WIC, or other programs provided by your university (Swipe Out Hunger by CSUSB)?
Yes

No
Prefer not to answer
No answers only: Please select the one applies for you regarding receiving food programs
I am not eligible for them.
I am eligible but I did not apply yet.
I am eligible but I do not plan to apply.
I am aware of programs, but I do not know if I am eligible or not.
I do not know what food programs are, and I am not interested in.
I do not know what food programs are, but I am interested in learning more about the program.
Prefer not to answer.

What is your food source mostly?
I cook all/most of my meals for myself
Someone cooks all/most of my meals for me
I cook occasionally, rest from other sources
Someone cooks for me occasionally
I only buy ready to eat meals
I only order outside to pick up
I only order outside with online delivery services
Other
Prefer not to answer.

Do you have resources to cook in your living area? (basic kitchen equipment such as a stove, oven, microwave, etc.)?
Yes
No
I don't know
Prefer not to answer

How do you define your dietary preferences?
Vegan: includes plant-based foods only and excludes animal foods of any kind.
Vegetarian: includes eggs, milk, milk products and plant foods, but excludes red meat, fish, and poultry.
Standard: includes red meat, fish, poultry, eggs, milk, milk products and plant foods.
Pescetarian: includes fish, eggs, milk, milk products and plant foods, but excludes red meat and poultry.
Other
Prefer not to answer.

Do you have any food allergies or intolerances?
- Yes
- No
- Prefer not to answer

NUTRITION KNOWLEDGE RELATED QUESTIONS

Did you receive or are you receiving any nutrition education?
- Yes
- No
- Prefer not to answer
  - *Yes answers only:* What is the source of nutrition education that you received?
    - Nutrition class in school
    - Education from health care provider
    - Education provided by food program (CalFresh, WIC, etc.)
    - Other
    - Prefer not to answer

How would you define your cooking ability?
- No knowledge/Do not cook
- Beginner
- Intermediate
- Advance
- Prefer not to answer

Have you attended any nutrition education sessions or workshops provided by the campus food pantry?
- Yes
- No
- I don't know that they exist
- Prefer not to answer
  - *No answers only:* Would you be interested in participating in nutrition-related educational activities at the food pantry?
    - Yes
    - No
    - Prefer not to answer
      - *Yes answers only:* Please select what type of classes are you interested in?
        - Lecture-style only
        - Cooking-demo only
        - Interactive- cooking class
        - Prefer not to answer

Would you rate your knowledge to find the right information when there are nutrition-related issues? (From 1: no knowledge to 5: expert in nutrition-related subjects)

Are you familiar with OR do you use the USDA MyPlate for your food intake?
- Yes
- No
- Prefer not to answer

Do you know the recommended number of fruits and vegetables for adults?
- Yes
- No
- Prefer not to answer

How would you rate your ability to read and interpret nutrition labels on food products? (From 1:lowest ability to 5:highest ability)

FOOD PANTRY RELATED QUESTIONS

Do you know that there is a food pantry on your campus which provides free grocery and snacks to students?
- Yes
- No
- Prefer not to answer
  - *Yes answers only:* How did you learn about the food pantry?
    - Friend
    - Campus orientation
    - Professor
    - Displayed flyers
    - Social media
    - Other
    - Prefer not to answer

  - *Yes answers only:* Do you use a food pantry located in your campus?
    - Yes. I use or used the campus food pantry to supplement regular food needs
    - Yes. I use or used food from campus food pantry as the sole source of food
    - No. I have not used the food pantry.
    - Prefer not to answer.

TO STUDENTS WHO USE THE FOOD PANTRY

Do you find foods in the campus pantry that meet your dietary preferences?
- Yes
- No
- Prefer not to answer

Do you feel that the food pantry adequately meets your nutritional needs?
- Yes
- No
- Prefer not to answer

Do you think that campus food pantry provides healthy food choices which are good for your overall health and well-being?
- Yes
- No
- Prefer not to answer

Have you noticed any positive changes in your eating habits since you started using the food pantry?
- Yes
- No
- Prefer not to answer
    - *Yes answers only:* Please type what changed in your eating habits since you started using the food pantry. (open ended)

What factors influence your decision to use the food pantry? Select all that apply.
- Convenience
- Financial constraints
- Lack of access to nutritious foods
- Other
- Prefer not to answer
    - *Other answers only:* Please type the factor/factors that influence your decision to use the food pantry. (open ended)

Do you think that on-campus food pantries need some improvements/changes in food quality and quantity?
- Yes
- No
- Prefer not to answer
    - *Yes answers only:* What is/are the food group/groups you would like to be more diverse/having more options?
        - Fresh Fruit

Fresh Vegetable
Snacks
Dried food
Ready-to-eat meals
Other
Prefer not to answer.

Yes answers only: Select the options that you may suggest to the pantry management to improve in order to increase the number of the students that use on-campus food pantry?

Food for family
Investing in destigmatizing food insecurity
Marketing services food pantry provides to students
More flexibility of access
No suggestions
Availability of non-perishable items
To clear out expired food
Access to clothing closet
Access to bed sheeting and other home related products
Feminine hygiene products
Prefer not to answer

TO STUDENTS WHO ARE NOT AWARE OF THE CAMPUS FOOD PANTRY

If you would know, would you like to go to an on-campus food pantry to check-it out?

Yes
No
Prefer not to answer

What kind of products would you expect from an on-campus food pantry? (open-ended)

FOOD PANTRY RELATED QUESTIONS (cont.)

Do you think there are barriers to access the on-campus food pantries?

I do not think there are barriers, and I DO NOT NEED the services provided by food pantry
I do not think there are barriers, and I NEED the services provided by food pantry
Yes, I think there are barriers
Prefer not to answer

Yes answers only: What would be the barriers? Please select all that apply.

- Being a full-time student
- Difficulties with transportation for both on/off-campus students
- Too embarrassed to be seen in the pantry
- Feeling like I do not deserve or need it
- Lack of info about the pantry's existence, operation, and eligibility
- Lack of time to participate
- Hard to access the food pantry location
- Poor food quality
- Inconvenient hours of operation
- Social stigma of being food insecure
- Prefer not to answer.
- Other
  - *Other answers only:* Please describe the barriers you think (open ended)

If you are willing to enter the drawing for a 50$ grocery card, please fill out the questions below.

- First Name
- Last Name
- Email Address
- Contact Phone Number

APPENDIX D

STAFF SURVEY

MANAGEMENT AND DONATION RELATED QUESTIONS

Which CSU campus do you work for?
- CSU Campus A
- CSU Campus B
- CSU Campus C
- CSU Campus D
- CSU Campus E
- CSU Campus F
- CSU Campus G
- Prefer not to answer.

What is your position in the food pantry? Please type. (open ended)

Which division do you report to within the university? Please type. (open ended)

Which programs does your food pantry work collaboratively? Please type. (open ended)

Where is the pantry located on campus?
- Inside of the student union
- Outside of the student union
- Prefer not to answer

Is there a limit to the use of food pantries?
- Yes
- No
- Prefer not to answer
  - *Yes answers only:* What are the limits per week for grocery? Please type.(open ended)
  - *Yes answers only:* what are the limits per week for snacks? Please type.(open ended)

What are the primary sources of food donations for your pantry? Select all that apply.
- Local businesses/farmers
- Grocery stores
- Community organizations
- Food drives
- Local food bank
- Non-profit organizations such as CAPS
- Other
- Prefer not to answer

Does the food pantry face challenges in acquiring nutritious food items through donations?

Yes
No
Prefer not to answer

Yes answers only: How do you address these challenges? Please type. (open ended)

What are the challenges your pantry faces stocking foods in your pantry?

Limited service area
Limited employee
Other
Prefer not to answer

Other answers only: If other, please type challenges. (open ended)

Are there specific strategies in place to promote the inclusion of fresh produce, whole grains, lean proteins, and other nutrient-dense foods? (open-ended)

<u>FOOD AND NUTRITION EDUCATION RELATED</u>

Is your campus a CalFresh Healthy Living site?

Yes
No
Prefer not to answer

Does your food pantry provide nutrition education materials or workshops to pantry participants?

Yes
No
Prefer not to answer

Yes answers only: How would you describe workshop participation? Please type. (open ended)

Yes answers only: Do you use any specific curriculum for nutrition education?

Yes
No
Prefer not to answer

Yes answers only: Please type what curriculum you use. (open ended)

Select the frequency of the foods you serve in your pantry? (twice a week, more than twice a week, once a week, once a month, once a year, none)

Fresh fruits
Fresh vegetables

Grains
Dairy products (milk, cheese)
Animal protein Sources (egg, red meat, poultry)
Vegan Protein Sources (Tofu, Nuts and nut butters, dried beans, and peas)
Fats and oils
Spices
Condiments
Snacks
Chronic disease specific products (i.e. gluten free)

How and how often do you evaluate the nutritional quality and variety of food items offered in the pantry? Please describe shortly. (open-ended)

APPENDIX E

INSTITUTIONAL REVIEW BOARD (IRB) APPROVAL

Date: 3-28-2024

IRB #: IRB-FY2024-14
Title: Factors Affecting the Use of Food Pantries by University Students
Creation Date: 8-22-2023
End Date:
Status: Approved
Principal Investigator: Dorothy Chen
Review Board: CSUSB Main IRB
Sponsor:

Study History

Submission Type	Review Type	Decision
Initial	Exempt	Exempt

Key Study Contacts

Member Beyza Aktepe	Role Co-Principal Investigator	Contact 008098760@coyote.csusb.edu
Member Dorothy Chen	Role Principal Investigator	Contact DChen@csusb.edu
Member Dorothy Chen	Role Primary Contact	Contact DChen@csusb.edu

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