Closing the Gap on Interventions and Strategies to Address College Student Food Insecurity

by

Abbigail Bailey Pace Hickey

A dissertation submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Auburn, Alabama
December 10, 2022

Keywords: food insecurity, college students, strategies, Community-Based Participatory
Research, capacity building

Approved by

Onikia Brown, Chair, Associate Professor of Nutritional Sciences
Alicia Powers, Managing Director of Hunger Solutions Institute
Carey Andrzejewski, Professor of Educational Foundations, Leaderships, & Technology
Andrew Frugé, Assistant Professor of Nursing

Abstract

Food insecurity is a condition of limited or inconsistent access to adequate food for a healthy, active lifestyle. Approximately 32 percent of college students experience food insecurity compared to 10.5 percent of households in the general population. Food insecurity negatively impacts physical and mental health, nutritional status, academic success, retention rates, and social well-being. It is important that college students experiencing food insecurity are supported during their academic pursuits by interventions and strategies that provide food aid and improve food access. The purpose of this dissertation was to (1) describe characteristics and outcomes of previous and current campus-based interventions and strategies that address college student food insecurity; 2) describe a Community-Based Participatory Research (CBPR) approach to address college student food insecurity; 3) assess and explore engagement and collaborative efforts of campus coalitions at two-year colleges; and 4) describe differences in engagement and collaborative efforts between two-and four-year campus coalitions.

A systematic review of interventions and strategies that addressed college student food insecurity demonstrated interventions and strategies with multiple components (e.g. offering nutrition education with free food) improved nutrient intake and successfully enrolled hundreds of college students in the Supplemental Nutrition Assistance Program (SNAP). Enrolling students in public assistance programs like SNAP, offering nutrition education, and providing recipes with food may offer long-term benefits and support as students can utilize these resources when campus-based food aid is not available, such as weekends and breaks. However, additional systematic interventions and strategies are needed to address the problem that food insecurity poses to the college student population.

To systematically address college student food insecurity, *Hunger Free Higher Ed (HFHE)* was developed. It includes a six-step approach adapted from the Substance Abuse and Mental Health Services Administration (SAMHSA) Strategic Prevention Framework (SPF) to improve college student food insecurity by utilizing principles of Community-Based Participatory Research (CBPR) (SAMHSA, 2019). *HFHE* collaborates with campuses by offering technical assistance in food security innovations, strategic planning, assessment, and evaluation; supporting food aid infrastructure; and promoting implementation of evidence-based initiatives. *HFHE* implemented the approach at 29 colleges and universities in Alabama. This research described each of the six steps and introduced the future of the approach through an innovative, electronic platform with the potential for national reach.

In 2021, two-year colleges in Alabama initiated the HFHE approach by joining the Alabama Campus Coalition for Basic Needs (ACCBN), a state network of campus coalitions with a mission of reducing college student food insecurity in Alabama. During the first step, campus coalition leaders (also known as campus champions) formed a coalition by engaging members of their campus and community to unite resources that improve student food security. Researchers assessed and explored these engagement and collaborative efforts through an explanatory, sequential mixed methods study. Campus champions completed a survey and semi-structured interview. Two inductive themes emerged from the results of the survey and interview: (1) champions noted feelings of being spread thin due to understaffing of employees and the impact of COVID-19; and (2) champions demonstrated intentionality in how they planned to engage members and develop a sustainable coalition. These results described challenges with community-capacity building and coalition maintenance at two-year college campuses.

Colleges and universities throughout Alabama have joined ACCBN and are matriculating through the *HFHE* approach in collaboration with *HFHE leaders*. Campus champions from four-year universities and two-year colleges participated in the ENGAGE assessment in 2019 and 2022, respectively. We compared and described differences in the survey and interview responses provided by two- and four-year campus champions. Results of this study demonstrated Campus champions from four-year universities rated their skills in writing proposals and obtaining resources significantly higher than two-year campus champions ($\chi^2 = 9.849$, *p* < .05). Campus champions from two-year colleges rated the incorporation of coalition activities within other agencies or institutions was absent at a significantly more frequent rate than four-year campus champions ($\chi^2 = 6.667$, *p* < .05). In addition, two- and four-year campus champions differed in their responses to interview questions concerning areas in which their coalition excelled, encountered challenges, or required improvement.

Acknowledgments

I have loved the field of nutrition for most of my life. The completion of this dissertation is truly a dream come true. I have many people to thank for their support as I worked towards this accomplishment. First, thank you to Dr. Brown for her support, mentorship, and friendship. I am beyond grateful that she has invested in me and encouraged me over the last six years. Thank you to Dr. Brown and Dr. Powers for allowing me to work with *Hunger Free Higher Ed* and share in the success of the project. Thank you to Dr. Andrzejewski and Dr. Frugé for their expertise and support as members of my committee. I am very thankful for those that helped me to grow along the way, including my friends and colleagues at Health Promotion & Wellness Services: Lauren, Shelby, Bridget, Eric, Tony, DaNavian, Melissa, Morgan, and Jessica-Lauren. Thank you to my graduate colleagues in *Hunger Free Higher Ed*: Rita, Sara, Malerie, Jessie, and Mary Beth. Thank you to my coworkers at Eastern Kentucky University for the opportunity to apply this work to students with food insecurity in my home state.

Last, thank you to my family: my siblings, Amelia, Meredith, Hope, and Ben and my parents, John and Angie. Their unconditional love and support were the catalysts for this accomplishment. Most of all, thank you to my husband, Hayden. His support, encouragement, and love made this possible. War Eagle!

Table of Contents

List of Tables

List of Figures

List of Abbreviations

Alabama Campus Coalition for Basic Needs .... ACCBN

Community-Based Participatory Approach .... CBPR

Economic Research Service .... ERS

Food and Nutrition Service .... FNS

Food Security Survey Module .... FSSM

Government Accountability Office .... GAO

Hunger-Free Higher Ed .... HFHE

National Center for Education Statistics .... NCES

Preferred Reporting Items for Systematic Reviews and Meta-Analysis .... PRISMA

Supplemental Nutrition Assistance Program .... SNAP

United States .... US

USDA

I: INTRODUCTION

Dissertation Organization

This dissertation is organized into six chapters. The first chapter is an introduction to the dissertation and includes the research problem, statement of purpose, research questions, and objectives. The second chapter is a literature review of college student food insecurity including a manuscript "*Campus-based interventions and strategies to address college students with food insecurity: A systematic review*" accepted into the *Journal of Hunger and Environmental Nutrition* (Hickey, Brown, & Fiagbor, 2022). The third chapter provides methodology on a six-step, iterative approach utilizing principles of Community-Based Participatory Research (CBPR), including a manuscript "*Hunger-Free Higher Ed*: *A collaborative, capacity-building process to end college student food insecurity*" to be submitted to the *Journal of Nutrition Education and Behavior*. The fourth chapter is a manuscript entitled "*Engagement and collaborative efforts of campus-based food security coalitions at two-year colleges in Alabama: A mixed methods inquiry*", to be submitted to *Journal of Health Education and Behavior*. The fifth chapter is a manuscript "*Comparing engagement and collaborative efforts among food security campus coalitions at two-year colleges and four-year universities in Alabama*" to be submitted to *Journal of Health Education and Behavior*. The sixth chapter includes overall conclusions of the dissertation and recommendations for future research.

Research Problem

As many as 60% of college students experience food insecurity, a condition of inadequate and inconsistent food for an active, healthy lifestyle (Abbey et al., 2022; Bruening et al., 2017; Cockerham et al., 2021; Core indicators of nutritional state, 1990; Nazmi et al., 2018). Food insecurity increases the risk of negative outcomes on physiological health, nutritional status,

mental health, social well-being, and academic success in college students (Allen & Alleman, 2019; Dubrick et al., 2016; Mei et al., 2021; Mukigi et al., 2018; Payne-Sturges et al., 2018; Philips et al., 2018; Silva et al., 2017). Due to the increased risk of experiencing food insecurity, experts called upon institutions of higher education to address student food insecurity (Broton & Goldrick-Rab, 2015). The need for effective strategies has become more pertinent as there is evidence that the COVID-19 pandemic led to worsened food security status among college students (Owens et al., 2020). Common solutions to address food insecurity include educating faculty, staff, and students about food insecurity and resources that are available to address food insecurity; cooking and budgeting classes; offering food aid, such as food pantries; centralizing student support services, such as counseling and financial aid; providing opportunities for emergency aid; and conducting research about student food insecurity (U.S. GAO, 2018). However, there is a gap in the literature concerning evidence-based programs and interventions that effectively address college student food insecurity (Davis et al., 2020).

Community-Based Participatory Research (CBPR) empowers collaborative partnerships among community members, stakeholders, and researchers through the integration of skills and knowledge (Butterfoss et al., 1993; Hacker et al., 2012; Simmons et al., 2001). CBPR brings together researchers, local leaders, and stakeholders to address community concerns and social determinants of health. Efforts focus upon the creation of solutions and implementation of initiatives that draw upon strengths and resources of a local community (Israel et al., 1998). CBPR builds community capacity, an interaction between human, organizational, and social entities that allows a community to garner resources and promote systematic change (Chaskin, 1999; Craig, 2007; Simmons et al., 2001). CPBR methods have been used to address issues of food insecurity among low-income families, individuals with HIV, pre-school children, Native

American families, People of Color, and families with school-aged children. (Dailey et al., 2017; Derose, et al., 2021; Jarrott, et al., 2021; Jernigan et al., 2012; Palakshappa, et al., 2021; Paschal et al., 2019). This dissertation expands the literature by describing a CBPR approach that addresses food insecurity among college students. *Hunger-Free Higher Ed* is a partnership between Auburn University Department of Nutritional Sciences and Hunger Solutions Institute (HSI). The mission of *HFHE* is to decrease college student food insecurity by convening, collaborating, and multiplying best practices at colleges and universities. *HFHE* is an iterative-six step, capacity-building approach utilizing principles of CBPR to systematically address college student food insecurity. The steps were adapted from the Substance Abuse and Mental Health Services Administration (SAMHSA) Strategic Prevention Framework (SPF) (SAMHSA, 2019). The six steps are (1) ENGAGE, (2) ASSESS, (3) PLAN, (4) IMPLEMENT, (5) EVALUATE, and (6) CELEBRATE. *HFHE* implemented this approach in 29 colleges and universities in Alabama.

Statement of Purpose

This dissertation 1) described characteristics and outcomes of campus-based interventions and strategies that address college student food insecurity; 2) proposed a CBPR approach to address college student food insecurity; 3) assessed and explored engagement and collaborative efforts campus coalitions at two-year colleges; and 4) described differences in engagement and collaborative efforts between two- and four-year campus coalitions.

Research Questions and Objectives

Objective 1: Describe characteristics and outcomes of campus-based interventions and strategies that address college student food insecurity.

1. What interventions and strategies have been used to address student food insecurity on college campuses?

2. What strategies and interventions produced positive outcomes in addressing college student food insecurity

Objective 2: Describe a CBPR approach to address college student food insecurity

Objective 3: Assess and explore engagement and collaborative efforts of campus coalitions at two-year colleges.

1. What characteristics of coalition building are present among two-year campus coalitions during the Engage Step, including personnel, structure, formation, implementation, maintenance, and institutionalization?

2. What are experiences of campus champions in building their campus coalition?

Objective 4: Explore differences in engagement and collaborative efforts among campus champions at two- and four-year colleges.

3. What are the differences in engagement and collaborative efforts at two- and four-year campus coalitions early in coalition development?

II: LITERATURE REVIEW

Food insecurity is the limited or inconsistent access to adequate food for an active, healthful lifestyle and is characterized by the inadequate quality and/or quantity of food from a dependable, consistent source (Core indicators of nutritional state, 1990). Individuals with food insecurity have lower diet quality and increased risk of negative health outcomes (Gunderson & Ziliak, 2015). College students with food insecurity often consume low amounts of nutrient-dense foods and high amounts of energy-dense foods leading to nutritional deficiencies and increased risk of chronic disease (Bruening et al., 2018; Darling et al., 2017; Shi et al., 2021). As college students are in transitional years of growth and development, food insecurity can have long-term impacts on health and well-being.

Food Insecurity Assessment and Prevalence Among College Students

United States Department of Agriculture (USDA) developed and validated the Food Security Survey Module (FSSM) to measure food security status among US households (Bickel et al., 2000). FSSM is offered in a 6-, 10-, and 18-item survey. The 18-item FSSM assesses food insecurity within a household, including lack of food access experienced by children. The 10-item FSSM is used for households without children and enables less respondent burden. The 6-item FSSM is used when the 10-item FSSM cannot be implemented due to respondent burden. However, it also does not ask questions concerning child dietary intake and does not measure the most severe level of food security. All FSSM assessments ask participants to provide a response based on their experience with food access in the last 12 months. It is possible to modify that time frame to 30 days for accuracy. FSSM scores describe levels of food security in three groups (high food security, low food security, and very low food security) depending on limitations to diet quality and quantity as well as anxiety related to accessing adequate food. Most food

security prevalence studies with college students utilized the 10-item FSSM (Bruening et al., 2018). While the FSSM is validated in the general population, studies have suggested FSSM does not appropriately assess the prevalence of food insecurity in college students (Ames & Barnett, 2019; Nikolaus et al., 2019a; Nikolaus et al., 2019b).

Economic Research Service (ERS) estimates that 10.5% of US households experience food insecurity (Coleman-Jensen et al., 2021). In a 2018 report, the US Government Accountability Office (GAO) reported between 9-50% of college students are food insecure (GAO, 2018). However, food insecurity estimates have reached as high as 60% in one sample of undergraduate nursing students (Cockerham et al., 2021). In a systematic review, Bruening et al. (2017) found the average prevalence for college student food insecurity was 35% in peer-reviewed articles and 44% in grey literature. Moreover, Nazmi et al. (2018) discovered the unweighted mean for food insecurity prevalence among eight studies was 43.5%. A recent systematic review of 42 studies indicated 32.2% college students experienced food insecurity (Abbey et al., 2022).

College Students with Increased Risk for Food Insecurity

Minoritized groups often experience higher rates of food insecurity. A 2018 report from GAO stated students with a disability, first generation students, former foster youth, students experiencing housing insecurity, students from low-income families, single parents, and students receiving SNAP are more likely to experience food insecurity (US GAO, 2018). Other studies identified groups that had a higher risk of food insecurity in college, including students that identify as a African American/Black, Hispanic/Latino, other race/ethnicity, multiracial, LGBTQ+, financial aid recipients, Pell Grant recipients, first generation students, being financially independent from their families, live off campus, and being food insecure as a child

(Cockerham et al., 2021; El Zein et al., 2020; El Zein et al., 2018; Goldrick-Rab et al., 2019; Leung et al., 2021; Martinez et al., 2016; Mialki et al., 2021; Payne-Strurges et al., 2018; Reeder et al., 2020; Sackey et al., 2021; Soldavini & Berner, 2020; Weaver et al., 2020).

Moreover, cost of tuition and fees to attend college continues to increase while there are limitations to public assistance programs to supplement student needs. The cost of tuition and fees to attend a public, four-year college and a public, two-year college was 10.5% and 18% higher in 2019-2020 compared to 2010-2011, respectively (National Center for Education Statistics, 2021). More students from households that fell at or below the poverty line attended college in 2016 (39%) compared to 1996 (28%) (Radwin et al., 2018). In 2015-2016, 17% more students utilized the Federal Pell Grant than in the 1999-2000 academic year. The GAO recognized that federal student aid does not cover the cost of attending college and described limitations to accessing public assistance programs, such as Supplemental Nutrition Assistance Program (SNAP), due to restrictions on eligibility (US GAO, 2018). Therefore, as more students from under-represented households attend college, postsecondary education will need to have adequate resources and strategies to meet their needs.

Impacts of Food Insecurity in College Students

Recent evidence indicates food insecurity leads to poorer overall physical health in college students (Davitt et al., 2021; Farahbaksh et al., 2017; Hagedorn et al., 2021; Knol et al., 2017; Leung et al., 2019; Martinez et al., 2019; McArthur et al., 2018; Willis, 2021). The negative health impacts resulting from food insecurity are multi-faceted, including poor dietary quality and lack of medical care (Kushel et al., 2006; Mukigi et al., 2018). As a result of limited financial resources, students may purchase low-cost food, skip meals, stretch food to last for longer amounts of time, and eat less at mealtimes (McArthur et al., 2018a; McArthur et al.,

2018b; Smith et al., 2020). College students with food insecurity also have diets low in fiber, are less likely to eat breakfast, have lower daily meal consumption, have fewer healthy eating habits, lack cooking skills and nutrition literacy, and demonstrate low nutrition self-efficacy (Bruening et al., 2016; Bruening et al., 2018; Cuy & Holcomb, 2020; Davitt et al., 2021; Laska et al., 2021; Leung et al., 2021; McArthur et al., 2018a; Mei et al., 2021). Students with food insecurity consume diets with higher levels of energy-dense foods, such as fast food, food products high in saturated fat and added sugar, and sugar-sweetened beverages (Davitt et al., 2021; Drewnowski & Darmon, 2005; El Zein et al., 2019; Gallegos et al., 2014; Laska et al., 2021; Mei et al., 2021; Mello et al., 2010). Student food insecurity is also associated with lower intakes of nutrient-dense foods, such as fruits, vegetables, and whole grains (El Zein et al., 2020; Farahbaksh et al., 2017; Martinez et al., 2019; Mei et al., 2021; Mirabitur et al., 2016). As a result of a poor-quality diet, food insecure students have a higher risk for inferior micronutrient intake, including calcium, vitamin E, vitamin A, and carotenoids (Bhattacharya et al., 2004; Dixon et al., 2001; Gundersen & Ziliah, 2015). College students with food insecurity are more likely to have a higher Body Mass Index (BMI), poorer sleep quality, and less physical activity (Bruening et al., 2018; Davitt et al., 2021; El Zein et al., 2018; El Zein et al., 2019; Hagedorn et al., 2021; Laska et al., 2021; Leung et al., 2021; Martinez et al., 2019; Owens et al., 2020; Willis, 2021). Moreover, students with food insecurity are at higher risk for chronic diseases and other health conditions, including diabetes, hypertension, obesity, hyperlipidemia (Bhattacharya et al., 2004; Holben et al., 2010; Martinez et al., 2019; Gunderson & Ziliak, 2015; Pan et al., 2012; Seligman et al., 2010).

In addition to poor physiological health, students with food insecurity experience poorer mental and social health compared to their food secure counterparts (Becerra & Becerra, 2020;

Farahbaksh et al., 2017; Hagedorn et al., 2021; Mukigi et al., 2018; Weaver et al., 2020). In addition, food insecure students are more likely to have poorer social support, peer support, and psychosocial health and fewer supportive relationships (Cockerham et al., 2021; Keogh et al., 2020; Laska et al., 2021; Raskind et al., 2019). Students with food insecurity have a higher risk for depression, stress, anxiety, disordered eating, eating disorders, psychological distress, and poor resiliency (Barry et al., 2021; Becerra & Becerra, 2020; Bruening et al., 2016; Bruening et al., 2018; Chrisstensen et al., 2021; Cockerham et al., 2021; El Zein et al., 2018; Laska et al., 2021; Leung et al., 2019; Rashkind et al., 2019; Reeder et al., 2020; Wattick et al., 2018; Willis, 2021).

Academic success is negatively impacted by the lack of consistent nutrition. Food insecure students are more likely to experience difficulty concentrating in class and drop out of college (Farahbakhsh et al., 2017; Maroto et al., 2014; Martinez et al., 2018; Skomsvold et al., 2011). Students with food insecurity are more likely to have lower Grade Point Averages (GPAs) than food secure students (Cockerham et al., 2021; El Zein et al., 2018; Laska et al., 2021; Leung et al., 2019; McArthur et al., 2019a; Maroto et al., 2014; Martinez et al., 2018; Mukigi et al., 2018; Patton-Lopez et al., 2014; Silva et al., 2017; Weaver et al., 2020). As the brain continues to develop in the twenties, food insecurity has a prolonged impact on cognitive and physical development (Pujol et al., 1993).

Manuscript 1. Campus-based Interventions and Strategies to Address College Students with Food Insecurity: A Systematic Review

Abstract

44% percent of college students experience food insecurity. This systematic review describes characteristics and outcomes of interventions and strategies that addressed college students with food insecurity to provide best practices for colleges and universities that seek to address college student food insecurity. Three electronic databases were searched for peer-reviewed articles and grey literature concerning food aid interventions and strategies. Of the 271 articles identified, eight articles met eligibility criteria and were included. This review offers insight into interventions and strategies that improve nutrient intake, reduce food waste and food aid stigma, and offer long-term benefits or support.

Keywords

Introduction

Food insecurity is characterized by the limited access to adequate food for an active, healthy lifestyle (Core indicators of nutritional state, 1990; USDA Definitions of Food Security, 2022). According to researchers, 44% of college students experience food insecurity at some point in their college career compared to an estimated 10.5% of households in the general population (ERS, 2022; GAO, 2018; Nikolaus et al., 2020). College students are at an increased risk for food insecurity due to increasing costs of college, decreased buying power of grants and

loans, and difficulty accessing government aid (Broton & Goldrick-Rab, 2016; College Board, 2017; Dynarski & Scott-Clayton, 2013; Mitchell et al., 2015; NCES, 2017). Various studies have demonstrated the impact of food insecurity on college student physical, mental, and academic wellness (Bhattacharya et al., 2004; Bruening et al., 2017; Bruening et al., 2018; Dixon et al., 2001; Drewnowski & Darmon, 2005; Gallegos et al., 2014; Gundersen & Ziliak, 2005; Hege et al., 2021; Johnson & Rochkind, 2009; Mello et al., 2010; Meza et al., 2019; Shi et al., 2021; Silva et al., 2017). Students who are food insecure are more likely than their food secure counterparts to have a lower GPA, drop out of college, experience academic difficulties such as concentrating in class or on exams, consume more energy-dense foods, consume less nutrient-dense foods, have poorer health, and experience mental health concerns. (Bhattacharya et al., 2004; Bruening et al., 2017; Bruening et al., 2018; Dixon et al., 2001; Drewnowski & Darmon, 2005; Gallegos et al., 2014; Gundersen & Ziliak, 2005; Hege et al., 2021; Johnson & Rochkind, 2009; Mello et al., 2010; Meza et al., 2019; Shi et al., 2021; Silva et al., 2017).

Examples of strategies and interventions that address food insecurity include food pantries, community gardens, food scholarships, and enrollment in Supplemental Nutrition Assistance Program (SNAP). However, a college student may have difficulty accessing community resources as a result of lack of awareness or transportation (Henry, 2017). Due to the concerns of increased prevalence and impact of food insecurity in college students, colleges and universities need to implement and document interventions, programs, and strategies to address food insecurity (Davis et al., 2020). To our knowledge, the body of literature does not include a review that specifically details the characteristics and outcomes of intervention or strategies that target college students with food insecurity. Therefore, the purpose of this review is to describe characteristics and outcomes of interventions and strategies that addressed college students with

food insecurity to provide best practices for colleges and universities that aim to address college student food insecurity.

Materials and Methods

The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines for systematic reviews was used to plan and conceptualize the study (Moher et al., 2009). Electronic databases were searched for eligible peer-reviewed articles and grey literature, including thesis and dissertations. The keywords food insecurit* or food secur*; college student* or university student*; intervention* or strateg* or program* or best practice* were searched on MEDLINE and ERIC databases through EBSCOhost. Those keywords were selected as they commonly appear in literature concerning food insecurity in college students. Articles that were published between January 2001 and March 2021 were considered for inclusion. The first-round search yielded limited eligible articles; therefore, the search was expanded in three ways: (1) PUBMED was added to the databases that were searched; (2) the date was updated to January 2001 through November 20, 2021, in all databases; (3) keywords were added to capture a broader selection of articles. The keywords in the second-round search included food insecurit* or food secur* or hunger; college student* or university student*; intervention* or strateg* or program* or best practice* or direct student support* or student support* or systemic reform* or practice* or protocol*.

Selection Criteria

Titles and abstracts of the articles were independently screened by three researchers. Articles were considered eligible for further review if the study was based in the United States; was in English; and included information about an intervention or strategy that addressed college students with food insecurity at colleges and universities, including 2-year, 4-year, and

professional students. Full-text review of eligible articles was conducted for all articles that met inclusion criteria. The reference lists of eligible articles were reviewed to identify additional articles that met the inclusion criteria.

Data Extraction and Limiting Researcher Bias

Data were extracted from eligible articles by three researchers. Information on description of study setting, details about the intervention or strategy, duration of the study, variables of the study, sample characteristics, and outcomes were gleaned from each article. Study bias was monitored by the researchers throughout the article selection and data extraction. Discussions concerning the inclusion of the articles occurred in regularly scheduled meetings. To limit bias, multiple researchers examined each article throughout each step of the review process and consensus among the researchers was obtained for each article before it was included in the review. Data extracted from each article was verified by at least two researchers.

Results

The first-round search yielded 136 articles in which duplicates were excluded by EBSCOhost during the search. See figure 1 Selection Criteria. Title and abstract review excluded 101 articles for the following reasons: did not address food insecurity (n=57), was not based in the U.S. (n=12), did not target college students (n=6), was not an intervention or strategy (n=23), and was not a peer-reviewed journal article or grey literature (n=3). As a result of the first-round search, 35 articles were considered eligible for full-article review. A second-round search was commenced which yielded 134 articles for additional review. Duplicates found between the first- and second-round searches and removed (n=57). Title and abstract review excluded 62 articles for the following reasons: did not address food insecurity (n=44), was not based in the U.S. (n=2), did not target college students (n=5), was not an intervention or strategy (n=10), and was

not a peer-reviewed journal article or grey literature (n=1). 15 articles were considered eligible for full-article review from the second-round search.

Fifty full-text articles remained eligible from the first (n=35) and second (n=15) round searches. The reference lists of the 50 articles were screened for other articles that met all inclusion criteria. Five articles were identified from the reference list search and were included in the full-text review. Therefore, the full-text of 55 articles were reviewed. The full-text review led to the removal of 41 articles for the following reasons: was not about food insecurity (n=3), did not target the college student population (n=3), was not an intervention or strategy to address food insecurity (n=33), and was not a peer-reviewed article or grey literature (n=2). Fourteen articles were included in the data extraction; however, 6 articles were removed during extraction as they did not meet criteria as an intervention or strategy. Eight articles met all inclusion criteria and were included in the review.

Figure 1. Systematic Review Selection Criteria
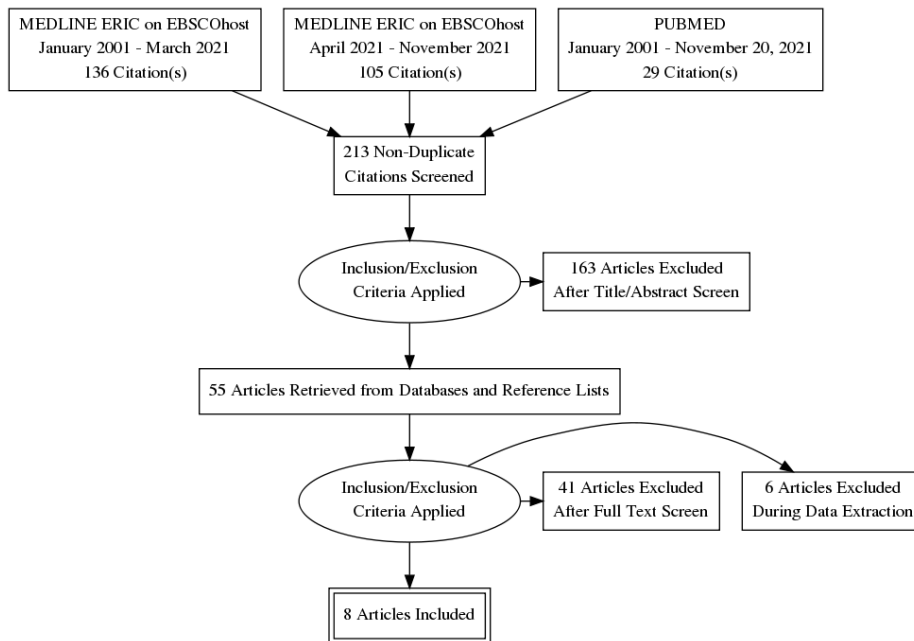
Characteristics and Outcomes of Interventions and Strategies

Most articles described interventions or strategies at four-year institutions (Alexis et al., 2020; Balzer Carr & London, 2021; Clerkin et al., 2021; Cuite et al., 2020; Frank, 2020; Novak & Johnson, 2017; Twill, 2016). Food pantry resources (Alexis et al., 2020; Balzer Carr & London, 2021; Clerkin et al., 2021; Cuite et al., 2021; Troester-Trate, 2021; Twill et al., 2016) were the most popular intervention or strategy followed by food scholarship/vouchers (Alexis et al., 2020; Cuite et al., 2021; Novak & Johnson, 2017). All interventions or strategies provided free food or access to food (Alexis et al., 2020; Balzer Carr & London, 2021; Clerkin et al., 2021; Cuite et al., 2021; Frank, 2020; Novak & Johnson, 2017; Troester-Trate, 2021; Twill et al., 2017). A preponderance of interventions and strategies focused solely on food aid (Alexis et al., 2020; Clerkin et al., 2021; Cuite et al., 2021; Frank, 2020; Novak & Johnson, 2017; Twill et al., 2016) while two interventions also addressed other basic needs, such as transportation, childcare, financial assistance, and mental health services (Balzer Carr & London, 2021; Troester-Trate, 2021). Three interventions or strategies aimed to improve diet quality of students with food insecurity (Alexis et al., 2020; Clerkin et al., 2021; Cuite et al., 2021); two of those interventions or strategies provided nutrition education, cooking videos, or recipes with food resources to improve dietary quality and reduce food waste (Alexis et al., 2020; Clerkin et al., 2021). Balzer Carr and London (2021) provided assistance with SNAP enrollment to students that sought resources for other supports, such as financial aid, housing, clinical health referral, tutoring, food pantry, and other food aid resources. Clerkin et al. (2021) provided recipes and cooking videos with food pantry items to improve nutritional intake of students with food insecurity. Cuite et al. (2021) offered produce vouchers to be used at a local farmers' market and partnered with a community garden to stock the food pantry with fresh produce. Frank (2020) used a learning

management system to communicate opportunities of food that was left over from campus catering events. Novak and Johnson (2017) offered 75 meal swipes per semester loaded onto the student's school identification card. Troester-Trate (2021) offered food pantry, transportation, and childcare resources to students. Twill et al. (2016) collaborated with campus partners to start a food pantry. A variety of funding sources were represented among the articles, including donations, institutional support, private funders, and state grants. See Table1 for Study Characteristics and table 2 for Overview of Study Characteristics.

Table 1. Systematic Review Study Characteristics

First Author and year of publication	Setting	Intervention	Socio-ecological Construct	Duration	Variables and Assessment
Alexis, 2020	Texas Woman's University	10-week Food scholarship program in which students received fruits, vegetables, meat and dairy products, and nonperishable foods twice each month. Students were provided directions and recipes to aid in food preparation.	Intrapersonal	2 semesters (fall and spring)	• Houston Food Bank Baseline Survey (included information concerning demographics, financial status, food assistance, education, and employment status) • USDA 6-item Food Security Survey Module • Three-day food logs were converted to Healthy Eating Index-2015 score • Food Frequency Questionnaire
Balzer Carr, 2020	University of California, Santa Cruz	Slug Support is a campus initiative that addresses student needs of food and housing security, mental health, and financial support.	Institutional and Policy	Data collection from institutional records limited to fall quarter 2012 to fall quarter 2017.	• Codes were created for services rendered and referrals offered. • Demographic and retention information gleaned from student records.
Clerkin, 2020	Western Illinois University	Food pantry items with weekly videos on food preparation that demonstrate cost effective recipes containing fruits and vegetables.	Intrapersonal and Interpersonal	Six-weeks	• 24-hour recall using National Cancer Institute's Automated Self-Administered 24-hours pre- and post- intervention.

First Author and year of publication	Setting	Intervention	Socio-ecological Construct	Duration	Variables and Assessment
Cuite, 2020	Rutgers New-Bruswick	$10 Farmers market vouchers each week for students utilizing the food pantry. Produce from Rutgers Gardens Student Farms donations made to the food pantry.	Intrapersonal and Institutional	Meal vouchers offered June through October 2017. Weekly produce deliveries from June to November 2019.	
Frank, 2020	La Salle University	A "course" was created utilizing a Learning Management System to send messages on location and type of food available after catered events on campus.	Institutional	12-month pilot program	• Assessment of "course" analytics by utilization of the learning management system. • Survey assessing student experiences was also used for program evaluation.
Novak, 2017	Public Land Grant	Students Against Hunger (SAH) receive 75 Meal Swipes each semester by use of their student identification cards.	Intrapersonal	Applications from three academic semester (Spring 2015, Fall 2016, and Spring 2016) were reviewed	• Demographic and academic characteristics • State's Department Higher Education index score. • GPA • Persistence of enrollment
Troester-Trate, 2021	Rural community college in upstate New York	Jefferson County School Program provided support by means of Transportation, Childcare, and Food Pantry	Institutional	2 academic semesters (fall 2016 and spring 2017)	• *Retention and Persistence* Scale
Twill, 2016	Wright State University	Food Pantry and Advisory Board	Institutional	First 25 months of pantry	• Demographic information of users. • Pantry utilization

Table 2. Systematic Review Overview of Study

	Alexis, 2020	Balzer Carr, 2020	Clerkin, 2020	Cuite, 2020
Four-year institution	X	X	X	X
Food Pantry	X	X	X	X
Food Scholarship or Voucher	X			X
Nutrition Education	X		X	
Cooking Videos or Recipes	X		X	
Learning Management System				
Meal Swipes				
Food Aid	X	X	X	X
Other Basic Needs		X		
Multiple Components	X	X	X	X
Intrapersonal Level	X		X	X
Institutional Level		X	X	X
Policy Level		X		

Characteristics

(continued)	Frank, 2020	Novak, 2017	Troester-Trate, 2021	Twill, 2016
Four-year institution	X	X		X
Food Pantry			X	X
Food Scholarship or Voucher		X		
Nutrition Education				
Cooking Videos or Recipes				
Learning Management System	X			
Meal Swipes		X		
Food Aid	X	X	X	X
Other Basic Needs			X	
Multiple Components			X	
Intrapersonal Level		X		
Institutional Level	X	X	X	X
Policy Level				

The studies included in this review utilized interventions that could be categorized into one or more of the socioecological constructs: intrapersonal (n=4) (Alexis et al., 2020; Clerkin et al., 2021; Cuite et al., 2021; Novak & Johnson, 2017); institutional (n=7) (Balzer Carr & London, 2021; Clerkin et al., 2021; Cuite et al., 2021; Frank, 2020; Novak & Johnson, 2017; Troester-Trate, 2021; Twill et al., 2016); and policy (n=1) (Balzer Carr & London, 2021). Interventions that aimed to improve nutrition knowledge or provide food vouchers/scholarships were considered to be an intrapersonal level intervention. Intrapersonal level interventions successfully improved the nutrition status and fresh produce intake among participants (Alexis et al., 2020; Clerkin et al., 2021; Cuite et al., 2021) as well as increased enrollment persistence among students that received a semester meal swipe voucher for 75 meals loaded onto the student's identification card (Novak & Johnson, 2017). Food pantries and alerts of free food were considered institutional level interventions. Cuite et al (2021). reported produce donated from a local community garden to the campus food pantry improved the nutrient-density of students' diets and provided consistency with food. Additionally, Frank (2020) reported that 106 free food announcements were made to 191 students through a Learning Management System that alerted students to leftover food from catered events on campus thereby reducing food waste. Twill et al. (2016) developed a procedure for the creation of a campus food pantry in which 51% of food pantry records were repeat visits demonstrating the utility of the service. Troester-Trate (2021) implemented a program that offered food, childcare, and transportation assistance at the institutional level. However, there was not a statistically significant difference in persistence or retention between students enrolled in the program and the control group. Interventions that sought to enroll students in public assistance programs were considered policy-

level interventions. Balzer Carr and London (2021) took advantage of a policy that modified

SNAP eligibility criteria to include a larger portion of students with low-incomes. This study

enrolled 507 students in California's SNAP program, also known as "CalFresh". In a

retrospective review of student records, students enrolled in CalFresh demonstrated a higher

retention rate than the general student population. See Table 3 for Study Outcomes and Table 4

for Overview of Study Outcomes.

Table 3. Systematic Review Study Outcomes

First Author and year of publication	Sample Characteristics	Outcomes
Alexis, 2020	49 students participated in the study. Students were mostly female (78%), white (49%), single (76%). Average age of students was 28 years old. 26% used food aid assistance and 8% were SNAP recipients.	No significant changes in macronutrient, vitamin A, D and E, folate, calcium, iron, sodium and total fiber intake over the study period. There was a significant increase in intake of protein, niacin, magnesium, phosphorus and potassium. Vegetables consumed per day increased during 10 weeks ($p = 0.034$). HEI-2015 scores did not change from baseline to 10-weeks (55.9 and 57.7, respectively). Prevalence of food insecurity at ten weeks (47%) did not significantly change from baseline (53%).
Balzer Carr, 2020	Data from 3,726 students was reviewed. Slug Support users were mostly first-generation students (62.9%), Educational Opportunities Program (EOP) eligible (59.3%), women (58.8%), freshmen (70.5%), and Latinx (47.4%).	The most common supports included assistance with financial aid, housing office referral, clinical health referral, tutoring referral, pantry bags, and grocery store card. Most supports were categorized as "one-off" supports. 507 students were enrolled in CalFresh. Increased retention rates for students utilizing CalFresh students (93.1%) even compared to the general student population (92.1%) in their second year. Retention continued to increase for the students receiving CalFresh in their third year (93.5%) and fourth year (95.2%) Historically underrepresented groups held higher retention rates while on Slug Support compared to not underrepresented groups.
Clerkin, 2020	29 participants completed four or more sessions and the post-test. Of those participants, most were female (65.5%) and were an average age of 24.6 years.	The intervention increased fruit and vegetable consumption among female college student but not their male counterparts ($p = .021$).

First Author and year of publication	Sample Characteristics	Outcomes
Cuite, 2020	Sample size was not disclosed. Students at Rutgers-New Bruswick. Other sample characteristics not specified.	Authors indicated an increased number of vouchers were used each year signaling an increase in student use. Users expressed the programs have improved nutrient-density of diets and provided consistency with food.
Frank, 2020	At the time of the survey, 191 students were enrolled in the "course". The number of students utilizing the course increased to 451 after 12 months.	Over the 12-month pilot period, 43 faculty and staff posted 106 free food announcements. Based on survey results, most students learned about the "course" by email (59%), and 73% received phone notifications through the learning management system app. 78% of users reported the food was of 'good' or 'excellent' quality.
Novak, 2017	320 student applications were reviewed. Most applicants and recipients were first generation students (74%, 64%), students of color (73%, 63%), and female (57% for both).	Academic preparation measures were similar among groups. GPA for waitlisted SAH applicants was statistically lower in the term they were denied entry in the program compared to the semester before they applied ($p=.013$). GPA statistically the same between semesters for students that received SAH ($p=.371$). Persistence was high in both groups (93% for waitlisted students and 98% for recipients), and there was a significant difference between the groups ($\chi^2 = .008$).
Troester-Trate, 2021	45 students enrolled in the JCS program were selected from archived data. 45 students that were not enrolled in the JCS program were selected to mirror the sample of enrolled students in terms of enrolled credit hours, gender, age, Pell Grant status, and time of enrollment. Both groups were mostly females ($N = 34$); were an average age of 27.58 (JCS support) and 26.53 (non-JCS support); and were enrolled in an average of 12.96 academic hours (JCS support) and 10.93 (non-JCS support). All students were Pell Grant recipients.	No statistically significant difference in retention or persistence of JCS program enrolled students and non-enrolled students ($p > .05$).

First Author and year of publication	Sample Characteristics	Outcomes
Twill, 2016	There were 870 records of pantry use. The average age of pantry users was 26 years old. Most users were Black or African American students (50.7%), female (69.9%), full time students (89.7%), and first year students (27.8%), lived with a roommate (42.2%), unemployed (66%), and Pell Grant Recipients (57%).	51% of records of food pantry use were repeat visits. Creation of a food pantry on campus addressed student food insecurity and enhanced collaboration in the development and support of a sustainable program aimed to improve student retention. An advisory board of various university faculty, staff, students, and stakeholders supervised the pantry's services and created policies and procedures for operation.

Table 4. Systematic Review Overview of Study Outcomes

	Alexis, 2020	Balzer Carr, 2020	Clerkin, 2020	Cuite, 2020
Improved Macro- and Micronutrient Intake	X			
Improved Nutrient-dense Food Intake	X		X	X
Enrolled students in SNAP		X		
Improved Retention or Persistence Rates		X		
Reduced Food Waste				
Reduced Stigma of Food Aid			X	
Created Food Pantry				
Long-term Benefits or Support	X	X	X	

(continued)	Frank, 2020	Novak, 2017	Troester-Trate, 2021	Twill, 2016
Improved Macro- and Micronutrient Intake				
Improved Nutrient-dense Food Intake				
Enrolled students in SNAP				
Improved Retention or Persistence Rates		X		
Reduced Food Waste	X			
Reduced Stigma of Food Aid	X	X		
Created Food Pantry				X
Long-term Benefits or Support				

Many of these interventions and strategies utilized multiple components to provide more

comprehensive resources to students (Alexis et al., 2020; Balzer Carr & London, 2021; Clerkin

et al., 2021; Cuite et al., 2021; Troester-Trate, 2021). These resources, such as nutrition

education (Alexis et al., 2020; Clerkin et al., 2021), recipes (Alexis et al., 2020; Clerkin et al.,

2021), meal and produce vouchers (Alexis et al., 2020; Cuite et al., 2021; Novak & Johnson,

2017), SNAP enrolment (Balzar Carr & London, 2021), and referrals to campus basic needs

resources (Balzar Carr & London, 2021) demonstrated success in improving macro- and

micronutrient intake in food insecure students (Alexis et al., 2020); improving intake of nutrient-

dense foods (Alexis et al., 2020; Clerkin et al., 2021; Cuite et al., 2021); and improving retention

among low-income students (Balzar Carr & London, 2021). Three interventions provided best

practices for decreasing food waste and stigma related to using food aid resources (Clerkin et al.,

2021; Frank, 2020; Novak & Johnson, 2017). Twill et al. (2016) operated under the assumption

that students who sought assistance at the food pantry were food insecure and did not require

proof of need or a lengthy intake process. Novak and Johnson (2017) loaded the free meal

swipes on student school identification cards to be used at campus dining facilities so that meals are obtained in the same way as students that purchased meal swipes. Frank (2020) created a "class" in a Learning Management System in which students could self enroll to receive alerts of free food leftover from campus catering events. Many of the interventions and strategies provided on-going support or offered repeat support through food pantry access (Alexis et al., 2020; Balzer Carr & London, 2021; Clerkin et al., 2021; Cuite et al., 2021; Troester-Trate, 2021; Twill et al., 2016), food scholarship or food vouchers (Alexis et al., 2020; Cuite et al., 2021; Novak & Johnson, 2017), meal swipes (Novak & Johnson, 2017), and free food from catering events (Frank, 2020). However, the benefits are limited to the confounds of the program duration, semester, business hours, and availability of food and may not be able to offer support during times when campus is closed, such as holidays and weekends. Three interventions and strategies provided the potential for long-term benefits (Alexis et al., 2020; Balzer Carr & London, 2021; Clerkin et al., 2021). Two interventions provided nutrition education and recipes that taught students how to make low-cost nutritious meals thereby providing the potential for long-term health benefits (Alexis et al., 2020; Clerkin et al., 2021). One intervention enrolled students in SNAP in which students would have on-going access to food outside of campus aid (Balzer Carr & London, 2021).

Discussion

This systematic review is the first to describe characteristics and outcomes of interventions and strategies that addressed colleges students with food insecurity. This study highlights several key findings that have implications for colleges and universities that aim to provide support to students with food insecurity. Interventions and strategies with multiple components were successful in improving intake of macro- and micronutrients and nutrient-

dense foods in students with food insecurity as well as enrolling students in public assistance programs. Additionally, studies included in this review offered strategies for reducing food waste and stigma associated with seeking food aid. Last, this review highlighted the importance of policy-level interventions and interventions with nutrition education and recipe sharing as those interventions can offer long-term benefits and support, including on weekends and semester breaks when other campus-based interventions and strategies may not be accessible.

Prevalence of food insecurity among college students is demonstrated in the literature as well as documented in governmental reports, such as the GAO's report that calls for better information concerning college student access to federal food aid resources (GAO, 2018). Bruening et al. (2017) reviewed the discussion sections of food insecurity prevalence studies to compile a list of suggested solutions. This list was organized into themes by socioecological constructs, including intrapersonal aid (i.e. food and financial literacy program); interpersonal aid (i.e. donation of meal plans to a student in need); institutional aid (i.e. campus food pantries,); community aid (i.e. community gardens); and policy/systems aid (i.e. change eligibility to SNAP for college students). Hagedorn et al. (2020, p. 1) created a *WISH4Campus* toolkit to serve as a resource for campus stakeholders to "promote a food-secure campus environment". Ezekekwu et al. (2021) examined effective community- and system-level interventions and programs that increased the intake of nutritious foods among individuals with food insecurity. Similar to the findings in this review, Ezekekwu et al. (2021) reported interventions with multiple components were beneficial to individuals experiencing food insecurity. Furthermore, interventions that included nutrition education had the potential to go beyond short-term benefits or assistance.

Many of the interventions included in this review had successful outcomes in improving food access for college students; however, food pantries and food vouchers may only offer short-term benefits or assistance. Various entities called for policy reform of Supplemental Nutrition Assistance Program (SNAP) by modifying eligibility criteria to include a larger portion of college students with low incomes. One example is the CalFresh program which expanded eligibility criteria by counting academic hours as anticipated or actual federal work study hours (Balzer Carr & London, 2021; Dubrick et al., 2016; GAO, 2018; O'Hara, 2019). Changes to SNAP policy during COVID-19 allowed for temporary expansion in eligibility for college students (FNS, 2021). This expansion of eligibility criteria enabled support for an estimated 3 million college students and delivered $700 million in food assistance per month for college students (Granville, 2022). Furthermore, it is meaningful that several studies included in this review addressed the intake of nutritious foods by providing nutrition education and recipes. As many college students are in formidable years of growth and development, these interventions have long-term implications for student health and well-being.

Various studies provide strategies that address college student food insecurity in ways that give students autonomy in their food choices and are mindful to reduce stigma associated with seeking food aid. Special attention must be paid to accessibility of food aid strategies. If possible, physical barriers to accessing aid should be addressed by placing resources in an accessible campus location at various times so that students can utilize the resources on evenings, weekends, and holiday breaks (El Zein et al., 2018; Neff, 2019). Food aid resources should consider a self-select model in which students can "shop" or self-select food to promote student autonomy, reduce food waste, and decrease stigma (Cuite et al., 2021; Novak & Johnson, 2017). Additionally, reducing barriers by eliminating proof of need or lengthy intake to utilize

food aid resources is recommended (Twill et al., 2016). The aid of various organizations, such as College and University Food Bank Alliance, are available for institutions interested in starting a food bank (Metti, n.d.). It is also noteworthy to address the barriers students encounter when seeking food aid. Issues with communicating available resources, feelings of being undeserving of help, frustration from lack of support of the larger institution, and stigma of seeking food aid are addressed in the literature (Henry, 2017; Meza et al., 2019). Additionally, there is a need for targeted interventions to groups of individuals that may be at risk for food insecurity, such as students of color, first generation students, and former foster youth (Frank, 2020). As the population of college students continues to diversify, supports to meet the cultural needs of students will be necessary for the well-being, health, and retention of students that are at increased risk for food insecurity. The literature would benefit from additional documentation of programs that address student food insecurity, including publication of pilot programs or procedures that help to build best practices or offer insight into lessons learned. The call for effective strategies is more pertinent as COVID-19 pandemic worsened college student food security status (Owens et al., 2020; Soldavini et al., 2020). Future studies with evidence of innovative strategies that put food in the hands of students such as intrapersonal and interpersonal interventions. However, an emphasis on addressing systemic issues of food access at the policy level or by enacting strategies with long-term benefit or assistance are pertinent to the overall goal of decreasing student food insecurity. Studies that highlight novel strategies to address food security while also combating climates of stigma are of particular importance.

Limitations

This review restricted inclusion to peer-reviewed journal articles and grey literature. However, information concerning campus-based food security interventions and strategies is

available in other forms of media, such as institution websites, campus resource documentation, and conference proceedings. While the articles in this review contribute to the gap in the literature concerning interventions and strategies that address college students with food insecurity, the literature would benefit from additional peer-reviewed articles that provide outcomes of interventions and strategies that address college students with food insecurity. This gap in scholarship is a limitation of this review. None of the articles included in this review measured food security status over a long period of time. Future studies should aim to be longitudinal in nature to understand effectiveness in reducing food insecurity.

The three databases that were used to search for eligible articles were selected as these databases host academic journals that commonly publish studies about nutrition, food insecurity, and college students. However, it is possible that other databases would also include eligible articles that could have been included in this review. In terms of limitations within the articles included in this review, Cuite et al (2021).[30] did not provide a sample size or data concerning use of food vouchers; rather, the authors indicated use of the strategy had increased overtime. The findings from Troester-Trate (2020)[33] found no significant difference in retention or persistence among students that were enrolled in programming and students not enrolled in programming. Frank (2020)[31] and Twill (2016)[34] reported student use of the initiatives but no outcome data. Moreover, data gleaned from the articles were not synthesized due to heterogeneity of variables and assessments.

Conclusion

This systematic review was the first to describe characteristics and outcomes of interventions and strategies that addressed college students with food insecurity. The information in this review offers insight into best practices for institutions seeking to implement interventions

or strategies that aim to support students with food insecurity. Additionally, this review

highlights the need for additional studies that successfully address food security on college

campuses, particularly interventions at the policy level or interventions that promote nutrition

education and cooking skills.

Conflict of Interest Disclosure
The authors report there are no competing interests to declare.

References

Alexis, T. D., Unruh, D., Wang, W., Dave, J. M., Miketinas, D. C., Chen, T. A., & Moore, C. E.

(2020). Implementation of a food scholarship program improves nutrient intake and

dietary quality of college students. *Journal of American College Health,* 1–8.

https://doi.org/10.1080/07448481.2020.1848847

Balzer Carr, B. & London, R. A. (2020). Healthy, housed, and well-fed: Exploring basic needs

support programming in the context of university student success. *AERA Open,* 6(4).

https://doi.org/10.1177%2F2332858420972619

Bhattacharya, J., Currie, J., & Haider, S. (2004). Poverty, food insecurity, and nutritional

outcomes in children and adults. *Journal of Health Economics*, *23*(4), 839–862.

https://doi.org/10.1016/j.jhealeco.2003.12.008

Broton, K., & Goldrick-Rab. S. (2021). The dark side of college (un)affordability: Food and

housing insecurity in higher education. *Change: The Magazine of Higher Learning*,

48(1), 16-25.

Bruening, M., Argo, K., Payne-Sturges, D., & Laska, M. N. (2017). The struggle Is real: A

systematic review of food insecurity on postsecondary education campuses. *Journal of*

the *Academy of Nutrition and Dietetics*, *117*(11), 1767–1791.

https://doi.org/10.1016/j.jand.2017.05.022

Bruening, M., van Woerden, I., Todd, M., & Laska, M. N. (2018). Hungry to learn: the

prevalence and effects of food insecurity on health behaviors and outcomes over time

among a diverse sample of university freshmen. *The international journal of behavioral*

nutrition and physical activity, *15*(1), 9. https://doi.org/10.1186/s12966-018-0647-7

Clerkin, K. D., Pohl, C. J., Shupe, E. R., & Kim, M. J. (2021). Influencing nutritional habits of

college students using a food pantry. *Journal of American College Health, 69*(8), 937–

941. https://doi.org/10.1080/07448481.2020.1721506

College Board. (2017). *Trends in student aid 2017*. Research.

https://research.collegeboard.org/trends/student-aid

Core indicators of nutritional state for difficult-to-sample populations. (1990). *The Journal of*

nutrition, *120 Suppl 11*, 1559–1600. https://doi.org/10.1093/jn/120.suppl_11.1555

Cuite, C. L., Brescia, S. A., Errickson, L. B., & Sawatzky, A. J. (2020). Farm-based programming

for college students experiencing food insecurity. *Journal of Extension*, *58*(6),

https://tigerprints.clemson.edu/joe/vol58/iss6/18

Davis, H., Sisson, S. B., & Clifton, S. (2021). A call for evidence to support food security

interventions on college campuses. *Journal of American College Health*, *69*(6), 693–695.

https://doi.org/10.1080/07448481.2019.1705829

Dixon, L. B., Winkleby, M. A., & Radimer, K. L. (2001). Dietary intakes and serum nutrients

differ between adults from food-insufficient and food-sufficient families: Third National

Health and Nutrition Examination Survey, 1988-1994. *The Journal of Nutrition*, *131*(4),

1232–1246. https://doi.org/10.1093/jn/131.4.1232

Drewnowski, A., & Darmon, N. (2005). The economics of obesity: dietary energy density and

    energy cost. *The American Journal of Clinical Nutrition*, *82*(1 Suppl), 265S–273S.

    https://doi.org/10.1093/ajcn/82.1.265S

Dubick, J., Mathews, B., & Cady, C. (2016) *Hunger on campus: The challenge of food insecurity*

    for college students. 2016. Students Against Hunger.

    http://studentsagainsthunger.org/wp-content/uploads/2016/10/Hunger_On_Campus.pdf

Dynarski S., & Scott-Clayton, J. (2013). Financial aid policy: Lessons from research. *Future*

    Child, *23*(1), 67-91. DOI: 10.1353/foc.2013.0002.

El Zein, A., Mathews, A. E., House, L., & Shelnutt, K. P. (2018). Why are hungry college

    students not seeking help? Predictors of and barriers to using an on-campus food

    pantry. *Nutrients*, *10*(9), 1163. https://doi.org/10.3390/nu10091163

Ezekekwu, E., Salunkhe, S. S., Jennings, C. J., Kelly Pryor, B. N. (2021). Community-based and

    system-level interventions for improving food security and nutritious food consumption:

    A systematic review. *Journal of Hunger & Environmental Nutrition,17*(2), 149-

    169. DOI: 10.1080/19320248.2021.2021120

Food and Nutrition Service. *Supplemental Nutrition Assistance Program Students*. United States

    Department of Agriculture. https://www.fns.usda.gov/snap/students

Frank L. B. (2020). "Free food on campus!": Using instructional technology to reduce university

    food waste and student food insecurity. *Journal of American College Health,* 1–5.

    https://doi.org/10.1080/07448481.2020.18460

Gallegos, D., Ramsey, R., & Ong, K.W. (2014). Food insecurity: Is it an issue among tertiary

    students? *Higher Education*, *67*(5), 497–510. https://doi.org/10.1007/s10734-013-9656-2

Granville, P. (2021). Congress made 3 million college students newly eligible for snap food aid. here's what must come next. *The Century Foundation.* https://tcf.org/content/commentary/congress-made-3-million-college-students-newly-eligible-snap-food-aid-heres-must-come-next/

Gundersen, C. & Ziliak, J. P. (2015). Food insecurity and health outcomes. *Health Affairs, 34*(11), 1830-1839.https://doi.org/10.1377/hlthaff.2015.0645

Hagedorn, R. L., Pampalone, A. L., Hood, L. B., Yura, C. A., Morrow, D. F., & Olfert, M. D. (2020). Higher education food insecurity toolkit development and feedback. *Journal of Nutrition Education and Behavior*, *52*(1), 64–72. https://doi.org/10.1016/j.jneb.2019.09.021

Hege, A., Stephenson, T., Pennell, M., Revlett, B., VanMeter, C., Stahl, D., Oo, K., Bressler, J. & Crosby, C. (2021). College food insecurity: Implications for student success and applications for future practice. *Journal of Student Affairs Research and Practice, 58*(1), 44-61. DOI:10.1080/19496591.2020.1726359

Henry, L. (2017). Understanding food insecurity among college students: experience, motivation, and local solutions. *Annals of Anthropological Practice*, *41*(1), 6-19. https://doi.org/10.1111/napa.12108

Johnson, J. & Rochkind, J. (2009). *With their whole lives ahead of them: Myths and realities about why so many students fail to finish college.* Public Agenda. 2009. https://files.eric.ed.gov/fulltext/ED507432.pdf

Mello, J. A., Gans, K. M., Risica, P. M., Kirtania, U., Strolla, L. O., & Fournier, L. (2010). How is food insecurity associated with dietary behaviors? An analysis with low-income,

ethnically diverse participants in a nutrition intervention study. *Journal of the American Dietetic Association*, *110*(12), 1906–1911. https://doi.org/10.1016/j.jada.2010.09.011

Metti, T. (n.d.) *College and University Food Bank Alliance*. Swipe Out Hunger. https://www.swipehunger.org/cufba/.

Meza, A., Altman, E., Martinez, S., & Leung, C. W. (2019). "It's a feeling that one is not worth food": A qualitative study exploring the psychosocial experience and academic consequences of food insecurity among college students. *Journal of the Academy of Nutrition and Dietetics*, *119*(10), 1713–1721.e1. https://doi.org/10.1016/j.jand.2018.09.006

Mitchell, M., Palacios, V., & Leachman, M. (2015). States are still funding higher education below pre-recession levels. *Journal of College Bargaining in the Academy*, *0*. https://thekeep.eiu.edu/jcba/vol0/iss10/71

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *BMJ, 339*, b2535 doi:10.1136/bmj.b2535

National Center for Education Statistics. (2017). Digest of education statistics: 2017. https://nces.ed.gov/programs/digest/d17/ch_3.asp. .

Neff, O. (2019). Food insecurity prevalence on college campuses, the stigma associated with food pantries and the best practices moving forward. *Student Research, 3.* https://scholarship.depauw.edu/studentresearchother/3

Nikolaus, C. J., An, R., Ellison, B., & Nickols-Richardson, S. M. (2020). Food Insecurity among College Students in the United States: A Scoping Review. *Advances in Nutrition*. *11*(2), 327- 348. https://doi.org/10.1093/advances/nmz111

Novak, H. & Johnson, J. J. (2017) Students against hunger: an approach to food insecurity at a

    large public land grant university. *Journal of Student Affairs,* 26: 99-110.

    https://mountainscholar.org/bitstream/handle/10217/180886/JOUF_JOSA_v26-2016-

    17.pdf?sequence=1#page=100

O'Hara RE. Could addressing college food insecurity be a SNAP? (2019). *New England Journal*

    of Higher Education. https://eric.ed.gov/?id=EJ1216146

Owens, M. R., Brito-Silva, F., Kirkland, T., Moore, C. E., Davis, K. E., Patterson, M. A.,

    Miketinas, D. C., & Tucker, W. J. (2020). Prevalence and social determinants of food

    insecurity among college students during the covid-19 pandemic. Nutrients, 12(9), 2515.

    https://doi.org/10.3390/nu12092515

Shi, Y., Davies, A., & Allman-Farinelli, M. (2021). The association between food insecurity and

    health outcomes in university students: A systematic view. *Journal of Academy of*

    Nutrition and Dietetics, *121*(12), 2475-2500. https://doi.org/10.1016/j.jand.2021.07.015

Silva, M. R., Kleinert, W. L., Sheppard, A. V., Cantrell, K. A., Freeman-Coppadge, D. J., Tsoy,

    E., Roberts, T., & Pearrow, M. (2017). The relationship between food security, housing

    stability, and school performance among college students in an urban university. *Journal*

    of College Student Retention: Research, Theory and Practice, 19(3), 284-

    299. https://doi.org/10.1177/1521025115621918

Soldavini, J., Andrew, H., & Berner, M. (2020). Characteristics associated with changes in food

    security status among college students during the COVID-19 pandemic. *Translational*

    behavioral medicine, 11(2), 295-304. https://doi.org/10.1093/tbm/ibaa110

Troester-Trate, K. E. (2020). Food insecurity, inadequate childcare, & transportation

 disadvantage: student retention and persistence of community college

 students. *Community College Journal of Research and Practice*, *44*(8), 608-622.

Twill, S. E., Bergdahl, J., & Fensler, R. (2016). Partnering to build a pantry: A university campus

 responds to student food insecurity. *Journal of Poverty, 20*(3), 340-358, DOI:

 10.1080/10875549.2015.1094775

United States Department of Agriculture (2021). *Definitions of food security.* Economic Research

 Service. https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-

 us/definitions-of-food-security.aspx

United States Department of Agriculture. *Food security and nutrition assistance*. Economic

 Research Service. https://www.ers.usda.gov/data-products/ag-and-food-statistics-

 charting-the-essentials/food-security-and-nutrition-assistance/

United States Government Accountability Office (2018). *Food insecurity, better information*

 could help eligible college students access federal food assistance benefits. (GAO 19-95)

 https://www.gao.gov/assets/700/696254.pdf

III: METHODOLOGY

Community-Based Participatory Research (CBPR) is a collaborative approach to address public health concerns in which academic researchers and community stakeholders equitably participate, share knowledge, and provide expertise (Israel et al., 1998). CBPR unites partners and stakeholders that contribute unique sets of skills and knowledge to better address community concerns (Green, 1995). Israel et al. (1998) provided key principles of CBPR: (1) the community is a unit of identity; (2) strengths and resources of a community are utilized; (3) partners work in collaboration by contributing a unique skill set; (4) knowledge and action to benefit the community are integrated; (5) social inequities are addressed through a process of co-learning and empowerment; (6) iterative process of assessment, research, implementation, and maintenance is embraced; (7) positive and ecological approaches to address issues of health are used; (8) findings as well as knowledge are shared to stakeholders. CBPR creates opportunity for community members to be active in the research process by providing their experiences and expertise in order to identify concerns, develop solutions, implement activities, and evaluate impact.

Collaboration within CBPR builds community capacity to address health concerns and disparities. Community capacity building is a way of community development that brings together knowledge, personnel, structures, and systems for the purposes of improving the well-being of a community to create an infrastructure that can support health promotion activities (Smith et al., 2006). Community capacity is built from the advancement of knowledge and skills through collaborative partnerships that embrace cohesiveness among stakeholders (Smith et al., 2006). In a systematic review of the definitions of community capacity building, Simmons et al. (2001) described community capacity building as a process that seeks to create a collaborative

partnership for the purpose of promoting health and wellbeing, influencing health through limiting health disparities, empowering communities through increasing participation, and attracting community members to use resources (Goodman et al., 1998; Simmons et al., 2011; Smith et al., 2006).

To address issues of food insecurity among college students, *Hunger Free Higher Ed (HFHE)* developed a six-step iterative approach utilizing principles of CBPR. *HFHE,* a partnership between Auburn University Department of Nutritional Sciences and Hunger Solutions Institute (HSI), facilitated a state-wide food security coalition, the Alabama Campus Coalition for Basic Needs (ACCBN) with representatives from twelve four-year universities and seventeen two-year colleges in Alabama. At each of these campuses, *HFHE* worked with campus representatives, known as campus champions, to implement the six-step approach.

Manuscript 2. Hunger-Free Higher Ed Approach: A Process of Increasing Initiatives to Reduce College Student Food Insecurity

Abbigail Hickey, MS, RDN, Alicia Powers, PhD, Sara Rains, BS, Malerie Goodman, EdS, Onikia Brown, PhD, RDN

Abstract

Hunger-Free Higher Ed (HFHE) approach is a six-step process to improve college student food security utilizing principles of Community-Based Participatory Research (CBPR). *HFHE* collaborates with campuses by offering technical assistance in food security innovations, strategic planning, assessment, and evaluation; supporting food aid infrastructure; and promoting implementation of evidence-based initiatives.

Key words: food insecurity, college students, higher education, community-based participatory research

INTRODUCTION

Food insecurity is the limited or inconsistent access to adequate nourishment for an active, healthy lifestyle (USDA Definitions of Food Security, 2022). About 32% of college students experience food insecurity at some point in their college career (Abbey et al., 2022). Food insecurity negatively impacts nutritional status, physical and mental health, student success, retention rates, and social well-being (Allen & Alleman, 2019; Mei et al., 2021; Mukigi et al., 2018; Payne-Sturges et al., 2018; Phillips et al., 2018). Strategies aimed at reducing food insecurity on college campuses include food pantries, nutrition education and recipe sharing with food pantry users, Supplemental Nutrition Assistance Program (SNAP) enrollment, meal plan scholarships, produce vouchers, and free food alerts (Bruening et al., 2017; Hickey et al.,2022; . However, few peer-reviewed articles detail systematic strategies and outcomes of food aid resources.

Hunger Free Higher Ed (*HFHE*) is a partnership between researchers at Auburn University Department of Nutritional Sciences and Hunger Solutions Institute (HSI) with the mission to decrease college student food insecurity by convening, collaborating, and multiplying best practices at colleges and universities. *HFHE* administrators developed an iterative, six-step approach utilizing principles of Community-Based Participatory Research (CBPR) to build community capacity and enhance food security initiatives. *HFHE* administrators collaborate with campus leaders and stakeholders to build community capacity by offering technical assistance in the areas of assessment and evaluation, strategic planning, and food security innovations; supporting infrastructure that systematically decreases food insecurity in college students; and promoting implementation of evidence-based initiatives in the areas of food aid, advocacy, and policy. Throughout the approach, *HFHE* administrators assist colleges and universities by

supporting the formation of a hunger-free campus coalition and conduct of assessments;

developing reports; providing action planning materials; supporting implementation of food

security strategies; evaluating process, outcomes, and impacts; and publicizing efforts.

    HFHE steps were adapted from the Substance Abuse and Mental Health Services

Administration (SAMHSA) Strategic Prevention Framework (SPF), a comprehensive process

used by substance abuse and misuse prevention planners to facilitate the understanding of the

complex interaction between behavioral concerns and environmental contexts (SAMHSA, 2019).

The six steps of *HFHE* approach include (1) ENGAGE, (2) ASSESS, (3) PLAN, (4)

IMPLEMENT, (5) EVALUATE, and (6) CELEBRATE. The objectives and outcomes for each

of the six steps are detailed in Table 1. While the six steps are distinct from one another, many of

the activities associated with the ENGAGE and EVALUATE steps occur in all steps.

Table 5. *Hunger Free Higher Ed* Approach Steps: Overview, objectives, role of *HFHE*, and outcomes.

HFHE Step	Overview	Objectives	Role of *HFHE* Administrators	Outcomes
(1) ENGAGE	Engage campus and community members, stakeholders, and individuals who are interested in or have access to food-aid resources for college students to form a hunger-free campus coalition	• Establish collaboration with *HFHE* administrators • Recruit potential coalition members • Appoint a campus coalition champion • Initiate hunger-free campus coalition meetings	• Aid campus leaders in the formation of a hunger-free campus coalition • Assist campuses in identifying coalition members • Offer technical support and materials on coalition development and maintenance	Formation of hunger-free campus coalition that shares the common goal of reducing college student food insecurity
(2) ASSESS	Determine campus food insecurity prevalence, current campus resources, culture related to food aid, and capacity to address food insecurity	• Assess student food security prevalence using USDA Food Security Survey Module (Bickel et al., 2000) • Facilitate Campus Food Aid Self-Assessment Tool (C-FAST) (González & Powers, 2022)	• Assist campuses with implementation and dissemination of assessments • Curate assessment report • Offer recommendations for action planning steps	Development of campus-specific assessment report contextualized with the institution's strategic plan and offers recommendations for next steps.
(3) PLAN	Develop a specific, measurable action plan for the implementation of food security initiatives that aligns with the institution's strategic plan	• Develop Action Plan using S.M.A.R.T. goals with corresponding objectives and strategies that focuses on direct student support and systemic reform (Doran, 1981)	• Support the hunger free campus coalition in creating an Action Plan with campus-specific goals, objectives, and strategies	Development of action plan with goals and objectives that aim to improve student food security for the next three to five years

HFHE Step	Overview	Objectives	Role of HFHE Administrators	Outcomes
(4) IMPLEMENT	Implement initiatives to meet goals as outlined in the action plan	• Begin initiatives to meet S.M.A.R.T. goals (Doran, 1981) • Secure personnel and funding resources to carry out action plan goals • Document implementation of initiatives	• Offer technical support for implementation of Action Plan activities • Provide documentation for progress monitoring • Assist campus champions in monitoring progress of coalition efforts	Fulfillment of objectives that support students with food insecurity
(5) EVALUATE	Determine process, outcomes, and impacts measures associated with the coalition efforts, goals, and objectives	• Collect process, outcome, and impact measures to emphasize progress in achieving action plan goals • Conduct follow-up assessments for food security prevalence and C-FAST	• Provide technical support for collecting progress measures • Work with campus coalition to collect process, outcome, and impact measures • Provide feedback from evaluations to improve efficacy and reach of food security initiatives	Data on action items, assessments, impacts, and effectiveness
(6) CELEBRATE	Celebrate coalition efforts and successes. Continue working toward a hunger-free campus.	• Curate a final report on coalition efforts and initiatives • Publicizes accomplishments through media, research, grand openings, and facility tours	• Curate a final report • Aid coalitions in publicizing hunger-free campus coalition successes	• Final report on coalition initiatives • Establishment of best practices, publications, and conference presentations concerning food security initiatives

Step 1: ENGAGE

In the ENGAGE step, *HFHE* administrators aid campus stakeholders in the formation of a hunger free campus coalition, which serves as the infrastructure for strategic planning and implementation associated with campus food security efforts. A coalition is a diverse group of individuals that agree to combine resources and expertise to work toward a common goal (Butterfoss et al., 1996). The hunger free campus coalition is the collaborative group that leads efforts to improve food security on campus. The overarching goals of the hunger free campus coalition are to bring awareness to student food insecurity; improve access to healthy, affordable, and culturally appropriate food; and make food security a priority on campus. The hunger-free campus coalition brings together campus and community members, stakeholders, and individuals who are interested in or have access to food-aid resources for college students. In the initial days of coalition formation, a leader is appointed, also known as the campus coalition champion, to facilitate partnerships, lead meetings, recruit additional members, advocate for funding, oversee coalition efforts, and act as a liaison to *HFHE* administrators.

HFHE administrators assist colleges and universities in identifying coalition members that may be most helpful, such as administrators, faculty, staff, students, alumni, and community organizations (such as food banks or public assistance program coordinators). Recruitment of coalition members occurs throughout the six steps to improve coalition resources or expertise, support initiatives, glean diverse perspectives, and address member turnover. *HFHE* provide materials for initial coalition meetings, including member and champion roles and responsibilities; information about college student food insecurity and its impacts; and materials concerning coalition mission, vision, and goals. *HFHE* administrators assist campus champions in adapting materials to fit specific needs of the campus. In this first step, *HFHE* administrator

offers technical assistance to coalition champions in building knowledge, skills, and resources for the development and maintenance of a sustainable coalition.

Step 2: ASSESS

The purpose of the ASSESS step is to measure student food insecurity prevalence, current campus resources, food aid culture, and capacity to address food insecurity on campus. This information is used for evidence-based planning and implementation of initiatives in subsequent steps. *HFHE* administrators use the United States Department of Agriculture Food Security Survey Module (USDA FSSM) and the Campus Food Aid Self-Assessment Tool (C-FAST) to assess food insecurity on campus and campus appropriate campus resources, respectively (USDA Survey Tools., 2000; González & Powers, 2022). *HFHE* administrators assist campuses in conducting assessments, analyzing data, and reporting findings.

Student food insecurity prevalence is assessed using the USDA FSSM 6-item survey (USDA Survey Tools 2000). USDA FSSM is a standardized module that produces an aggregated score to determine food security status (USDA Definitions of Food Security, 2022). The USDA FSSM and demographic questions are disseminated by email to a sample of students via electronic survey. *HFHE* administrators aggregate and analyze responses with demographic variables to identify the number of students that fall into food insecure categories and evaluate food security prevalence within population sub-groups.

The Campus Food Aid Self-Assessment Tool (C-FAST) is a survey-based tool designed to bridge the gap between food security prevalence and appropriate campus responses (González & Powers, 2022). To complete C-FAST, members participate in a 15-minute training with *HFHE* administrators. Hunger-free campus coalition members are instructed to collectively rate the college or university's performance in six dimensions associated with college student food

insecurity: (1) student services and supports; (2) involvement; (3) advocacy; (4) campus culture and awareness of food insecurity; (5) education and training; and (6) research, scholarship, and creative works (González & Powers, 2022). HFHE administrators analyzes C-FAST responses and provides a report of C-FAST findings. C-FAST can take place at a coalition meeting or over the course of several meetings, if needed. In addition to quantitative assessments, *HFHE* administrators can work with campus coalitions to explore student experiences utilizing food aid resources through qualitative assessments.

HFHE administrators consolidates results of the student food insecurity prevalence survey and C-FAST into a comprehensive report with details on key findings. *HFHE* administrators provide recommendations for action plan objectives based on the assessment report. For maximum impact, results and recommendations are integrated and contextualized with the college or university's strategic plan. The assessment report is used to justify need and urgency of action plan goals, objectives, and strategies in later steps.

Step 3: PLAN

The aim of the PLAN step is to develop a specific, measurable action plan focused on direct student supports and overarching systemic reform to improve student food security. The action plan is the guiding document for implementation of food security initiatives. It aligns with the college or university's strategic plan, demonstrates sustainable change, prioritizes goals, and proposes a timeline for implementation. Hunger free campus coalition members work with campus stakeholders, governing organizations (such as Student Government Associations), and campus administration to set goals and determine strategies. *HFHE* administrators collaborate with the hunger-free campus coalition to create goals, objectives, and strategies that are campus-specific, align with the institution's strategic plan, and are appropriate for resources available.

The action plan consists of specific, measurable, attainable, relevant, and time-bound (S.M.A.R.T.) goals (Doran, 1981). Within each goal, objectives and strategies are outlined along with activities, responsible partners, resources available, resources needed, and a timeline. Action plans are a combination of short-, intermediate-, and/or long-term objectives based on the needs of the campus. Short-term objectives may include developing marketing material concerning campus food aid or creating a social media account to bring awareness to student food insecurity on campus. Intermediate-term objectives, such as the creation of a campus food pantry or food scholarship, require more funding and resources compared to short-term objectives while producing a higher impact. Long-term objectives yield systemic change, such as creating campus policy concerning food aid, hiring a food aid coordinator, or creating a long-term graduate assistant position focused on food security initiatives. The action plan is disseminated to student representatives, campus and community partners, and stakeholders for feedback.

Step 4: IMPLEMENT

After the action plan is finalized, objectives and strategies to meet goals are implemented by the campus coalition and appropriate partners to advance toward a hunger-free campus. The hunger-free campus coalition meets regularly to maintain momentum and progress toward goals. In addition, recruiting additional coalition members, partnering with community and campus stakeholders, and obtaining funds may be needed to accomplish goals as outlined in the PLAN step. Implementation of short-term objectives creates early success and generates enthusiasm for coalition efforts and goals. The implementation of all strategies related to objectives is documented by coalition members or subcommittees and reported to the campus coalition champion to demonstrate progress, of action plan goals. *HFHE* administrators offer technical

assistance as colleges and universities implement the action plan. *HFHE* administrators also provide materials to support progress monitoring documentation and assists coalition champions in monitoring progress of coalition efforts.

Step 5: EVALUATE

The aim of EVALUATE is to determine and highlight processes, outcomes, and impacts associated with goals, objectives, and strategies by conducting formal and informal evaluation. *HFHE* administrators provide technical assistance and materials for collecting goal measures to determine outcomes and impacts of hunger-free campus coalition efforts. *HFHE* administrators recommend and assists with follow-up food security prevalence and C-FAST assessments. In addition, *HFHE* administrators work with the hunger free campus coalition to collect and report process, outcome, and impact measures.

Process measures emphasize progress toward goals or successes of objectives while also identifying barriers, challenges, and areas that need improvement. Process measures are collected during most steps: (1) coalition rosters and meeting minutes from the ENGAGE step; (2) action planning documents and finalized action plan from the PLAN step; and (4) reach, barriers, and challenges of strategies from the IMPLEMENT step.

Outcome measures are collected to demonstrate utility of food security initiatives. Outcome measures are recorded in most steps: (1) hunger free campus coalition characteristics in ENGAGE; (2) results from initial and follow-up food security prevalence and C-FAST assessments contextualized by the institution's strategic plan in ASSESS and EVALUATE; (3) achievement of goals and objectives in the action plan; (4) result of the implementation of objectives from IMPLEMENT, such as the number of students that utilized the food pantry, initiation of food aid resources on campus, funds donated to food scholarship funds, partnerships

developed through the implementation of coalition goals, and progress towards specific, measurable, attainable, relevant, and time-bound (S.M.A.R.T.) goals (Doran, 1981).

Impact of hunger free campus coalition goals, objectives, and strategies is measured by its effect upon the campus and student population. This effect includes the impact on student food security status, nutritional quality, physical and mental health, academic success, retention rates, and social well-being. Impacts also include: (1) effects that result from coalition partnerships; (2) trends in campus culture concerning food aid; (3) modification to institution policy or strategic plan; (4) changes to structures that provide food aid.

Data received during the EVALUATE step are used to improve efficacy of initiatives, increase collaboration among partners, obtain funding, and aid the coalition in prioritizing next steps. *HFHE* administrators provide feedback to hunger free campus coalitions based on findings of evaluations to improve efficacy and reach of food security initiatives. *HFHE* administrators use evaluation results to develop and multiply best practices and to inform food security innovations and strategic planning within the *HFHE* approach.

Step 6: CELEBRATE

Coalition efforts and successes are celebrated in the final step, and celebrate also occurs during all steps. Details of the hunger-free campus coalition's efforts, strategies, outcomes, and impacts are described in a final report developed by *HFHE* administrators. The final report includes information concerning activities in each step: hunger-free campus coalition membership; findings and trends of assessments; action planning documents; action plan progress; reports of process, outcomes, and impact evaluation; and achievements, awards, and academic proceedings. The final report is shared with hunger free campus coalition members. Members can then distribute the report to food aid resource stakeholders, colleges or university

administration, the community, subject-matter experts, and other institutions. Initiatives, findings, and data can be publicized by the campus coalition through local, regional, and national conferences, press releases, grand openings, and facility tours. *HFHE* administrators work collaboratively with the hunger free campus coalition to publicize successes, including through academic publications, conference proceedings, mass media, and social media. Reporting successes and lessons learned of efforts, goals, and initiatives can aid in the development of best practices for combating food insecurity on college campuses.

At this time, 29 Alabama colleges and universities, who are part of a state-wide coalition known as Alabama Campus Coalition for Basic Needs (ACCBN), are implementing the *HFHE* approach. As a part of the IMPLEMENT step, this ACCBN cohort implemented various activities and initiatives that provided food aid directly to students, such as: relocated the campus food pantry to a larger space with 24/7 swipe access; added commercial grade storage appliances to the food pantry; added a food locker pick up system; established a meal and textbook scholarship fund for students; purchased laptops to loan to students; strengthened transportation options and networks. Other initiatives aided students indirectly, such as: trained support staff in student food insecurity case management practices; developed an annual employee giving program to support the food pantry; hired and trained on-call personnel to support students with food insecurity; hired an AmeriCorps Vista volunteer to support the campus food pantry expansion and marketing; created webpage for food security support; increased marketing and communication strategies to raise awareness of student support services; developed a Hunger Studies minor for undergraduate students; and hired graduate assistant or undergraduate student worker to lead food pantry expansion, student engagement, and marketing materials for food aid resources.

FUTURE PLAN FOR *HUNGER FREE HIGHER ED* APPROACH

For streamlined implementation, *HFHE* administrators developed an online platform, *HFHE* Pathways, to allow colleges and universities to work collaboratively with *HFHE* administrators to implement the six-step approach. *HFHE* Pathways includes materials and resources, enables communication and technical assistance, and streamlines assessment and evaluation. *HFHE* administrators are well-positioned to implement its approach nationally to improve student food security and access across the country.

References

Abbey, E. L., Brown, M., & Karpinski, C. (2022). Prevalence of food insecurity in the general college population and student-athletes: A review of the literature. *Current nutrition reports*, *11*(2), 185–205. https://doi.org/10.1007/s13668-022-00394-4

Allen, C.C., & Alleman, N.F. (2019). A private struggle at a private institution: effects of student hunger on social and academic experiences. *Journal of College Student Development 60*(1), 52-69. doi:10.1353/csd.2019.0003.

Bruening, M., Argo, K., Payne-Sturges, D., & Laska, M. N. (2017). The struggle is real: A systematic review of food insecurity on postsecondary education campuses. *Journal of the Academy of Nutrition and Dietetics*, *117*(11), 1767–1791. https://doi.org/10.1016/j.jand.2017.05.022

Butterfoss, F. D., Goodman, R. M., & Wandersman, A. (1996). Community coalitions for prevention and health promotion: factors predicting satisfaction, participation, and planning. *Health education quarterly*, *23*(1), 65–79.

Doran, G.T. (1981). There's a S.M.A.R.T. way to write managements' goals and objectives. *Management Review*, *70*(11), 35.

https://community.mis.temple.edu/mis0855002fall2015/files/2015/10/S.M.A.R.T-Way-Management-Review.pdf

González, S. R, Powers, A. R. (Eds.) (2022). *Assessing the environment of food insecurity at Alabama colleges and universities*. Society for Nutrition Education and Behavior Annual Conference. https://www.jneb.org/article/S1499-4046(22)00198-1/fulltext

Hickey, A., Brown, O., Fiagbor, R. Campus-based interventions and strategies to address college students with food insecurity: A systematic review. *Journal of Hunger and Environmental Nutrition*. DOI: 10.1080/19320248.2022.2101413

Mei, J., Fulay, A. P., Wolfson, J. A., & Leung, C. W. (2021). Food insecurity and dietary intake among college students with unlimited meal plans at a large, midwestern university. *Journal of the Academy of Nutrition and Dietetics*, *121*(11), 2267–2274. https://doi.org/10.1016/j.jand.2021.04.009

Mukigi D, Thornton K, Binion A, et al. (2018) Food insecurity among college students: an exploratory study. *Journal of Nutrition and Health Sciences*, *5*(1). doi:10.15744/2393-9060.5.106

Payne-Sturges, D. C., Tjaden, A., Caldeira, K. M., Vincent, K. B., & Arria, A. M. (2018). Student hunger on campus: food insecurity among college students and implications for academic institutions. *American Journal of Health Promotion, 32*(2), 349–354.

Phillips, E., McDaniel, A., & Croft, A. (2018) Food insecurity and academic disruption among college students. *Journal Student Affairs Research and Practice, 55*(4), 353-372. https://doi.org/10.1080/19496591.2018.1470003

Substance Abuse and Mental Health Services Administration (SAMSHA). (2019). A guide to SAMHSA's strategic prevention framework.

https://www.samhsa.gov/sites/default/files/20190620-samhsa-strategic-prevention-

framework-guide.pdf

United States Department of Agriculture. (2022). *Definitions of food security*. Economic

Research Service. https://www.ers.usda.gov/topics/food-nutrition-assistance/food-

security-in-the-us/definitions-of-food-security.aspx

United States Department of Agriculture. (2022). *Survey tools*.

https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-u-

s/survey-tools/

Notes

Chapter IV: Manuscript 3. Engagement and collaborative efforts of campus-based food security coalitions at two-year colleges in Alabama

Hickey, A. B., Powers, A., Andrzejewski, C., Brown, O. Submitted to *Journal of Health Education and Behavior*

Abstract

It is estimated that two-thirds of community college students experience food insecurity, a condition of limited and inconsistent access to adequate food. Alabama Campus Coalition for Basic Needs (ACCBN) is a network of Alabama college and university campus coalitions with the mission to systematically address college student food insecurity by utilizing principles of Community-Based Participatory Research (CBPR). In 2021, fifteen community colleges in Alabama joined ACCBN and created campus-based basic needs coalitions at their college with an initial emphasis on addressing food insecurity. Campus coalition leaders, also known as campus champions, recruited members of their campus and community to be coalition members that bring together resources and expertise for the purposes of addressing food insecurity. Campus coalition leaders participated in an explanatory, sequential mixed-methods study to assess and explore member engagement and coalition formation for each campus-based basic needs coalition. Campus champions completed a 76-item survey on coalition characteristics followed by a semi-structured interview to explore coalition constructs. Two themes emerged from the interviews and were contextualized with the survey results: (1) champions noted feelings of being spread thin due to understaffing of employees and the impact of COVID-19; (2) champions demonstrated intentionality in how they planned to engage members and develop a sustainable coalition. This study offers valuable information for colleges and universities seeking

to address food insecurity through coalitions as it describes challenges with community capacity building and offers potential solutions for overcoming these challenges.

Keywords: *food insecurity, basic needs, college students, coalitions, community-based participatory research*

Introduction

Food insecurity is the limited or inconsistent access to adequate food for a healthy lifestyle (Core Indicators of Nutritional State for Difficult-To-Sample Populations, 1990; Coleman-Jensen, 2017, summary page). College students experience higher rates of food insecurity compared to the general population (Nikolaus et al., 2018; food insecurity prevalence US, 2020). Research suggests two out of three community college students are food insecure (Goldrick-Rab et al., 2017). Students of color, first generation students, former foster youth, students that identify as LGBTQ+, and students that were food insecure as a child are at a higher risk for being food insecure (El Zein et al., 2019; Morris et al., 2016; United States Government Accountability Office, 2018). Food insecurity is linked to poorer physical and mental health, nutrition status, retention rates, grade point average, and social well-being (Bruening et al., 2017; El Zein et al., 2019; Hege et al., 2021; Meza, Altman, Martinez, & Leung, 2018; Mukigi et al., 2018; Silva et al., 2017; Shi et al., 2021). Experts called upon institutions of higher education to address food insecurity to improve the health of students and provide them the opportunity to have a productive college experience (Broton & Goldrick-Rab, 2015). To address systematic health concerns, colleges and universities formed coalitions by bringing together resources to accomplish a shared mission and goals. Coalitions have been formed to address HIV prevention, substance use, violence prevention, and suicide prevention in college students (Butterfoss et

al.,1993; Feighery & Rogers, 1989; Gebhardt et al., 2000; Lee et al., 2010; Linowski & DiFulvio, 2012; Singleton & Hurst, 1996).

Alabama Campus Coalition for Basic Needs (ACCBN) is a network of college and university campus coalitions with the mission to unify college campuses throughout Alabama to ensure student basic needs are met, thereby empowering all students to succeed in school, earn their degrees, and open doors to opportunity. ACCBN was founded by faculty in Auburn University Department of Nutrition Sciences and Hunger Solutions Institute (HSI).

In 2021, community colleges participating in the Alabama Campus Coalition for Basic Needs (ACCBN) were recruited to implement *Hunger Free Higher Ed (HFHE)*, an approach for systematically addressing college student food insecurity utilizing principles of Community-Based Participatory Research (CBPR). CBPR is a collaboration between community members, organizations, stakeholders, and researchers to promote systematic change through the implementation of initiatives that draw upon the strengths and resources of the campus and community (Israel et al., 1998). CBPR increases community capacity, an interaction between human, organizational, and social capacity within a community to collectively garner resources for the purpose of addressing community concerns and issues (Craig, 2007; Chaskin, 1999; Israel et al., 2010; Simmons et al., 2011).

Fifteen Alabama community colleges elected to join and initiated the six-step *HFHE* approach. The first step in *HFHE* (ENGAGE) includes the formation of campus-based basic needs coalitions with a preliminary focus on implementing strategies that improved food security in their student population. Each campus elected one or more coalition leaders, also called campus champions, to serve as a liaison to the ACCBN network. Campus champions were employees of the college and agreed to initiate coalition efforts in collaboration with HFHE. In

65

ENGAGE, champions formed a campus coalition by recruiting members of their campus and community to unite their resources. This study utilized an explanatory, sequential mixed method research approach to assess and explore engagement and collaborative efforts at two-year colleges in the process of forming basic needs coalitions.

Methods

This study received approval from the researchers' Institutional Review Board as an exempt study. To fulfill the aim, researchers selected an explanatory approach to allow the development of inductive themes which could be compared to survey responses. A sequential design (quantitative > QUALITATIVE) allowed for comparison between responses of quantitative (survey) and qualitative (interview) inquiry for corroboration and triangulation and to increase validity of findings.

Sample

A convenience sample of 36 ACCBN coalition campus champions from 15, two-year Alabama community colleges received an email inviting them to participate in the study. To be eligible for participation, individuals had to be older than the age of 18 and be an ACCBN campus champion at a two-year college.

Instrumentation

The survey included a 76-item survey of two previously validated instruments, Coalition Effectiveness Inventory (Goldstein, 1997) and Level of Collaboration Inventory (Frey et al., 2006). The Coalition Effectiveness Inventory assesses coalition characteristics, including personnel, structures, processes, formation, maintenance, and institutionalization. Campus champions rated coalition characteristics on a scale of (0) absent; (1) present but limited; (2) present; or not applicable. The Level of Collaboration Inventory is a scale of collaboration from

the lowest form of collaboration to the highest form of collaboration: networking, cooperation, coordination, coalition, and collaboration. See table 6 for characteristics of each form of collaboration. Campus champions listed each individual, organization, department, or division represented on the coalition and then rated the extent to which the campus champion currently interacted with that individual, organization, department, or division.

Planned interview questions were informed by previously validated instruments (Cramer et al., 2006; Frey et al., 2006; Goldstein, 1997). These questions explored coalition formation, areas in which the coalition had excelled, barriers of coalition formation, challenges of coalition engagement and collaboration, and areas in which the coalition required improvement. Additional questions further explored survey results and interview responses for the purpose of data triangulation, corroboration, enrichment, and exploration of outliers or group differences (Creswell & Plano Clark, 2015).

Table 6. Levels of Collaboration Inventory Scale

Networking (1)	Cooperation (2)	Coordination (3)	Coalition (4)	Collaboration (5)
- Aware of organization - Loosely defined roles - Little communication - All decisions are made independently	- Provide information to each other - Somewhat defined roles - Formal communication - All decisions are made independently	- Share information and resources - Frequent communication - Some shared decision making	-Share ideas -Share resources -Frequent and prioritized communication -All members have a vote in decision making	- Members belong to one system - Frequent communication with mutual trust - Consensus is reached on all decisions

Study Procedures and Data Analysis

All ACCBN two-year college campus champions received an invitation email with information about study participation and a link to the survey. Campus champions received two reminder emails after one week and two weeks of the initial invitation email. The researcher

contacted campus champions by phone one week after the last reminder email was sent. The survey was approximately 20 minutes in duration. After the completion of the survey, campus champions were redirected to a calendar website to schedule an interview. Champions were able to participate in the interview individually or in a group with other co-champions. Campus champions received a Zoom link by email to confirm the interview time. The principal investigator (PI) reviewed results of the survey at the beginning of each semi-structured interview with a campus champion. Semi-structured interviews were conducted and recorded on Zoom.

The PI trained two additional study staff members on emergent coding by extracting explicit and implicit themes from sample transcripts. The training instructed study staff to listen to audio recordings and review written transcripts multiple times before utilizing emergent coding to identify inductive themes within the transcripts. Study staff cleaned and coded interview transcripts in Microsoft Word using emergent coding techniques to glean themes from the data. A third study staff member compared the codes and consolidated them into themes. This individual compared survey and interview responses for purposes of data triangulation and integration. During data analysis, study staff compared survey and interview responses to better understand the extent to which qualitative data gave context to quantitative data (Creswell & Plano Clark, 2015). Moreover, study staff converted survey results into narrative form by contextualizing within the themes identified from the interviews (Teddlie & Tashakkori, 2009). Results of both types of inquiry were blended to obtain data inferences.

Results

Nineteen campus champions participated in the survey (56%). Eight responses were removed for incomplete answers. One response was withdrawn and resubmitted, as a campus

champion felt they had selected incorrect responses. Therefore, survey responses were summarized based on eleven completed surveys by campus champions from nine colleges. Three campus co-champions from one college submitted the survey, however delegated the interview to one campus co-champion to represent their college. Twelve campus champions from nine colleges participated in an interview individually or in a group with other campus champions. One college had four campus co-champions that participated in the interview.

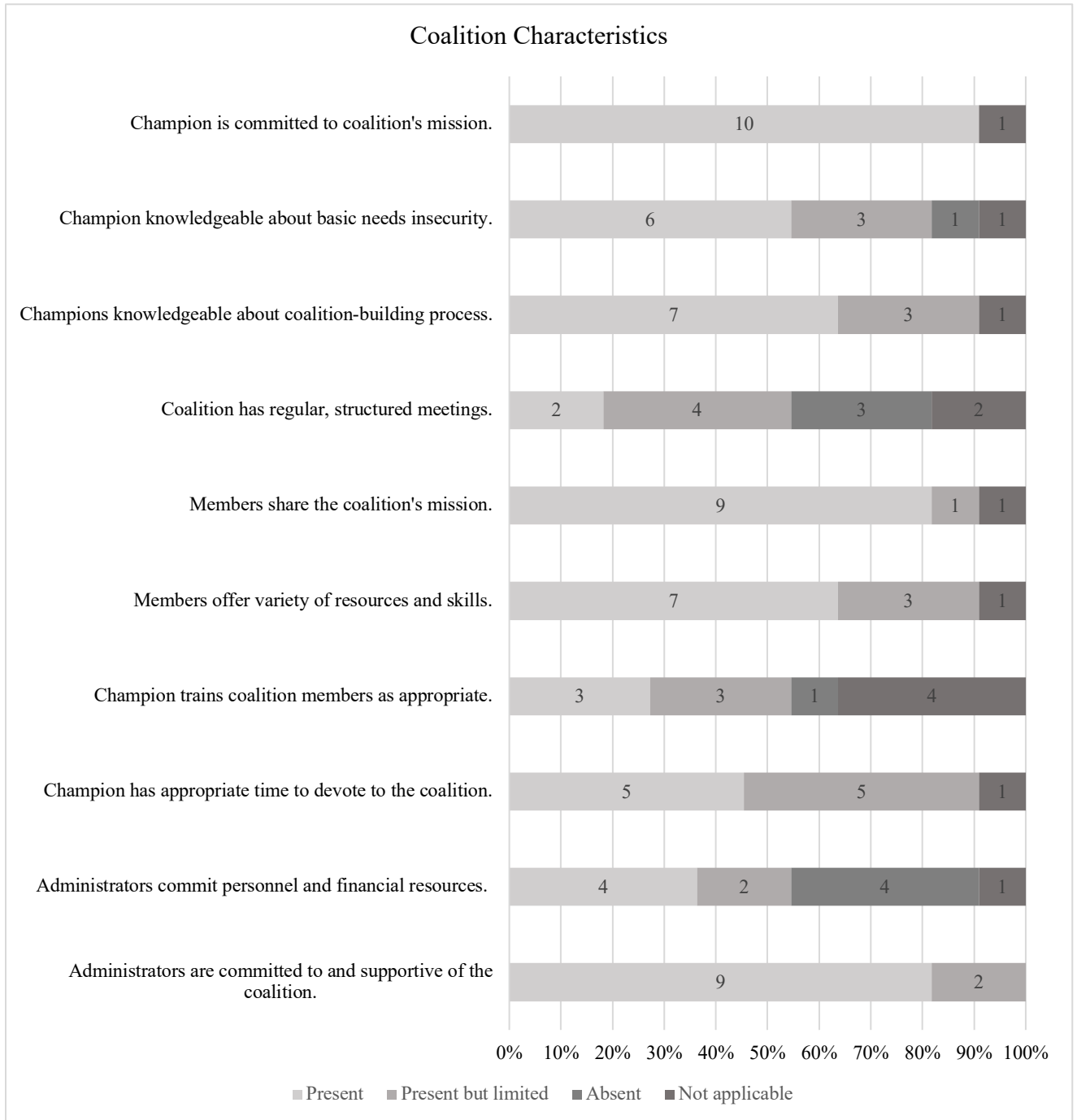### Sample and Coalition Partnership Characteristics

In the interview, campus champions indicated they served in various capacities at their college, including Dean of Students, Director of Counseling Center, Director of Student Activities and Community Engagement, Instructor, Student Life Coordinator, Title IX Coordinator, Student Activities Coordinator, Director of Student Activities, and Director of Student Success. All of the campus champions volunteered or were appointed by a supervisor, however the role as a campus champion was not included in their job descriptions.

In the survey, campus champions indicated their commitment to the coalition as well as their knowledge concerning basic needs insecurity and coalition-building process. 10 campus champions (91%) indicated they were committed to the mission of the coalition. Six campus champions (55%) noted they were knowledgeable about the basic needs content area. Four campus champions (36%) felt they were knowledgeable about the coalition-building process. See Figure 2 for coalition characteristics from survey responses.

All campus champions were in the process of recruiting campus and community partners to join their coalition. Collectively, campus champions reported 33 partnerships had been formed. Of these partnerships, 9.1% of partnerships were rated as networking, 18.2% were rated as coordination, 48.5% were rated in the coalition form, and 24.2% were in the collaboration

form. In the survey, four campus champions (36%) reported meetings did not occur regularly due to challenges with recruiting coalition members and scheduling conflicts. In the survey, nine campus champions (82%) indicated coalition members shared the campus coalition's mission. Additionally, seven campus champions (64%) felt their members offered variety of resources and skills, and four campus champions (36%) provided training for coalition members.

Figure 2. Two-year Engage Assessment Coalition Characteristics

Coalition Characteristics

Characteristic	Present	Present but limited	Absent	Not applicable
Champion is committed to coalition's mission.	10			1
Champion knowledgeable about basic needs insecurity.	6	3	1	1
Champions knowledgeable about coalition-building process.	7	3		1
Coalition has regular, structured meetings.	2	4	3	2
Members share the coalition's mission.	9		1	1
Members offer variety of resources and skills.	7	3		1
Champion trains coalition members as appropriate.	3	3	1	4
Champion has appropriate time to devote to the coalition.	5	5		1
Administrators commit personnel and financial resources.	4	2	4	1
Administrators are committed to and supportive of the coalition.	9	2		

Legend: ■ Present ■ Present but limited ■ Absent ■ Not applicable

Emergent Themes for Engagement and Collaborative Interview Responses

Emergent Themes for Engagement and Collaborative Efforts

Two themes emerged from interview responses: (1) champions noted feelings of being

spread thin due to understaffing of employees and the impact of COVID-19; (2) champions

demonstrated intentionality in how they planned to engage members and develop a sustainable

coalition. See table 7 for a list of interview responses organized by theme. Every campus

champion had experience providing food aid or discussed experiences of having direct contact

with students experiencing food insecurity. Champions described the impact of basic needs

insecurities on their students' ability to be successful in the classroom and matriculate through

their degree. See table 8 for interview responses from campus champions concerning the impact

of basic needs insecurities on students.

Table 7. Two-year Engage Assessment interview responses organized by theme.

Champions noted feelings of being spread thin due to understaffing of employees and the impact of COVID-19	*We honestly just have not had a chance to sit down and hash it all out…it has been crazy. It has been busy. We are under-staffed and short-staffed because of organizational chart changes and because of COVID. [We are] trying to catch back up. I think a lot of people are wearing many hats…*
	People are spread thin. COVID has thrown some things our way. And so, the coalition really consists of just myself and [one other person].
	We have been discussing [coalition involvement] with students, because I think employees are really spread thin and have multiple job functions. If we can get the buy-in of the students, I think [the food pantry] could run itself.
	The reality of it is people who generally have your back have a lot of people's back… the time that they can devote to [the coalition] and energy that they can devote to [the coalition] is limited. I have to respect that and understand that, because my own time is limited.
	When speaking about COVID-19: *I think people just have tunnel vision right now. People have tunnel vision on the task at hand and are buried in that [task].*
	[The coalition has] not met this semester yet. I will be honest, part of that is I have been truly overwhelmed with responsibilities this semester.

	I should assign this [champion role] to someone else, because I do not feel like I am able to give it the time that it needs. The reason I wanted to [be a champion] is I really feel like our students need someone that is going to advocate for them to get the services that they need.
Champions demonstrated intentionality in how they planned to engage members and develop a sustainable coalition	*How do we not only build this [coalition] but how do you make it sustainable, and again, I just have to repeat with: being intentional.*
	You want to be able to connect and to partner and collaborate with as many people as possible. I think you have to be really intentional about that.
	When talking about the champion's upcoming retirement: *I do not want the pantry to be done when [I retire].Our [food pantry] is going to be here long after I am gone. And it will continue to evolve.. into something even bigger and greater... I want to make sure that [our efforts] are sustainable.*
	I want to start with 'how do we sustain this?'. What if the funding runs out? What if someone from this position retires or they are no longer working the same position? What will you do to still ensure [continued] involvement? How can this coalition thrive?
	I definitely know I need to engage more community partnerships to try to make [the coalition] be sustainable.
	[ACCBN is] a more comprehensive, structured, and sustainable way. I think [ACCBN] allowed for [members to take action]. I think that is what triggered the excitement. Previously, food aid initiatives were being done in such a way that it was not successful or productive.
	We do have such a small student-to-faculty ratio. They are very involved in the students' lives so we rely on them a lot to communicate to their students and be their go-to.
	So many [faculty] already contribute to helping students. They will pay book fees or buy lunch in the cafeteria. They already have such a huge heart to help students that are in need... I really think that it is important for instructors [to be included in the coalition], because [faculty] are the ones that see the kids every day.
	One champion spoke about engaging faculty and coaches that students trusted: *Students feel comfortable talking to and confiding in trusted faculty and coaches… They are approachable, and the students feel comfortable with them.*

Table 8. Two-year Engage Assessment campus champions discussed impact of basic needs

insecurity

Impact of Basic Needs Insecurity, including food insecurity
[We are] getting data indicating that students are not able to be successful. Not because of academics, but because of other issues that we plan to address through food (aid)…
…Our students are the ones that we are helping. We want them [to go] from student to graduate. But they cannot graduate if they are not here. And if their basic needs are not met, then they are not [in school]. We have to do something to help them stay [in school]…
I am excited about how we are changing students' lives, and I know for a fact that we have retained students by helping them through these barriers…
Hunger is just a symptom of a bigger problem.

Feelings of Being Spread Thin: Challenges with Building Community Capacity. Campus

champions discussed the challenges they were experiencing in leading the coalition and engaging

members. Many campus champions reported the employees on their campus were feeling spread

thin due to the many extra roles they held at their college as a result of being under-staffed and

impacts of COVID-19. Campus champions believe they will have difficulties recruiting campus

members to be a part of the coalition as many of those individuals are already fulfilling more

responsibilities than their assigned job duties. These challenges led to a difficulty in building

community capacity within their coalition. Campus champions were not exempt from the feeling

of being spread thin. In the survey, five campus champions (45%) reported their time to dedicate

to the coalition was limited. Two campus champions elaborated on their struggle to meet

demands of leading a campus coalition due to job requirements and other responsibilities at the

college.

To address these challenges, campus champions noted ways in which they were planning to

build community capacity. One campus champion focused on the important role community

members had in the coalition: *"It is just in [our] name: Community. We want to engage our community as much as we can…"* In the survey, three (27%) campus champions indicated their coalition was also accessible to community members. To increase buy-in from the community, one campus champion emphasized the importance in supporting students and investing in their future of the community: *We're creating our own workforce right, so the more that we develop our students in a positive way, the more they are going to give back to their community as they exit into the workforce.*

Champions demonstrated intentionality in how they planned to engage members and develop a sustainable coalition. Campus champions were intentional about who they engaged and how they were bringing together resources. Campus champions focused their efforts on building a sustainable coalition from its formation by recruiting members that would be invested in the coalition. Campus champions discussed inviting certain people to join the coalition to build trust and rapport with students, such as instructors and coaches. Campus champions were aware of barriers that could impede coalition efforts and sustainability. One coalition member felt slow momentum would harm the sustainability of the coalition: *One of the most important things is to be organized and to present an achievable plan. I do not like to talk in hypotheticals. I like to have concrete things that we are going to do, because I feel like hypotheticals just waste time.* Another coalition member discussed the role of administration in coalition momentum: *[I] was in a meeting with [our president] last week about it, and he is already wanting to expand and offer clothes…So, I think one of our strengths is having administration on our side through the whole process.* In the survey, nine campus champions (82%) reported college administration was committed and supportive of the campus basic needs coalition. One campus champion mentioned the administration was delayed in approving the coalition, therefore members were

not yet able to be recruited and coalition activities had not begun. Four campus champions (36%) reported on the survey that their college administration commits personnel and financial resources to the campus basic needs coalition.

Impact Statement and Discussion

This study assessed and explored engagement and collaborative efforts at two-year colleges in the process of forming basic needs coalitions. First, campus champions faced challenges with engaging membership as colleagues were feeling spread thin due to being understaffed and the impacts of COVID-19. These challenges led to difficultly in building community capacity that is necessary to collectively address community concerns, such as food insecurity. Second, campus champions described intentionality with engaging members and in their efforts to form a sustainable coalition. These findings provide useful information for colleges seeking to utilize coalitions or community-based participatory research approaches to address college student food insecurity.

Building community capacity was a concern for this sample of campus champions as resources, such as time, energy, and participation of members, were limited for member engagement and coalition formation. Goodman et al. (1998) noted participation of members is essential to building community capacity, influencing coalition activities, and attracting participants to utilize community resources. In addition, recruiting individuals that see themselves as stakeholders in the well-being of the community is pertinent for building community capacity (Chaskin, 1999). Capacity building functions include the creation of partnerships that are committed to the mission of the coalition as well as garnering resources (Butterfoss et al., 1998; Hacker et al., 2012; Simmons et al., 2001).

As demonstrated by results, campus champions were intentional about engaging members and building a sustainable coalition. Important stimulants for coalition formation are recognition of a common purpose or need, failure of previous efforts, catalysts for bringing together resources, and ability to maintain relationships (Benard, 1989; Mizrahi & Rosenthal, 1992; Schermerhorn, 1975; Whetten, 1981 as cited in Butterfoss, 1993). Additionally, Hacker et al. (2012) indicated intentionality of sustainability is important for community capacity building, especially in the early stages of a partnership. Formalization of coalition operations, strong central leadership, diverse membership, member participation, member satisfaction and commitment, and member skill training were identified as supportive elements for coalition implementation and maintenance (Butterfoss et al., 1993). Despite challenges with member recruitment, the campus coalitions as described in this study possessed features that are important for coalition formation and maintenance, such as leadership, member commitment to the mission, training, and intentionality.

Previous research with ACCBN campus champions at four-year universities demonstrated the importance of administration involvement in the early phases of coalition engagement (Hickey et al., 2020). Results of the current study also demonstrated ways in which administration can accelerate or impede coalition progress.

To our knowledge, there are not data on building community capacity during the COVID-19 pandemic. Campus champions indicated responsibilities related to COVID-19 was a primary concern for coalition engagement; therefore, this study offers insight into the impact of COVID-19 on building community capacity within basic needs security coalitions.

Strengths and Limitations

Investigators recruited a small, convenience sample to answer research questions about a specific process. Investigators used a mixed methods research (MMR) design for this study for four reasons: (1) one method of inquiry could not sufficiently answer the research questions; (2) this design generates greater depth of information that is required to fully understand member engagement and coalition formation processes; (3) use of quantitative and qualitative inquiry decreases bias and increases validity of findings through triangulation and corroboration of data; (4) the small, convenience sample does not allow for meaningful use of inferential statistics, therefore qualitative inquiry is used to increase credibility and trustworthiness of the quantitative data through legitimation (Collins et al., 2007).

This research possesses various strengths. The mixed methods research design that triangulated and corroborated responses from the survey and interview is a strength of the study. The participation of campus champions and their lived-experiences is also a strength of this study. Though the sample was small, campus champions provided important insight into the role and challenges of developing and leading a coalition at a community college which may highlight broader concerns within higher education, such as health perceptions of employees during COVID-19 and feelings of burnout (Fischer & Cossey, 2022; Peacock, 2022). Future studies should further elaborate on impacts of COVID-19 on campus coalition engagement and formation, including the effects of the pandemic on member recruitment and participation.

Implications for Practice

This study described characteristics of coalition member engagement and collaboration within basic needs security coalitions at two-year colleges in Alabama. Findings of this research demonstrated feelings of being spread thin due to understaffing of employees and the impact of

78

COVID-19 as well as the intentionality of campus champions as they engaged members and worked to implement a sustainable coalition. Furthermore, results of the study described impacts of COVID-19 on coalition formation and community capacity building that will have implications for coalitions that seek to address issues of food insecurity during and post-onset of the COVID-19 pandemic. The findings of this study are useful for experts utilizing community-based participatory research and coalitions to address basic needs insecurity on college campuses.

Acknowledgements

References

Core Indicators of Nutritional State for Difficult-To-Sample Populations. (1990). *Journal of Nutrition, 120*(11), 1557-1600. doi: 10.1093/jn/120.suppl_11.1555.

Benard, B. (1989) Working together: principles of effective collaboration. *Prevention Forum*, October 4-9.

Broton, K., & Goldrick-Rab, S. (2015). *Public testimony on hunger in higher education.* National Commission on Hunger. https://www.academia.edu/15493080/Public_Testimony_on_Hunger_in_Higher_Education_Submitted_to_the_National_Commission_on_Hunger

Bruening, M., Argo, K., Payne-Sturges, D., & Laska, M. N. (2017). The struggle Is real: A systematic review of food insecurity on postsecondary education campuses. *Journal of the Academy of Nutrition and Dietetics*, *117*(11), 1767–1791. https://doi.org/10.1016/j.jand.2017.05.022

Butterfoss, F. D., Goodman, R. M., & Wandersman, A. (1993). Community coalitions for

 prevention and health promotion. *Health Education Research*, *8*(3), 315–330.

 https://doi.org/10.1093/her/8.3.315

Chaskin, R. J. (1999) Defining community capacity: A framework and implications from a

 comprehensive community initiative. Urban Affairs Association Annual Meeting, Fort

 Worth, April 22-25, 1998. https://www.lisc.org/media/filer_public/27/0f/270f0aa3-a66d-

 4f57-ad8c-f733584dca64/08102018_resource_defining_community_capacity.pdf

Coleman-Jensen, A., Nord, M., & Singh, A. (2017). *Household food security in the United States*

 in 2016 (Report No. ERR-237).

 https://www.ers.usda.gov/webdocs/publications/84973/err-237.pdf?v=42979

Collins, K. M. T., Onwuegbuzie, A. J., & Jiao, Q. G. (2007). A mixed methods investigation of

 mixed methods sampling designs in social and health science research. *Journal of Mixed*

 Methods Research, *1*(3), 267–294. DOI: 10.1177/1558689807299526

Craig, G. (2007). Community capacity-building: Something old, something new . . .? *Critical*

 Social Policy, *27*(3), 335–359. https://doi.org/10.1177/0261018307078846

Cramer, M. E., Atwood, J. R., & Stoner, J. A. (2006). Measuring Community Coalition

 Effectiveness Using the ICE   Instrument. *Public Health Nursing, 23*(1), 74-87.

 https://doi-org.spot.lib.auburn.edu/10.1111/j.0737-1209.2006.230111.x

Creswell, J. W., & Plano Clark, V. L. (2015). *Designing and conducting mixed methods*

 research (3rd ed.). Thousand Oaks, CA: SAGE.

El Zein, A., Shelnutt, K.P., Colby, S. Vilaro, M. J., Greene, G., Olfert, M. D., Riggsbee, K.,

 Stabile Morell, J., Mathews, A. E. (2019). Prevalence and correlates of food insecurity

among U.S. college students: a multi-institutional study. *BMC Public Health, 19*(660). https://doi.org/10.1186/s12889-019-6943-6

Feighery, E. & Rogers, I. (1989). *Building and maintaining effective coalitions (Number 12).* Stanford Health Promotion Resource Center.

Fischer, H. & Cossey, K. M. (2022) Navigating the storm: Community colleges' decision to pivot to virtual international education in response to the covid-19 pandemic. *Community College Journal of Research and Practice*, *46*(1-2), 122-133, DOI: 10.1080/10668926.2021.1972360

Frey, B. B., Lohmeier, J. H., Lee, S. W., & Tollefson, N. (2006). Measuring collaboration among grant partners. *American Journal of Evaluation, 27*(3), 383-392. https://doi.org/10.1177/1098214006290356

Gebhardt, T. L., Kaphingst, K., & DeJong, W. (2000). A campus-community coalition to control alcohol-related problems off campus: an environmental management case study. *Journal of American College Health*, *48*(5), 211–215. https://doi-org.spot.lib.auburn.edu/10.1080/07448480009599306

Goldrick-Rab, S., Richardson, J., & Hernandez, A. (2017). *Hungry and homeless in college: Results from a national study of basic needs insecurity in higher education*. Madison, WI: Wisconsin Hope Lab.

Goldstein S. M. (1997). Community coalitions: A self-assessment tool. *American Journal of Health Promotion*, *11*(6), 430–435. https://doi.org/10.4278/0890-1171-11.6.430

Goodman, R., Speers, M., Mcleroy, K., Fawcett, S., Kegler, M., Parker, E., Smith, S., Sterling, T., & Wallerstein, N. (1998). "Identifying and defining the dimensions of community

capacity to provide a basis for measurement." *Health Education & Behavior, 25*(3), 258-278. http://hdl.handle.net/2027.42/67070

Hacker, K., Tendulkar, S. A., Rideout, C., Bhuiya, N., Trinh-Shevrin, C., Savage, C. P., Grullon, M., Strelnick, H., Leung, C., & DiGirolamo, A. (2012). Community capacity building and sustainability: outcomes of community-based participatory research. *Progress in Community Health Partnerships: Research, Education, and Action*, *6*(3), 349–360. https://doi.org/10.1353/cpr.2012.0048

Hege, A., Stephenson, T., Pennell, M., Revlett, B., VanMeter, C., Stahl, D., Oo, K., Bressler, J., & Crosby, C. (2021). College food insecurity: Implications on student success and applications for future practice. *Journal of Student Affairs Research and Practice*, *58*(1), 44-61, DOI: 10.1080/19496591.2020.1726359

Hickey, A. B., Powers, A., and Brown, O. (2020). *Alabama campus coalition for basic needs engage assessment*. [Unpublished masters thesis]. Auburn University.

Israel, B. A., Coombe, C. M., Cheezum, R. R., Schulz, A. J., McGranaghan, R. J., Lichtenstein, R., Reyes, A. G., Clement, J., & Burris, A. (2010). Community-based participatory research: a capacity-building approach for policy advocacy aimed at eliminating health disparities. *American Journal of Public Health*, *100*(11), 2094–2102. https://doi.org/10.2105/AJPH.2009.170506

Israel, B. A., Schulz, A. J., Parker, E. A., & Becker, A. B. (1998). Review of community-based research: assessing partnership approaches to improve public health. *Annual review of Public Health*, *19*, 173–202. https://doi.org/10.1146/annurev.publhealth.19.1.173

Lee, J. G. L., Goldstein, A. O., Kramer, K. D., Steiner, J., Mathew, M., Ezzell, M. M., & Shah, V. (2010). Statewide diffusion of 100% tobacco-free college and university

policies. *Tobacco Control*, *19*(4), 311–317. https://doi-

org.spot.lib.auburn.edu/10.1136/tc.2009.032888

Linowski, S. A., & DiFulvio, G. T. (2012). Mobilizing for change: a case study of a campus and

community coalition to reduce high-risk drinking. *Journal of Community Health*, *37*(3),

685–693. https://doi-org.spot.lib.auburn.edu/10.1007/s10900-011-9500-5

Meza, A., Altman, E., Martinez, S., & Leung, C. W. (2019). "It's a feeling that one is not worth

food": A qualitative study exploring the psychosocial experience and academic

consequences of food insecurity among college students. *Journal of the Academy of

Nutrition and Dietetics*, *119*(10), 1713–1721.e1.

https://doi.org/10.1016/j.jand.2018.09.006

Mizrahi, T. &Rosenthal, B. (1992) Managing dynamic tensions in social change coalitions. In

Community Organization and Social Administration: Advances, Trends, and Emerging

Principles. Haworth Press

Morris, L. M., Smith, S., Davis, J., & Null, D. B. (2016). The prevalence of food security and

insecurity among illinois university students. *Journal of Nutrition Education and

Behavior*, *48*(6), 376–382.e1. https://doi.org/10.1016/j.jneb.2016.03.013

Mukigi, D., Thornton, K., Binion, A., Brown, K., Church, M., Cook, M., Henry, D., Hopkinson,

J., Musucci,C., Pruett, J., Rogers, M., Singleton, O., Vichi-Miller, V., Wofford, R.,

Brown, O. (2018). Food insecurity among college students: An exploratory study.

Journal Nutrition Health Sciences, 5(1). DOI:10.15744/2393-9060.5.106

Nikolaus, C. J., An, R., Ellison, B., Nickols-Richardson, S. M. Food insecurity among college

students in the United States: A scoping review. (2020). *Advances in Nutrition,11*(2),

327-348, https://doi.org/10.1093/advances/nmz111

Peacock, J. (2022) University employees' perceptions of health during the early stages of the

    Covid-19 pandemic. *Journal of Further and Higher Education*, *46*(1), 107-

    114, DOI: 10.1080/0309877X.2021.1887464

Schermerhorn, J. (1975) Determinants of interorganizational cooperation. *Academy of*

    Management Journal, *18*, 846—856

Shi, Y., Davies, A., & Allman-Farinelli, M. (2021). The association between food insecurity and

    health outcomes in university students: A systematic view. *Journal of Academy of*

    Nutrition and Dietetics. *121*(12), 2475-2500. https://doi.org/10.1016/j.jand.2021.07.015

Silva, M. R., Kleinert, W. L., Sheppard, A. V., Cantrell, K. A., Freeman-Coppadge, D. J., Tsoy,

    E., Roberts, T., & Pearrow, M. (2017). The relationship between food security, housing

    stability, and school performance among college students in an urban university. *Journal*

    of College Student Retention: Research, Theory & Practice, *19*(3), 284–

    299. https://doi.org/10.1177/1521025115621918

Simmons, A., Reynolds., R. C., and Swinburn, B. (2011, April). Defining community capacity

    building: is it possible? *Preventative Medicine, 52*(3-4), 193-199.

Singleton, E. K., & Hurst, C. (1996). Coalition building: a strategy for creating HIV/AIDS

    awareness on a college campus. *The ABNF Journal: Official Journal of the Association of*

    Black Nursing Faculty in Higher Education, Inc, *7*(2), 42–46.

Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating*

    qualitative and quantitative approaches in the social and behavioral sciences. Thousand

    Oaks, CA: SAGE.

United States Department of Agriculture. (2021). *Food Security and nutrition assistance.*

    Economic research service. https://www.ers.usda.gov/data-products/ag-and-food-

    statistics-charting-the-essentials/food-security-and-nutrition-assistance/

Whetten, D. (1981) Interorganizational relations: A review of the field. *Journal of Higher*

    Education, *52*, 1-27.

Chapter V: Manuscript 4. Comparing engagement and collaborative efforts among food security campus coalitions at two-year colleges and four-year universities in Alabama

Hickey, A. B., Powers, A., Brown, O. Submitted to *Journal of Health Education and Behavior.*

Abstract

Background: Food insecurity is a condition of limited or inconsistent food for an active, healthy lifestyle. Approximately, 32-44% percent of college students experience food insecurity. Alabama Campus Coalition for Basic Needs (ACCBN) is a network of campus coalitions with a mission to address college student food insecurity to ensure all student basic needs are met.

Aims: To compare and describe differences in engagement and collaborative efforts among two- and four-year ACCBN campus coalitions.

Methods: ACCBN campus champions completed The Coalition Effectiveness Inventory and The Level of Collaboration Inventory survey instruments followed by a semi-structured interview. Analysis of survey responses included descriptive statistics and Pearson's Chi-Squared tests. Emergent coding of interview transcripts led to themes.

Results: Campus champions from four-year universities rated their skills in writing proposals and obtaining resources significantly higher than two-year campus champions ($\chi^2 = 9.849$, $p < .05$). Campus champions from two-year colleges rated the incorporation of coalition activities within other agencies or institutions was absent at a significantly more frequent rate than four-year campus champions ($\chi^2 = 6.667$, $p < .05$). In addition, two- and four-year campus champions differed in their responses to interview questions concerning areas in which their coalition excelled, encountered challenges, or required improvement.

Conclusions: Results of this study suggest two-year colleges should seek resources in the community to improve availability of resources and increase awareness of students that use food

aid resources. While campus coalitions at four-year universities should focus on building sustainable coalitions by retaining consistent membership, investing in coalition structures, expanding coalition recognition on campus, and creating a collaborative group.

Keywords: food insecurity, capacity building, Community-Based Participatory Research, coalitions, college students

Introduction

Approximately 32-44% of college students in the United States experience food insecurity, a condition of limited or inconsistent food to meet dietary needs for a healthy, active lifestyle (Abbey et al., 2022; Bruening et al., 2017; Coleman-Jensen, 2017, summary page; Core Indicators of Nutritional State for Difficult-To-Sample Populations., 1990; Nazmi et al., 2018). Experts have called upon institutions of higher education to address college student food insecurity, so that students have a productive college experience (Broton & Goldrick-Rab, 2015). Common solutions to address food insecurity on campuses include educating the campus community about food insecurity; implementing food pantries; cooking and budgeting classes; and conducting research to better understand food insecurity (U. S. GAO, 2018). However, there is a need for systematic strategies to decrease food insecurity beyond emergency aid on college campuses (Davis et al., 2020).

To initiate systematic change, colleges and universities have utilized coalitions to address health concerns of college students, including substance use, violence prevention, and HIV (Gebhardt et al., 2000; Lee et al., 2010; Linowski & DiFulvio, 2012; Singleton & Hurst, 1996). Coalitions are groups of individuals, organizations, and stakeholders that combine resources to address a common mission or goal (Butterfoss et al., 1993). Coalitions promote community capacity building by bringing together community resources and members of the community to

collaboratively enact change (Butterfoss et al., 1993; Goodman et al., 1998; Hacker et al., 2012; Simmons et al., 2001).

Founded in 2019, *Hunger-Free Higher Ed (HFHE)* [a partnership between Auburn University Department of Nutritional Sciences and Hunger Solutions Institute (HSI)] developed a six-step approach to decrease college student food insecurity by convening, collaborating, and multiplying best practices at colleges and universities. The *HFHE* approach utilizes principles of Community-Based Participatory Research (CBPR) to build community capacity by recruiting campuses and community members to unite resources that address student food insecurity. *HFHE* steps were adapted from the Substance Abuse and Mental Health Services Administration (SAMHSA) Strategic Prevention Framework (SPF), a comprehensive process used by substance abuse and misuse prevention planners to facilitate the understanding of the complex interaction between behavioral concerns and environmental contexts (SAMHSA, 2019). The six steps of the *HFHE* approach are (1) ENGAGE, (2) ASSESS, (3) PLAN, (4) IMPLEMENT, (5) EVALUATE, and (6) CELEBRATE. *HFHE* initiated this six-step approach in Alabama with colleges and universities participating in the Alabama Campus Coalition for Basic Needs (ACCBN), a network of college and university campus coalitions in Alabama with a purpose of decreasing college student food insecurity. Each ACCBN campus initiated the HFHE approach by appointing one or more campus champions to lead campus coalition efforts and serve as a liaison to the ACCBN.

During the ENGAGE step, campus champions initiated a collaboration with *HFHE,* recruited members of the campus and community to form a campus coalition, and initiated campus coalition meetings. ENGAGE assessment evaluated and explored engagement and collaborative efforts at two- and four- year colleges and universities during the initial activities of

coalition formation. The aim of this study is to compare and describe differences in engagement and collaborative efforts among two- and four-year ACCBN campus coalitions.

Methods

Sample

Researchers recruited a convenience sample of ACCBN campus champions from two-year colleges and four-year universities to participate in a study during the ENGAGE step. Four-year universities were recruited to join ACCBN in spring of 2019 and initiated the ENGAGE step in summer of 2019. Therefore, campus champions from four-year universities participated in the ENGAGE assessment in the fall of 2019. Two-year colleges were recruited to join ACCBN in fall of 2021 and initiated the ENGAGE step in fall of 2021 and spring of 2022. Campus champions from two-year colleges participated in the ENGAGE assessment in spring of 2022. Campus champions received an email with an invitation to participate in the study. To be eligible for participation, individuals had to be older than 18 and hold the role of ACCBN campus champion at a two- or four- year college or university.

Instrumentation

At least one campus champions from each campus completed a 76-item survey developed from two validated instruments, the Coalition Effectiveness Inventory (Goldstein, 1997) and Level of Collaboration Inventory (Frey et al., 2006). The Coalition Effectiveness Inventory required campus champions to rate coalition characteristics, including coalition personnel, structures, processes, formation, maintenance, and institutionalization on a scale of (0) absent; (1) present but limited; (2) present; and not applicable. The Level of Collaboration Inventory was used to assess the level of collaboration between campus champions and coalition partners on a scale of 1-5 (lowest to highest): (1) networking, (2) cooperation, (3) coordination, (4) coalition,

and (5) collaboration. See Table 9 for characteristics of each level of collaboration. Campus

champions listed each coalition partner, including individuals, organizations, departments, or

divisions, that actively participated in the coalition and rated their level of collaboration with

each of those partners.

      Following completion of the survey, an investigator scheduled a semi-structured

interview with the campus champion. Campus champions could participate individually or in a

group with his/her co-campus champions. Pre-prepared interview questions were informed by

validated instruments (Goldstein, 1997; Cramer, Atwood, & Stoner, 2006; Frey, et al, 2006). The

questions inquired about their coalition's engagement and collaborative processes, including

ways in which their coalition had excelled, encountered challenges, and required improvement.

Follow-up interview questions elaborated upon survey and planned interview question responses.

Table 9. Levels of Collaboration Inventory Scale (Frey et al., 2006)

Networking (1)	Cooperation (2)	Coordination (3)	Coalition (4)	Collaboration (5)
- Aware of organization - Loosely defined roles - Little communication - All decisions are made independently	- Provide information to each other - Somewhat defined roles - Formal communication - All decisions are made independently	- Share information and resources - Frequent communication - Some shared decision making	-Share ideas -Share resources -Frequent and prioritized communication -All members have a vote in decision making	- Members belong to one system - Frequent communication with mutual trust - Consensus is reached on all decisions

Protocol

      All ACCBN campus champions received an invitation email with information on

participating in the study and a link to the survey. Campus champions received two reminder

emails at one week and two weeks after the initial email was sent. At three weeks after the initial

invitation email, the investigators contacted campus champions by phone to invite them to participate in the study.

After completion of the survey, four-year campus champions were contacted by email to schedule the interview. Two-year campus champions were redirected to a calendar website to schedule the interview. Both samples participated in the interview using Zoom. The interviewer reviewed survey results at the beginning of the interview with each campus champion. Interviews were recorded for transcription and data analyses purposes. For interviews that could not be recorded (n= 2), the investigator took in-depth notes. Recordings of the interviews were transcribed by Otter Live Notes for Zoom (Otter.ai, Mountain View, CA, USA) or Zoom (Zoom Video Communications, Inc., San Jose, CA, USA). All transcripts were cleaned in Microsoft Word.

Data Analysis

Survey responses were analyzed in SPSS using descriptive statistics and Pearson's Chi-squared non-parametric tests to determine if there was a significant difference in ranked scores between responses provided by campus champions at two-year colleges and four-year universities (IBM Corporation, 2021). Responses were coded in SPSS as present (2), present but limited (1), and absent (0). 'Not applicable' responses were coded as missing values. Statistical significance was measured using p-value set at <0.05.

During the interview, campus champions discussed ways in which their coalition excelled, encountered challenges, and required improvement. Investigator used emergent coding to extract inductive themes within the interview transcripts using Microsoft Word. For the purposes of comparison, interview responses from two-year campus champions and four-year campus champions were treated as two separate groups. The investigator coded and organized

themes in the interview responses within each group. The themes between the two groups were compared to describe differences in engagement and collaboration between two-year colleges and four-year universities.

Results

Nine out of 12 four-year campus champions from 10 universities participated in the study. One response was excluded due to incomplete answers. Eight, four-year campus champions from seven universities participated in a semi-structured interview (67%); one university had co-champions who both participated in the interview simultaneously. Nineteen out of 34 two-year campus champions from 15 colleges received an invitation to participate in the study. Eight responses were removed for incomplete answers. One response was withdrawn and resubmitted, as a campus champion felt they had selected incorrect responses. Three campus co-champions from one college submitted the survey, however delegated the interview to one of the other campus co-champions. Therefore, 11 surveys from nine two-year colleges were analyzed. Thirteen two-year campus champions (38%) from nine colleges participated in an interview individually or in a group with other campus co-champions. One college elected to have four campus co-champions participate in the interview as they each led a small coalition at the college's satellite campuses.

Survey Results

Campus champions from four-year universities rated their skills in writing proposals and obtaining resources significantly higher than the rated responses provided by two-year campus champions ($\chi^2 = 9.849$, $p < .05$). See Table 9 for descriptive statistics of survey responses and results of statistical analyses. Seventy-five percent of four-year campus champions noted they possessed the skill of writing proposals and obtaining resources compared to 10% of two-year

campus champions indicating they possessed that skill without limitations. Campus champions from two-year colleges rated the incorporation of coalition activities within other agencies or institutions was absent at a significantly more frequent rate than four-year campus champions (χ^2 = 6.667, $p < .05$). However, there was not a significant difference between the responses from two- and four-year champions concerning the ability to garner resources.

Collectively, four-year campus champions reported 47 partnerships at various levels of collaboration. Of the 47 partnerships, 8.5% were rated to be at the level of networking, 4.3% were at the level of cooperation, 8.5% were at the level of coordination, 44.7% were at the level of coalition, and 34% were at the level of collaboration. Two-year campus champions reported 33 partnerships. Of those 33 partnerships, 9.1% were rated at the level of networking, 18.2% were rated at the level of coordination, 48.5% were at the level of coalition, and 24.2% were at the level of collaboration. There were no significant differences between two-and four-year campus champions concerning the level of collaboration of members (χ^2 = 0.471, $p = .471$).

Interview Responses

During interviews, coalition champions elaborated upon ways in which their coalition had excelled, encountered challenges, and required improvement. See Table 10 for interview responses organized within interview themes.

Table 9. Two- and Four-year Comparative Engage Assessment survey responses

Coalition Characteristic	Campus	Present	Present but limited	Absent	Pearson's Chi-squared test	p-value
Champion skillful in writing proposals and obtaining funding/ resources	Two-year	1 (10%)	7 (70%)	2 (20%)	9.849	.007*
	Four-year	6 (75%)	2 (25%)	0 (0%)		
Coalition's activities are incorporated within other agencies or institutions	Two-year	0 (0.0%)	3 (33.3%)	6 (66.7%)	6.667	.036*
	Four-year	3 (50%)	0 (0%)	3 (50%)		
Administrators committed and supportive of coalition	Two-year	9 (81.8%)	2 (18.2%)	0 (0%)	0.130	
	Four-year	6 (75%)	2 (25%)	0 (0%)		
Administrators commit personal and financial resources	Two-year	4 (40%)	2 (20%)	4 (40%)	3.574	
	Four-year	1 (12.5%)	5 (62.5%)	2 (25%)		
Champion has time to devote to coalition	Two-year	5 (50%)	5 (50%)	0 (0%)	2.300	
	Four-year	6 (75%)	1 (12.5%)	0 (0%)		
Champion knowledgeable about basic needs	Two-year	6 (60%)	3 (30%)	1 (10%)	3.662	
	Four-year	7 (75%)	0 (12.5%)	0 (0%)		
Champion adept at garnering resources for the coalition	Two-year	7 (70%)	2 (20%)	1 (10%)	2.550	
	Four-year	7 (100%)	0 (0%)	0 (0%)		
Members share coalition's mission	Two-year	9 (90%)	1 (10%)	0 (0%)	0.152	
	Four-year	5 (83.3%)	1 (16.7%)	0 (0%)		
Members offer variety of resources and skills	Two-year	7 (70%)	3 (30%)	0 (0%)	0.565	
	Four-year	6 (75%)	1 (25%)	0 (0%)		
Members participate and attend meetings	Two-year	4 (57.1%)	3 (42.9%)	0 (0%)	0.124	
	Four-year	4 (66.7%)	2 (33.3%)	0 (0%)		

*Significant value $p < 0.05$

Table 10. Two- and Four-year Comparative Engage Assessment interview responses

Areas in which the coalition excelled		
Campus	**Theme**	*Interview Responses*
Two-Year	Campus champion had experience in offering food aid resources.	*I already have a little bit of clout [with the community] when it comes to [food aid], because I have run [a community non-profit] for so long. I do not foresee funding being a problem [for the food pantry]. We have really generous people.*
		I created and coordinated the [campus food pantry] and have done that for 11 years.
		When I started [in this position], I got an email about people who would be interested in [participating in the coalition]. And since I have knowledge in starting, running, and maintaining a pantry, I [volunteered] to be champion.
	Campus and community were supportive of the coalition.	*We have a really supportive campus community. Our faculty and staff really care about our college and our campus. We're grateful to have that support.*
		I could honestly say that everyone on our coalition goes above and beyond. They have a true passion for students… Our hearts are in the right place in that we will do whatever it takes to help struggling students.
		[When speaking about community partners]: *"People are really excited to just get on board and do what they can to assist the coalition, particularly if they have resources available.*
		[When engaging coalition members]: *The Dean was not so sure I would get the response that I needed when asking for volunteers, however I got 32 people… the individuals that volunteered are passionate about assisting students with hunger issues.*

Campus	Theme	*Interview Responses*
Four-Year	The coalition had diverse representation.	*We tried to be strategic about pulling in people from different areas so that they could bring their own personal expertise.*
		I think we have a great representation of the various areas across campus as well as community partners, that work together.
		There's a diverse group of individuals that participate in the coalition, from academic to Student Affairs to administration to support services throughout the university.
	Resources were readily available to the coalition.	*Pretty much anything we need is there and that is one nice thing about being on a college campus. There are so many credible experts that are available and so many well-versed and well-published discipline experts, too.*
		We have a partnership with financial aid in which we sent a message to all work-study students to inform them that they can enroll in Supplemental Nutrition Assistance Program.
		We are getting food from dining services to redistribute, because it has a longer shelf life than they can keep it in their stores. We have been able to develop that partnership.
		Our library is starting to stay open 24 hours. They agreed to be a pick-up location for pre-packaged food [provided by the food pantry].

Challenges of the coalition		
Campus	**Theme**	*Interview Responses*
Two-year	Limited time and resources to dedicate to the coalition.	*I should assign [the champion role] to someone else. I do not feel like I am able to give it the time that it needs.*
		[My co-champion] asked for participation and has not received any [volunteers]… I know people are spread thin due to COVID-19.
		[Our staff] has tunnel vision… People are dealing with personal things going on in their lives… I have not asked for [volunteers]…I think people are dealing with enough.
		We have had one meeting and have not met this semester yet. I will be honest, part of that is I have been truly overwhelmed with responsibilities this semester.
		I think [our administration] wants [the coalition] to be a good thing. I think they have their hands full right now…
		[The college] has three initiatives going on right now. It has been difficult for me to pull everybody together… This coalition will be the fourth [initiative].
Four-year	The coalition experienced difficulty maintaining consistent membership.	*[One of our champions] took another position out of the state. At this point, we are trying to re-establish ourselves.*
		A few key players of the coalition recently left the university or retired. We are in the process of rebuilding…
	Champions had difficulty creating a collaborative group.	*Initially, there were challenges in getting everyone in a room together…*
		[It is a challenge] to make people feel a part of the coalition. As you build the collaborative piece, [it is a challenge] to make people feel join ownership… It is always a balance of working in this coalition together.
		There is a balance of having different levels of administration, faculty, staff, and students and making them all feel equitable in their voice, success, and influence.

Areas in which the coalition required improvement		
Campus	**Theme**	*Interview Responses*
Two-Year	Champions needed to engage additional members to combat limitations of resources and time to dedicate to the coalition.	*We need someone that has the time to lead the coalition. The coalition members are doing a good job, but they need someone that [reminds them to complete tasks].*
		There is limited time that campus partners can devote to the coalition and limited energy that they can devote to the coalition... I need to engage more community partners to make the coalition sustainable.
		[We need to engage] someone who can advocate for us, push our mission, or find funding for us.
	The coalition needed to increase the number of students that utilized the food aid resources.	*Because students are not on campus [due to COVID-19 mitigation strategies], they are not engaged in the coalition. We have tried different activities. But it is just very difficult to engage students online.*
		The next challenge is getting students to be interactive and make sure they are comfortable enough to tell us what they need...
		We could work on including our students in the coalition and decision-making process on creating ideas that best support students. Having that perspective is critical.
Four-year	The coalition needed to improve its recognition among campus stakeholders.	*One area of improvement is reaching other areas of the university, such as teaching and research. I think we could do a better job of getting the Provost and Vice President of Research more involved.*
		The coalition is new. There is not a lot of recognition. There is not campus recognition, because we are just getting started.
		I am really hoping to help the coalition accomplish greater collaborative work. There are so many divisions doing great work. I think one of the first priorities is helping everyone understand what each other is doing...
	The coalition needed to increase coalition structures.	*We talked about having more structure, such as writing our mission and goals.*
		We do not have a mission statement [in writing]. Just a mission as of now.

Areas in which the coalition excelled. When asked to describe ways in which their coalition excelled, two-year campus champions noted (1) the campus champion had experience in offering food aid resources and (2) the campus and community was supportive of the coalition. Four-year campus champions indicated (1) the coalition had diverse representation and (2) resources were readily available to the coalition. Both two- and four-year campus champions mentioned their coalition excelled at securing the approval and involvement of campus administration. A two-year campus coalition champion reported: *I was in a meeting with our president last week about the pantry, and he is already wanting to expand the pantry to offer clothes.* Multiple four-year campus champions reported administration support and involvement. See Table 11.

Table 11. Administration involvement at Four-year universities

Campus Champions discussed their administration's support and involvement in the campus coalition.
We had a meeting with the Vice President of Student Affairs, and he gave his approval to move forward with the coalition.
We got our coalition approved [by Shared Governance] yesterday.
[Our Vice President of Student Affairs] *is someone who has the capability and influence as far as accessing the university resources and addressing food insecurity among our students. He is very active [in the coalition] and plays a very pivotal role in coming up with strategies to assist our students.*

Challenges with coalition engagement and collaborative efforts. Campus champions described challenges they have encountered while engaging members of their campus and community. Overwhelmingly, two-year campus champions indicated the campus champion,

members, and the administration had limited time and resources to dedicate to the coalition. Four-year campus champions reported (1) the coalition experienced difficulty maintaining consistent membership and (2) champions had difficulty creating a collaborative group.

Areas of coalition improvement. During interviews, champions discussed ways in which they felt their coalition required improvement. Two-year champions reported (1) champions needed to engage additional members, such as community members, to increase allocation of resources and time that were being dedicated to the coalition and (2) the coalition needed to increase the number of students that utilized the food aid resources. Among four-year campus champions, two areas of improvement were discussed (1) the coalition needed to improve its recognition among campus stakeholders and (2) the coalition needed to increase coalition structures, such as putting their mission statement in writing.

Discussion

This study compared and described differences in engagement and collaborative efforts among two- and four-year campus food security coalitions during the ENGAGE step of the *HFHE* approach. The findings demonstrated four-year campus champions rated their skills to write proposals and gather resources significantly higher than two-year campus champions. In addition, two-year campus champions rated the incorporation of coalition activities within other agencies or institutions was absent at a significantly more frequent rate than four-year campus champions. Moreover, four-year campus champions felt their skills and availability of resources was an area in which their campus excelled and felt resources were readily available for the coalition to utilize. In contrast, two-year campus champions noted campus coalition champions, campus members, and administration had limited time and resources to dedicate to the coalition in the interview. Analyses of survey responses suggested there was no difference among other

100

rated coalition characteristics between two- and four-year campus champions. However, thematic coding of interview responses indicated differences in areas in which the coalitions excelled, encountered challenges, and required improvement. Results of this study suggest two-year colleges should seek resources in the community to improve availability of resources and increase awareness of students that use food aid resources. While campus coalitions at four-year universities should focus on building sustainable coalitions by retaining consistent membership, investing in coalition structures, expanding coalition recognition on campus, and creating a collaborative group.

Capability to maintain consistent membership and ability to bring together available resources were important stimulants for coalition formation (Benard, 1989; Mizrahi & Rosenthal, 1992; Schermerhorn, 1975; Whetten, 1981 as cited in Butterfoss, 1993). Supportive elements for coalition formation included experienced leadership, supportive members, diverse member representation, and development of coalition structures (Butterfoss et al., 1993). In addition, member participation is necessary to increase coalition activities, develop awareness of coalition efforts, and improve utilization of community resources (Goodman et al., 1998). Kaslow et al. (2012) reported administration involvement was critical for coalition member participation and buy-in within a campus-based coalition for suicide prevention. Member recruitment and participation as well as the ability to garner resources were essential for community capacity building (Butterfoss et al., 1998; Goodman et al., 1998; Hacker et al., 2012; Simmons et al., 2001). Chaskin (1999) indicated recruitment and participation of members that see themselves as stakeholders is a community capacity building function. The results of this study demonstrated two-year campus coalitions possessed characteristics necessary for coalition formation and community capacity building, such as leadership experience, supportive

membership, and administration involvement. However, two-year campus coalitions experienced challenges due to limited time and resources to dedicate to the coalition. In juxtaposition, four-year campus coalitions excelled in bringing together resources, having diverse representation on the coalition, and administrator involvement. However, four-year campus coalitions experienced challenges with maintaining consistent membership, awareness and reach of coalition awareness, and developing coalition structures. Both samples garnered support of campus administration. This partnership was valuable for capacity building and promoting a sustainable coalition.

Limitations and Strengths of research

First, this study is an evaluation of coalition efforts within a specific process of community capacity building. Therefore, a small, convenience sample was used to answer specific questions about engagement and collaborative efforts of campus-based food security coalitions. Additionally, data collection occurred three years apart as two-year campuses joined ACCBN at a later time. For this reason, the sample of four-year campus champions participated in the study prior to the onset of COVID-19. However, COVID-19 may have influenced ways in which two-year campus champions engaged members and collaborated with their coalitions. Additionally, these studies focused on the perspective of the campus champions. Therefore, perspectives of coalition members are not offered in these findings. Last, this study did not evaluate the impact or outcomes of coalition efforts; this topic should be a focus of future research. However, the use of samples from two types of institutions is a strength of this study. Campus champions offered lived experience and expertise that are pertinent to understanding how food insecurity is addressed on campus. In addition, the mixed methods research approach allowed for researchers to triangulate data provided by campus champions and allowed for enrichment of data analyses. The results of this study can be useful for coalition formation and

community capacity building when the *HFHE* approach is replicated in additional states or systems.

Implications for Practice

The results of this study can inform campus leaders of concerns and challenges of coalition building on a college or university campus. In particular, these findings provide a perspective in which four-year universities have more resources to draw upon compared to two-year colleges. Therefore, two-year colleges should create partnerships outside of campus, including community partners, to improve access to resources and reduce burden for campus coalition partners. In conclusion, this study highlighted differences in coalition formation among two- and four-year campuses and may be valuable for campuses that seek to address student food insecurity utilizing coalitions or CBPR approach.

References

Abbey, E. L., Brown, M., & Karpinski, C. (2022). Prevalence of food insecurity in the general college population and student-athletes: A review of the literature. *Current Nutrition Reports*, *11*(2), 185–205. https://doi.org/10.1007/s13668-022-00394-4

Core indicators of nutritional state for difficult-to-sample populations. (1990). *Journal of Nutrition, 120*(11), 1557-1600. doi: 10.1093/jn/120.suppl_11.1555.

Andreoletti, C. & June, A. (2019) Coalition building to create an age-friendly university (AFU), *Gerontology & Geriatrics Education, 40*(2), 142-152, DOI: 10.1080/02701960.2019.1572008

Benard, B. (1989) Working together: Principles of effective collaboration. *Prevention Forum*, October 4-9.

Bruening, M., Argo, K., Payne-Sturges, D., & Lasta, M. K. (2017). The struggle is real: A

   systematic review of food insecurity on postsecondary education campuses. *Journal of*

   Academy of Nutrition and Dietetics, 117(11), 1767-1791.

   https://doi.org/10.1016/j.jand.2017.05.022

Broton, K., & Goldrick-Rab, S. (2015). *Public testimony on hunger in higher education* National

   Commission on Hunger. Retrieved from:

   https://www.academia.edu/15493080/Public_Testimony_on_Hunger_in_Higher_Educati

   on_Submitted_to_the_National_Commission_on_Hunger

Butterfoss, F. D., Goodman, R. M., & Wandersman, A. (1993). Community coalitions for

   prevention and health promotion. *Health Education Research, 8*(3), 315-330. DOI:

   10.1093/her/8.3.315

Chaskin, R. J. (1999) Defining community capacity: A framework and implications from a

   comprehensive community initiative. Urban Affairs Association Annual Meeting, Fort

   Worth, April 22-25, 1998. https://www.lisc.org/media/filer_public/27/0f/270f0aa3-a66d-

   4f57-ad8c-f733584dca64/08102018_resource_defining_community_capacity.pdf

Coleman-Jensen, A., Nord, M., & Singh, A. (2017). *Household food security in the United States*

   in 2016 (Report No. ERR-237).

   https://www.ers.usda.gov/webdocs/publications/84973/err-237.pdf?v=42979

Cramer, M. E., Atwood, J. R., & Stoner, J. A. (2006). Measuring Community Coalition

   Effectiveness Using the ICE   Instrument. *Public Health Nursing, 23*(1), 74-87.

   https://doi-org.spot.lib.auburn.edu/10.1111/j.0737-1209.2006.230111.x

Davis, H. Sisson, S. B., & Clifton, S. (2020) A call for evidence to support food security

    interventions on college campuses. *Journal of American College Health.*

    https://doi.org/10.1080/07448481.2019.1705829

Frey, B. B., Lohmeier, J. H., Lee, S. W., & Tollefson, N. (2006). Measuring collaboration among

    grant partners. *American Journal of Evaluation, 27*(3), 383-392.

    https://doi.org/10.1177/1098214006290356

Gebhardt, T. L., Kaphingst, K., & DeJong, W. (2000). A campus-community coalition to control

    alcohol-related problems off campus: an environmental management case study. *Journal*

    of American College Health, 48(5), 211–215. https://doi-

    org.spot.lib.auburn.edu/10.1080/07448480009599306

Goldstein S. M. (1997). Community coalitions: A self-assessment tool. *American Journal of*

    Health Promotion, *11*(6), 430–435. https://doi.org/10.4278/0890-1171-11.6.430

Goodman, R., Speers, M., Mcleroy, K., Fawcett, S., Kegler, M., Parker, E., Smith, S., Sterling,

    T., & Wallerstein, N. (1998). Identifying and defining the dimensions of community

    capacity to provide a basis for measurement. *Health Education & Behavior, 25*(3), 258-

    278. http://hdl.handle.net/2027.42/67070

IBM Corporation. (2021). *IBM SPSS Statistics for Windows* (Version 28.0). [Computer software]

    https://www.ibm.com/analytics/spss-statistics-software

Lee, J. G. L., Goldstein, A. O., Kramer, K. D., Steiner, J., Mathew, M., Ezzell, M. M., & Shah,

    V. (2010). Statewide diffusion of 100% tobacco-free college and university

    policies. *Tobacco Control*, *19*(4), 311–317. https://doi-

    org.spot.lib.auburn.edu/10.1136/tc.2009.032888

Linowski, S. A., & DiFulvio, G. T. (2012). Mobilizing for change: A case study of a campus and community coalition to reduce high-risk drinking. *Journal of Community Health*, *37*(3), 685–693. https://doi-org.spot.lib.auburn.edu/10.1007/s10900-011-9500-5

Mizrahi, T. & Rosenthal, B. (1992). Managing dynamic tensions in social change coalitions. In Community Organization and Social Administration: Advances, Trends, and Emerging Principles. Routledge.

Nazmi, A., Martinez, S., Byrd, A., Robinson, D., Bianco, S., & Maguire, J. (2018). A systemic review of food insecurity among US students in higher education. *Journal of Hunger & Environmental Nutrition. 14*(5), 725-740.

https://doi.org/10.1080/19320248.2018.1484316.

Otter.ai. (n.d.). https://otter.ai/ Retrieved July 21, 2022.

Schermerhom, J. (1975). Determinants of interorganizational cooperation. *Academy of Management Journal*, *18*, 846-856

Simmons, A., Reynolds., R. C., and Swinburn, B. (2011). Defining community capacity building: Is it possible? *Preventative Medicine, 52*(3-4), 193-199.

United States Government Accountability Office (GAO). (2018). Food insecurity, better information could help eligible college students access federal food assistance benefits (Report No. GAO-19-95). Retrieved from: https://www.gao.gov/assets/700/696254.pdf

Whetten, D. (1981). Interorganizational relations: A review of the field. *Journal of Higher Education*, *52*, 1-27.

Zoom (n.d.). https://zoom.us/ Retrieved July 21, 2022

VI: GENERAL CONCLUSIONS

It is pertinent that colleges and universities address issues of food access and consistency among their student populations so that student have healthful and successful college experiences. Colleges and universities have worked to initiate strategies to improve food security status in students, however systematic interventions are necessary to produce sustainable and far-reaching outcomes and impacts. This research described characteristics and outcomes of interventions and strategies to reduce college student food insecurity as demonstrated in the literature. Additionally, it described a Community-Based Participatory Research approach (CBPR) to addressing college student food insecurity, known as the *Hunger-Free Higher Ed* approach. As part of the *HFHE* approach, this research assessed and explored engagement and collaborative efforts of Alabama Campus Coalition for Basic Needs (ACCBN) in the first step of the *HFHE* approach. Last, this research compared and described differences in engagement and collaborative efforts between hunger-free campus coalitions at two-year colleges and four-year universities.

A systematic review of interventions and strategies to address college student food insecurity demonstrated key findings for colleges and universities. First, interventions and strategies with multiple components, such as nutrition education and food vouchers, demonstrated success in improving nutrient intake and enrolling students in CalFresh, California's Supplemental Nutrition Assistance Program (SNAP). In addition, the studies included in the review described strategies for reducing food waste and stigma of seeking food aid. Last, the findings outline the importance of enrolling students in public assistance programs and interventions that offer nutrition education and recipe sharing. These types of strategies and interventions provide long-term benefits and support, including on weekends and holidays when

campus food aid may not be accessible. The implications of this research offer details on potential best practices for food aid interventions and strategies to increase food access, decrease food waste, and improve nutrient intake among college students with food insecurity.

As demonstrated by this research, food aid interventions and strategies have helpful outcomes with long-term benefits. However, there is a need for strategies that impact a broader student population and systematically address college student food insecurity. *Hunger-Free Higher Ed (HFHE)* developed a six-step approach to improve college student food security utilizing principles of Community-Based Participatory Research (CBPR) adapted from the Substance Abuse and Mental Health Services Administration (SAMHSA) Strategic Prevention Framework (SPF), a comprehensive process used by substance abuse and misuse prevention planners to facilitate the understanding of the complex interaction between behavioral concerns and environmental contexts (SAMHSA, 2019). The six steps include (1) ENGAGE, (2) ASSESS, (3) PLAN, (4) IMPLEMENT, (5) EVALUATE, and (6) CELEBRATE. *HFHE* collaborates with campuses by offering technical assistance in food security innovations, strategic planning, assessment, and evaluation; supporting food aid infrastructure; and promoting implementation of evidence-based initiatives. At this time, *HFHE* implemented the approach at 29 Alabama colleges and universities. *HFHE* has developed *HFHE* Pathways, an electronic platform that allows colleges and universities to utilize *HFHE* approach in collaboration with *HFHE*. This process will allow HFHE to implement its approach on a national scale, thereby systematically improving college food security.

In 2021, two-year colleges in Alabama initiated the *HFHE* approach by joining the Alabama Campus Coalition for Basic Needs (ACCBN), a state network of campus coalitions with a mission of reducing college student food insecurity in Alabama. ENGAGE step of *HFHE*

approach was initiated in fall of 2021 and spring of 2022 at 19, two-year colleges. During this

step, campus coalition leaders (also known as campus champions) engaged members of their

campus and community to form a coalition that unites resources that improve student food

security. This research assessed and explored these engagement and collaborative efforts through

an explanatory, sequential mixed methods research study. Campus champions completed a

survey and semi-structured interview. Two inductive themes emerged from the results of the

survey and interview: (1) champions noted feelings of being spread thin due to understaffing of

employees and the impact of COVID-19; (2) champions demonstrated intentionality in how they

planned to engage members and develop a sustainable coalition. These results described

concerns with building community capacity due to challenges with engagement of coalition

members. It also described ways in which campus champions were intentional about recruiting

members and creating a sustainable coalition. The results of this research have implications for

best practices and recommendations for the *HFHE* approach. In addition, these findings provide

useful information for colleges seeking to utilize coalitions or community-based participatory

research approaches to address college student food insecurity.

Last, this research compared and described differences in engagement and collaborative

efforts among two-year colleges and four-year universities during the ENGAGE step of the

HFHE approach. Campus champions at four-year universities and two-year colleges participated

in the ENGAGE assessment in 2019 and 2022, respectively. Responses from a survey and semi-

structured interview were compared between the two samples to understand how the processes

differ. In this study, four-year campus champions rated their skills to write proposals and gather

resources significantly higher than two-year campus champions ($\chi^2 = 9.849$, $p < .05$). Campus

champions from two-year colleges rated the incorporation of coalition activities within other

agencies or institutions was absent at a significantly more frequent rate than four-year campus champions ($\chi^2 = 6.667$, $p < .05$). Moreover, interview responses concerning how their coalitions excelled, encountered challenges, and required improvement differed among the two samples. Results of this study suggest two-year colleges should seek resources in the community to improve availability of resources and increase awareness of students that use food aid resources. While campus coalitions at four-year universities should focus on building sustainable coalitions by retaining consistent membership, investing in coalition structures, expanding coalition recognition on campus, and creating a collaborative group.

Recommendations for future research

      Closing the gap on interventions and strategies that address college student food insecurity is pertinent and urgent to combat college student food insecurity and its impacts. As discussed in this research, systematic strategies, such as the *HFHE* approach, have the potential to improve food access by uniting resources, initiating collaboration between campus leaders and food security experts, and building an infrastructure for food aid. Future research should evaluate the efficacy and impact of *HFHE* approach as the first cohort matriculates through the steps of the approach. This information will allow experts to establish best practices for addressing food insecurity. Moreover, additional research should address the efficacy of utilizing coalitions and CBPR in combating college student food insecurity.

References

Abbey, E. L., Brown, M., & Karpinski, C. (2022). Prevalence of food insecurity in the general

    college population and student-athletes: A review of the literature. *Current Nutrition*

    Reports, *11*(2), 185–205. https://doi.org/10.1007/s13668-022-00394-4

Alabama Campus Coalition for Basic Needs. (n.d.). End Child Hunger. Retrieved January 21,

    2021 from http://wp.auburn.edu/endchildhungeral/alabama-campus-coalition-for-basic-

    needs/#:~:text=Mission,and%20open%20doors%20to%20opportunity.

Allen, C.C., & Alleman, N. F. (2019). A Private struggle at a private institution: Effects of

    student hunger on social and academic experiences. *Journal of College Student*

    Development, 60(1), 52-69. doi:10.1353/csd.2019.0003.

Ames, A. J., & Barnett, T. M. (2019). Psychometric Validation of the 10-Item USDA Food

    Security Scale for Use with College Students. *Journal of applied measurement*, *20*(3),

    228–242.

Barry, M. R., Sonneville, K. R., & Leung, C. W. (2021). Students with food insecurity are more

    likely to screen positive for an eating disorder at a large, public university in the

    midwest. *Journal of the Academy of Nutrition and Dietetics*, *121*(6), 1115–1124.

    https://doi.org/10.1016/j.jand.2021.01.025

Becerra, M. B., & Becerra, B. J. (2020). Psychological distress among college students: Role of

    food insecurity and other social determinants of mental health. *International Journal of*

    Environmental Research and Public Health, *17*(11), 4118.

    https://doi.org/10.3390/ijerph17114118

Bhattacharya, J., Currie, J., & Haider, S. (2004). Poverty, food insecurity, and nutritional

    outcomes in children and adults. J*ournal of Health Economics, 23,* 839-862. DOI:

    10.1016/j.jhealeco.2003.12.008

Bickel, G., Nord, M., Price, C., Hamilton, W., & Cook, J. (2000). *Guide to measuring household*

    food security. Measuring Food Security in the United States. https://fns-

    prod.azureedge.us/sites/default/files/FSGuide.pdf

Broton, K. M., & Cady, C. L. (2020). Food insecurity on campus: Action and intervention. *Johns*

    Hopkins University Press. Baltimore, MD.

Broton, K., Frank, V., & Goldrick-Rab, S. (2014). Safety, security, and college attainment: An

    investigation of undergraduates' basic needs and institutional response. Madison, WI:

    Wisconsin HOPE Lab.

Broton K & Goldrick-Rab S. (2015). Public Testimony on Hunger in Higher Education

    Submitted to the National Commission on Hunger. Madison, WI: Wisconsin Hope Lab.

Bruening, M., Argo, K., Payne-Sturges, D., & Lasta, M. K. (2017). The struggle is real: A

    systematic review of food insecurity on postsecondary education campuses. *Journal of*

    Academy of Nutrition and Dietetics. 117(11): 1767-1791.

    https://doi.org/10.1016/j.jand.2017.05.022

Bruening, M., Brennhofer, S., van Woerden, I., Todd, M., & Laska, M. (2016). Factors related to

    the high rates of food insecurity among diverse, urban college freshmen. *Journal of the*

    Academy of Nutrition and Dietetics, *116*(9), 1450–1457.

    https://doi.org/10.1016/j.jand.2016.04.004

Bruening, M., van Woerden, I., Todd, M., & Laska, M. N. (2018). Hungry to learn: the

    prevalence and effects of food insecurity on health behaviors and outcomes over time

among a diverse sample of university freshmen. *The International Journal of Behavioral Nutrition and Physical Activity*, *15*(1), 9. https://doi.org/10.1186/s12966-018-0647-7

Butterfoss, F. D., Goodman, R. M., & Wandersman, A. (1993). Community coalitions for prevention and health promotion. *Health Education Research*, *8*(3), 315–330. https://doi.org/10.1093/her/8.3.315

Chaparro, M. P., Zaghloul, S. S., Holck, P., & Dobbs, J. (2009). Food insecurity prevalence among college students at the University of Hawai'i at Manoa. *Public Health Nutrition, 12*(11), 2097–2103.

Chaskin, R. J. (1999) Defining community capacity: A framework and implications from a comprehensive community initiative. Urban Affairs Association Annual Meeting, Fort Worth, April 22-25, 1998. https://www.lisc.org/media/filer_public/27/0f/270f0aa3-a66d-4f57-ad8c-f733584dca64/08102018_resource_defining_community_capacity.pdf

Christensen, K. A., Forbush, K. T., Richson, B. N., Thomeczek, M. L., Perko, V. L., Bjorlie, K., Christian, K., Ayres, J., Wildes, J. E., & Mildrum Chana, S. (2021). Food insecurity associated with elevated eating disorder symptoms, impairment, and eating disorder diagnoses in an American University student sample before and during the beginning of the COVID-19 pandemic. *The International journal of eating disorders*, *54*(7), 1213–1223. https://doi.org/10.1002/eat.23517

Cockerham, M., Camel, S., James, L., & Neill, D. (2021). Food insecurity in baccalaureate nursing students: A cross-sectional survey. *Journal of Professional Nursing: Official Journal of the American Association of Colleges of Nursing*, *37*(2), 249–254. https://doi.org/10.1016/j.profnurs.2020.12.015

Coleman-Jensen, A., Nord, M., & Singh, A. (2017). *Household food security in the United States in 2016* (Report No. ERR-237). https://www.ers.usda.gov/webdocs/publications/84973/err-237.pdf?v=42979

Core indicators of nutritional state for difficult-to-sample populations. (1990) *Journal of Nutrition, 120*(11), 1557-1600. doi: 10.1093/jn/120.suppl_11.1555.

Craig, G. (2007). Community capacity-building: Something old, something new . . .? *Critical Social Policy*, *27*(3), 335–359. https://doi.org/10.1177/0261018307078846

Creswell, J. W., & Plano Clark, V. L. (2015). *Designing and conducting mixed methods research* (3rd ed.). SAGE.

Cuy Castellanos, D., & Holcomb, J. (2020). Food insecurity, financial priority, and nutrition literacy of university students at a mid-size private university. *Journal of American College Health*, *68*(1), 16–20. https://doi.org/10.1080/07448481.2018.1515762

Dailey, A. B., Hess, A., Horton, C., Constantian, E., Monani, S., Wargo, B., Davidson, K., & Gaskin, K. (2015). Healthy options: a community-based program to address food insecurity. *Journal of prevention & intervention in the community*, *43*(2), 83–94. https://doi.org/10.1080/10852352.2015.973248

Darling, K. E., Fahrenkamp, A. J., Wilson, S. M., D'Auria, A. L., & Sato, A. F. (2017). Physical and mental health outcomes associated with prior food insecurity among young adults. *Journal of health psychology*, *22*(5), 572–581. https://doi.org/10.1177/1359105315609087

Davis, H. Sisson, S. B., & Clifton, S. (2020) A call for evidence to support food security interventions on college campuses. *Journal of American College Health.* https://doi.org/10.1080/07448481.2019.1705829

Davitt, E. D., Heer, M. M., Winham, D. M., Knoblauch, S. T., & Shelley, M. C. (2021). Effects

    of COVID-19 on University Student Food Security. *Nutrients*, *13*(6), 1932.

    https://doi.org/10.3390/nu13061932

Derose, K. P., Fulcar, M. A., Acevedo, R., Armenta, G., Jiménez-Paulino, G., Bernard, C. L.,

    Del Rosario, L. E. P., & Then-Paulino, A. (2021). An integrated urban gardens and peer

    nutritional counseling intervention to address food insecurity among people with HIV in

    the Dominican Republic. *AIDS Education and Prevention: Official Publication of the*

    International Society for AIDS Education, *33*(3), 187–201. https://doi-

    org.spot.lib.auburn.edu/10.1521/aeap.2021.33.3.187

Dixon, L. B., Winkleby, M.A., & Radimer, K. L. (2001). Dietary Intakes and Serum Nutrients

    Differ between Adults from Food-Insufficient and Food-Sufficient Families: Third

    National Health and Nutrition Examination Survey, 1988–1994. *Journal of Nutrition,*

    *131(*4), 232–1246. DOI: 10.1093/jn/131.4.1232

Drewnowski, A. & Darmon, N. (2005) The economics of obesity: Dietary energy density and

    energy cost. *American Journal of Clinical Nutrition, 82,* 265S-273S. DOI:

    10.1093/ajcn/82.1.265S

Dubrick, J., Mathews, B., & Clare, C. (2016) Hunger on campus: The challenge of food

    insecurity for college students. *Students Against Hunger.*

    https://studentsagainsthunger.org/wp-content/uploads/2016/10/Hunger_On_Campus.pdf

Farahbakhsh, J., Hanbazaza, M., Ball, G. D. C., Farmer, A. P., Maximova, K., & Willows, N. D.

    (2017) Food insecure student clients of a university-based food bank have compromised

    health, dietary intake and academic quality. *Journal of Dietitians Association of*

    Australia, 74(1), 67-73

El Zein, A., Colby, S. E., Zhou, W., Shelnutt, K. P., Greene, G. W., Horacek, T. M., Olfert, M. D., & Mathews, A. E. (2020). Food Insecurity Is Associated with Increased Risk of Obesity in US College Students. *Current developments in nutrition*, *4*(8), nzaa120. https://doi.org/10.1093/cdn/nzaa120

El Zein, A., Mathews, A. E., House, L., & Shelnutt, K. P. (2018). Why Are Hungry College Students Not Seeking Help? Predictors of and Barriers to Using an On-Campus Food Pantry. *Nutrients*, *10*(9), 1163. https://doi.org/10.3390/nu10091163

El Zein, A., Shelnutt, K. P., Colby, S., Vilaro, M. J., Zhou, W., Greene, G., Olfert, M. D., Riggsbee, K., Morrell, S. & Mathews, A. E. (2019). Prevalence and correlates of food insecurity among US college students: A multi-institutional study. *BMC public health*, *19*(1), 1-12.

Gaines, A., Robb, C. A., Knol, L. L., & Sickler, S. (2014). Examining the role of financial factors, resources and skills in predicting food security status among college students. *International Journal of Consumer Studies, 38*(4), pps 374-384.

Gallegos, D., Ramsey, R., & Ong, K.W. (2014). Food insecurity: Is it an issue among tertiary students? *Higher Education, 67*(5), 497–510. https://doi.org/10.1007/s10734-013-9656-2

Goldrick-Rab, S., Baker-Smith, C., Coca, V., Looker, E., & Williams, T. (2019). *College and university basic needs insecurity: A national #RealCollege survey report.* https://hope4college.com/wpcontent/uploads/2019/04/HOPE_realcollege_National_report_digital.pdf

Goldrick-Rab, S., Richardson, J., & Hernandex, A. (2017). Hungry and homeless in college: results from a national student of basic needs insecurity in higher education. *Higher Education Policy for Minorities in the United States*, 1268, 1-32.

Green, L. W. (1995). Study of participatory research in health promotion: Review and

    recommendations for the development of participatory research in health promotion in

    Canada. Royal Society of Canada.

Gundersen, C. & Ziliak, J. P. (2015) Food insecurity and health outcomes. Health Affairs,

    34(11), pp. 1830-1839.

Hacker, K., Tendulkar, S. A., Rideout, C., Bhuiya, N., Trinh-Shevrin, C., Savage, C. P., Grullon,

    M., Strelnick, H., Leung, C., & DiGirolamo, A. (2012). Community capacity building

    and sustainability: outcomes of community-based participatory research. *Progress in*

    Community Health Partnerships: Research, Education, and Action, *6*(3), 349–360.

    https://doi.org/10.1353/cpr.2012.0048

Hagedorn, R. L., Olfert, M. D., MacNell, L., Houghtaling, B., Hood, L. B., Savoie Roskos, M.

    R., Goetz, J. R., Kern-Lyons, V., Knol, L. L., Mann, G. R., Esquivel, M. K., Hege, A.,

    Walsh, J., Pearson, K., Berner, M., Soldavini, J., Anderson-Steeves, E. T., Spence, M.,

    Paul, C., Waity, J. F., … Fontenot, M. C. (2021). College student sleep quality and

    mental and physical health are associated with food insecurity in a multi-campus

    study. *Public health nutrition*, *24*(13), 4305–4312.

    https://doi.org/10.1017/S1368980021001191

Holben, D. (2010) Position of the American Dietetic Association: Food insecurity in the United

    States. *Journal of American Dietetic Association, 110*(9), 1368-1377. DOI:

    10.1016/j.jada.2010.07.015

Hughes, R., Serbebryanikova, I., Donaldson, K., & Leveritt, M. (2011). Student food insecurity

    the skeleton in the university closet. *Journal of Dietitians Association of Australia, 68*(1),

    pp. 27-32.

Israel, B. A., Schulz, A. J., Parker, E. A., & Becker, A. B. (1998). Review of community-based research: assessing partnership approaches to improve public health. *Annual Review of Public Health*, *19*, 173–202. https://doi.org/10.1146/annurev.publhealth.19.1.173

Jarrott, S. E., Cao, Q., Dabelko-Schoeny, H. I., & Kaiser, M. L. (2021). Developing intergenerational interventions to address food insecurity among pre-school children: A community-based participatory approach. *Journal of Hunger & Environmental Nutrition*, *16*(2), 196–212. https://doi-org.spot.lib.auburn.edu/10.1080/19320248.2019.1640827

Jernigan, V. B., Salvatore, A. L., Styne, D. M., & Winkleby, M. (2012). Addressing food insecurity in a Native American reservation using community-based participatory research. *Health Education Research*, *27*(4), 645–655. https://doi.org/10.1093/her/cyr089

Knol, L. L., Robb, C. A., & Wood, M. Food insecurity, self-related health, and obesity among college students. (2017). *American Journal of Health Education, 48*(4), p. 248-255.

Keogh, B., Kushalnagar, P., & Engelman, A. (2020). Peer support and food security in deaf college students. *Journal of American College Health, 68*(1), 1–5. https://doi.org/10.1080/07448481.2018.1515750

Kushel, M. B., Gupta, R., Gee, L., & Haas, J. S. (2006). Housing instability and food insecurity as barriers to health care among low-income Americans. *Journal of General Internal Medicine, 21*(1), 71–77. https://doi.org/10.1111/j.1525-1497.2005.00278.x

Laska, M. N., Lenk, K., Lust, K., McGuire, C. M., Porta, C. M., & Stebleton, M. (2020). Sociodemographic and health disparities among students screening positive for food insecurity: Findings from a large college health surveillance system. *Preventive medicine reports*, *21*, 101297. https://doi.org/10.1016/j.pmedr.2020.101297

Leung, C. W., Farooqui, S., Wolfson, J. A., & Cohen, A. J. (2021). Understanding the cumulative burden of basic needs insecurities: Associations with health and academic achievement among college students. *American Journal of Health Promotion*, *35*(2), 275–278. https://doi.org/10.1177/0890117120946210

Leung, C. W., Wolfson, J. A., Lahne, J., Barry, M. R., Kasper, N., & Cohen, A. J. (2019). Associations between food security status and diet-related outcomes among students at a large, public midwestern university. *Journal of the Academy of Nutrition and Dietetics*, *119*(10), 1623–1631. https://doi.org/10.1016/j.jand.2019.06.251

Maroto, M. E., Snelling, A., & Linck, H. (2014). Food insecurity among community college students: Prevalence and association with grade point average. *Community College Journal of Research and Practice, 39*(6). https://doi.org/10.1080/10668926.2013.850758

Martinez, S., Brown, E., & Ritchie, L. (2016). What factors increase risk for food insecurity among college students? *Journal of Nutrition Education and Behavior*, *48*(7), S4.

Martinez, S. M., Grandner, M. A., Nazmi, A., Canedo, E. R., & Ritchie, L. D. (2019). Pathways from food insecurity to health outcomes among california university students. *Nutrients*, *11*(6), 1419. https://doi.org/10.3390/nu11061419

Martinez, S. M., Frongillo, E. A., Leung, C., & Ritchie, L. (2018). No food for thought: Food insecurity is related to poor mental health and lower academic performance among students in California's public university system. *Journal of Health Psychology, 00*(0), 1-10.

McArthur, L. H., Ball, L., Danek, A. C., & Holbert, D. (2018a). A high prevalence of food insecurity among university students in Appalachia reflects a need for educational

interventions and policy advocacy. *Journal of Nutrition Education and Behavior*, *50*(6), 564–572. https://doi.org/10.1016/j.jneb.2017.10.011

McArthur, L. H., Fasczewski, K. S., Wartinger, E., & Miller, J. (2018b). Freshmen at a university in Apalachia experience a higher rate of campus than family food insecurity. *Journal of Community Health*, *43*(5), 969–976. https://doi.org/10.1007/s10900-018-0513-1

Mei, J., Fulay, A. P., Wolfson, J. A., & Leung, C. W. (2021). Food insecurity and dietary intake among college students with unlimited meal plans at a large, midwestern university. *Journal of the Academy of Nutrition and Dietetics*, *121*(11), 2267–2274. https://doi.org/10.1016/j.jand.2021.04.009

Mello, J. A., Gans, K. M., Risica, P. M., Kirtania, U., Strolla, L. O., & Fournier, L. (2010). How is food insecurity associated with dietary behaviors? An analysis with low income, ethnically diverse participants in a nutrition intervention study. *Journal of American Dietetics Association, 110*(12), 1906-1911. doi: 10.1016/j.jada.2010.09.011

Mialki, K., House, L. A., Mathews, A. E., & Shelnutt, K. P. (2021). Covid-19 and college students: food security status before and after the onset of a pandemic. *Nutrients*, *13*(2), 628. https://doi.org/10.3390/nu13020628

Mirabitur, E., Peterson, K. E., Rathz, C., Matlen, S., & Kasper, N. (2016). Predictors of college-student food security and fruit and vegetable intake differ by housing type. *Journal of American College Health*, *64*(7), 555–564. https://doi.org/10.1080/07448481.2016.1192543

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009) Preferred reporting items for

    systematic reviews and meta-analyses: the PRISMA statement. *BMJ*, *339*, b2535

    doi:10.1136/bmj.b2535

Mukigi, D., Thornton, K., Binion, A., Brown, K., Church, M., Cook, M., Henry, D., Hopkinson,

    J., Musucci, C., Pruett, J., Rogers, M., Singleton, O., Vichi-Miller, V., Wofford, R.,

    Brown, O. Food insecurity among college students: An exploratory study. (2018).

    Journal Nutrition Health Sciences, *5*(1). DOI:10.15744/2393-9060.5.106

National Center for Education Statistics. (2021). Price of attending an undergraduate

    institution. *Condition of Education.* U.S. Department of Education, Institute of Education

    Sciences. https://nces.ed.gov/programs/coe/indicator/cua.

Nazmi, A., Martinez, S., Byrd, A., Robinson, D., Bianco, S., & Maguire, J. (2018). A systemic

    review of food insecurity among US students in higher education. *Journal of Hunger &*

    Environmental Nutrition. 14(5): 725-740.

    https://doi.org/10.1080/19320248.2018.1484316.

Nikolaus, C. J., An, R., Ellison, B., &Nickols-Richardson, S. M. (2020) Food Insecurity among

    College Students in the United States: A Scoping Review. *Advances in Nutrition*, *11*(2),

    327–348. https://doi.org/10.1093/advances/nmz111

Nikolaus, C. J., Ellis, B., & Nicklos-Richardson, S. M. (2019a). College students' interpretations

    of food security questions: results from cognitive interviews. *BMC Public Health*,

    19(1282).

Nikolaus CJ, Ellison B, Nickols-Richardson SM. (2019b). Are estimates of food insecurity

    among college students accurate? Comparison of assessment protocols. PLoS One, 14(4),

    e0215161.

Owens, M. R., Brito-Silva, F., Kirkland, T., Moore, C. E., Davis, K. E., Patterson, M. A., Miketinas, D. C., & Tucker, W. J. (2020). Prevalence and social determinants of food insecurity among college students during the COVID-19 pandemic. *Nutrients. 12(*9), 2515. https://doi.org/10.3390/nu12092515

Palakshappa, D., Tam, M., Montez, K., Dezern, K., Moore, K., Best, S., & Skelton, J. A. (2021). Engaging food insecure families on the weekend to improve nutrition and health. *Progress in Community Health Partnerships: Research, Education, and Action*, *15*(4), e11–e12. https://doi.org/10.1353/cpr.2021.0051

Pan, L., Sherry, B., Njai, R., & Blanck, H.M (2012). Food insecurity is associated with obesity among US adults in 12 states. *Journal of the Academy of Nutrition and Dietetics, 112*(9), 1403–1409. doi:10.1016/j.jand.2012.06.011.

Paschal, A. M., Mitchell, J. B., Burton, W. M., Nickelson, J., & Murphy P. Z., & Ford, F. (2020) Using community-based participatory research to explore food insecurity in African American adults. *American Journal of Health Education*, *51*(3), 186-195, DOI: 10.1080/19325037.2020.1744491

Patton-López, M. M., López-Cevallos, D. F., Cancel-Tirado, D. I., & Vazquez, L. (2014). Prevalence and correlates of food insecurity among students attending a midsize rural university in Oregon. *Journal of Nutrition Education and Behavior*, *46*(3), 209–214. https://doi.org/10.1016/j.jneb.2013.10.007

Payne-Sturges, D. C., Tjaden, A., Caldeira, K. M., Vincent, K. B., & Arria, A. M. (2018). Student hunger on campus: Food insecurity among college students and implications for academic institutions. *American Journal of Health Promotion, 32*(2), 349–354. https://doi.org/10.1177/0890117117719620

Phillips, E., McDaniel, A., & Croft, A. (2018) Food insecurity and academic disruption among

    college students. *Journal of Student Affairs Research and Practice*, *55*(4), 353-

    372, DOI: 10.1080/19496591.2018.1470003

Pujol, J., Vendrell, P., Junque, C., Marti-Vilalta, J., &Capdevila, A. (1993). When does human

    brain development end? Evidence of corpus callosum growth up to adulthood. *Annals of*

    Neurology, 34(1), 71-75. https://doi.org/10.1002/ana.410340113

Radwin, D., Conzelmann, J.G., Nunnery, A., Lacy, T.A., Wu, J., Lew, S., Wine, J., & Siegel, P.

    (2018). 2015–16 National Postsecondary Student Aid Study (NPSAS:16): Student

    Financial Aid Estimates for 2015–16 (Report No. NCES 2018-466). Retrieved from:

    http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2018466.

Raskind, I. G., Haardörfer, R., & Berg, C. J. (2019). Food insecurity, psychosocial health and

    academic performance among college and university students in Georgia, USA. *Public*

    Health Nutrition, *22*(3), 476–485. https://doi.org/10.1017/S1368980018003439

Reeder, N., Tapanee, P., Persell, A., & Tolar-Peterson, T. (2020). Food Insecurity, Depression,

    and Race: Correlations Observed Among College Students at a University in the

    Southeastern United States. *International journal of environmental research and public*

    health, *17*(21), 8268. https://doi.org/10.3390/ijerph17218268

Sackey, J. D., Pike, K., Rothpletz-Puglia, P., Brody, R., & Touger-Decker, R. (2021). Food

    insecurity among health sciences graduate students at a large northeastern

    university. *Journal of Nutrition Education and Behavior*, *53*(5), 428–433.

    https://doi.org/10.1016/j.jneb.2020.11.003

Seligman, H. K, Laraia, B. A, & Kushel, M. B. (2010). Food insecurity is associated with chronic disease among low-income NHANES participants. *Journal of Nutrition, 140*(2), 304–310. https://dx.doi.org/10.3945%2Fjn.109.112573

Shi, Y., Davies, A., & Allman-Farinelli, M. (2021). The association between food insecurity and dietary outcomes in university students: A systematic review. *Journal of the Academy of Nutrition and Dietetics*, *121*(12), 2475–2500.e1. https://doi.org/10.1016/j.jand.2021.07.015

Simmons, A., Reynolds., R. C., and Swinburn, B. (2011, April). Defining community capacity building: is it possible? *Preventative Medicine, 52*(3-4), 193-199.

Silva, M. R., Kleinert, W. L., Sheppard, A. V., Cantrell, K. A., Freeman-Coppadge, D. J., Tsoy, E., Roberts, T., & Pearrow, M. (2017). The relationship between food security, housing stability, and school performance among college students in an urban university. *Journal of College Student Retention: Research, Theory & Practice*, *19*(3), 284–299. https://doi.org/10.1177/1521025115621918

Skomsvold, P., Radford, A. W., & Berkner, L. (2011). Web tables: Six-year attainment, persistence, transfer, retention, and withdrawal rates of students who began postsecondary education in 2003-04 (Report No. ED-02-CO-0011). Retrieved from: https://nces.ed.gov/pubs2011/2011152.pdf

Smith, E. A., Story, C. R., Hobbs, K. C., Bos, T., & Thareja, G. (2020). Food insecurity, carotenoid values and coping strategies of students on a mid-sized college campus. *American Journal of Health Studies*, *35*(3). https://doi.org/10.47779/ajhs.2020.240

Smith, B. J., Tang, K. C., & Nutbeam, D. (2006). WHO health promotion glossary: New

    terms. *Health promotion international*, *21*(4), 340-345.

Soldavini, J., & Berner, M. (2020). The importance of precision: differences in characteristics

    associated with levels of food security among college students. *Public health*

    nutrition, *23*(9), 1473–1483. https://doi.org/10.1017/S1368980019004026

Trawver, L. R. & Hedwig, T. (2019). Food and housing insecurity and homelessness among

    students in an open-enrollment university. *Journal of Social Distress and Homelessness,*

    29(1), 57-64.

United States Department of Agriculture. (2020, September). *Survey Tools.*

    https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/survey-

    tools/

United States Government Accountability Office. (2018). *Food insecurity, better information*

    could help eligible college students access federal food assistance. Report to

    congressional requesters. https://www.gao.gov/assets/700/696254.pdf

Wattick, R. A., Hagedorn, R. L., & Olfert, M. D. (2018). Relationship between diet and mental

    health in a young adult appalachian college population. *Nutrients*, *10*(8), 957.

    https://doi.org/10.3390/nu10080957

Weaver, R. R., Vaughn, N. A., Hendricks, S. P., McPherson-Myers, P. E., Jia, Q., Willis, S. L.,

    & Rescigno, K. P. (2020). University student food insecurity and academic

    performance. *Journal of American College Health, 68*(7), 727–733.

    https://doi.org/10.1080/07448481.2019.1600522

Willis D. E. (2021). Feeding inequality: food insecurity, social status and college student

   health. *Sociology of Health & Illness*, *43*(1), 220–237. https://doi.org/10.1111/1467-

   9566.13212

Appendix I: ACCBN Campus Champion Survey

Q15 Signed Information Letter will go here.

Q12 What is the name of your institution?

_____

Q13 Please answer the following questions about coalition effectiveness and engagement to the best of your ability and knowledge based on Campus Basic Needs Coalition engagement efforts that are currently happening at your institution.

Q2
2. At what level would you rate the following characteristics for ADMINISTRATORS at your university?

	Absent (129)	Present but limited (130)	Present (131)	Not applicable (132)
A. Our university's administrators are committed to and supportive of the campus basic needs coalition. (1)	○	○	○	○
B. Our university's administrators commit personnel and financial resources to the campus basic needs coalition. (2)	○	○	○	○
C. Our university's administrators are knowledgeable about coalitions. (3)	○	○	○	○
D. Our university's administrators are experienced in collaboration. (4)	○	○	○	○
E. Our university's administrator replaces a campus basic needs coalition representative if a vacancy occurs. (5)	○	○	○	○

Page Break

	Q3 3. At what level would you rate the following characteristics for the FACILITATOR/CHAIR of your campus basic needs coalition?			
	Absent (1)	Present but limited (2)	Present (3)	Not applicable (4)
A. Our coalition's facilitator is knowledgeable about the coalition-building process. (1)	○	○	○	○
B. Our coalition's facilitator is skillful in writing proposals and obtaining funding/resources. (2)	○	○	○	○
C. Our coalition's facilitator trains coalition members as appropriate. (3)	○	○	○	○
D. Our coalition's facilitator is competent in needs assessment and research. (4)	○	○	○	○
E. Our coalition's facilitator encourages collaboration and negotiation. (5)	○	○	○	○
F. Our coalition's facilitator communicates effectively with members. (6)	○	○	○	○
G. Our coalition's facilitator is committed to the coalition's mission. (7)	○	○	○	○

H. Our coalition's facilitator provides leadership and guidance in maintaining the coalition. (8)	○	○	○	○
I. Our coalition's facilitator has appropriate time to devote to the coalition. (9)	○	○	○	○
J. Our coalition's facilitator plans effectively and efficiently. (10)	○	○	○	○
K. Our coalition's facilitator is knowledgeable about the basic needs content area. (11)	○	○	○	○
L. Our coalition's facilitator is flexible in accepting different viewpoints. (12)	○	○	○	○
M. Our coalition's facilitator demonstrates a sense of humor. (13)	○	○	○	○
N. Our coalition's facilitator promotes equity and collaboration among members. (14)	○	○	○	○
O. Our coalition's facilitator is adept in organizational and communication skills. (15)	○	○	○	○

P. Our coalition's facilitator works within influential political and community networks. (16)	○	○	○	○
Q. Our coalition's facilitator is competent in negotiating, solving problems, and resolving conflicts. (17)	○	○	○	○
R. Our coalition's facilitator is attentive to individual member concerns. (18)	○	○	○	○
S. Our coalition's facilitator is effective in managing meetings. (19)	○	○	○	○
T. Our coalition's facilitator is adept in garnering resources. (20)	○	○	○	○
U. Our coalition's facilitator values members' input. (21)	○	○	○	○
V. Our coalition's facilitator recognizes members for their contributions. (22)	○	○	○	○

	Q4 4. At what level would you rate the following characteristics for MEMBERS of your campus basic needs coalition?			
	Absent (1)	Present but limited (2)	Present (3)	Not applicable (4)
A. Coalition members share the coalition's mission. (1)	○	○	○	○
B. Coalition members offer variety of resources and skills. (2)	○	○	○	○
C. Coalition members clearly understand their roles. (3)	○	○	○	○
D. Coalition members actively plan, implement and evaluate activities. (4)	○	○	○	○
E. Coalition members assume lead responsibility for tasks. (5)	○	○	○	○
F. Coalition members share workload. (6)	○	○	○	○
G. Coalition members regularly participate in meetings and activities. (7)	○	○	○	○
H. Coalition members communicate well with each other. (8)	○	○	○	○

I. Coalition members feel a sense of accomplishment. (9)	○	○	○	○
J. Coalition members seek out training opportunities. (10)	○	○	○	○

Q5 5. At what level would you rate the following characteristics for your campus basic needs coalition STRUCTURE?

	Absent (1)	Present but limited (3)	Present (4)	Not applicable (5)
A. Our coalition has bylaws/rules of operation. (1)	○	○	○	○
B. Our coalition has a mission statement in writing. (2)	○	○	○	○
C. Our coalition has goals and objectives in writing. (3)	○	○	○	○
D. Our coalition provides for regular, structured meetings. (4)	○	○	○	○
E. Our coalition establishes effective communication mechanisms. (5)	○	○	○	○
F. Our coalition has an organizational chart. (6)	○	○	○	○
G. Our coalition has written job descriptions. (7)	○	○	○	○
H. Our coalition has a core planning group (e.g. steering committee). (8)	○	○	○	○
I. Our coalition has subcommittees. (9)	○	○	○	○

Q6 6. At what level would you rate the following characteristics for your campus basic needs coalition PROCESSES?

	Absent (1)	Present but limited (3)	Present (4)	Not applicable (5)
A. Our coalition has a mechanism to make decisions, e.g. voting. (1)	○	○	○	○
B. Our coalition has a mechanism to solve problems and resolve conflicts. (2)	○	○	○	○
C. Our coalition allocates resources fairly. (3)	○	○	○	○
D. Our coalition employs process and impact evaluation methods. (4)	○	○	○	○
E. Our coalition conducts annual action planning session. (5)	○	○	○	○
F. Our coalition assures that members complete assignments in timely manner. (6)	○	○	○	○
G. Our coalition orients new members. (7)	○	○	○	○
H. Our coalition regularly trains new and old members. (8)	○	○	○	○

Q7 7. At what level would you rate the following characteristics for the FORMATION of your campus basic needs coalition?

	Absent (1)	Present but limited (2)	Present (3)	Not applicable (4)
A. Our coalition has designated permanent staff. (1)	○	○	○	○
B. Our coalition has broad-based membership, including community leaders, professionals, and grass-roots organizers representing the target population. (2)	○	○	○	○
C. Our coalition has designated office and meeting space. (3)	○	○	○	○
D. Our coalition has structures in place. (4)	○	○	○	○

Q8 8. At what level would you rate the following characteristics for the IMPLEMENTATION of your campus basic needs coalition?

	Absent (1)	Present but limited (2)	Present (3)	Not applicable (4)
A. Our coalition has processes in place. (1)	○	○	○	○
B. Our coalition conducted a needs assessment. (2)	○	○	○	○
C. Our coalition developed a strategic plan. (3)	○	○	○	○
D. Our coalition implemented strategies as planned. (4)	○	○	○	○

Q9 9. At what level would you rate the following characteristics for the MAINTENANCE of your campus basic needs coalition?

	Absent (1)	Present but limited (2)	Present (3)	Not applicable (4)
A. Our coalition revises strategies as necessary. (1)	○	○	○	○
B. Our coalition secures financial and material resources. (2)	○	○	○	○
C. Our coalition is broadly recognized as authority on issues it addresses. (3)	○	○	○	○
D. Our coalition has maintained or increased the number of its members. (4)	○	○	○	○
E. Our coalition membership benefits outweigh costs. (5)	○	○	○	○
F. Our coalition is accessible to the community. (6)	○	○	○	○
G. Our coalition's accomplishments are shared with members and the community. (7)	○	○	○	○

Q10 10. At what level would you rate the following characteristics for the INSTITUTIONALIZATION of your campus basic needs coalition?

	Absent (1)	Present but limited (2)	Present (3)	Not applicable (4)
A. Our coalition is included in other collaborative efforts (1)	○	○	○	○
B. Our coalition's sphere of influence includes state and private agencies and governing bodies. (2)	○	○	○	○
C. Our coalition has access to power within legislative and executive branches of agencies/government. (3)	○	○	○	○
D. Our coalition's activities are incorporated within other agencies/institutions. (5)	○	○	○	○
E. Our coalition has obtained long-term funding. (6)	○	○	○	○
Our coalition's mission is refined to encompass other issues/populations. (7)	○	○	○	○

11. In the section on the left, list each campus/community organization, department or division (example: Dining Services, Alumni Association, etc) represented by an individual serving in your campus basic needs coalition. Using the scale provided on the right, select the extent to which you (as the coalition facilitator/leader) currently interact with the organization and/or individual.

	Networking -Aware of organization -Loosely defined roles -Little communication -All decisions are made independently (1)	**Cooperation** -Provide information to each other -Somewhat defined roles -Formal communication -All decisions are made independently (2)	**Coordination** -Share information and resources -Defined roles -Frequent communication -Some shared decision making (3)	**Coalition** -Share ideas -Share resources -Frequent and prioritized communication -All members have a vote in decision making (4)	**Collaboration** -Members belong to one system -Frequent communication is characterized by mutual trust -Consensus is reached on all decisions (5)
1. (1)	○	○	○	○	○
2. (2)	○	○	○	○	○
3. (3)	○	○	○	○	○
4. (4)	○	○	○	○	○
5. (5)	○	○	○	○	○
6. (6)	○	○	○	○	○
7. (7)	○	○	○	○	○
8. (8)	○	○	○	○	○
9. (9)	○	○	○	○	○
10. (10)	○	○	○	○	○

Appendix II: Planned Interview Questions for the Engage Assessment

Below are the planned interview questions for the Engage Assessment
- To begin, tell me about yourself and your role at your institution?
- Tell me about your coalition.
- In what ways have you engaged people from your campus and community to join your coalition?
- What role has your student liaison played in your coalition?
    - o NOTES: Information requested by ECMC. Make sure this is asked.
- What types of expertise does your coalition possess?
- In what ways do you believe does your coalition excels?
- In what ways do you believe your coalition may require improvement?
- What are the challenges you have faced while building your coalition?
- Before we wrap up, is there anything else about your coalition that you would like to share?