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Addressing Social Determinants of Mental Health to Improve College Access, Retention, and Completion

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Addressing Social Determinants of Mental Health to Improve College Access, Retention, and Completion

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ABSTRACT

Addressing non-medical factors that adversely impact mental health, wellness, and academic persistence is important to increasing access to college for vulnerable college students. This systematic review synthesized 63 articles on interventions to address college student SDOMH (social determinants of mental health) challenges. Researchers found that SDOMH themes were addressed in intervention studies at different rates, specifically, healthcare access and quality (n = 27, 42.3%), education access and quality (n = 24; 37.5%), social and community context (n = 11; 17.4%), economic stability (n = 3; 4.7%), and neighborhood and built environment (n = 1; 1.6%). Implications for higher education stakeholders conclude the article.

Keywords: Social determinants of mental health (SDOMH), college access, college persistence, college students, systematic review

According to the U.S. Department of Health and Human Services (2020), social determinants of health (SDOH) are the external factors in individuals' lives that impact quality of life, functioning, and overall well-being. Social determinants of mental health (SDOMH) expands on this idea by addressing factors which have an impact on individuals' mental health functioning and related outcomes (Fink-Samnack, 2021). College students are particularly impacted by SDOMH, given the cost associated with

college attendance, housing, and transportation, among other challenges. SDOMH challenges can adversely impact college access, persistence, and college student mental health (Baugus, 2020; Martinez et. al, 2021; Waters-Bailey et. al, 2019). The purpose of this systematic review is to identify and summarize interventions implemented by higher education institutions intended to address college student SDOMH challenges.

Social Determinants of Mental Health and College Students

The social determinants of mental health (SDOMH) are the non-medical factors that inequitably impact quality of life across the lifespan. The five SDOMH domains include: (1) economic stability, (2) education access and quality, (3) health care access and quality, (4) neighborhood and built environment, and (5) social and community context (U.S. Department of Health and Human Services [USDHHS], 2020). College students are a very vulnerable population that can be adversely impacted by SDOMH (Fink-Samnack, 2021).



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Figure 1.
Social Determinants of Mental Health.

Economic Stability
Education Access and Quality
Health Care Access and Quality
Neighborhood and Built Environment
Social and Community Context

U.S. Department of Health & Human Services

The domain of economic stability is related to how individuals' incomes can impact their ability to meet both their basic needs and health needs (USDHHS, 2020). An example of this domain is college affordability, which can represent a significant barrier to college access and persistence (Blagg & Blom, 2018; Dwyer et. al, 2013; Letkiewicz et. al, 2014). The education access and quality domain is defined as individuals being afforded the opportunity to receive quality K-12 and higher education, which is linked to healthier lives and overall better health outcomes (USDHHS, 2020). Research suggests that higher educational attainment results in improved health outcomes, life expectancy, and overall satisfaction with life (Kaplan et al., 2014; Zajacova & Lawrence, 2018).

The domain of health care access and quality is defined as individuals' access to adequate healthcare (USDHHS, 2020). For college students, access to physical and mental health care has a direct impact on the ability to persist in school (Choi et al., 2010). A goal of "Healthy People 2030" regarding the

neighborhood and built environment domain is to create neighborhoods and environments that promote health and safety (U.S. Department of Health and Human Services [USDHHS], 2020). For college students, campus safety is a determinant of students' mental and physical health (Maffini & Dillard, 2022; Nijs et. al 2014; Shalka & Leal, 2022). Finally, the social and community context domain relates to social and community support. Students with healthy relationships with their professors, classmates, and other college personnel tend to have better academic outcomes (Xerri et. al, 2017). In sum, SDOMH domains impact all aspects of students' lives, academic success, and overall well-being; unaddressed SDOMH challenges pose a substantial hurdle for college student access and persistence, and yield impacts beyond the students' immediate college experience.

Impact of Unaddressed SDOMH Challenges to College Students

Unaddressed SDOMH can adversely impact college access, persistence, and student mental health outcomes (Allensworth, 2011; Backhaus et al., 2020; Johnson et al., 2021; Olfert et al., 2021). Regarding access, a study with unhoused community college students found that college was inaccessible due to cost and documentation needed to prove homelessness to complete the financial aid verification process (Crutchfield et al., 2016). Another study of undocumented and formerly undocumented Latinx college students found that students had to

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rely solely on their own financial resources to attend college, as they did not qualify for scholarships, loans, and federal and state aid (Diaz-Strong et al., 2011).

Another area impacted by unmet SDOMH needs includes college persistence, often characterized by a student's sense of belonging and commitment to the institution (Robb et al., 2011). In a study on college students' debt accumulation and persistence, researchers found that 54% of undergraduate students who had loans in their names were more likely to drop out for financial reasons (Robb et al., 2011). There are disparities in postsecondary persistence between first-generation college students and their peers. Researchers found that first generation college students who tend to come from lower socioeconomic backgrounds attribute their reason for dropping out of college to the inability to afford tuition (McCallen & Johnson, 2020). Persistence in college may also be thwarted by healthcare crises worsened by insufficient healthcare coverage (Stegenga et al., 2021), which is directly connected to the healthcare access and quality SDOMH domain.

In terms of mental health, unaddressed SDOMH issues (i.e., food insecurity, housing instability, etc.) led to increased anxiety (Johnson, 2020) and depression symptomatology (Johnson et al., 2021) in a USA southeastern public university undergraduate student population. A study of international college students found that

the lack of a financial safety net to meet basic needs increased stress and mental health challenges amongst the students (Martinez et al., 2021). In another study of college students, researchers found that food insecurity and the lack of food was associated with malnutrition (Adamovic et al., 2021). Physical consequences of food insecurity, such as fatigue and illness, can affect students' academic success by affecting their concentration in classes (Martinez et al., 2021). Moreover, the relationships and meaningful interactions college students engage in throughout their studies are essential to mental well-being and the progression toward degree completion (White, 2018). White (2018) argued that psychological support for a student promotes academic competence and school adjustment. For example, instructor-student relationships may help reduce anxiety related to academic performance. Students who have stronger relationships within the university are more likely to succeed, and this is directly connected to the social and community context SDOMH domain.

In sum, unaddressed SDOMH challenges in all five domains can severely disrupt college access, persistence, and college student mental health (Allensworth, 2011; Backhaus et al., 2020; Johnson et al., 2021; Olfert et al., 2021). Addressing SDOMH challenges is an important equity issue for college administrators and stakeholders to address through policy and intervention.

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Addressing SDOMH in College Settings

Colleges have had an awakening as it relates to the diverse needs of their student body, including the SDOMH needs. One of the first publicly made cases about SDOMH and college students was written in a book titled, “Homeless to Harvard,” in which a student details their persistence in college despite challenges in several SDOMH domains (Murray, 2015). Other research studies have found that college students are struggling with food insecurity, housing insecurity, healthcare access, and transportation which contribute to issues surrounding retention and mental health (Baugus, 2020; Waters-Bailey et al., 2019). Colleges have responded by increasing funding for social services on campus (Waters-Bailey et al., 2019).

Specifically, Watkins et. al (2012) found that college counseling centers increased their funding to bring on graduate students who were in internship to provide services. Colleges have also begun implementing programming to address the issues that students may face by starting food pantries on campus, and providing students with meal vouchers and emergency funds (El Zein et al., 2018; Freudenberg et al., 2019). Waters-Bailey et al. (2019) provided strategies colleges can use to help address barriers that students may experience such as food insecurity, housing insecurity, transportation as well as mental health care. College campuses have also made policy changes to address these nonacademic barriers (Congressional Research Service, 2021; Ngo & Hinojosa, 2021). Critical to

addressing college students’ SDOMH is an understanding of the SDOMH domains, SDOMH domains typically addressed, the types of interventions developed and executed, and intervention outcomes. Understanding of these areas can inform changes in university initiatives, policies, funding decisions, and overall culture concerning SDOMH.

Theoretical Framework

Ecological Systems Theory (EST) posits that development is affected by interactions between an individual and different levels of their environment which increase in scope (Bronfenbrenner, 1979). For example, the microsystem refers to one’s immediate childhood context (e.g., classrooms), while the mesosystem is defined as “the interrelations among two or more settings in which the developing person actively participates” (p. 25). For college students, such systems may include their friends and religious community. The exosystem refers to events external to the individual, such as the actions of a college dean, while the macrosystem concerns wider cultural beliefs, ideologies, and the like, such as the general culture on a college campus (Bronfenbrenner, 1979). SDOMH are included in each environmental level. A college student’s microsystem may include SDOMH such as their access to a local grocery store. A general cultural attitude in one’s geographic area, a part of the macrosystem, such as racism, influences health and wellbeing, leading to discrimination, a SDOMH, and lack of

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opportunity. Given that college students are affected by various systems within and beyond the college setting, we chose to conceptualize this systematic review through the lens of EST. Institutions of higher education are conceivably invested in student outcomes like retention, academic achievement, and career attainment, and are well-situated to address SDOMH which influence these outcomes at their various environmental levels, according to EST. Thus, we conceptualized whether and how institutions of higher education assess for and address students' SDOMH needs considering the systems and environmental levels described in EST.

Purpose

The purpose of this systematic review was to identify and summarize interventions implemented by higher education institutions intended to address college students' SDOMH challenges. Interventions were defined as efforts that addressed one of the five SDOMH domains. We are interested in practice and policy recommendations that can be drawn from the synthesis of the available research. Current research on this topic suggests that universities are addressing SDOMH through policy, programming, and community engagement, with a range of different intended outcomes (i.e., alleviating burden, mental health, academic persistence, etc.); however limited information is known about SDOMH challenges targeted. Through this systematic review we intended to

identify, evaluate, and integrate findings from studies conducted in the United States that address the following research questions:

- (1) For each identified SDOMH intervention, what was the type of intervention, targeted population, domain addressed, and outcome?;
- (2) What are the demographics of the colleges and universities implementing SDOMH interventions?; and
- (3) What was the rigor and the quality of SDOMH intervention studies reviewed?

Methodology

A systematic review is a tool researchers can use to summarize empirical evidence to answer a research question and draw empirically based conclusions (Munn et al., 2018). The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) framework was utilized to provide structure and reporting guidance to authors. We utilized the PRISMA checklist to (a) assess eligibility, (b) identify sources of information, (c) conduct a screening process to select included articles, (d) chart data items, (e) conduct a critical appraisal of included articles, and (f) synthesize results. We utilized the systematic review checklist to assess: study purpose, research question(s), author(s), year, method, theoretical framework, sample size, and relevant study characteristics (See Table 2 – Appendix: pages 71-87). The research team included five doctoral student researchers and two professors.

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Inclusion and Exclusion Criteria

In generating a usable and relevant dataset of research studies, four databases were searched: PsychINFO, Ebscohost, Web of Science, and Google Scholar. These databases are comprehensive in nature and cover topics in higher education, health, and social sciences. In addition, ten interdisciplinary peer reviewed journals were searched: *Journal of American College Health*, *American Journal of Health Promotion*, *American Journal of Preventive Medicine*, *New Directions for Community College*, *Journal of College Access*, *Journal of College Counseling*, *Journal of College Student Development*, *Journal of Counseling & Development*, *Innovative Higher Education*, *Journal of Higher Education Research*, and *Community College Journal of Research and Practice*. Studies were included if they: (a) were published in English on a U.S. population, (b) reported on a college student SDOH intervention, and (c) were published between 2000-2022 in one of the selected databases or journals. The review period was deemed as an adequate time frame to capture research guided by similar principles and understanding of SDOH which has changed over time.

Search Procedures

In conducting the searches, the following key terms were used for each database: social determinants of mental health intervention (OR) social determinants of health intervention (AND) college students, community college students, university students (AND) college access, persistence, retention, thriving, and mental health.

In order to widen the search, additional search terms were used in conjunction with the key terms: food insecurity, transportation, housing insecurity, financial instability, economic stress, financial stress, healthcare access and quality, social support, college community or campus community, safety, neighborhood and built environment, and educational access. The keywords were selected for use based on the research topic and keywords in prominent articles on addressing SDOH needs of college students.

Data Selection, Extraction, and Coding

The selection and review processes were conducted in accordance with the PRISMA framework outlined by Moher et al. (2009). Three doctoral student researchers utilized the search procedures and the exclusion/inclusion criteria to select and review relevant studies independently. The selection process took approximately 35 days and a total 139 articles were initially selected for further review. The list of selected articles was placed on a spreadsheet in a shared drive and shared with the research team who assisted in the review process. The first review was conducted to remove duplicate articles (n = 1). In the next review, we focused on establishing article relevance and adherence to the inclusion criteria. Research team members were assigned articles and instructed to review title, abstract, keywords and additional information as needed, to determine if the article was aligned with the inclusion criteria. Each article was reviewed by at least two research team members for

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inter-rater reliability purposes. This review resulted in the removal of 75 articles (see Figure 2 on page 53).

The coding method for this report included five trained reviewers who read and coded 63 articles using a standard coding protocol (Saldaña, 2009). The first cycle of coding was done to extract initial information as guided by the PRISMA checklist and the second cycle produced the final codes. The following information was extracted: purpose, research questions, study design, sampling, sample characteristics, setting, theory, intervention, methods, analytic strategy, results, practical implications, limitations, and additional comments. To ensure coding consistency, approximately 75% of all articles were double-coded by a reviewer and doctoral-level coder. The research team met to discuss emerging codes and resolve any issues associated with coding.

Results

We identified 139 articles for review through the search process. A total of 63 articles met the criteria for inclusion in the systematic review. Many of the articles that did not meet criteria for inclusion did not report on a college student SDOMH intervention or were published outside of the US population. We sought to answer the following research questions:

(1) For each identified SDOMH intervention, what was the type of intervention, targeted population, domain addressed,

and outcome?;

- (2) What are the demographics of the colleges and universities implementing SDOMH interventions?; and
- (3) What was the rigor and the quality of SDOMH intervention studies reviewed?

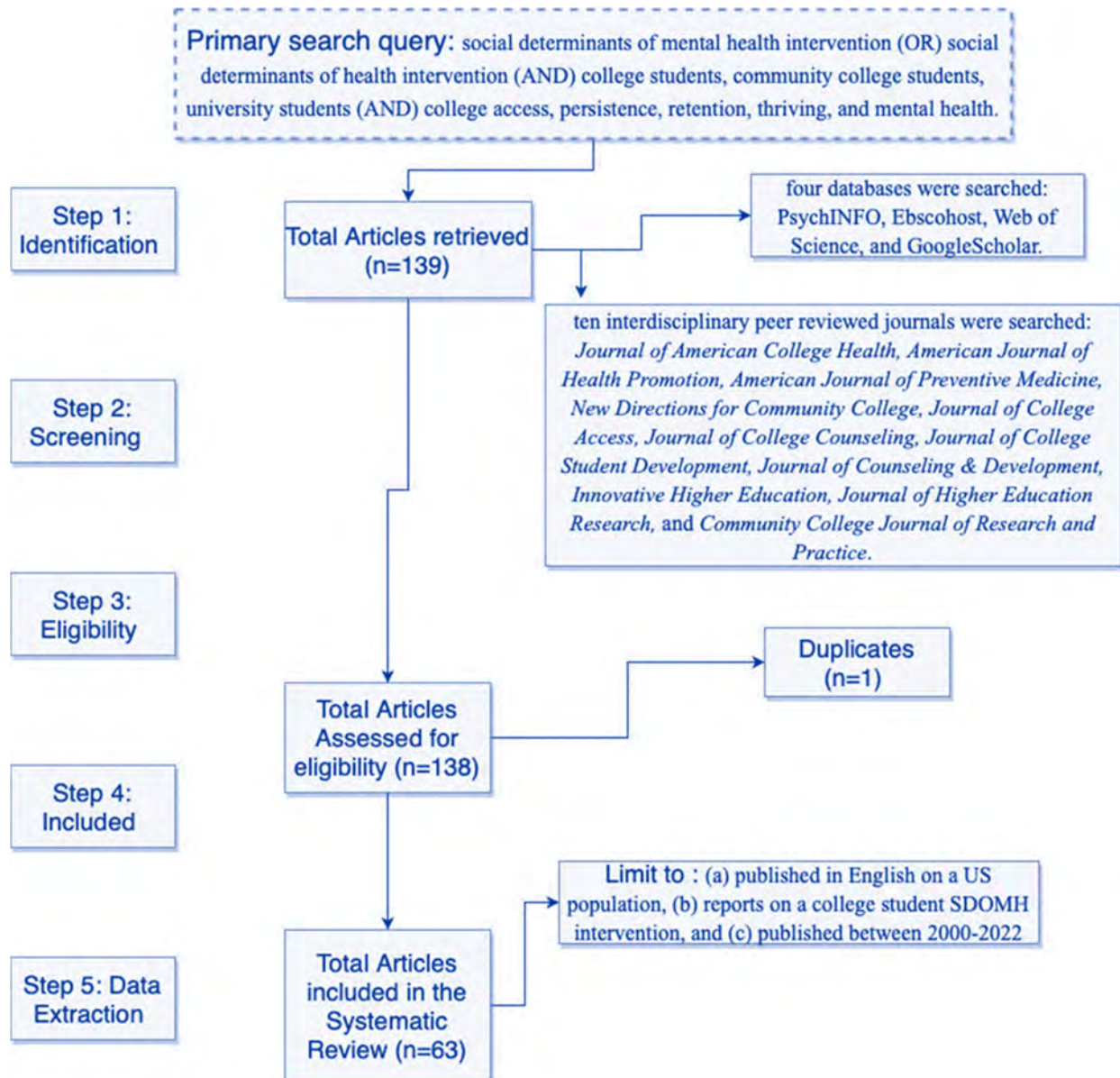
Overview of Included Articles

The majority of articles reviewed focused on SDOMH interventions targeting undergraduate students at four-year colleges and universities ($n = 54$; 85.71%). The remaining studies were conducted at a two-year college ($n = 6$, 9.52%), utilized a two-year college campus ($n = 1$, 1.59%), or did not specify the type of institution ($n = 2$, 3.17%). For the type of college setting, the majority of articles did not specify what type of college campus ($n = 49$; 77.78%).

However, five studies were conducted at research-intensive universities (7.94%), three were at a Minority Serving Institutions (MSI; 4.76%), two were on an urban campus (3.17%), two at a Primarily White Institutions (PWI; 3.17%), one at a Hispanic Serving Institution (HSI; 1.59%), and one at a Historically Black College (HBCU; 1.59%). Finally, the majority of included studies focused on undergraduate students ($n = 59$; 93.65%). Two focused on undergraduate and graduate students (3.17%), one focused on medical students (1.59%), one focused on transfer students (1.59%), and one focused on the clinician's perspective of an intervention (1.59%).

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Figure 2.
Data Selection, Extraction, and Coding.



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Within these student types, some articles focused on specific descriptors including race-ethnicity specific students (n = 5; 7.84%), sex/gender specific students (n = 2; 3.17%), and first-generation college students (n = 5; 7.94%). Given ETS' emphasis on environmental factors, the SDOMH needs for college students can vary depending on the type of college setting such as urban versus rural or PWI versus HBCU.

In terms of methodology, the studies included in the systematic review were mostly quantitative and more than half of the studies used a quasi-experimental design. Lastly, post-intervention data, such as monthly drinking diaries, performance prompts, test anxiety inventories, satisfaction questionnaires, follow up telephone interviews, self-reported psychosocial adjustment to college, and daily experience surveys were collected in 13 of the articles (20%) and 21 articles included data beyond self-report (33%), such as grade point averages, retention rates, exam test scores, residency programs quality measures, class performances, field notes, and feedback reports. See Table 1 on next page for details.

Social Determinants of Mental Health Domains Addressed

In terms of SDOMH domains addressed, we sorted the domains based on the aforementioned World Health Organization's five domains (2022). The domains and the percentage of studies addressing those domains include: Economic stability (n = 3; 4.7%), Education access and quality (n = 24;

37.5%), Healthcare access and quality (n = 27, 42.3%), Neighborhood and built environment (n = 1; 1.6%), and Social and community context (n = 11; 17.4%). In terms of the names of the different interventions, Table 2 (in the Appendix starting on page 71) details the name, description, characteristics, SDOMH domains, and the outcomes of the interventions deployed.

Social Determinants of Mental Health Addressed in Multiple Domains

Three articles (Hu & Ma, 2010; Hill & Woodward, 2013; Evans et al., 2020) were coded under multiple domains. Hu and Ma (2010) aimed to evaluate student engagement and persistence in college and the outcomes from the study showed that mentorship was positively associated with student persistence in college. Thus, this article was coded in the education access and quality and social and community context domain. Hill and Woodward (2013) aimed to examine the impact of learning communities on students' retention and the outcomes from the study showed that involvement in a learning community improved students' retention. Thus, this article was coded in the education access and quality and social and community context domain. Evans et al. (2020) aimed to evaluate community college completion rates of low income students through a "stay the course intervention" and the outcomes from the study showed that the intervention significantly increased persistence and degree completion for women. Thus, this article was coded in the economic stability and education access and quality domain.

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Table 1.
Study Research Design and Rigor.

Study Descriptors	n	%
Quantitative research	48	76%
Qualitative research	8	13%
Mixed methods research	7	11%
Pilot study	6	10%
Randomized controlled trial	21	33%
Quasi-experimental design	34	54%
Control or comparison group	42	67%
Repeated measures	20	32%
Post-intervention data	13	20%
Assessment beyond self-report	21	33%
Sample size over 100	42	67%
Sample size over 1000	7	11%
Report effect size	41	65%
Standardize Curriculum	2	3%

Note: Total number of articles = 63

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Study Outcomes by Social Determinant of Mental Health Domain

The results of the systematic review are organized by the five SDOMH domains. Each article is organized in a domain according to the focus of the intervention.

Economic Stability

The SDOMH domain of economic stability is defined by a person's ability to meet their financial responsibilities as well as have savings for emergencies (U.S. Department of Health and Human Services [USDHHS], 2020). A total of three articles addressed the economic stability domain, which focused on interventions to address Latino/a career development (Berríos-Allison, 2011), providing financial and financial stress counseling (Britt et al., 2015), and supporting low-income students through case management (Evans et al., 2020). These studies utilized randomized control trials, mixed methods, and pre/post surveys to evaluate the effects of voluntary group counseling and voluntary individual advising. Outcomes often looked at student retention, college persistence, college graduation rates, financial literacy, and levels of financial stress management.

Education Access and Quality

The domain of education access and quality, is defined as efforts to make education affordable, expand access to educational resources, addressing systemic barriers that

limit access for some groups, and support to improve education quality at the K-16 level (U.S. Department of Health and Human Services [USDHHS], 2020). A total of 21 articles addressed the education access and quality domain with interventions focused on the major themes of academic outcomes and achievement, student persistence and retention or resilience, student engagement, career choice or aspirations, political empowerment, satisfaction, and metacognitive awareness. Nine articles addressed academic outcomes and achievement with interventions that focused on test taking strategies (Holzer et al., 2009); student counseling services (Lee et al., 2009); mentoring and coaching programs (Brown-DuPaul et al., 2013; Morales et al., 2016; Capstick et al., 2019); a success course (Coleman et al., 2018); early interventions (Gordanier et al., 2019); student empowerment (Griffin, 2019); and learning communities (Markle & Stelzriede, 2020). Five studies addressed student persistence and retention or resilience and interventions focused on educational opportunities (Claus-Ehlers & Wibrowski, 2007); learning communities (Hill & Woodward, 2013); case management (Evans et al., 2020); academic coaching (Simmons & Smith, 2020); and coursework (Yadusky et al., 2020). Three articles addressed student engagement with interventions that focused on scholarship programs (Hu & Ma, 2010; Collier et al., 2019) and educational activities (Stephens et al., 2014). Two studies addressed career choice or aspirations and interventions focused on

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academic advising (Sweeney & Villarejo, 2013) and outreach programs (Kitchen et al., 2018).

Three final articles addressed political empowerment through behavior modification interventions (Angelique et al., 2002), student satisfaction through a modification in the grading scale (Bloodgood et al., 2009), and metacognitive awareness through academic coaching (Howlett et al., 2021) respectively. These studies often used randomized control trials, pre-tests and post-tests, interviews, surveys, multiple baseline design, retrospective cohort study and quasi-experimental designs. Outcomes of these studies sought to improve students' academic achievement, participation and engagement, resilience and persistence and support their learning and future goals.

Healthcare Access and Quality

Healthcare access and quality include college student's access to physical and mental health care (U.S. Department of Health and Human Services [USDHHS], 2020). A total of 27 articles addressed the healthcare access and quality domain. There were three themes identified within this domain: physical health and overall wellbeing, mental health, and substance use reduction. Nine articles addressed physical health and overall wellbeing: one intervention study to improve physical activity (Mailey et al., 2010); three mindfulness meditation intervention studies (Nguyen-Feng et al., 2017; Canby et al., 2015; Seppälä et al., 2020); one health seeking

intervention study (Demyan & Anderson, 2012); one gratitude practice intervention study (Geier and Morris, 2022); two intervention studies on resilience and coping (Houston et al., 2016; Ray et al., 2019); and one intervention study on protective behavioral strategies training (LaBrie et al., 2015). Eight articles addressed mental health: two interventions focused on reducing symptoms of depression and anxiety (Fitzpatrick et al., 2017; Paul & Eubanks Flemming, 2019); two sexual assault intervention studies (Feldwisch et al., 2020; Foubert & Newberry, 2006); one social support intervention study for survivors of partner abuse and sexual aggression (Edwards et al., 2018); one online psychotherapy intervention (Benton et al., 2016); one online educational intervention to reduce stigmatizing attitudes toward help seeking (Kirschner et al., 2020) and one emotional disorders prevention study (Bentley et al., 2017). Lastly there were ten substance use reduction studies: Amaro et al., 2010; Denering & Spear, 2012; Borsari & Carey, 2000; Martens et al., 2007; Kenney et al., 2014; Wagstaff & Welfare, 2021; LaBrie et al., 2006; DeJong et al., 2009; Wood et al., 2009; Ulupinar & Kim, 2021. Outcomes of these studies sought to increase physical activity, coping, and decrease distressing symptoms and substance use.

Neighborhood and Built Environment

The neighborhood and built environment domain of SDOMH is related to the quality of housing, safety, crime and violence, and environmental conditions (U.S. Department of

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Health and Human Services [USDHHS], 2020). The single article that addressed this domain utilized a cross-sectional study design that examined the impact of a new recreation center for students (Zizzi et al., 2004). The implications for this study were related to ways to creatively increase engagement with recreational centers/activities. The outcomes for this study looked at creative ways to improve physical activity rates and overall student wellness. This single article addressing neighborhood and built environment underlines the need for an ETS framework and systematic approach as neighborhood can directly shape a student's wellbeing and development.

Social and Community Context

The social and community context domain of SDOMH relates to social and community support, which for a college student can include healthy relationships with their professors, classmates and other college personnel to increase academic outcomes (U.S. Department of Health and Human Services [USDHHS], 2020). This domain resembles the mesosystem within the ETS framework. A total of 11 articles aligned with this domain.

Interventions in this domain focused on networking opportunities (Hill & Woodward, 2013; Larracey et al., 2022; Mattanah et al.,

2012), self-esteem and self- authorship (Jehangir et al., 2012), campus belonging, engagement, and social connection (Baleria, 2019; Evans et al., 2012; Murphy et al., 2020; Strayhorn, 2021;), faculty and professional mentorship (Crowe, 2021; Hu & Ma, 2010) and peer coaching and training (Chiu et al., 2017). These studies tended to use quantitative survey methods with control or comparison groups, although five were qualitative and three used mixed methods that utilized phenomenological and

longitudinal interviews. Outcomes often looked at campus belonging, college persistence, metacognitive awareness, social connection and social reactions, academic achievement, and skill building. Overall themes in these studies included mentorship and social connection.



“Over half of the interventions reviewed were in the education (37.5%) and healthcare (42.3%) access and qualities domains.”

Discussion

This systematic review synthesized intervention studies implemented in higher education settings to address SDOMH. The findings highlighted SDOMH domains most addressed in higher education settings, domains that were least addressed, and the rigor of the research. Overall, findings suggest that universities are aware of SDOMH issues that can impact their students' college access and persistence.

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Prominent SDOMH Areas of Focus

Over half of the interventions reviewed were in the education (37.5%) and healthcare (42.3%) access and qualities domains. The focus on education access and quality, aspects of the microsystem (Bronfenbrenner, 1979) is unsurprising given the nature and goals of institutions of higher education. The focus on healthcare access and quality domain is a newer finding in the literature. It is possible that a large number of interventions were included in this domain due to legislation aimed to increase healthcare access of college students such as the Affordable Care Act (ACA), which was signed into law in 2010. The ACA helped reduce the uninsured population of college students by 10% (Mitchell, 2017) and non-elderly adults by 43% (Uberoni et al., 2016), and serves as an example of exosystem influence, according to EST (Bronfenbrenner, 1979). Currently, there are three million college students through college-sponsored health insurance policies (U.S. Centers for Medicare & Medicaid Services, n.d.).

While legislation is one potential factor, it is also noted that the majority of the studies in the healthcare access domain focused on substance use reduction. Prior research indicates that substance abuse can have negative consequences for college students and the wider community, including health concerns, academic performance, safety concerns, and campus culture (Bailey et al., 2016). Therefore, it is encouraging that universities are addressing substance use

issues and our findings are inline with current needs and research trends.

Less Prominent SDOMH Areas of Focus

The least reviewed interventions were in the social and community context domain (17.4%), economic stability domain (4.7%), and neighborhood and built environment (1.6%). These least reviewed interventions are all aspects of students' mesosystems, concerning interconnected relationships among multiple settings (Bronfenbrenner, 1979). This finding may serve as evidence for increased need for colleges to consider, interact with, and seek to enhance their connections to local communities. The existence of a single article which addressed the neighborhood and built environment was unsurprising, given that the literature has highlighted the dearth of interventions in school settings focused on promoting health and safety in neighborhoods (Havlik et al., 2014, 2017).

The lack of interventions addressing economic factors for college students was surprising as research emphasizes the association between financial hardships and poor overall wellbeing for college students (Hattangadi, et al., 2019). It is imperative to develop targeted interventions, as research shows differences in financial distress between first generation college students and non-first-generation college students (House et al., 2020). Further, research highlights the need to evaluate the effects of the COVID-19 pandemic on students' financial stability to support implementation of effective

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interventions (Jones et al., 2021; Galanza, 2023; Son et al., 2020). The chronosystem is another aspect of Bronfenbrenner's (1979) ETS framework which describes the role of time in shaping an individual's development. The influence of historical events such as COVID drastically impacted college students beyond the economic factors (Jones et al., 2021; Son et al., 2020).

Lastly, social community context was amongst the least reviewed interventions, though there were several studies which addressed themes related to mentorship, school connectedness, and social engagement. The social community context themes are correlated to college student persistence and graduation (Fender & Navarro, 2021); therefore, it is important to continue this intervention and research trajectory. Addressing these contextual factors in the mesosystem level of Bronfenbrenner's ETS framework can significantly contribute to students' own development in relation to others.

Target Populations for Intervention

Through this synthesis of the SDOMH interventions, we also sought to understand if specific college student populations were identified and targeted for interventions. The results indicate that research on SDOMH interventions for college students overwhelmingly focused on undergraduate students at four-year institutions, and limited attention was given toward targeting particularly vulnerable populations of college

students (e.g., first generation, BIPOC, low-income). Researchers have highlighted the importance of targeted interventions to mitigate the impacts of inequity and to address the barriers faced by students (Blagg & Blom, 2018; Dwyer et al., 2012; Letkiewicz et al., 2014). It is imperative that more intervention studies target vulnerable populations of college students to support their college access and persistence. Moreover, as our findings highlight the need for research which addresses mesosystem interactions amongst various settings, like the university and local community, future studies in this area may yield interventions which holistically support vulnerable students through attention to the mesosystem (Bronfenbrenner, 1979).

Quality and Rigor

An examination of the incorporated interventions for rigor and characteristics considered desirable in a quality intervention identified that 54% of the studies employed a quasi-experimental design and 33% of the included studies utilized randomized control trials.

Furthermore, including a control group is a marker of quality in educational intervention research (Pressley & Harris, 1994), and of the studies examined, 67% used a control or comparison group in their design. Another marker of quality would entail using a standardized curriculum to address students' SDOMH challenges; however, only two manuscripts utilized a standardized

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curriculum. Of all the studies which included an intervention component, most of which utilized a quasi-experimental design, only about half collected post-intervention data. Most studies only collected self-report data. These findings suggest the need for both higher-quality experimental studies of SDOMH interventions in college settings, as well as the need for more in-depth exploration of student outcomes and experiences related to SDOMH needs and intervention. This aligns with the suggestion of Gopalan et al. (2020) to embrace quality descriptive and qualitative studies to counterbalance the methodological limitation of quasi-experimental designs and randomized control trials that lack the ability to explain specific pathways to the produced treatment effects.

Limitations

Although this review aimed to provide a comprehensive analysis of interventions that address college student SDOMH challenges, there are several limitations that should be considered. Only published studies were integrated into this review and the inclusion criteria of select journals could have prevented other interventions from being identified and evaluated. It is quite possible that universities are engaging in campus wide interventions. However, they are not publishing the results of the intervention; rather, the information is contained in an annual report. Studies were not included which took place outside of the United States,

nor were non-English language studies incorporated. These studies were intentionally excluded to ensure the results were sufficiently relevant and increase the applicability of the data to the population of interest. Lastly, this review was not registered on a database such as the International Prospective Register of Systematic Reviews (PROSPERO) once the population of interest was identified.

However, the research team adhered to the PRISMA guidelines diligently by following a two-step screening process, participating in conversations to reach consensus and ensure adequate blinding.

Future Research

Most interventions reviewed in this study focused on a single SDOMH domain as the predictor variable. Including multiple domains within models could further our understanding of the potential interaction effects between domains that have the most salient impact on student's mental health, college access, and persistence. Longitudinal or historical data on changes in SDOMH could also be used to inform future policy reforms. The devastating impact of global crises such as the COVID-19 pandemic have been felt in all SDOMH domains, particularly among the most vulnerable communities (Tai et al., 2021). Distance learning and other prevention efforts on U.S. campuses drastically changed the social determinants of college students. The long-term impact of such changes remains to be studied and used

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to inform future prevention efforts. Future research on the SDOMH for college students should continue to shift the focus of interventions away from the individual to the wider structural forces impinged on students.

Implications for Higher Education Stakeholders

The results of this systematic review emphasize the need for higher education researchers and or settings to increase research and practice in the SDOMH domains of economic stability and neighborhood and built environment. Based on our findings, critical barriers, such as economic stability, are not being addressed at the same rate of other SDOMH challenges.


Economic stability is directly related to college access and persistence and universities can invest in this area by increasing financial aid and scholarships, work study programs, affordable housing, and community partnerships. In addition, the domains of education access and quality, healthcare access and quality, as well as social and community context were more commonly researched. Researchers might consider adding in elements of the least reviewed SDOMH domains to areas that are frequently researched. For example, the infrastructure and support may be available to research college student access to tutoring, adding in their access to financial support could support better understanding of a student's situation as well as add to the limited research

available on economic stability. Higher education administrators and policymakers in these studies are encouraged to do broad system-level changes, including structured and cooperative programming on campuses and online to enhance campus climate, as well as encouraging holistic approaches to prepare students for the academic, health, and social demands of college.

Conclusion

The current review of interventions that address SDOMH have revealed notable trends and provided potential signals for future research. More specifically, the findings from this systematic review highlight the need for higher education researchers and institutions to broaden their efforts by prioritizing research and implementing programs targeted to address the needs of their student body. The specific areas or domains that appear to need more attention specifically are the economic stability and neighborhood and built environment domains of SDOMH. Counselors working with college students should consider the impacts that SDOMH have on students and be prepared to address these barriers. Although enrollment in postsecondary education has declined slightly since 2010, the college experience remains an integral institution for many Americans (Bauman & Cranney, 2020). Thus, critical examination of the SDOMH for college students is crucial. Studies on specific SDOMH domains could inform education and social policies aimed to reduce mental health and education

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inequities. Using SDOMH data to frame discussions such as health and educational disparities could reinforce the systemic nature of stratification and injustices, and lead to more support to increase college student access, persistence, and retention. 

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APPENDIX

Table 2.

Social Determinants of Mental Health Interventions and Outcomes.

Citation	Name of Intervention	Description	Mode of Delivery	Dependent Variable	Domain	Outcome
2000, Borsari & Carey, Effects of a brief motivational intervention	Brief Alcohol Screening and Intervention for College Students (BASICS)*	The intervention provided students feedback on personal consumption, perceived drinking norms, alcohol-related problems, situations associated with heavy drinking, and alcohol expectancies.	in-person sessions	alcohol consumption	Healthcare Access and Quality	The brief intervention group in this study exhibited a decrease in drinking but not a concurrent reduction in drinking-related problems.
2002, Angelique et al., Promoting Political Empowerment	Two-Semester Fieldwork Course	The intervention focused on learning behavior modification skills, providing community advocacy, and understanding adolescent social problems. After the classroom training, an experiential component was the focus of the remainder of the intervention.	in-person training/ activity	political empowerment	Education Access and Quality	Individuals randomly assigned to participate in the intervention had increased levels of Political Commitment compared to those who did not.
2004, Zizzi et al., The Impact of New Student Recreation Centers	New Student Campus Recreation Centers	A Student Recreation Center opened approximately nine months before the assessment.	in-person training/activity	physical activity rates	Neighborhood and Built Environment	Women became the greater proportion of new exercisers (50.5%); those who visited the SRC more often were more physically active.

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2006, Foubert & Newberry, Two Versions of Empathy- Based Rape Prevention	The Men's Program	The module focused on consent in situations involving alcohol, including a definition of consent, the importance of verbal consent, and the importance of avoiding intimate behavior with anyone who may be too intoxicated to consent.	in-person sessions	sexual assault actions & attitudes	Healthcare Access and Quality	Participants in both program groups experienced significant within-group changes in all four dependent variables.
2006, LaBrie et al., A Group Motivational Interviewing Intervention	Adaptation of Motivational Interviewing	The group intervention consisted of a Timeline Follow back assessment of drinking, normative feedback, decisional balance assessment of changing drinking behavior, relapse prevention, expectancy challenges, and the creation of behavioral goals.	in-person sessions	alcohol consumption	Healthcare Access and Quality	Post hoc comparisons revealed significant reductions in drinking behavior across time on all drinking variables for all participants.
2007, Claus- Ehlers & Wibrowski, Building Educational Resilience and Social Support	The Educational Opportunity Fund (EOF) Program	The EOF program featured an orientation, retreat, academic coursework, and an awards ceremony. The retreat encouraged students to engage in activities where they learned to work in teams, build trust, and develop leadership skills.	in-person sessions	educational resilience	Education Access and Quality	EOF summer academic institute increased a sense of resiliency and social support from peers and supervisors among first and second-generation college students.

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2007, Martens et al., Implementing a screening and brief intervention	Screening and Brief Intervention (SBI) Programs: BASICS intervention	Clinicians deliver personalized feedback summaries in non- confrontational, empathic, and collaborative face-to-face interventions. They may also use cognitive-behavioral strategies such as challenging expectancy and teaching prevention skills.	in-person sessions	alcohol consumption	Healthcare Access and Quality	Results indicated that after receiving the intervention, students reported decreased alcohol use, more accurate perceptions of other students' drinking, and increased use of protective behavioral strategies.
2009, Bloodgood et al., A Change to Pass/Fail Grading	Pass/Fail Grading	The intervention consisted of a change in the grading system in the first two years	in-person; institutional/ classroom policy change	well-being & satisfaction	Education Access and Quality	The pass/fail class exhibited a significant increase in well-being and greater satisfaction with personal lives during the first three semesters and greater satisfaction with the quality of education during the first four semesters.
2009, DeJong et al., A Multisite Randomized Trial of Social Norms	Social Norms Marketing (SNM) Campaigns	SNM media campaigns reported normative behaviors for all undergraduates and corrected identified misperceptions. Pilot- tested and approved materials were distributed via credible, far- reaching, and cost-effective campus media venues.	media campaign	alcohol consumption	Healthcare Access and Quality	Controlling for other predictors, having an SNM campaign was not significantly associated with lower perceptions of student drinking levels or lower self-reported alcohol consumption.
2009, Holzer et al., The Test- Taking Strategy Intervention	The Test-Taking Strategy (PIRATES)	According to the manual, the test- taking strategy was taught in full, with a few modifications. The length of teaching time for the strategy was modified to be more conducive to one-on-one training and the higher learning level of college students.	in-person sessions	academic achievement	Education Access and Quality	The strategy increased performance for four students with moderate to large effect sizes and a large effect on decreasing the performance of one student in the intervention phase, with a moderate effect in the follow-up phase.

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2009, Lee et al., The Effects of College Counseling Services	College Counseling Services	Counseling Services/Counseling Centers were evaluated	in-person sessions	academic achievement & retention	Education Access and Quality	Counseling experience was found to be significantly associated with student retention measured by third-semester registration both when controlling for precollege academic performance and when entered on its own.
2009, Wood et al., Common Ground	Common Ground	A media campaign-supported prevention program featuring increased enforcement, decreased alcohol access, and other environmental management initiatives targeting college student drinking.	media campaign; telephone surveys	alcohol consumption (availability & attitudes)	Healthcare Access and Quality	There were increases in students' awareness of formal alcohol control and enforcement efforts. There were decreases in the perceived likelihood of other students' negative behavior at off-campus parties.
2010, Amaro et al., Brief Screening and Intervention	Brief Alcohol Screening and Intervention for College Students (BASICS)*	Information about the student's AOD use was gathered, and the student was given self-monitoring cards to complete with the study nurse. The student and nurse reviewed the self-monitoring cards and the personalized feedback packet together.	in-person sessions	drug & alcohol consumption	Healthcare Access and Quality	Drinking and drug use decreased between baseline and 6 months. Participants reported an increase in protective factors and in readiness to change alcohol-related behaviors, and a decrease in alcohol-related consequences and in distress symptoms.
2010, Hu & Ma, Mentoring and Student Persistence in College	Washington State Achievers Program	Data was gathered from two surveys. The baseline survey was administered to the high school class of 2005, and the follow-up survey was administered in 2007 when the students had been in college for two years.	scholarship program	student engagement & persistence	Education Access and Quality & Social and Community Context	Having a college mentor was positively related to persisting in college. Persistence was associated with mentees engagement with mentors for support and perceived importance of experiences with mentors.

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2010, Mailey et al., Internet-Delivered Physical Activity Intervention	Internet- Delivered Physical Activity Intervention	A group was given a program overview, a website introduction, and given pedometers to wear daily. They were provided the software, secure website access, and two monthly meetings with their physical activity counselors.	online/web-based	depression, anxiety, & self-efficacy	Healthcare Access and Quality	Both groups increased their physical activity levels. Increases in physical activity were associated with increased exercise self- efficacy and decreased barriers to self-efficacy and depression in the intervention condition.
2010, Mattanah et al., A Social Support Intervention	Social Support Discussion Intervention Program	During each meeting, students discussed a topic related to their college transition, with the exception of the two meetings in which students completed questionnaires and the initial group meeting when students were introduced to the intervention.	in-person support group	loneliness	Social and Community Context	This study found that the intervention reduced loneliness and raised perceptions of social support by the end of the first year of college.
2011, Berríos-Allison, Career Support Group for Latino/a Students	Career Support Group	The intervention consisted of a on-campus Latino/a support groups sponsored by Career Services Offices	in-person support group	help-seeking behaviors	Economic Stability	Groups were found to be useful for promoting overall wellness; improving academic performance, retention, and graduation rates; and enhancing successful transitioning into the job market and/or the continuation of postgraduation plans.
2012, Demyan & Anderson, Effects of a Brief Media Intervention	Brief Mass Media Intervention	Focus groups were held to identify how to develop best a positive help-seeking message that would appeal to a college-age population while targeting belief-based/expectation predictors of help-seeking.	media campaign	expectations, attitudes, and intentions surrounding help-seeking	Healthcare Access and Quality	The media intervention was not influential on expectation and belief-based barrier variables. However, the media intervention effectively increased positive attitudes toward help-seeking.

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2012, Denering & Spear, Routine Use of Screening and Brief Intervention	Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) and ASSIST Linked Brief Intervention	If a positive prescreen was indicated (based on AUDIT-C scores), the clinician then administered the ASSIST and provided personalized feedback or simple educational information based on the results.	in-person sessions	drug & alcohol consumption	Healthcare Access and Quality	Slight reductions in the rates and number of days (in the prior 30 days) of binge drinking and marijuana use were found.
2012, Evans et al., "It's More Than a Class"	Leisure Skills Classes	This study aimed to explore how for-credit leisure skills classes at a mid-sized southeastern university could build engagement.	in-person training/activity	student engagement	Social and Community Context	Results indicated that leisure education provides a unique environment for building students' sense of engagement with their institution through an enhanced sense of community, self, and active learning.
2012, Jehangir et al., Influence of Multicultural Learning Communities	TRiO	Three courses were linked together by identity, community, and social agency themes. The learning community intended to challenge the isolation and marginalization many first-generation students feel, particularly at large PWIs.	in-person training/activity	intrapersonal self- authorship for historically marginalized students	Social and Community Context	Findings indicated that intentionally drawing students' lived experiences into the learning process and providing opportunities to reflect on multiple identities positively impacts the development of the intrapersonal dimension of self-authorship.
2012, Mattanah et al., Social Support Intervention and Achievement	Social Support Group	Each group meeting included a brief check-in, a group discussion, and a wrap-up. Group members were also given information about campus resources.	in-person support group	loneliness & academic achievement	Social and Community Context	Correlations among the three variables of interest demonstrated that the social support group was associated with greater academic achievement and reduced loneliness and that loneliness was associated with worse academic achievement.

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2013, Bergen-Cico et al., Examining Mindfulness-Based Stress Reduction	Brief Mindfulness Meditation Program	During brief meetings, participants engaged in sitting meditation and breathwork, guided body scan, and moving meditation. Participants also engaged in a class discussion about the mind-body connection to physical and emotional health.	in-person training/activity	mindfulness, self-compassion, & trait anxiety	Healthcare Access and Quality	Analysis of covariance revealed significant improvements in psychological health, measured by mindfulness and self-compassion, among brief MBSR participants. Significant reductions in trait anxiety were not evident.
2013, DuPaul et al., A High Impact Practice that Works	Mentoring Program	Students participated in grant-funded mentoring programs and pre and post-assessments were completed when they entered and when they graduated from the program.	in-person support/training/activity	academic achievement & persistence	Education Access and Quality	Students who participated in the mentoring programs showed increased persistence and higher grade point average compared to the general population of similar majors.
2013, Hill & Woodward, Examining the Impact Learning Communities Have	Learning Community Membership	Peer mentors in the LCs assisted fellow students with finding academic support and developing social and cultural opportunities and were liaisons between students and coordinators/faculty members, helping transition the students to college life.	in-person support/training/activity	student retention	Education Access and Quality & Social and Community Context	Involvement in a Learning Community improved student retention, whether specifically formed to address and promote student success in a given area/major or in a more general/university-wide Learning Community.
2013, Sweeney & Villarejo, Influence of an Academic Intervention Program	Biology Enrichment Program	Mandatory meetings were held with professional advisers in the College of Biological Sciences who advised on academic matters, supported student goals, and provided a sympathetic but objective ear for student concerns.	in-person support/training/activity	minority student career choice	Education Access and Quality	A large majority (65%) of interviewees said that their advisors and/or mentors provided significant encouragement and emotional support, enabling them to continue difficult courses of study and make tough decisions about their futures.

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2014, Kenney et al., Examining the Efficacy of a Brief Group Training	Protective Behavioral Strategies Training**	Sessions followed a cognitive– behavioral skills training model and focused on PBS and the participants’ use of them. Goals included raising participants’ awareness and developing skills for using PBS to reduce risky drinking and its consequences.	in-person sessions	alcohol consumption	Healthcare Access and Quality	Participants reported greater use of PBS, lower levels of risky drinking, and fewer negative consequences post intervention. However, the intervention was more effective at reducing high-risk drinking than overall drinking levels.
2014, Stephens et al., Closing the Social- Class Achievement Gap	Difference- Education Intervention	Participants were randomly assigned to two discussion panels: a difference-education panel or a standard panel. In the difference- education condition, the panelists’ story content was linked to the panelists’ social-class backgrounds.	in-person training/activity	student engagement, achievement, & well-being	Education Access and Quality	Difference education increased first-generation students’ tendency to seek resources and improve their end-of-year grade point averages. The college transition was improved for all students on numerous psychosocial outcomes.
2015, Britt et al., Financial Stress and Financial Counseling	Financial Counseling	Students scheduled counseling sessions online and completed brief intake questionnaires indicating their “presenting issue.” Students were matched with a trained peer financial counselor who knew the presenting issue indicated.	in-person training/activity	knowledge, satisfaction, anxiety, & behaviors related to finances	Economic Stability	Regardless of changes in actual knowledge, students felt more knowledgeable and were more satisfied and felt slightly less anxious about their financial situation. The remaining statistical significance was noted in financial behavior.
2015, Canby et al., A Brief Mindfulness Intervention for Students	Shortened Mindfulness- Based intervention (adapted MBSR)***	Participants completed a Mindfulness-Based Stress Reduction class involving a mixture of meditations, discussions, lectures, and group activities. Participants were expected to practice daily exercises in conjunction with the course.	in-person training/activity	psychological well-being	Healthcare Access and Quality	The intervention significantly reduced psychological distress. It significantly increased self- reported mindful awareness, self- control, and subjective vitality. At the same time, meta-mood was unaffected.

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2015, LaBrie et al., The Efficacy of Standalone Protective Intervention	Protective Behavioral Strategies Training**	The intervention used Protective Behavioral Strategies and Skills Training with Personalized Feedback. Sessions took approximately 30 minutes and participants completed online follow-up surveys at 1 and 6 months post-intervention.	in-person sessions	alcohol consumption	Healthcare Access and Quality	Students reported significantly greater PBS use but no differences in alcohol use or consequences. Tests of mediation indicated that the intervention indirectly led to a reduction in drinking outcomes at 6 months through increased PBS use.
2016, Benton et al., Therapist- Assisted Online Intervention for Anxiety	Therapist Assisted Online (TAO) Psychotherapy	TAO Psychotherapy involved only brief psychotherapist-direct contact and used daily homework, online educational modules, outcome measures, and accountability within a therapeutic relationship.	online/web- based	anxiety, global mental health, life functioning, & sense of well- being	Healthcare Access and Quality	In research conducted at a large university counseling center, TAO clients had greater reductions in anxiety and improved global mental health, life functioning, and their sense of well-being than treatment-as-usual clients.
2016, Houston et al., Trial of Resilience and Coping Intervention	Resilience and Coping Intervention (RCI)	The intervention consisted of Resilience and Coping Intervention sessions once per week for 3 weeks	in-person sessions	hope & stress	Healthcare Access and Quality	RCI participants reported significantly more hope and less stress and depression from Week 1 to Week 3. Results for resilience also approached statistical significance. Effect sizes were small to moderate.
2016, Morales et al., Transmitting Success	Peer Mentoring Program	This study presented and assessed a developmental math-focused peer mentoring program at a public urban university.; The program aimed to increase participants' pass rates in developmental math courses.	in-person sessions	academic achievement	Education Access and Quality	The participants passed at a rate of 37% greater; approximately 80% of the students reported general feelings of increased belief in themselves and their abilities to reach their academic goals; 100% increased social integration and engagement.

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2017, Bentley et al., Development of a Single-Session	Unified Protocol for Transdiagnostic Treatment of Emotional Disorders	The workshop consisted of slides, didactic verbal material, media clips, and interactive discussion, including treatment modules distilled from the full Unified Protocol treatment.	in-person training/activity	anxiety & depression	Healthcare Access and Quality	Students rated the intervention as a "highly" acceptable mode of delivery; the modal accuracy of the content delivered was over 80%.
2017, Chiu & Graham, The Effect of a Peer- Based Stories Intervention	Peer-Based Personal Stories Intervention	Opportunities for participation included viewing an eating disorder documentary and attending an ethnically diverse panel of peers from the same college who shared their illnesses' etiology, consequences, and insights.	in-person sessions	intergroup anxiety & social distance	Social and Community Context	Students who attended the film reported wanting more social distance towards the mentally ill than students who attended the panel discussion at follow-up.
2017, Fitzpatrick et al., Delivering CBT Using Fully Automated Agent	Woebot	The bot's primary process was a decision tree with suggested responses that accepted natural language inputs with discrete embedded sections of processing Techniques at specific points to determine routing to subsequent conversational nodes.	online/web-based	anxiety, depression & mood	Healthcare Access and Quality	Woebot was associated with high levels of engagement; most individuals used the bot nearly every day. Those utilizing Woebot experienced a significant reduction in depression.
2017, Nguyen- Feng et al., Using Online Interventions to Deliver Resources	Online Present Control Intervention (PCI)	The first enhanced PCI contained more systematic and detailed present control exercises. The second added mindfulness meditation exercises based on evidence that mindfulness skills can be effectively taught online.	online/web-based	stress, anxiety, depression, & perceived stress	Healthcare Access and Quality	Participants in all groups reported significant decreases in all primary outcomes. Results suggested that Internet-based interventions lower distress among college students, and specific approaches may be practical for certain subgroups of students.

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2018, Coleman et al., College Success Courses: Success for All	College Success Course	Students participated in a College Success Course (CSC) across a Community College System. CSC outcomes were calculated both across and within the six main campuses of the Community College System concerning gender, ethnicity, and age.	in-person training/activity	academic achievement & engagement	Education Access and Quality	Women fared better than men. The youngest, then oldest, student groups passed at higher rates. Black students held the lowest passing rates and highest withdrawal rates. Hispanic students passed at higher rates than any other ethnic group.
2018, Edwards & Ullman, An Intervention to Reduce Negative Social Reaction	Supporting Survivors and Self (SSS)	The SSS intervention included several skill-building exercises, scenarios, and role-playing activities, a discussion of overcoming potential barriers to positive action to enhance self- efficacy, and behavioral contracting.	in-person training/activity	social reactions to IPV, SA, & alcohol consumption	Social and Community Context	Anticipated negative SR to SA disclosure and IPV disclosure, encouragement of IPV victims to leave, and SA victims to cope with alcohol decreased significantly. Anticipated positive SR to IPV disclosure increased significantly.
2018, Kitchen et al., The Impact of Summer Bridge Programs	Outreach Programs and Science Career Intentions (OPSCI) Study	The intervention consisted of a survey divided into five sections: a) career plan development, b) middle school science and math experiences, c) high school background, d) STEM-related interests, and e) student and family characteristics.	in-person training/activity	students' STEM career aspirations	Education Access and Quality	Program participants had twice the odds of STEM career aspirations compared to their nonparticipating peers.
2019, Baleria, Counteracting Othering in Community College	Semi-Structured Micro Interventions	Participants were matched manually and engaged in semi- structured micro-interventions on an online portal. The goal was to have people engage via video chat using a semi-structured conversation guide.	online/web-based	student engagement	Social and Community Context	The four findings that emerged were: a) preconceived notions of the other; b) building rapport across differences; c) discovering commonality; and d) comfort, connection, and respect.

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2019, Capstick et al., Exploring the Effectiveness of Academic Coaching	Academic Coaching	Students on academic warning participated in ACE academic coaching sessions related to promoting academic success and retention.	in-person training/activity	academic achievement & retention	Education Access and Quality	Participation in academic coaching significantly predicted a student earning a 2.00 or higher in the intervention semester for both FT and PT students. Participation was a significant predictor of retention for FT students only.
2019, Collier et al., Helping Students Keep the Promise	The Kalamazoo Promise	Students received a scholarship providing tuition for post- secondary education.	scholarship program	student engagement & motivation	Education Access and Quality	Stopped-out students reported higher motivation and lower engagement than enrolled students. The findings revealed that motivation, faculty engagement, and being male negatively influenced GPA, while staff interaction positively influenced GPA.
2019, Gordanier et al., Early Intervention in College Classes	Early Academic Intervention in Principles of Economics	Students with poor performance and excessive absences early in the semester were referred to the university's Student Success Center (SSC). The SSC informed the referred students about tutoring opportunities and training on success skills.	in-person training/activity	academic achievement	Education Access and Quality	Student scores improved on the final exam by 6.5 to 7.5 percentage points for students at or near the performance threshold. The gains are particularly large for students who entered college with below- average math placement scores.
2019, Griffin, Psychosocial Techniques Used in the Classroom	Cultural Empowerment Teaching Andragogy	Cultural Empowerment Teaching Andragogy (CETA) was implemented. Techniques used included cognitive empowerment, collaborative learning exercises, and testing of the student limits to guide mastery of the material.	in-person; classroom policy change	Achievement, understanding, confidence & self-esteem	Education Access and Quality	Student accomplishments included increased assignment grades, improved classroom material articulation, confidence in independent oral responses, and increased self-esteem as a college student and developing career professional.

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2019, Paul & Eubanks Fleming, Anxiety Management on Campus	MindShift	This intervention involved using an anxiety-reducing phone application for three weeks.	online/web-based	anxiety	Healthcare Access and Quality	There was a significant reduction in physical and general anxiety symptoms over three weeks. In addition, depression symptoms significantly reduced among participants between baseline and week 3.
2019, Ray et. al, Testing Restorative Narratives	Student Resilience Project Training Program	The purpose of this study was to test restorative narratives that would be published on the website. Authors expected greater outcome expectations to lead to intent to share the content with others.	online/web-based	student engagement	Healthcare Access and Quality	Perceptions of restorative narratives can directly predict students' behavioral intentions, including their intention to seek resources and share content with other students, and indirectly influence behavior.
2020, Evans et al., Increasing Community College Completion Rates	Stay the Course (STC) intensive case-management program	A "navigator" met with students for assessment and identification of goals, barriers, strengths, and weaknesses. They developed a service plan with action steps for each goal and updated it every 90 days.	in-person sessions	student persistence, retention, & achievement	Economic Stability & Education Access and Quality	STC significantly increased persistence and degree completion for women; estimates for the full sample are imprecise. The statistically significant estimates for women imply that STC tripled associate degree receipt by 31.5 percentage points.
2020, Feldwisch et al., Safe Sisters: A Sorority-Based Intervention	Safe Sisters	Training sessions lead to membership in a group called Safe Sisters. Sorority members participating in Safe Sisters are trained to recognize the warning signs that a sexual assault may occur and learn ways to intervene safely.	in-person training/activity	sexual assault actions & attitudes	Healthcare Access and Quality	Significant differences between treatment and waitlist control groups were shown on posttest scores for action, bystander efficacy, intent to help friends, and intent to help strangers.

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2020, Kirschner et al., Mental Health Stigma Among College Students	Online Interactive Educational Program	An online gatekeeper training helped college students and student leaders identify, approach, and refer to help at-risk peers. Participants acted as friends to facilitate referrals to mental health services.	online/web-based	stigmas & attitudes toward help-seeking	Social and Community Context	Interactive programs may be an accessible and efficient means to reduce stigmatizing attitudes toward help-seeking among college students.
2020, Markle & Stelzriede, Comparing First to Continuing-Generation Students	First-Generation Learning Community	The learning community included several social and co-curricular events, readings, assignments, and community-based learning projects specifically addressing first-generation student experiences, identities, and challenges.	in-person training/activity	academic & social involvement & outcomes	Education Access and Quality	First-generation students who participated in the learning community outperformed continuing-generation students in gains in intellectual development, interpersonal development, and engagement with diverse perspectives.
2020, Murphy et al., A Belonging Intervention Improves Retention	A Customized Belonging Intervention	Students read stories highlighting common academic and social challenges to belonging that represented them as normal and temporary. They then completed writing exercises to facilitate the personalization and internalization of the message.	narrative accounts	student persistence & retention	Social and Community Context	The likelihood that racial-ethnic minority and first-generation students maintained continuous enrollment increased. Feelings of social and academic fit one-year post-intervention mediated the two-year gain in persistence.
2020, Seppälä et al., Promoting Mental Health and Psychological Thriving	SKY Campus Happiness (SKY); Foundations of Emotional Intelligence (EI); Mindfulness- Based Stress Reduction (MBSR)***	SKY, EI, and MBSR offered equal dosages of instruction and included one or more short retreats in addition to class time. Certified facilitators with seven or more years of teaching experience delivered the interventions.	in-person training/activity	anxiety, depression, gratitude & social connectedness	Healthcare Access and Quality	SKY Campus Happiness showed the greatest impact, benefiting six outcomes: depression, stress, mental health, mindfulness, positive affect, and social connectedness. EI benefited from one outcome: mindfulness. The MBSR group showed no change.

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2020, Simmons & Smith, Success Central: Addressing Persistence	Success Central	African-American and Latinx sophomore students received peer coaching from Success Central. The students were surveyed regarding their experience.	in-person support/ training/activity	student persistence, retention, & achievement	Education Access and Quality	The four-year graduation rate of the 2014–15 Success Central cohort, which consisted of only African- American and Latinx sophomore students, exceeded the average graduation rate of all sophomore students at the institution.
2020, Yadusky et al., Helping Under- prepared Students Succeed	Developmental Coursework	This research illustrated students' experiences and challenges in their pre-curriculum courses through in- depth interviews with 16 students who successfully completed or were on track to complete their developmental coursework.	survey	student persistence, retention, & achievement	Education Access and Quality	Findings showed that being labeled as “underprepared” generated feelings of isolation, stigmatization, and a lack of control, which we argue are threats to identity that led to strong emotional and behavioral reactions.
2021, Crowe, A Climate that Increases Student's Belonging	Scholarship Program	Students were involved in a three- year scholarship program that focused on providing faculty mentorship of student research, opportunities for professional development and networking.	in-person training/activity	student sense of belonging & satisfaction	Social and Community Context	Findings showed that the scholarship program had a positive impact on scholars. Scholars had a higher sense of belonging and high satisfaction levels in their majors.
2021, Howlett et al., Investigating the Effects of Academic Coaching	Academic Coaching	Academic support services and coaching were provided outside of the classroom to foster college students' development and use of metacognitive skills.	in-person training/activity	metacognitive awareness	Education Access and Quality	Students in both the in-person and online academic coaching conditions significantly increased their metacognitive skills from pre- to post-test. Positive experiences were reported with both in-person and online academic coaching.

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2021, Strayhorn, First-Year Students’ Sense of Belonging at an HBCU	Academic Intervention	This program was a web-based academic video intervention.	online/web-based	student sense of belonging	Social and Community Context	Results supported the hypothesis that participants in the experimental video condition would have higher sense of belonging scores than those in the placebo and control groups.
2021, Ulupinar & Kim, AWARE: A Personalized Normative Group Intervention	AWARE	This group intervention was based on the principles of PNF and is similar to the BASICS program. It involved an icebreaker, alcohol education, narrative activity with self-reflection, PNF, informal qualitative peer responses, PBS, and goal setting.	in-person sessions	alcohol consumption & perception of peer alcohol use		The most important finding of this study was that non-White students did not change their perception of campus drinking norms even though their alcohol use was significantly reduced.
2021, Wagstaff & Welfare, Brief Alcohol Screening and Intervention on Campus	(BASICS) - Brief Alcohol Screening and Interventions for College Students*	The overarching goal was to reveal discrepancies between students’ high-risk drinking behaviors and their values and goals. The three- tiered model targets a) individual students, b) the campus community, and c) the surrounding community.	in-person sessions	alcohol consumption	Healthcare Access and Quality	Visible differences existed with the implementation of the intervention. The BASICS manual authors conceded that the PFR generation is expensive. Therefore, counselors must remember that MI is a key component of the BASICS intervention.
2022, Geier & Morris, A Gratitude Intervention During COVID- 19	Gratitude Intervention	Participants were asked to write 10 weekly (positive) gratitude journals. A complete record consisted of a pre-intervention mental well-being assessment, 10 gratitude journals, and a post- intervention mental well-being assessment.	online/web-based	mental wellbeing	Healthcare Access and Quality	The treatment group showed significantly higher well-being after the 10 weekly gratitude reflection journals. The impact of the gratitude intervention was significantly positive and of medium effect size.

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2022, Larracey et al., “A Place to Be Heard and to Hear”	Humanities Collaboratory (HLAB)	A summer research program emerging from a partnership with a research university that fostered impactful relationships among the area community college system and offered intensive humanities research experience.	in-person training/activity	educational inequity	Social and Community Context	Students detailed the benefits and importance of collaborative skill- building, opportunities for peer support, networking connections, and possibilities for more holistic personal growth in UR experiences.
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* The BASICS intervention is utilized in four studies

** Protective Behavioral Strategies Training intervention is utilized in two studies

*** Mindfulness Based Stress Reduction interventions are utilized in two studies