Sociodemographic Correlates of Mental Health Treatment Seeking Among College Students: A Systematic Review and Meta-Analysis

Julia Pei, M.Sc., Yagmur Amanvermez, Ph.D., Daniel Vigo, M.D., Dr.P.H., Joseph Puyat, Ph.D., Ronald C. Kessler, Ph.D., Philippe Mortier, M.D., Ph.D., Ronny Bruffaerts, Ph.D., Osiris Rankin, M.A., Sook Ning Chua, Ph.D., Vania Martínez, M.D., Ph.D., Charlene Rapsey, Ph.D., Liviu A. Fodor, M.A., Oana A. David, Ph.D., Claudia Garcia, B.Sc. (Hons.), Pim Cuijpers, Ph.D.

Objective: College students have high rates of mental health problems and low rates of treatment. Although sociodemographic disparities in student mental health treatment seeking have been reported, findings have not been synthesized and quantified. The extent to which differences in perceived need for treatment contribute to overall disparities remains unclear.

Methods: A systematic search of PubMed, PsycInfo, and Embase was conducted. Studies published between 2007 and 2022 were included if they reported treatment rates among college students with mental health problems, stratified by sex, gender, race-ethnicity, sexual orientation, student type, student year, or student status. Random-effects models were used to calculate pooled prevalence ratios (PRs) of having a perceived need for treatment and of receiving treatment for each sociodemographic subgroup.

Results: Twenty-one studies qualified for inclusion. Among students experiencing mental health problems, consistent and significant sociodemographic differences were identified in perceived need for treatment and treatment receipt. Students from racial-ethnic minority groups (in particular, Asian students [PR=0.49]) and international students (PR=0.63) reported lower rates of treatment receipt than White students and domestic students, respectively. Students identifying as female (sex) or as women (gender) (combined PR=1.33) reported higher rates of treatment receipt than students identifying as male or as men. Differences in perceived need appeared to contribute to some disparities; in particular, students identifying as male or as men reported considerably lower rates of perceived need than students identifying as female or as women.

Conclusions: Findings highlight the need for policy makers to address barriers throughout the treatment-seeking pathway and to tailor efforts to student subgroups to reduce treatment disparities.

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The onset of mental and substance use disorders peaks between adolescence and early adulthood; consequently, college students report high rates of mental health problems (1). Results from the World Health Organization's World Mental Health International College Student (WMH-ICS) initiative indicate that 31.4% of surveyed first-year students across eight countries screened positive for at least one *DSM-IV* anxiety, mood, or substance use disorder in the past year (2).

The college years may offer a unique opportunity to treat mental health problems. Colleges provide integrated settings that often encompass educational and social activities, residences, and low-threshold support services, such as free or subsidized health services (3). In addition, the treatment of mental health problems during the college years, which occur before truncation of educational attainment and the

HIGHLIGHTS

- A systematic search of the literature was conducted to quantify the sociodemographic differences in having a perceived need for mental health treatment and in receiving mental health treatment among college students with mental health problems.
- Students from racial-ethnic minority groups (in particular, Asian students), international students, students identifying as male (sex), and students identifying as men (gender) reported the lowest comparative rates of mental health treatment.
- The extent to which differences in perceived need contributed to overall treatment disparities appeared to vary across student subgroups, with the greatest difference occurring between the two combined sex-gender subgroups (i.e., female-woman vs. male-man).

development of other adverse secondary effects, can reduce the reciprocal impacts of these secondary effects on disorder progression (4).

However, college students with mental disorders report low treatment rates, with 12-month treatment rates ranging from 25.3% to 29.5% for students with positive screens for mental disorders or suicidal thoughts and behaviors (5). Students comprise a substantial and increasing proportion of young people; in most high-income countries, a majority of young people are enrolled in postsecondary institutions (6). Improving the accessibility and utilization of mental health treatment in college populations would therefore provide an important avenue to improve the mental health of young people.

Previous studies have reported variations in mental health treatment–seeking intentions and behaviors by sociodemographic characteristics, including gender, sex, race-ethnicity, sexual orientation, student type (e.g., undergraduate or graduate), age, student status (e.g., international), and socioeconomic status (as measured by parental education level and current financial situation) (5, 7–18). A 2012 review (19) discussed trends in student mental health treatment seeking by gender, race, and ethnicity, but, to our knowledge, no comprehensive review has been conducted that examines the full extent of sociodemographic correlates evaluated in the literature and that quantifies the magnitude of their effects. Identifying the subgroups of students with the highest unmet needs for mental health treatment is critical for informing student mental health service planning, improving treatment rates, and reducing treatment inequities.

Perceived need for treatment is a critical intermediate outcome in the mental health treatment–seeking pathway (20). It is one of the strongest drivers of mental health treatment seeking in students, and the lack of perceived need for treatment has been reported as a major barrier to treatment (3, 19, 21, 22). The preference for handling mental health problems alone, the preference for receiving support from informal helpers rather than from professionals, and stigma are other commonly reported barriers to mental health treatment among students and may decrease perceived need for treatment (21, 23–25). Structural barriers to mental health treatment (e.g., cost, lack of culturally sensitive treatment options) are also frequently reported by students and may hinder access to treatment for students with a perceived need for treatment (21, 25, 26). Examining the extent to which the sociodemographic disparities in mental health treatment rates are attributable to differences in rates of perceived need for treatment can provide insight into the underlying causes of these disparities as well as the efforts needed to address them.

To this aim, we conducted a systematic review and meta-analysis to synthesize the results of past studies and quantify the sociodemographic correlates of having a perceived need for professional mental health treatment and of receiving professional mental health treatment among students experiencing mental health problems.

METHODS

This study was conducted as part of the WMH-ICS initiative (27). It was prospectively registered with the Open Science Framework on June 20, 2022 (https://osf.io/5ru4d?mode=&revisionId=&view_only=). No approval by an ethics committee was required.

Inclusion and Exclusion Criteria

Studies were included if they used a validated tool to report rates of perceived need for mental health treatment or mental health treatment rates among college students who screened positive for a mental health problem (psychological distress, mental disorder, or suicidal thoughts and behaviors), stratified by at least one sociodemographic characteristic of interest (gender, sex, race-ethnicity, sexual orientation, student type [e.g., undergraduate or graduate], student year, student status [international or domestic], or socioeconomic status). Studies were excluded if they were entirely qualitative, were retrieved from non–peer-reviewed sources (e.g., conference papers or dissertations), or included same-aged noncollege students in their sample, unless they reported rates separately for college students. Our search had no restriction on publication year but did not include studies published in books.

Study Identification and Selection

Studies were identified through the secondary screening of studies included in a broader systematic review on treatment-seeking intentions, behaviors, and barriers among college students (unpublished data; see https://doi.org/10.17605/OSF.IO/WEMZF for the protocol). Studies from the broader systematic review were retrieved through a systematic search of PubMed, PsycInfo, and Embase. (The PubMed search string is included in the online supplement to this review.) Studies cited in the reference lists of the included studies and studies included in related systematic reviews were also screened. Title and abstract screening and full-text screening were both conducted by at least two independent reviewers (J.P. [first author], Y.A., O.R., L.A.F., C.G., Franckie Castro-Ramirez). Discrepancies were resolved through discussion or consultation with an additional reviewer (P.C.). The search was conducted initially on June 22, 2021, and again on November 21, 2022.

Authors were contacted for studies that measured at least one sociodemographic characteristic of interest and reported on treatment-seeking rates among college students with a need for mental health treatment but that did not report rates stratified by all characteristics of interest. In cases where multiple studies reported on overlapping years or countries from the same survey, the corresponding author of the publication with the largest reported sample was contacted first, and authors of the other publications were contacted if no response was obtained. In cases where multiple publications reported on the exact same study sample, the corresponding author of the publication reporting more

sociodemographic characteristics of interest was contacted first, and authors of the other publications were contacted if no response was obtained. Authors were sent follow-up e-mails 10 and 20 days after initial contact if no response was obtained.

Data Extraction and Study Characteristics

Two of three reviewers (J.P. [first author], Y.A., S.N.C.) independently extracted data from each included study and all data shared by study authors by using a standardized form. Discrepancies were resolved through discussion and, if needed, consultation with a fourth reviewer (P.C.). The data extracted included characteristics of the study (authors, publication year, country, study design), characteristics of the sample (recruitment strategy, response rate, mean participant age, gender or sex distribution, student type, and student year), characteristics of the outcome (details of perceived need for treatment or treatment received and corresponding time frames), and outcome data (number of students who reported having received treatment or indicated a perceived need for treatment).

Quality Assessment

A modified version of the Newcastle-Ottawa Scale was used to evaluate risk of bias (28, 29). Sample representativeness, sample size, response rate, assessment of mental health problems, and quality of the reporting of descriptive statistics were assessed. (The full scale is included in the online supplement.) Each domain was assigned 0 points or 1 point (higher scores indicate less risk of bias), and studies with fewer than three domains met (i.e., <3 points) were considered to have high risk of bias. Two of three reviewers (J.P. [first author], Y.A., V.M.) independently evaluated the risk of bias of each study, and discrepancies were resolved through discussion.

Treatment-Seeking Outcomes

The two treatment-seeking outcomes of interest were having a perceived need for mental health treatment and receiving such treatment. The perceived need outcome evaluated whether participants reported needing professional treatment or thinking they needed professional treatment for mental health or substance use problems. The receiving treatment outcome evaluated whether participants received professional mental health treatment. Professional mental health treatment was defined as treatment (e.g., counseling or medication) from a professional (as defined by a given study) for a mental, psychological, or substance-related problem. Analyses of the receiving treatment outcome included participants with and participants without a perceived need for treatment. As such, disparities in the receiving treatment outcome may have been attributable to differences in perceived need for treatment.

Sociodemographic Characteristics

The sociodemographic characteristics examined were sex (male or female) and gender (man or woman), race-ethnicity (White, Asian, Black, Hispanic, non-White), sexual orientation (heterosexual, gay or lesbian, bisexual, other, non-heterosexual), student type (undergraduate, graduate, professional, graduate or professional), student year among undergraduates (first, second, third, or fourth), and student status (domestic or international). Although socioeconomic status (e.g., parents' education and financial situation) was also a sociodemographic characteristic of interest, measures of socioeconomic status were not reported in a sufficient number of studies to be included in analyses.

Sex and gender are distinct constructs that are interrelated and correlated. Sex (male, female, or intersex) is a biological measure, whereas gender (man, woman, nonbinary, etc.) captures social, cultural, and environmental factors, including gender identity and gender norms (30). With the exception of the 2020–2021 Healthy Minds Study data set, none of the included studies measured both sex and gender, and it is unclear whether the terms "sex" and "gender" were used interchangeably during data collection. As such, the sex and gender constructs were analyzed both in combination (i.e., by using a "sex or gender" construct) and separately, although an insufficient number of studies were available to evaluate the effects of gender separately for the perceived need analysis. To be consistent with data from the other Healthy Minds Study data sets, the "sex" construct from the 2020–2021 Healthy Minds Study data set was used for the combined analyses.

Race and ethnicity are also distinct constructs. The categorization of race is rooted in ancestral origin and physical characteristics, whereas ethnicity describes cultural identity (31). The data on race and ethnicity were limited by the measures reported in the included studies. Therefore, race and ethnicity were combined into one category. In addition, although the experiences of students from racial-ethnic minority groups are diverse, the broad category "non-White" was analyzed in addition to the more granular racial-ethnic minority categories because it allowed for the pooling of a greater number of studies. Of note, although the effects of race-ethnicity and student status may be particularly heterogeneous across cultural contexts, all studies evaluating these constructs were conducted in the United States.

The student year variable was used as a proxy for age because the age categories reported in included studies were often heterogeneous. Student year was evaluated only for undergraduate students in order to avoid grouping undergraduate, graduate, and professional (e.g., medical) students in the same year of their respective programs.

Mental Health Problems

Each of the included studies examined a defined subgroup of students experiencing specific mental health problems. The criteria used to define the subgroups varied across studies; some examined students experiencing specific conditions (e.g., depression, substance use disorder, suicidal thoughts and behaviors), whereas others examined students

experiencing at least one of a broader range of conditions. All analyses were limited to the subgroups of students experiencing a mental health problem defined in their corresponding studies.

The types of mental health problems experienced may mediate the relationships between sociodemographic characteristics and treatment outcomes. For example, men are more likely than women to experience substance use disorders, which are, in turn, associated with lower rates of perceived need for treatment and treatment receipt compared with mood and anxiety disorders (32, 33). Insufficient data were available to control for the type of mental health problem experienced; therefore, this review examined the total effect of sociodemographic characteristics on treatment seeking for the combined set of mental health problems included in each study.

Data Analysis

Because cross-sectional data were collected, prevalence ratios (PRs) were calculated to compare the prevalence of the treatment-seeking outcome in each sociodemographic group of interest with the corresponding prevalence of the treatment-seeking outcome in a predetermined reference group. The reference groups were male (sex), man (gender), White (race-ethnicity), heterosexual (sexual orientation), undergraduate (student type), first (student year), and domestic (student status). The number of events (i.e., the number of students who reported receiving treatment or indicated a perceived need for treatment) and sample sizes were extracted for each sociodemographic group (e.g., first-year undergraduate students). PRs were calculated by dividing the prevalence of the outcome in the group of interest by the prevalence of the outcome in the reference group.

PRs do not follow a normal distribution. Therefore, the PRs were transformed into log PRs, pooled, and then back-transformed after pooling. The Mantel-Haenszel exact method was used to pool studies. Given the heterogeneity between studies, random-effects models were used for all meta-analyses. The restricted maximum-likelihood estimator was used to estimate τ^2, and Knapp-Hartung adjustments were used when calculating the confidence interval (CI) of the pooled effect size (34).

Meta-analyses were conducted separately for every PR (i.e., comparison of rates between a sociodemographic group and its corresponding reference group) for each outcome (i.e., treatment received or perceived need for treatment) that was measured in at least three studies. At least 10 participants in each subgroup (e.g., male sex) were required to be included in a corresponding meta-analysis. The study time point closest to "current" was included in the overall meta-analysis for studies reporting multiple time points. As a sensitivity analysis, time point–specific meta-analyses were conducted for time points with a sufficient number of studies. When sufficient data were available, sensitivity analyses excluding studies with a high risk of bias were performed. Patterns of treatment seeking may differ between mental health conditions and alcohol use– or substance use–related conditions. Consequently, sensitivity analyses excluding studies evaluating alcohol use– or substance use–related conditions were also conducted. Sensitivity analyses limited to American studies were conducted because a majority of the studies were conducted in the United States.

The I^2 heterogeneity statistic and its 95% CI were used to evaluate heterogeneity of effect sizes. An I^2 value of 25% was considered low heterogeneity, 50% was considered moderate heterogeneity, and 75% was considered substantial heterogeneity (35). Prediction intervals were also calculated to indicate the range in which the true effect size would fall in 95% of populations (36). To assess publication bias (small-sample bias), funnel plots were generated and inspected for each primary meta-analysis. In addition, bias-corrected estimates of effect size were calculated by using the Duval-Tweedie trim-and-fill method and were compared with the original effect sizes as a sensitivity analysis. The Duval-Tweedie trim-and-fill method imputes "missing" effects to adjust for funnel plot asymmetry (37). Individual PRs with CIs that did not overlap with the CI of the pooled PR were considered outliers. When outliers were identified, analyses were performed both with and without outliers, and both results were reported.

All meta-analyses were conducted by using the meta package in R, version 4.1.2. A significance level of $p<0.05$ was used for all analyses.

RESULTS

Inclusion of Studies

Through database searches, 7,355 studies were identified. The full texts of 638 studies were screened for the broader review, and 56 studies qualified for inclusion. Of those studies, 20 qualified for inclusion in this review. The data set from one additional study identified through author correspondence qualified for inclusion in this review, yielding a total of 21 included studies. Primary outcome data provided by the study authors were used for 17 of the included studies. The PRISMA (38) flow chart and further details on the study selection process are available in the online supplement.

Study Characteristics

The characteristics of the included studies are presented in Table 1 (7, 17, 21, 39–56), and the assessment tools and cutoff scores used to define the psychological conditions are described in the online supplement. Of the 21 included studies, 14 were conducted in the United States, two in Africa, three in Europe, and one in Asia, and one was a cross-national study. Ten of the included studies evaluated broad college student populations, eight evaluated undergraduate students, two evaluated first-year students, and one evaluated medical, dentistry, and veterinary students. Average ages ranged from 18.8 to 23.6 years, and most study samples were

predominantly female and White. Although a wide range of mental health problems was evaluated, depression and suicidal thoughts and behaviors were reported most frequently.

Risk of Bias

The results of the risk-of-bias assessment are presented in Table 2. Of the 21 studies assessed, seven were considered to have a high risk of bias (i.e., fewer than three domains were met). The highest risk of bias was associated with the nonrespondents (response rate) domain, which was met in only three studies, followed by the sample size and representative sample domains, which were each met in 10 studies. Sixteen studies met the reporting of descriptive statistics domain, and all studies met the assessment of mental health problems domain.

Perceived Need for Professional Mental Health Treatment

The pooled PRs of perceived need for professional mental health treatment among students experiencing mental health problems are presented in Table 3. Students identifying as female or as women (sex or gender; combined PR=1.21) had a statistically significantly higher prevalence of perceived need than students identifying as male or men, as did nonheterosexual students (PR=1.13) compared with heterosexual students. Black students (PR=0.96) and non-White students overall (PR=0.92) had a significantly lower prevalence of perceived need than White students. Although third-year undergraduate students (PR=1.11) had a significantly higher prevalence of perceived need than first-year students, no clear gradient was found between student year and perceived need for treatment. No significant trends in perceived need were found by student type or student status. Heterogeneity, as measured by I^2, varied across analyses from low (0%) to substantial (89.8%). No outliers were identified. Results of the analyses excluding studies with a high risk of bias are presented in Table S2 in the online supplement; no change in direction of effect was found compared with the main analysis. Insufficient data were available to conduct any time point–specific perceived need analyses. Excluding studies evaluating alcohol use– or substance use–related conditions resulted in negligible changes in the magnitudes of effect and did not change any directions of effect (Table S3 in the online supplement). The effects of excluding studies conducted outside the United States were also negligible (Table S4 in the online supplement).

Receiving Professional Mental Health Treatment

The pooled PRs of receiving professional mental health treatment among students experiencing mental health problems are presented in Table 4. Students identifying as female or as women (sex or gender; combined PR=1.33) had a significantly higher treatment rate than students identifying as male or as men. Gay or lesbian students (PR=1.44), bisexual students (1.47), and nonheterosexual students overall (PR=1.41) had significantly higher treatment rates than heterosexual students. Asian (PR=0.49), Hispanic (PR=0.68), and non-White students overall (PR=0.69) had significantly lower treatment rates than White students, and international students (PR=0.63) had significantly lower treatment rates than domestic students. Although Black students reported lower treatment rates than White students, this finding was not significant. When the outlier study (44) was excluded, the trend among Black students became significant (PR=0.63) (Table S5 in the online supplement). Professional students (PR=1.28) had a significantly higher treatment rate than undergraduate students. Although graduate students had higher treatment rates than undergraduate students, and treatment rates appeared to increase with increasing student year among undergraduate students, these trends were not significant.

Heterogeneity varied across analyses from low (0.0%) to substantial (90.3%). Results of the analyses excluding outliers are presented in Table S5 in the online supplement; although the trend among Black students became significant, no change in direction was found. In addition, results of the analyses excluding studies with a high risk of bias are presented in Table S6 in the online supplement; no significant change in direction of effect was found compared with the main analysis. Three time point–specific analyses were conducted (current, past 12 months, lifetime) (Tables S7–S9 in the online supplement). The direction of effects in the time point–specific analyses was consistent with that of the main analysis. Excluding studies evaluating alcohol use– or substance use–related conditions attenuated the magnitude of the disparity by sex and gender (Table S10 in the online supplement). When studies conducted outside the United States were excluded, the magnitude of the disparities by sex or gender and by sex only increased (Table S11 in the online supplement).

Assessment of Publication Bias

The bias-corrected pooled PRs of perceived need for treatment and of receiving treatment are presented in Tables S12 and S13 in the online supplement. The effects of the bias correction varied across analyses, increasing the magnitude of some pooled PRs and decreasing the magnitude of others. In the perceived need analysis, the trends among students identifying as female, non-White students, and third-year students lost significance, suggesting that the effects of small-sample bias may have inflated the magnitude of the pooled PRs. Conversely, in the receiving treatment analysis, the trend among Black students gained significance, suggesting that small-sample bias may have diminished the magnitude of the pooled PR.

DISCUSSION

Main Results

This study sought to identify and quantify sociodemographic disparities in treatment seeking among college students

TABLE 1. Characteristics of included studies on mental health treatment seeking among college students (N=21 studies)

Study	Country	Sample (N)[a]	Age in years (M)	Female (%)	White (%)	Mental health problems	Treatment-seeking outcomes	Treatment-seeking measure
Borsari et al. (39)	United States	Undergraduate students (N=98)	19.3	54	74	Heavy drinking or heavy drinking, depression, and PTSD	Perceived need for treatment	"I think I should get therapy/counseling for my psychological distress"
Bruffaerts et al. (7)	Cross-national	First-year students (N=6,644)	19.3	58	na	Major depressive episode, generalized anxiety disorder, panic disorder, broad mania, alcohol abuse or dependence, drug abuse or dependence, or suicidal thoughts and behaviors	Treatment received	Not reported; treatment was defined as "psychological counseling or medication for an emotional or substance problem"
Buscemi et al. (40)	United States	Undergraduate students (N=197)	19.4	54	69	Depression	Treatment received	Not reported; treatment was defined as "receiving formal help (with the campus counseling center, a counselor/psychologist, or a doctor or nurse at the campus health center)"
Caldeira et al. (41)	United States	Undergraduate students (N=548)	na	54	71	Substance use disorder	Perceived need for treatment	"At any time since starting college, did you need any help or treatment for drug or alcohol use?"
Capron et al. (42)	United States	Undergraduate students (N=222)	na	na	na	Hazardous drinking	Treatment received	Not reported; treatment was defined as "receiving treatment (counseling or medication) for [mental health] or alcohol problems (from a clinical psychologist, counselor, or [general practitioner])"
Dunbar et al. (43)	United States	College students (N=6,283)	na	54	37	Psychological distress	Treatment received	"Did you end up receiving psychological or mental health services on campus?" An additional question was asked about using mental health services off campus, but results were not reported
Eisenberg et al. (21)	United States	College students (N=4,234)	na	57	66	Depression, panic disorder, anxiety, suicidal ideation, nonsuicidal self-injury	Perceived need for treatment and treatment received	Perceived need: "In the past 12 months, did you think you needed help for emotional or mental health problems such as feeling sad, blue, anxious, or nervous?"; treatment received: not reported; treatment was defined as receiving therapy or counseling for mental or emotional health or taking any psychotropic medications at least several times per week
Eisenberg et al. (44)	United States	College students (N=228)	na	52	68	Eating disorder	Perceived need for treatment and treatment received	Perceived need: "Did you think you needed help for emotional or mental health problems such as feeling sad, blue, anxious, or nervous?"; treatment received: not reported; treatment was defined as "receiving counseling or therapy for . . . mental health or emotional health from a health professional (psychiatrist, psychologist, social worker, or physician), or tak[ing] any psychotropic medications"

continued

TABLE 1, *continued*

Study	Country	Sample (N)[a]	Age in years (M)	Female (%)	White (%)	Mental health problems	Treatment-seeking outcomes	Treatment-seeking measure
Gebreegziabher et al. (45)	Ethiopia	Undergraduate students (N=444)	21.2	29	na	Psychological distress	Treatment received	Not reported; treatment was defined as receiving help for a psychological or emotional problem from a professional with a "recognized role and appropriate training in providing help and advice, such as mental health professionals, teachers, and other mental health professionals"
Healthy Minds Study (46)	United States	College students (N=63,941)	23.6	69	59	Depression, anxiety, suicidal thoughts, or self-harm behaviors	Perceived need for treatment and treatment received	Perceived need: not reported; treatment received: not reported; treatment was defined as receiving any medication or therapy
Horwitz et al. (47)	United States	College students (N=3,358)	na	62	59	Elevated suicide risk (screening positive for ≥2 of depression, alcohol use, suicidal ideation, or suicide attempt)	Treatment received	"In the past 12 months, have you taken any of the following types of medications at least several times a week with a prescription from a health professional (select all that apply): psychostimulants, antidepressants, antipsychotics, antianxiety medications, mood stabilizers, sleep medications, other medication for mental or emotional health (specify), none"; "In the past 12 months, have you received counseling or therapy for your mental or emotional health from a health professional (such as psychiatrist, psychologist, social worker, or primary care doctor)?"
Hubbard et al. (48)	United States	College students (N=136)	19.6	67	57	Psychological distress	Treatment received	Not reported; treatment was defined as "receiving professional help for a psychological problem or disorder," and professionals included psychologists, social workers, counselors, psychiatrists, and general medical doctors
Janota et al. (49)	France	First-year students (N=627)	18.8	73	na	Suicidal thoughts	Perceived need for treatment and treatment received	Perceived need for treatment: exact question not reported; participants were asked whether "there was a time during the past 12 months when they felt they might have needed psychological counseling or medication for any emotional or substance use problem"; treatment received: not reported; treatment was defined as receiving psychological counseling or medication for an emotional or substance use problem
Knipe et al. (50)	United Kingdom	Medical, dentistry, and veterinary students (N=27)	21.0	76	na	Depression or suicidal behaviors	Treatment received	Not reported; treatment was defined as seeking professional help from a general practitioner, faculty staff, or university support staff

continued

TABLE 1, *continued*

Study	Country	Sample (N)[a]	Age in years (M)	Female (%)	White (%)	Mental health problems	Treatment-seeking outcomes	Treatment-seeking measure
Lipson et al. (17)	United States	College students (N=21,460)	na	56	71	Depression, anxiety, suicidal ideation, or nonsuicidal self-injury	Treatment received	"In the past 12 months, have you received counseling or therapy for your mental or emotional health from a health professional?"; "In the past 12 months, have you taken any of the following types of prescription medications?"
Lipson et al. (51)	United States	College students (N=18,322)	na	57	71	Depression, anxiety, eating disorder, nonsuicidal self-injury, or suicidal ideation	Treatment received	Not reported; treatment was defined as psychotropic medication use or mental health therapy
Nam et al. (52)	United States	Undergraduate students (N=190)	na	68	70	Suicidal thoughts	Perceived need for treatment and treatment received	Perceived need: "I felt the need for mental health services over the past year"; treatment received: not reported; treatment was defined as having "an appointment with a psychiatrist, clinical psychologist, or other mental health professional"
Negash et al. (53)	Ethiopia	Undergraduate students (N=339)	21.5	40	na	Psychological distress	Perceived need for treatment and treatment received	Perceived need: "Was there ever a time when you thought you should see a doctor, counselor, or other health professionals for your mental distress, but you did not go in the past 3 months?"; treatment received: not provided; treatment was defined as receiving formal mental health care from a doctor or psychologist
Sasaki (54)	Japan	Undergraduate students (N=122)	20.9	49	na	Depression, somatic symptoms, anxiety, or insomnia	Perceived need	"Do you need some mental health services now?"
Wadman et al. (55)	United Kingdom	College students (N=102)	20.7	85	na	Psychological distress	Treatment received	"Are you currently having any counseling or therapy for a mental, nervous, or emotional problem, e.g., at home, at a doctor's surgery, at a health care, hospital, or clinic?"; "In the past 12 months, have you spoken to a [general practitioner] or family doctor on your own behalf, either in person or on the telephone about being anxious or depressed about a mental, nervous, or emotional problem?"
Whitlock et al. (56)	United States	College students (N=1,776)	20.5	71	64	Nonsuicidal self-injury	Treatment received	Not reported; treatment was defined as going to therapy for any reason

[a] Sample N refers to the number of students with mental health problems.

TABLE 2. Risk-of-bias assessment with a modified version of the Newcastle-Ottawa Scale (N=21 studies)[a]

Study	Total score	Representative sample	Sample size	Nonrespondents	Assessment of mental health problems	Reporting of descriptive statistics
Borsari et al. (39)	2	0	0	0	1	1
Bruffaerts et al. (7)	4	1	1	0	1	1
Buscemi et al. (40)	2	0	0	0	1	1
Caldeira et al. (41)	2	0	0	1	1	0
Capron et al. (42)	1	0	0	0	1	0
Dunbar et al. (43)	3	1	1	0	1	0
Eisenberg et al. (21)	4	1	1	0	1	1
Eisenberg et al. (44)	3	0	1	0	1	1
Gebreegziabher et al. (45)	3	0	0	1	1	1
Healthy Minds Study (46)	na[b]	1	1	na[b]	1	1
Horwitz et al. (47)	4	1	1	0	1	1
Hubbard et al. (48)	3	1	0	0	1	1
Janota et al. (49)	3	0	1	0	1	1
Knipe et al. (50)	2	0	0	0	1	1
Lipson et al. (17)	3	1	1	0	1	0
Lipson et al. (51)	4	1	1	0	1	1
Nam et al. (52)	1	0	0	0	1	0
Negash et al. (53)	3	0	0	1	1	1
Sasaki (54)	3	1	0	0	1	1
Wadman et al. (55)	2	0	0	0	1	1
Whitlock et al. (56)	4	1	1	0	1	1

[a] Each domain of bias was assigned 0 points or 1 point. Total possible scores range from 0 to 5, with higher scores indicating less risk of bias.
[b] The nonrespondent score and total score could not be calculated for the Healthy Minds data set because the associated data were not included in the data set.

experiencing mental health problems. By using meta-analyses, we calculated pooled PRs of perceived need for treatment and of receiving treatment for the variables of sex, gender, sexual orientation, student type, student year, race-ethnicity, and student status subgroups.

Sex and gender. Students identifying as female or as women reported significantly higher treatment rates and rates of perceived need for treatment than students identifying as male or as men. The magnitude of the difference in perceived need was relatively large, suggesting an important

TABLE 3. Pooled prevalence ratios (PRs) of perceived need for professional mental health treatment among college students with mental health problems, across time points

Sociodemographic characteristic	Pooled PR	95% CI	Prediction interval	p	Studies combined (N)	I^2 (%)
Female or woman (sex or gender; reference: male or man)	1.21	1.04–1.41	.85–1.72	.022	9	81.5
Female (sex only; reference: male)	1.20	1.03–1.39	.83–1.73	.025	8	83.0
Race-ethnicity (reference: White)						
Asian	.82	.61–1.12	.12–5.55	.111	3	89.8
Black	.96	.95–.97	.93–.99	.003	4	.0
Multiracial	1.00	.97–1.03	.94–1.07	.922	3	48.0
Non-White	.92	.86–1.00	.79–1.09	.046	6	57.6
Nonheterosexual orientation (reference: heterosexual)	1.13	1.09–1.18	1.00–1.28	.002	4	.0
Student type (reference: undergraduate)						
Graduate (master's or doctoral)	1.03	.94–1.13	.59–1.80	.307	3	60.3
Professional	1.01	.99–1.02	.85–1.19	.325	3	.0
Graduate or professional	1.02	.95–1.11	.64–1.63	.311	3	47.9
Student year (undergraduate students only; reference: first)						
Second	1.07	.96–1.19	.86–1.33	.161	6	52.7
Third	1.11	1.03–1.20	.87–1.42	.020	6	67.8
Fourth	1.08	.91–1.28	.72–1.60	.298	5	78.0
International student (reference: domestic)	.88	.63–1.22	.18–4.21	.230	3	78.5

TABLE 4. Pooled prevalence ratios (PRs) of receiving professional mental health treatment among college students with mental health problems, across time points

Sociodemographic characteristic	Pooled PR	95% CI	Prediction interval	p	Studies combined (N)	I^2 (%)
Female or woman (sex or gender; reference: male or man)	1.33	1.16–1.54	.92–1.94	.001	15	79.3
Female (sex only; reference: male)	1.31	1.07–1.59	.89–1.93	.015	8	58.3
Woman (gender only; reference: man)	1.42	1.17–1.71	.96–2.10	.003	8	85.1
Race-ethnicity (reference: White)						
Asian	.49	.38–.62	.27–.88	<.001	7	78.1
Black	.75	.47–1.20	.19–2.94	.191	8	89.3
Hispanic	.68	.57–.82	.42–1.12	.003	6	88.0
Multiracial	.93	.82–1.05	.70–1.23	.186	5	69.4
Non-White	.69	.60–.80	.52–.92	<.001	10	84.3
Sexual orientation (reference: heterosexual)						
Gay or lesbian	1.44	1.39–1.50	1.34–1.56	<.001	4	.0
Bisexual	1.47	1.44–1.49	1.27–1.69	<.001	3	.0
Other	1.22	.92–1.63	.22–6.77	.094	3	70.6
Nonheterosexual	1.41	1.30–1.54	1.15–1.74	<.001	8	67.0
Student type (reference: undergraduate)						
Graduate (master's or doctoral)	1.14	.95–1.38	.75–1.74	.103	4	90.3
Professional	1.28	1.18–1.39	.83–1.98	.006	3	.0
Graduate or professional	1.16	1.06–1.28	.98–1.39	.013	4	44.6
Student year (undergraduate students only; reference: first)						
Second	1.02	.98–1.05	.97–1.06	.366	7	.0
Third	1.08	.85–1.37	.65–1.78	.459	7	33.5
Fourth	1.11	.81–1.51	.67–1.83	.467	7	46.6
International student (reference: domestic)	.63	.44–.90	.24–1.67	.023	5	85.8

contributing role of perceived need in the observed sex or gender disparities. The effects of sex and gender were challenging to disentangle, and it was difficult to discern the extent to which the identified trends were driven by each construct. Overall, however, the observed trends are consistent with the literature, which suggests that male students report decreased help-seeking attitudes and behaviors compared with female students and that men report decreased help-seeking attitudes and behaviors compared with women (7, 9, 57). Of note, excluding studies evaluating alcohol use– or substance use–related conditions attenuated the magnitude of the disparities by sex and gender. This finding suggests that alcohol use– and substance use–related conditions may be associated with larger sex and gender disparities, although further research is needed to confirm this trend, given that few studies have examined this relationship.

Sexual orientation. Nonheterosexual students reported significantly higher treatment rates than heterosexual students. Nonheterosexual students also reported significantly higher rates of perceived need for treatment, although the magnitude of this difference was relatively small compared with the overall disparity in treatment rates. As expected, when examined individually, the gay or lesbian subgroup and the bisexual subgroup of students also reported higher rates of treatment receipt than did heterosexual students. Unfortunately, an insufficient number of studies were available to evaluate differences in perceived need among these groups. These findings align with the literature; lesbian, gay, bisexual, queer, or questioning (LGBQQ) students and nonheterosexual students (overall) experiencing mental health challenges have reported higher rates of mental health treatment than their peers (7, 43). Furthermore, in the general population, lesbian, gay, and bisexual individuals with mental disorders have reported higher levels of perceived need for treatment than their peers (58). The higher rate of treatment seeking among nonheterosexual students may stem from having more facilitators of receiving treatment (e.g., lower levels of mental health stigma have been reported among LGBQQ students) or their greater need for treatment (e.g., sexual minority students may experience increased discrimination and harassment) (43, 59). Further research is needed to better understand the reasons underlying these trends.

Student type and student year. Professional students reported significantly higher treatment rates than did undergraduate students, and, although the finding was not statistically significant, graduate students also reported higher treatment rates than undergraduate students. Because only four studies were included in the graduate student meta-analysis, the lack of significance in the graduate student subgroup may have been due to a lack of power. There were no significant trends by student type in perceived need for treatment, and the magnitudes of the corresponding PRs were negligible,

suggesting that differences in other barriers predominantly drive the observed disparities. Among undergraduate students, the trends by student year were unclear; the only statistically significant difference reported was a higher rate of perceived need for treatment among third-year students compared with first-year students. Overall, student type appears to have a greater influence on treatment rates than student year, and younger undergraduate students may be a target for further mental health supports. These findings broadly align with the literature; a large American study reported that master's and doctoral students who screened positive for a mental health problem had marginally higher treatment rates than their undergraduate counterparts (17). Another American study reported that, among students who had received treatment, graduate students attended significantly more sessions than undergraduate students (11).

Race-ethnicity. Racial-ethnic treatment disparities vary across cultural contexts. As previously noted, the studies included in the race and ethnicity analyses were all conducted in the United States, and, as such, the following findings are specific to American contexts. Non-White students had significantly lower treatment rates than White students as well as significantly lower rates of perceived need for treatment. The difference in treatment rates was much larger than the difference in perceived need for treatment, indicating a greater role of other barriers in the observed disparity. The category of non-White students is highly heterogeneous; therefore, analyses were also conducted for individual racial-ethnic subgroups with sufficient data. Asian and Hispanic students reported significantly lower rates of treatment receipt than did White students, with Asian students reporting the lowest treatment rate. Black students reported significantly lower rates of perceived need for treatment compared with White students, although the difference was small. Although no significant trend emerged in perceived need for treatment among Asian students, this group had the lowest pooled PR, and the lack of statistical significance may have been due to lack of power (only three studies were included in the meta-analysis). These trends are well documented in the literature. Asian students, Black students, Hispanic students, and non-White students overall have consistently reported lower rates of mental health treatment compared with White students, with Asian students reporting particularly low rates of treatment (5, 9, 11, 12, 59).

Student status. As with race-ethnicity, the effects of student status vary across cultural contexts. The studies included in the student status analyses were also all conducted in the United States. Therefore, findings were specific to American contexts. International students had significantly lower treatment rates than domestic students, although no significant differences in rates of perceived need for treatment were observed, and the magnitude of the perceived need PR was relatively small. This finding suggests a greater contributing role of other barriers in the overall treatment disparities for international students. These findings align with the literature; a 2010 review also found that international students had lower rates of service use than domestic students (3). Further, in a 2019 Australian study, the sampled domestic and international students did not indicate any significant differences in intention to seek help for emotional problems, although domestic students had over double the rate of lifetime mental health service use (13).

Limitations and Strengths

This review's results must be interpreted in the context of several limitations. First, many meta-analyses had high levels of heterogeneity; 21 of the 33 primary meta-analyses conducted had I^2 values that indicated moderate-to-substantial heterogeneity. The highest levels of heterogeneity were associated with gender, race-ethnicity, student type, and student status. Heterogeneity may have arisen from variation in the study settings; treatment disparities have been found to vary across cultures (60). Second, the exclusion of studies conducted outside the United States was associated with an increased magnitude of treatment disparity by sex or gender, further suggesting cultural variation in treatment disparities. Rates of service use have also been found to vary widely across colleges, even within the United States, suggesting that the tailored mental health supports available to traditionally underserved students (e.g., racial-ethnic minority students and international students) may vary across college settings as well (19). Third, heterogeneity may have also arisen from variation in mediating factors, such as mental health conditions, levels of symptom severity, and comorbid conditions. Last, some heterogeneity may be attributable to heterogeneity within subgroups. Because of limitations in the available data, the broad categories of non-White and nonheterosexual were used despite encapsulating a wide diversity of identities. The other racial-ethnic categories, such as Asian, also encapsulate a wide range of identities from a diversity of cultures. Given the high heterogeneity, results should be interpreted cautiously, may be skewed by the characteristics of the included studies, and cannot necessarily be generalized to all students within each subgroup. Stratified analyses or meta-regressions may be used in future studies to evaluate context-specific disparities as well as disparities controlling for possible mediators.

Similarly, because individual respondent data were not obtained, this study reported unadjusted effect sizes and could not control for potential confounding factors, such as other sociodemographic characteristics. Furthermore, cross-sectional data were used; hence, causal relationships cannot be assumed in the identified disparities.

Despite these limitations, this study had several strengths: a thorough search strategy was used, a rigorous author-contacting strategy enabled the inclusion of otherwise unpublished data from 17 studies, and a wide range of sociodemographic characteristics was evaluated. Sociodemographic differences in rates of perceived need for treatment were also evaluated, providing more in-depth insight into the identified disparities. Together, these factors allowed for a

thorough examination of the sociodemographic disparities in mental health treatment seeking among college students experiencing mental health problems.

Future Directions

More research is needed on mental health treatment seeking among students with low socioeconomic status, gender minority (i.e., nonbinary) students, and students from racial-ethnic minority groups (e.g., Indigenous or Middle Eastern). In addition, social identities do not exist in a vacuum; the intersectionality framework describes how the effects of social categories can intersect (61). For example, the effects of belonging to a racial-ethnic minority group may be magnified for international students with lower levels of acculturation. Future research on the intersectional effects of sociodemographic characteristics on treatment seeking is therefore also needed.

Further research should also quantify the extent of sociodemographic disparities throughout the mental health treatment pathway. For example, this review did not evaluate disparities in the number of treatment sessions attended by students who received mental health treatment, and sociodemographic disparities in this domain have been documented in the literature (10). The true sociodemographic disparities in the mental health treatment experiences of students may be greater than those identified in this review.

Finally, further research is needed on the reasons underlying the identified trends. Although the perceived need analyses provide broad insight into the reasons underlying treatment disparities, differences in perceived need for treatment may stem from differences in a wide range of factors, including stigma, levels of mental health literacy, treatment preferences, and symptomatology. Qualitative research on the mental health treatment barriers, facilitators, and needs of the subgroups of students experiencing the greatest treatment disparities would provide more nuanced insights to guide policy makers in addressing barriers throughout the treatment-seeking pathway in order to better support underserved subgroups of students in receiving mental health care.

CONCLUSIONS

Through a comprehensive examination of the literature, this study identified a range of sociodemographic disparities in treatment seeking among college students experiencing mental health problems. Students belonging to racial-ethnic minority groups (in particular, Asian students attending college in the United States), international students, and students identifying as male or as men had the lowest comparative rates of treatment. Differences in rates of perceived need appeared to contribute to some of the overall treatment disparities, particularly among students identifying as male or as men, who reported relatively low rates of perceived need for treatment. That said, some overall treatment disparities extended well beyond those attributable to perceived need. Students belonging to racial-ethnic minority groups and international students reported considerably lower treatment rates than did White and domestic students, respectively, yet differences in perceived need were comparatively small. Together, these findings highlight heterogeneity in the underlying causes of the identified sociodemographic disparities in student mental health treatment seeking and, by extension, heterogeneity in the efforts needed to address these disparities. Findings also indicate the need for policy makers to address barriers throughout the treatment-seeking pathway by helping students recognize when they may benefit from treatment and by supporting students with a perceived need for treatment in accessing care. Coengagement with subpopulations of students is critical for guiding future research and treatment initiatives.

AUTHOR AND ARTICLE INFORMATION

Department of Psychiatry (Pei, Vigo) and School of Population and Public Health (Pei, Vigo, Puyat), University of British Columbia, Vancouver; Department of Clinical, Neuro-, and Developmental Psychology, Vrije Universiteit Amsterdam, Amsterdam (Amanvermez, Cuijpers); Department of Health Care Policy, Harvard Medical School, Boston (Kessler); Health Services Research Unit, Hospital del Mar Research Institute, Barcelona, Spain, and Consorcio Centro de Investigación Biomédica en Red en Epidemiología y Salud Pública, Madrid (Mortier); Center for Public Health Psychiatry, Katholieke Universiteit Leuven, Leuven, Belgium (Bruffaerts); Department of Psychology, Harvard University, Cambridge, Massachusetts (Rankin); Relate Mental Health Malaysia, Kuala Lumpur, and School of Biological Sciences, Nanyang Technological University, Singapore (Chua); Centro de Medicina Reproductiva y Desarrollo Integral del Adolescente, Facultad de Medicina, Universidad de Chile, and Millennium Nucleus to Improve the Mental Health of Adolescents and Youths, Santiago, Chile (Martínez); Department of Psychological Medicine (Rapsey) and Department of Psychology (Garcia), University of Otago, Dunedin, New Zealand; International Institute for the Advanced Studies of Psychotherapy and Applied Mental Health, Babeș-Bolyai University, Cluj-Napoca, Romania (Fodor, David, Cuijpers). Send correspondence to Ms. Pei (juliapei@student.ubc.ca).

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