Beyond the Student Food Pantry: Education and Cookware Boost Cooking and Nutrition Self-Efficacy in College Pantry Users

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ABSTRACT

Purpose: *This study investigates how providing students with cookware and foundational nutrition knowledge through informative videos affects their willingness to prepare healthier meals at home by removing financial barriers.* ***Methods:*** *Quasi-experimental design; pre-, post-, and follow-up-assessments used to evaluate the impact on students' perceived cooking confidence and perceived knowledge of nutrition and cooking techniques. Midwestern university in the U.S., utilizing the college food pantry for participant recruitment. Thirty-six participants were randomly chosen to participate; 19 completed all parts. Participants completed a pre-assessment survey, watched educational videos, received cookware, and completed post-assessment surveys immediately after the intervention and two months later. Changes in self-efficacy, perceived cooking skills, food practices, and nutrition knowledge were measured. ANOVA and paired-samples t-tests were conducted to assess the significance of changes in the variables.* ***Results:*** *Participants showed significant improvements in perceived cooking techniques and perceived confidence in general food practices, but no significant increase in home cooking frequency.* ***Conclusions and***

Implications: *Providing essential tools and knowledge can empower students in the kitchen, though barriers like academic and work obligations may impact home cooking frequency. Practitioners should continue exploring cookware as a key component in reducing food insecurity.*

Keywords: food insecurity, college students, cookware, nutrition, food pantry

INTRODUCTION

According to the United States Department of Agriculture (USDA, 2024), food insecurity refers to "limited or uncertain access to adequate food." Food insecurity does not necessarily include disrupted eating patterns or reduced food intake, it may also entail compromised quality, variety, or desirability of diet (USDA, 2024). In recent years, research has drawn attention to food insecurity as a prevalent concern among college students (Baker-Smith et al., 2020; Bruening et al., 2017; Lewis, 2024). A scoping review reported food insecurity estimates ranging from 10% to 75% on college campuses (Nikolaus, et al., 2020). Studies have identified specific subpopulations of college students who are particularly vulnerable to food insecurity, including minority students such as students of color, international students and students who identify as LGBTQ+ (Boncyk et al., 2021; El Zein et al., 2019). Students dependent on fellowships or assistantships for funding, students living off-campus, and students who received a Pell grant are also more likely to experience food insecurity (Boncyk et al., 2021; El Zein et al., 2019).

The adverse effects of food insecurity on academic performance and student success are widely established in literature. Multiple studies have linked food insecurity to lower grade point averages (Boncyk et al., 2021; Martinez et al., 2020). In a longitudinal study comprising a nationally representative sample of over 1,500 students, the researchers found that food insecure students were 40% less likely to graduate from college and over 60% less likely to obtain a post-graduate degree (Wolfson et al., 2021). Given the importance of a college degree for accessing financially promising career opportunities and professional advancement, these findings underscore the detrimental effects of food insecurity not only on student performance during their years of education, but also on long-term career success.

Food insecurity among college students is associated with various unhealthy lifestyle factors, impairing their physical and mental health. According to Martinez et al. (2019), food insecurity is associated with insufficient sleep and fewer days of physical activity among college students. Studies also report a higher prevalence of depression and anxiety among food insecure students (Bruening et al., 2018; Wattick et al., 2018). Wattick et al. (2018) observed that food insecure students struggled with depression and anxiety between 10-15 days a month, while Bruening et al. (2018) found food insecure students to be twice as likely to experience high stress levels and depressive moods. Furthermore, studies utilizing self-rated health surveys consistently demonstrated poorer overall health among food insecure students (Hagedorn & Olfert, 2018; Martinez et al., 2019).

Literature has established an adverse association between food insecurity and dietary intake (Larson et al., 2020; Leung & Tester, 2019). While college students are often found to consume diets of poor nutritional quality, emerging research indicated poorer dietary intakes among food insecure students compared to their counterparts (Mei et al., 2021; Shi et al., 2021). A recent review reported lower intakes of fresh fruits, vegetables and whole grains as well as higher intakes of fast foods and added sugars among food insecure students (Shi et al., 2021). Mei et al. (2021) observed poorer diet quality among food insecure students despite having the same food resources as food secure students, including identical meal plans and unlimited access to dining halls. The authors purported that food insecure students may have outside employment hours which deter them from accessing dining halls during operation hours. This is supported by Goldrick-Rab et al. (2018) who found a positive correlation between food insecurity rates and the number of hours that students worked per week. Further examination found that only 33% of students that identified as food insecure received food assistance through Supplemental Nutrition Assistance Program (SNAP) benefits (Lewis, 2024). These findings accentuate the complexity of food insecurity, with factors extending beyond financial constraints.

Further campus initiatives are needed to understand and address food insecurity among the student body in a comprehensive manner.

Cooking frequency has been identified as a predictor of food insecurity (Hagedorn et al., 2019; McArthur et al., 2017). Knol et al. (2019) conducted an online survey among students living off-campus and observed lower levels of cooking self-efficacy among students who were food insecure. The researchers also found that very low food secure students engaged in food preparation less often than students who were more food secure. In terms of barriers to cooking and healthy eating, multiple studies have cited location and transportation as primary limiting factors (Amore et al., 2019; Dhillon et al., 2019; Kaesberg et al., 2021). Many universities are also found in food deserts, and given the time, financial and transportation constraints that college students struggle with, the only practical food resources for students are gas stations, drugstores or fast-food restaurants, which are grossly limited in healthy food options (Dhillon et al., 2019).

The lack of nutrition and cooking knowledge also poses a barrier to cooking and healthy eating among college students, particularly among food insecure students (Amore et al., 2019; Morgan et al., 2021). However, even if students had adequate cooking skills and access to fresh foods, they often lack the cooking facilities required to prepare their own meals. According to Kaesberg et al. (2021), students identified time and lack of cooking equipment as primary factors keeping them from improving the nutrition quality of their meals. Amore et al. further noted that the lack of cooking utensils and facilities, including not having appropriate food storage equipment (e.g., a refrigerator), kept students from preparing healthier meals (Amore et al., 2019).

Video technology has become the increasingly preferred tool for learning (Surgenor et al., 2017; Surgenor et al., 2021). Additionally, short-duration culinary videos across multiple platforms such as TikTok, Instagram, and YouTube have risen in popularity among the younger generation. While video technology holds potential for delivering effective culinary education, few studies to date have explored the effectiveness of utilizing videos in developing food and nutrition literacy. Surgenor et al. (2017) found that video cooking demonstrations were effective in improving cooking competence and confidence, and enjoyment of the cooking process among low-skilled domestic cooks. Similarly, O'Neal and Cocco (2021) integrated online cooking videos with goal setting strategies in a college nutrition course, which resulted in greater cooking self-efficacy and increased fruit and vegetable intake among students. In a study conducted among undergraduate students living off-campus, cooking education delivered through video technology in addition to recipe cards was found to promote cooking self-efficacy among participants (Kaesberg et al., 2021). However, the frequency of cooking among participants was not increased between pre- and post-intervention, which the researchers found to be due to scarcity in time, finances, and cooking equipment among students. Overall, these findings emphasize the need for food insecurity interventions that comprehensively address the various factors of food insecurity on campus, targeting cooking competence and self-efficacy as well as the practical factors of time, cost, and accessibility to cooking equipment.

PURPOSE

The purpose of this study was to explore ways of reducing low food security in college students in a unique way. Food insecure individuals may have access to a food pantry for their basic needs, however, they may not have the necessary tools to cook those items at home. Cookware can be costly, and many may not know how to utilize the cookware to prepare healthier meals at home. Therefore, we sought to determine if providing college students with cooking videos along with basic cooking tools would increase students' perceived cooking self-efficacy and increase the number of meals cooked at home. This research was guided by two main questions: (1) Will the interventions improve students' perceived cooking self-efficacy? and (2) Will the interventions increase students' weekly frequency of cooking at home?

This study is significant for health professionals and educators because providing basic cooking tools and videos can be a mechanism for universities to improve student health and wellbeing which may lead to increased retention. This research further seeks to assess college students' perceived level of knowledge of basic nutrition and cooking, their perceived level of confidence in cooking skills, and perceived

level of confidence in food practices. By assessing this information, we are better able to determine if the cooking video intervention increased students' overall confidence in various aspects of cooking at home over time.

METHODS

Research Design

This research project was designed using the basic tenets of social cognitive theory: observational learning, modeling, and self-efficacy. Social cognitive theory is a psychological framework that emphasizes the importance of learning from observing others' modeled behavior which influences their own behaviors, thoughts, and emotions (Bandura & Walters, 1977). We chose to use a pre-test, mid-test, post-test design to assess change in behavior and self-efficacy over time.

Participants

After receiving approval from the university's Institutional Review Board, researchers partnered with a local college food pantry that services two universities and a community college to recruit participants. Participants in the project were college students 18 years or older who visited the food pantry at some point during the study duration. Potential participants were sent information about the study via email and flyers about the study were posted at the college food pantry. To be eligible for participation, individuals must be current college students (any level) and live off campus.

Data Collection

Data collection took place in stages and included an interest survey, pre-assessment, and two post-assessments. See Figure 1 for a full breakdown of the project flow.

Interest Survey

The interest survey was sent to all individuals registered with the local college food pantry. Individuals interested in the study completed an initial Qualtrics survey containing demographic questions, food insecurity status, cookware items owned, and cookware items they wished they had. Their name and email address were obtained through a secure separate survey to later contact for participation in the intervention stage. Additionally, those that completed the interest survey were asked to create a unique identifier to be used for all follow-up surveys, allowing the researchers to perform paired analyses for pre- and post-test differences.

Demographic items included gender, race/ethnicity, academic standing, where they live (on or off campus), and household size. Food insecurity was assessed with four items adapted from the USDA food insecurity scale, including "In the last 12 months, I worried whether my food would run out before I got money to buy more", "In the last 12 months, the food that I bought just didn't last, and I didn't have money to get more", "In the last 12 months, I couldn't afford to eat balanced meals", and "In the last 12 months, did you ever cut the size of your meals or skip meals because there wasn't enough money for food?" (USDA, 2024). Finally, the availability of cookware items was assessed using a "check all that apply" list of cookware items and one open ended question which asked, "Is there a cookware item that you wish you had?".

Due to availability of funding, there were 36 cookware packages available. Therefore, 36 participants were randomly chosen from the pool of interested participants to take part in the remaining stages of the project. This was done by first assigning numbers to all email addresses of those who completed the interest survey, then using a random number generator to choose 36 from that set. To ensure confidentiality, email addresses of participants and unique identifiers were kept separate from one another.

Pre-Assessment

The pre-assessment survey was developed using Qualtrics and sent to the 36 randomly chosen participants through e-mail. The instrument included a series of scales and open-ended questions. The scales included a self-assessment of knowledge of cooking and nutrition (3 items), frequency of meal preparation (1 item), perceived confidence in cooking scale (5 items), self-efficacy in cooking techniques scale (14 items), self-efficacy in food practices scale (19 items) (as adapted from Lavelle et al., 2017). Open ended questions asked participants to describe the challenges to cooking and preparing meals, and what (if any) food assistance programs they may be on.

Intervention

With the aim to increase knowledge of basic nutrition, food preparation, and cookware uses, six informational videos were developed. Social cognitive theory posits that individuals are more likely to model behavior if they 1) observe others completing that behavior, and 2) the model's characteristics are more similar to the observer. Therefore, the informational videos were professionally produced through the university media team with college students acting as the instructor (model) for the videos.

Students were given links to the videos via email with instructions. As they watched the videos through an educational tool called Edpuzzle, participants were asked simple questions to engage them and encourage them to watch the videos in their entirety. Three educational videos were created: 1) introduction to the pantry including a walkthrough of the facility, 2) a simple overview of nutrition and choosing healthy foods, and 3) an introduction to cookware tools found in most kitchens, including the tools the participants would receive at the completion of the project. Three additional videos focused on recipes and cooking techniques: 4) a no cook healthy snack option, 5) a versatile chicken fajita recipe, and 6) a one-pot chicken and rice recipe.

Each recipe was intentionally chosen to highlight a cooking skill or an easy-to-complete recipe that was modifiable to the viewer's preferences. For example, the chicken in either of the chicken recipes could be replaced with beef or pork or be turned into a vegetarian dish. Tips for modifying the recipes were included within the videos. Additionally, food safety tips were provided through the cooking demonstrations to ensure participants knew about proper cooking temperatures for poultry and the importance of hand washing. Many of the ingredients from the recipes could be found at the local food pantry with the exception of meats and poultry. To incentivize participation in watching the videos and completing the surveys, participants received a package of cookware tools to help them be more successful in cooking at home.

The intervention was designed so that the participants first completed the pre-assessment, followed by watching the three informational videos. Once the first three videos were completed, participants were eligible to pick up the first half of the cookware items that included: chef knife, wooden spoon, measuring cups, cutting board, saucepan, measuring spoons, and thermometer. Next, they were given the second three recipe videos and a link to post-assessment 1. See Figure 1 for a complete project flow chart.

Post-Assessment 1

After watching the six videos, participants were given a post-assessment. Post-assessment 1 included the same questions as the pre-assessment, which was later used to examine any changes in perceived confidence or knowledge gained from these videos. After completing the last three videos (the recipes) and post-assessment 1, participants were eligible to pick up the remaining cookware items that included: 10" non-stick skillet, baking sheet, liquid measurer, potholder, can opener, apron, and plastic storage containers. Of the 36 original participants, 28 students completed the post-assessment 1 and picked up their cookware items.

Post-Assessment 2

The final portion of this project was to examine if students were using the cookware tools provided to them and in what capacity. Approximately two months after the completion of post-assessment 1 and the cookware pickup, participants were emailed asking if they would be willing to complete one last assessment for a chance to receive one of four available $25 gift cards to a local grocery store, purchased by the researchers as part of the available funding. Post-assessment 2 included the same items as the pre-assessment and post-assessment 1, along with items assessing the frequency with which students use the cookware, whether they attempted the recipes, and the types of food they received through food assistance programs. There were also open-ended questions asking for feedback on the recipes and general feedback about their experience participating in this project. Of the 28 participants that received the email, 19 completed post-assessment 2.

Data Analysis

Surveys were distributed using Qualtrics and analyzed using SPSS v26. Fifty-six individuals completed the interest survey, of which 36 were randomly chosen to participate in the main study and receive the cookware package. Of the 36 randomly chosen participants, 33 completed the

pre-assessment, 28 completed post-assessment 1, and 19 completed post-assessment 2. Due to the dropout rate and the desire to compare variables across time, we determined that the best route would be to remove participants from the data analysis that did not complete all parts of the study. This allows us to use both paired samples t-tests and repeated-measures ANOVA to compare the pre-, post1- and post2-intervention responses. Therefore, the final participant count is 19 usable responses (Table 1).

RESULTS

Students' cooking self-efficacy

Paired-samples t-tests were conducted to evaluate whether students' self-efficacy in cooking skills and food practices had a statistically significant increase after the video intervention and receipt of the cookware. Two areas were assessed: perceived level of confidence in performing cooking techniques (i.e., chopping, blending, preparing raw meat/poultry, etc.), and perceived level of confidence in food practices (i.e., following a recipe, meal planning, using leftovers, etc.). See table 2 for mean scores, scale mean scores, and Cronbach's alpha of each scale.

There was found to be a statistically significant increase in the perceived level of confidence in performing cooking techniques between the pre-assessment (M = 2.77, SD = 0.87) and post-assessment 2 (M = 3.33, SD = 0.91), $t(18) = 4.16$, $p \leq 0.001$. The perceived level of confidence in performing cooking techniques was not evaluated in post-assessment 1.

There was found to be a marginally significant increase in the perceived level of confidence in food practices between the pre-assessment (M = 2.69, SD = 0.88) and post-assessment 2 (M = 3.08, SD = 0.95), $t(18) = 2.083$, $p = 0.05$. The perceived level of confidence in cooking practices was not evaluated in post-assessment 1.

Frequency of cooking at home

Paired-samples t-tests were conducted to determine if students' frequency of cooking at home increased after the video intervention and receipt of the cookware. Results indicate that there was not a statistically significant difference in how often students prepare their own meals between the pre-assessment (M = 4.11, SD = 1.29) and post-assessment 2 (M = 4.32, SD = 0.89), $t(18) = 0.721$, $p = 0.48$). While no statistically significant difference was observed between the two groups, there was a slight increase in the overall average time spent cooking at home. A deeper examination of participants' cooking habits revealed that prior to the intervention, 68.4% of students cooked at home three or more times per week, compared to 89.5% at the 2-month post intervention survey. This shift emphasizes the potential impact of the intervention and provision of cookware on participants' cooking at home more frequently.

General perceived level of nutrition and cooking knowledge

Repeated-measures ANOVA was performed to compare students' perceived level of knowledge of nutrition and cooking across three time points: pre-, post1-, and post2-assessments. Individual item mean scores and standard deviations, scale mean scores, and Cronbach's alpha for the perceived level of nutrition and cooking knowledge scale are presented in Table 3.

Mauchly's test indicated that the assumption of sphericity has been met, χ^2 (2) = 1.45, p = .485. The effect of time on perceived level of knowledge was significant at the .05 level, $F(2, 17) = 5.14$, $p = .018$. Post-hoc pairwise comparisons with a Bonferroni adjustment indicated that there was a statistically significant difference between perceived level of knowledge at the pre-assessment and post-assessment 1, (p = .02). There was also found to be a statistically significant difference between the pre-assessment and post-assessment 2, (p = .04). However, there was not found to be a statistically significant difference between post-assessment 1 and post-assessment 2 (p = 1.00).

Perceived level of confidence in cooking

Repeated-measures ANOVA was performed to compare students' perceived level of confidence in cooking across three time points: pre-, post1-, and post2- assessments. Individual item mean scores and standard deviations, scale mean scores, and Cronbach's alpha for the perceived confidence in cooking scale are presented in Table 3.

Mauchly's test indicated that the assumption of sphericity has been met, χ^2 (2) = 5.32, p = .07. The effect of time on perceived level of

confidence in cooking was significant at the .05 level, $F(2, 17) = 7.62$, $p = .004$. Post-hoc pairwise comparisons with a Bonferroni adjustment indicated that there was a statistically significant difference between perceived level of confidence in cooking at the pre-assessment and post-assessment 1, ($p = .03$). A statistically significant difference was also observed between the pre-assessment and post-assessment 2, ($p = .03$). However, there was not found to be a statistically significant difference between post-assessment 1 and post-assessment 2 ($p = 1.00$).

DISCUSSION

This research project aimed to achieve two primary objectives: (1) to assess the impact of implementing a series of educational videos covering various aspects of cooking on students' perceived cooking self-efficacy, and (2) to investigate whether exposure to these educational resources and access to cookware would lead to an increase in the frequency of students cooking at home. Moreover, the study delved into an innovative approach to addressing food insecurity and promoting home cooking by providing access to essential cookware.

The results indicate a sustained improvement in students' perceived proficiency in cooking techniques and their confidence in general food practices between the initial pre-assessment and post-assessment 2, administered two months after the intervention. The combination of educational videos and cookware may have empowered students with the necessary resources to enhance their overall self-efficacy in cooking at home, thereby offering support for our initial research objective.

Interestingly, the frequency of home cooking did not show a significant increase following the intervention. It's worth noting that post-assessment 2 coincided with the break between fall and spring semesters, potentially limiting some students' ability to cook at home due to resource constraints or time limitations, resulting in a lower overall mean for cooking frequency. Despite the observed improvement in cooking self-efficacy, and the increase in the percentage of students cooking at home three or more times per week, our study did not fully meet the second research objective of increasing the frequency of home cooking. Future research endeavors should consider employing longitudinal study designs to examine the sustainability in cookware utilization and home cooking over time. Additionally, investigating the seasonal patterns of cooking among students would be insightful, as certain periods of the academic year may pose challenges for home cooking due to increased academic demands and busier schedules.

Regarding students' self-assessment of their nutrition and cooking knowledge, there was an immediate increase post-video intervention, which remained stable two months later, indicating sustained perceived knowledge growth. The study also found that providing educational videos alongside cookware led to an initial boost in students' cooking confidence, with this confidence level remaining consistent even two months after the intervention, suggesting a potential long-term impact on perceived confidence.

An increased level of confidence in the understanding of nutrition and cooking could improve the eating habits of food insecure students by giving them more choices when visiting a food pantry. They would no longer have to rely on microwavable or ready to eat foods and may instead choose ingredients to build healthy meals at home. Students with better access to healthy foods can increase their health status which in turn may increase persistence in college (Woflson et al., 2021).

RECOMMENDATIONS

This study offers both theoretical and practical implications. This study offers insights into the applicability of social cognitive theory in understanding and enhancing cooking self-efficacy among students, providing valuable contributions to the literature on behavior change in culinary practices. Additionally, the findings suggest actionable strategies for institutions of higher education, food pantries, and community organizations to address food insecurity by integrating cooking education programs and providing access to essential cookware, thereby promoting healthier eating habits and self-sufficiency among students.

Institutions of higher education can adopt similar approaches by integrating cooking education and providing essential cookware to promote student well-being. Access to cooking resources can boost students' confidence and

success in preparing meals at home. While time constraints may still pose challenges to cooking at home, access to cookware can alleviate financial burdens. Many students arrive at college without the necessary resources to equip their living spaces, with cookware often low on the priority list. International students face additional hurdles, as they relocate without these items and may have limited financial means to purchase them. Institutions of higher education can enhance their food services on campus by offering cooking education and collaborating with various campus units to identify students lacking basic resources, facilitating their access to such necessities. This initiative could contribute to improved retention rates and increased engagement within the campus community.

Food pantries that service college students could adopt a similar strategy by expanding their offerings beyond food provisions to encompass cooking education and cookware essentials. This expansion could entail partnering with educational institutions to tackle food insecurity in a more holistic manner, customizing services to cater to the diverse needs of the student body. Such an approach would create a more comprehensive system of food assistance, addressing both immediate hunger needs and empowering students with the skills and tools necessary for sustainable food practices.

The findings of this research highlight a novel method for empowering individuals facing low food security. This innovative approach to addressing food insecurity among college students aims not only to address financial barriers to cooking, but also to empower students to cook nutritious meals at home, thus reducing the reliance on processed and fast foods. This presents a step towards addressing broader systemic issues underlying food insecurity, extending beyond mere access to food.

Limitations and Future Research

In this study, several limitations should be acknowledged. First, the absence of a control group poses a limitation in assessing the true impact of the intervention. Without a comparison group, it is challenging to determine whether the observed changes in cooking behavior were solely attributable to provision of cookware and educational resources or to other cofounding factors. Therefore, future research should consider incorporating a control group to better assess the relationship between the intervention and its outcomes.

The video interventions were designed to provide concise, 3-to-5-minute educational content and recipe overviews with professionally transcribed closed captioning. However, it's important to note that both the transcription and videos were exclusively produced in English, potentially excluding a significant subset of students who utilize the student food pantry, particularly international students. Incorporating future options to provide transcriptions in multiple languages could enhance accessibility and inclusivity. Additionally, student feedback indicated the desire for more international recipes, particularly those from South Asia and Middle Eastern origin. Future research could explore providing similar educational tools tailored specifically for international students.

In assessing students' knowledge levels, participants were asked to rate their general nutrition and cooking knowledge. However, reliance on self-reported answers limits our ability to measure actual increases in knowledge gained; we can only evaluate perceived improvements. Future research could employ a more objective approach by administering pre- and post-intervention quizzes to establish a baseline, determine if the intervention has a true effect on knowledge retained, and measure retention of knowledge over time.

Finally, researchers acknowledge that the response rate across the assessments decreased, with post-assessment 2 having fewer responses compared to either of the previous assessments. It is essential to acknowledge that participation in all segments of this study was voluntary. To ensure more consistent and reliable data, future research could strive for uniform response rates across all assessment rounds.

Expanding the scope of this project to encompass a broader range of groups, including other institutions of higher education, community groups, and more food pantries, presents a opportunity for future research and project growth. By broadening the study's reach, researchers can glean insights into the effectiveness of similar interventions across diverse populations, settings, and previous experience with cooking, thus enriching our understanding of strategies to address food

insecurity and promote healthier cooking practices on a larger scale.

CONCLUSIONS

The initial investment required for cookware items, including pots, pans, knives, and cutting boards, presents a significant financial hurdle for many students, making these tools inaccessible. The lack of access to food preparation items can impede students' ability to cook nutritious meals at home. The underlying aim of this research study was to empower students by supplying them with the necessary confidence and resources to begin preparing healthier meals in their own kitchens. Through the use of informative video content, alongside essential cookware items, we sought to bridge the gap between education and access with application of cooking at home. While this study focused on tools used in food preparation, and did not include serving or eating items (e.g., plates, bowls, utensils), this could be an area for future examination. Eating utensils are generally more accessible through other avenues, such as thrift stores and peer sharing, whereas quality cookware is less available and more costly.

It is crucial to acknowledge the multifaceted challenges that those with low food security face when trying to cook at home. Beyond financial constraints, additional barriers such as time constraints and limited culinary knowledge further compound the issue. Students are more likely to grab microwavable items than ingredients used to prepare meals due to simplicity and availability of cookware. By supplying students with not only the tools but also the foundational knowledge necessary for successful home cooking, we aimed to alleviate some of these burdens. Through this intervention, we aimed to remove one significant obstacle—financial affordability of essential cooking equipment—thereby opening up a pathway for students to engage more regularly in preparing nutritious meals at home. This approach represents a proactive step toward promoting healthier eating habits and fostering a greater sense of empowerment among students.

The provision of free or reduced-price cookware, coupled with educational resources, not only facilitates students' ability to cook nutritious meals at home but also has the potential to address food insecurity issues. By alleviating the financial burden associated with acquiring essential cooking tools, this intervention can contribute to reducing food insecurity among students. Access to cookware empowers individuals to utilize affordable ingredients and recipes, stretching their food budgets further and enabling them to prepare healthier meals.

Healthcare providers and educators can leverage these findings to enhance their programming aimed at addressing food insecurity. Understanding the pivotal role that access to cookware plays in promoting healthier eating habits, healthcare providers can incorporate discussions on cooking skills and resources into their patient interactions. By identifying patients experiencing food insecurity, healthcare providers can refer them to community programs or initiatives that provide free or reduced-price cookware alongside cooking education.

Educators, particularly those in food and nutrition-related fields, can integrate similar interventions into their curriculum or outreach efforts. By emphasizing the importance of cooking skills and providing practical resources, educators can empower students and community members alike to overcome barriers to home cooking, ultimately promoting better nutrition and food security.

Overall, the combination of accessible cookware and educational support represents a holistic approach to addressing food insecurity and promoting healthier lifestyles. By collaborating with healthcare providers, educators, and community organizations, we can work towards creating sustainable solutions to improve food access and nutrition outcomes for all.

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Table 1. Demographic, Socioeconomic, and Food Insecurity Status of College Student Users of Student Food Pantry (n=19)

		n	Percent
Gender			
Female		11	57.9
Male		8	42.1
Race/Ethnicity			
Black or African American		5	26.3
White		6	31.6
Hispanic/Latino		2	10.5
Asian		6	31.6
Academic Standing			
Sophomore		1	5.3
Junior		5	26.3
Senior		4	21.1
Graduate Student		9	47.4
Household Size			
1		8	42.1
2		5	26.3
4		4	21.1
5		1	5.3
6+		1	5.3
Food Insecurity Questions			
In the last 12 months…			
I worried whether my food would run out before I got money to buy more.			
	Often True	8	41.1
	Sometime True	11	57.9
The food that I bought just didn't last, and I didn't have money to get more.			
	Often True	5	26.3
	Sometime True	10	52.6
	Never True	4	21.1
I couldn't afford to eat balanced meals			
	Often True	10	52.6
	Sometime True	4	21.1
	Never True	5	26.3
Did you ever cut the size of your food or skip meal because there wasn't enough money for food?			
	Often True	7	36.8
	Sometime True	6	31.6
	Never True	6	31.6
Total		**19**	**100%**

Table 2: Results of T-Tests

	Pre Assessment			Post Assessment 2			Comparison of Assessments (n=19)		
Scale/Item	**M**	**SD**	**α**	**M**	**SD**	**α**	**t(18)**	***p***	**η^2**
Self-efficacy in Cooking Techniques Scale (14 items)	2.77	0.87	0.85	3.33	0.91	0.88	4.155	<.001*	0.49
Self-efficacy in Food Practices Scale (19 items)	2.69	0.88	0.89	3.08	0.95	0.94	2.083	0.05*	0.19
Frequency of Meal Preparation (1 item)	4.11	1.29	N/A	4.32	0.89	N/A	0.721	0.48	0.03

Statistical significance was set to $p \leq 0.05$.

Table 3: Results of Repeated Measures ANOVA for the Self-Assessment of Knowledge and Perceived Confidence in Cooking Scales (n=19)

	Pre Assessment			Post Assessment 1			Post Assessment 2			Comparison of Assessments (n=19)		
Scale/Item	**M**	**SD**	**α**	**M**	**SD**	**α**	**M**	**SD**	**α**	***F*(18)**	***p***	**Wilks's lambda**
Self Assessment of Knowledge	2.46	0.63	0.78	2.91	0.53	0.83	2.79	0.49	0.76	5.14	0.018*	0.62
general nutrition knowledge	2.26	0.87		2.95	0.71		2.68	0.58				
general cooking knowledge	2.63	0.83		2.89	0.57		2.89	0.57				
general cooking skills	2.47	0.51		2.89	0.57		2.79	0.63				
Perceived Confidence in Cooking Scale	3.18	0.57	0.69	3.60	0.68	0.87	3.52	0.71	0.85	7.62	<.001*	0.47
cooking at home	3.53	0.77		3.53	0.61		3.79	0.79				
following a written recipe	3.68	0.82		4.05	0.62		4.11	0.66				
preparing dinner from items already in the kitchen	3.26	0.87		3.63	0.96		3.53	0.90				
cooking from scratch	2.95	0.91		3.53	0.90		3.00	1.15				
planning and cooking healthy meals	2.47	0.90		3.26	1.05		3.16	0.90				

Figure 1: Project Outline