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Mental Health Challenges Among Chinese International Students During COVID-19: A Systematic Review and Meta-Analysis of Depression and Anxiety

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ABSTRACT

The COVID-19 pandemic has disproportionately impacted the mental health of international students, particularly Chinese international students (CISs), who have faced heightened sociocultural stressors and racial discrimination. This review examines the prevalence of depression and anxiety among CISs and explores associated factors via the socioecological model. Nine electronic databases were searched from January 2020 to July 2023. A proportional meta-analysis using random effects models estimated the prevalence of depression in nine studies ($n = 4,784$ CISs) and that of anxiety in nine studies ($n = 5,701$ CISs). The pooled prevalence was 51% (95% CI: 36%–65%) for depression and 48% (95% CI: 35%–62%) for anxiety. A qualitative synthesis of associated factors included 23 studies involving 19,802 cases of CIS. Related factors included fear of infection, family conflicts, sociocultural dilemmas, and discrimination. Institutional support and Chinese cultural beliefs. These findings highlight the urgent need for culturally sensitive, evidence-based interventions to support CISs' mental well-being during global crises.

Keywords: Anxiety, Chinese international students, COVID-19, depression, mental health, meta-analysis, systematic review

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INTRODUCTION

In December 2019, an outbreak of atypical pneumonia in Wuhan, China marked the emergence of what the World Health Organization officially named Coronavirus Disease 2019 (COVID-19) in March 2020 (Cucinotta & Vanelli, 2020). To control the spread of viruses, governments worldwide implemented stringent public health measures, including large-scale lockdowns, travel restrictions, social distancing, and closures of public facilities (Wilder-Smith & Freedman, 2020). While necessary for controlling the pandemic, these measures disrupted people's daily life and significantly affected public mental health (Salari et al., 2020). Amidst this global upheaval, the mental health of students has emerged as a topic of significant concern. A meta-analysis revealed that during the early stage of the COVID-19 pandemic, the prevalence of depression and anxiety among college students was 39% and 36%, respectively (Y. Li et al., 2021). Compared to domestic students, international students faced additional stressors from school closures, an abrupt shift to remote learning, travel restrictions, and uncertainties surrounding their visa statuses due to the pandemic (Kivelä et al., 2022). Many international students struggle with social isolation and xenophobia in their host countries, further exacerbating mental health challenges (Hamza et al., 2021). Regrettably, both their home countries and host regions often overlook their mental health (J. H. Chen et al., 2020). The experiences of Chinese international students (CISs) are particularly complex, as they not only face the usual pressures of adjusting to a foreign environment but also face the additional burden of COVID-19-related discrimination and Sinophobia (Cheah et al., 2023; Yin et al., 2024).

Chinese international students (CISs) are Chinese citizens enrolled in noncredit and credit courses and accredited education institutions outside mainland China (Santos, 2022). For decades, Chinese students constitute the largest cohort of international students worldwide (Organization for Economic Co-operation and Development, 2023), making their experiences critical for understanding the broader impact of the pandemic on student mobility and well-being. Before the pandemic, CISs were reported to be susceptible to mental health issues, with a high prevalence of depression and anxiety (J. A. Chen et al., 2015).

They also experience mental health stigma and low mental health literacy, making them less likely to seek professional support (Lu et al., 2013). The pandemic further intensified these challenges by disrupting their academic progress, social connections, and future career plans (Firang & Mensah, 2022).

Studies indicate that mental health support systems for international students during pandemics are often insufficient, making them vulnerable to worsening psychological distress (Moscaritolo et al., 2022). A recent systematic review highlights that CISs experience unique academic, sociocultural, and psychological adaptation challenges, further emphasizing the need for evidence-informed and cultural interventions (Xue & Singh, 2025). Despite these documented struggles, no prior review has systematically estimated the pooled prevalence of depression and anxiety symptoms among CISs in the pandemic period. Additionally, although factors associated with the mental health outcomes of CISs have been discussed across various studies, there has been no comprehensive synthesis of these factors using a structured framework.

To address this gap, we conducted a systematic review and meta-analysis to (1) estimate the pooled prevalence of depression and anxiety symptoms among CISs during the COVID-19 pandemic and (2) synthesize factors associated with mental health outcomes examined among CISs during the COVID-19 pandemic. The findings can inform the development of culturally responsive interventions to support CISs in post-pandemic recovery and enhance mental health resources for international students worldwide.

METHOD

The systematic review protocol was developed in accordance with the Joanna Briggs Institute manual for systematic reviews (Aromataris & Munn, 2020). It was registered in the International Prospective Register of Systematic Reviews (PROSPERO) with the registration number CRD42023437435. This systematic review and meta-analysis were reported by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) 2020 guidelines (Page et al., 2021).

Search strategy

Research articles published from January 2020 to June 2023 were searched in Web of Science, PubMed, Medical Literature Analysis and Retrieval System Online (MEDLINE), the Cumulative Index to Nursing and Allied Health Literature database (CINAHL) and PsycINFO via the formula with keywords ("international student*" OR "overseas student*" OR "mobile student*" OR "outbound student*" OR "exchange student*" OR "student exchange" OR "cross border" OR "cross border student*" OR "student mobility" OR "study* abroad" OR "international exchange program*" OR "cross border education") AND (social* OR emotion* OR psych* OR mental*) AND (COVID-19 OR coronavirus OR pandemic). The Japanese Medical Abstract Society and Citation Information by National Institute of Informatics were searched for Japanese

literature. The China National Knowledge Infrastructure (CNKI) and WanFang databases were searched for Chinese literature. The reference lists of all included articles were screened for additional articles.

Eligibility criteria

We applied the following inclusion criteria: (1) peer-reviewed original research articles published in English, Chinese, or Japanese; (2) Chinese international students included as participants; and (3) mental health outcomes (i.e., depression, anxiety) were assessed via standardized research methods. The exclusion criteria were as follows: (1) Chinese international students were not included as participants or as an independent group within any analyses; (2) mental health problems were not assessed; (3) they were published in languages other than English, Chinese or Japanese; and (4) they were gray or unpublished literature, editorial letters, dissertations and theses, conference abstracts, correspondences, or economic analyses.

Study selection

We imported all identified citations into Endnote and removed duplicates. The first and third authors screened the titles and abstracts. The full texts of potentially relevant sources were retrieved. The full texts of the selected studies were thoroughly assessed in detail based on the inclusion and exclusion criteria. The reasons for exclusion were recorded and reported. Any disagreements that arose between the authors at each stage of the selection process were resolved through discussion. If a consensus was not reached, the second author was involved. The search and selection process are illustrated in the PRISMA 2020 flow diagram (Page et al., 2021).

Quality appraisal

We assessed the quality of the studies based on the JBI critical appraisal checklists for quasiexperimental studies (9 items), cohort studies (10 items), cross-sectional studies (8 items), and qualitative studies (10 items) (Aromataris & Munn, 2020). All the included articles were independently assessed by the first and third authors, who recorded supporting information and justifications for their assessment (“yes,” “no,” “unclear,” or “not applicable”) of each checklist item. Disagreements were either discussed by the first and third authors or with the second author until a consensus was reached. We excluded studies with less than 50% “yes” responses.

Data extraction and synthesis

Data extraction and management were performed via Microsoft Excel software. Details about the authors, publication year, study design, sample size, host regions, mental health outcomes and measurements, prevalence, and

associated factors were extracted by the first author. The third author checked the data for completeness and accuracy. The results are presented in tabular format.

A proportional meta-analysis (Barker et al., 2021) was conducted to estimate the pooled prevalence of depression and anxiety via R software (version 4.4.2). For the meta-analyses, we included studies that reported quantitative prevalence estimates via validated screening instruments. Studies were excluded if they lacked sufficient data to calculate pooled prevalence (e.g., missing prevalence rates or sample size) or if they used overlapping samples. When duplication was identified, the study providing more comprehensive or recent data was retained. We also reviewed the cutoff scores used to define depression or anxiety symptoms and included only studies that applied validated thresholds for clinical relevance corresponding to mild or greater symptoms, such as the Patient Health Questionnaire-9 (PHQ-9) (Kroenke et al., 2001), the General Anxiety Disorder-7 (GAD-7) (Spitzer et al., 2006) and the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983). Studies without validated cutoffs were excluded from the meta-analysis but included in the qualitative synthesis. The results of the meta-analysis are displayed in forest plots with 95% confidence intervals (CIs). Heterogeneity was assessed through I^2 statistics (Higgins et al., 2003). A random effect model was used if $I^2 > 50\%$; otherwise, a fixed effect model was used (Borenstein et al., 2010). A subgroup analysis investigated differences in the prevalence of depression and anxiety with various measurement tools to explore the possible sources of heterogeneity. Additionally, a sensitivity analysis was performed to test the stability of the results. Publication bias was identified via the Doi plot with the Luis Furuya-Kanamori (LFK) index, which has a higher sensitivity and specificity than a funnel plot does. An LFK index score within ± 1 , between ± 1 and ± 2 , or greater than ± 2 indicates “no asymmetry,” “minor asymmetry,” or “major asymmetry,” respectively (Furuya-Kanamori et al., 2018).

Using a narrative and tabulated data synthesis approach (Campbell et al., 2020), we classified factors associated with the mental health of CISs during the COVID-19 pandemic into individual, interpersonal, community, and societal levels according to the socioecological framework (McLeroy et al., 1988).

RESULTS

A total of 1,153 articles were identified, of which 403 duplicates were removed and 691 were excluded based on titles and abstracts. Sixty-eight articles were sought for retrieval, 44 of which were excluded because they did not meet the eligibility criteria. The remaining 24 articles were appraised via JBI critical appraisal checklists. The results of the quality appraisal are presented in the Appendix file. One article (Y. Zhao, 2020) was excluded owing to a high risk of

bias. Finally, 23 original articles were included in the systematic review, with 10 articles reporting prevalence data used for meta-analysis. (Figure 1)

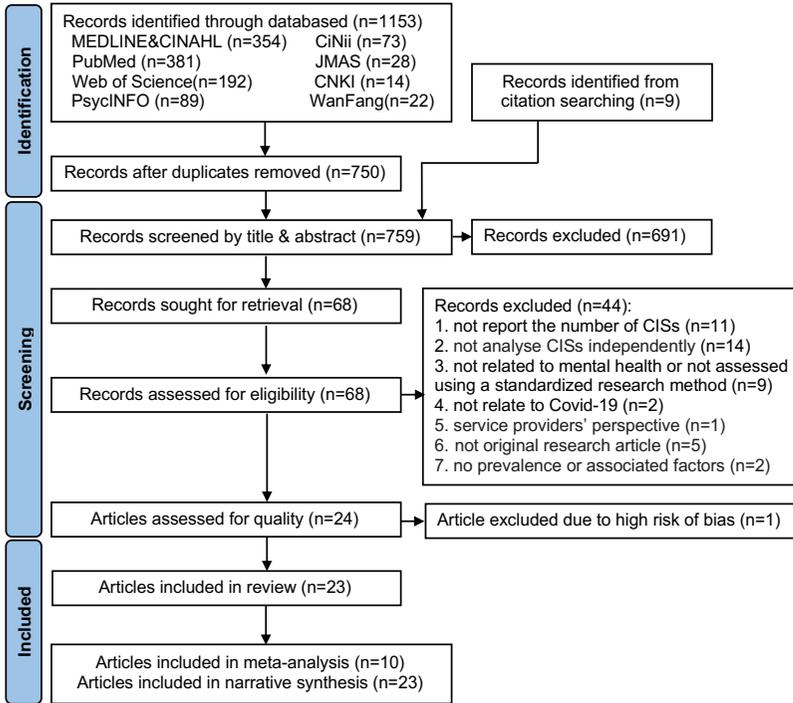


Figure 1: PRISMA 2020 flow diagram

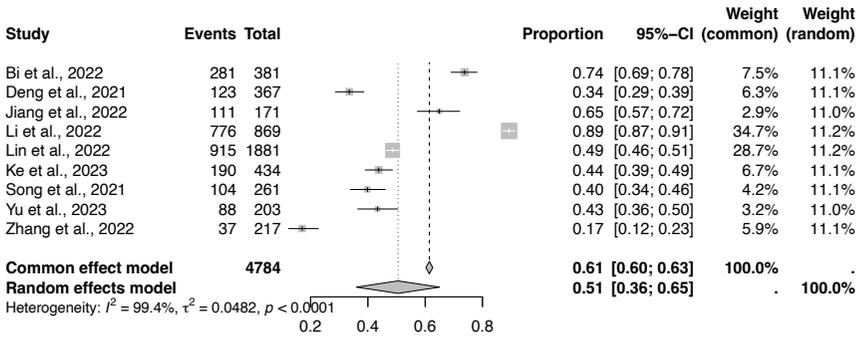
Study and participants' characteristics

We included 21 quantitative and 2 qualitative articles published between June 2020 and May 2023 for this review. Nineteen articles were published in English, and four were published in Chinese. The specific characteristics of the included studies are summarized in the Appendix file. The sample size ranged from 8 to 10,846, comprising 19,802 CISs. The participants were enrolled in educational institutions in North America (37.8%), followed by Europe (26.7%) and Asia (16.7%). Over half (51.5%) of the participants were enrolled in undergraduate programs, and 32.6% were enrolled in either graduate or equivalent programs. Twenty-two studies collected data during the first two years of the pandemic, and one study's data were collected in 2022. Among the nine mental health outcomes reported, anxiety and depression were the most common, appearing in 18 and 14 studies, respectively. Other outcomes, such as stress, posttraumatic stress disorder (PTSD), alienation, somatization, and neurasthenia, were reported by no more than two studies. Therefore, these outcomes were not included in the meta-

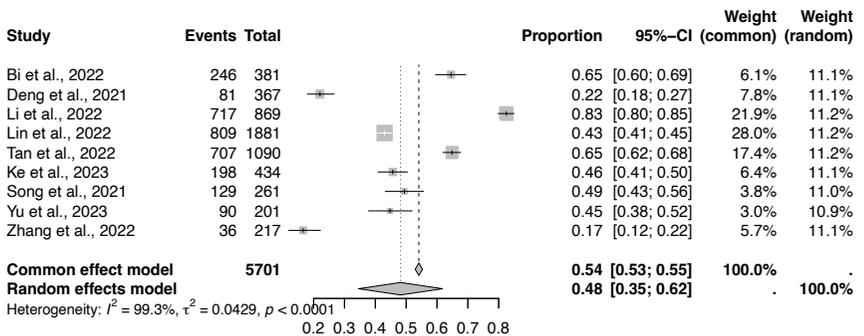
analysis but were qualitatively synthesized to provide comprehensive insights into the broader mental health challenges experienced by CISs.

Meta-analysis results

Ten articles reported the prevalence of depression, among which Jiang et al. (2022) and B. Zhao et al. (2021) used the same CISs sample. We only used the data from Jiang et al. (2022), as they provided more detailed data of interest. Based on the remaining nine studies, which comprised 4,784 CISs, the pooled prevalence of depression was 51% (95% CI: 36%–65%) (Figure 2a). The PHQ-9 is the most frequently used tool for measuring depression. Nine articles reported the prevalence of anxiety. The pooled prevalence of anxiety, with a sample size of 5,701 CISs, was 48% (95% CI: 35%–62%) (Figure 2b). The GAD-7 is the most frequently used measurement tool for anxiety. Given the substantial heterogeneity ($I^2 = 99.4\%$ for depression and 99.3% for anxiety), we employed a random effects model to account for variability across studies.



(a) Depression



(b) Anxiety

Figure 2: Forest plot of (a) depression and (b) anxiety among Chinese international students during the COVID-19 pandemic

A subgroup analysis (Table 1) demonstrated that the prevalence of depression was the highest when the PHQ-9 score was used, with a cutoff score of ≥ 5 (62%, 95% CI: 43%–81%), and the lowest prevalence was associated with the depression subscale of the HADS, with a cutoff score of ≥ 8 (17%, 95% CI: 12%–23%). The prevalence of anxiety was highest when the GAD-7 score was used, with a cutoff score of ≥ 5 (55%, 95% CI: 35%–76%), and the anxiety subscale of the HADS, with a cutoff score of ≥ 8 (17%, 95% CI: 12%–22%).

Table 1: Subgroup analysis of depression and anxiety prevalence among Chinese international students during the COVID-19 pandemic by measurement tools

Subgroup	No. of studies	No. of CISs	Cases	Pooled prevalence (95% CI)	I ² (%)
Depression (cutoff)	9	4784	2625	0.51(0.36, 0.65)	99.4%
PHQ-9 (≥ 5)	5	3669	2206	0.62(0.43, 0.81)	99.6%
PHQ-2 (≥ 3)	1	434	190	0.44(0.39, 0.49)	N/A
DASS-21 (>9)	2	464	192	0.41(0.37, 0.46)	0.0%
HADS (≥ 8)	1	217	37	0.17(0.12, 0.23)	N/A
Anxiety (cutoff)	9	5701	3031	0.48(0.35, 0.62)	99.3%
GAD-7 (≥ 5)	5	4588	2560	0.55(0.35, 0.76)	99.5%
GAD-2 (≥ 3)	1	434	198	0.46(0.41, 0.50)	N/A
DASS-21 (>7)	2	462	219	0.47(0.43, 0.52)	0.0%
HADS (≥ 8)	1	217	36	0.17(0.12, 0.22)	N/A

Abbreviations: PHQ=Patient Health Questionnaire; DASS=Depression, Anxiety, and Stress Scale; HADS=Hospital Anxiety and Depression Scale; GAD=Generalized Anxiety Disorder Questionnaire.

Publication bias and sensitivity analysis

For depression, the LFK index was -2.74, indicating major asymmetry and suggesting the presence of publication bias. This may reflect a tendency for studies reporting higher prevalence rates of depression to be more likely published. In contrast, the LFK index for anxiety was -0.27, indicating no asymmetry and therefore no significant evidence of publication bias. The sensitivity analysis was conducted by omitting one study at a time and repeating the meta-analysis via a random effects model. All the results remained within a $\pm 5\%$ range of the initial pooled prevalence for both depression and anxiety, indicating that the results were robust and not unduly influenced by any single study.

Associated factors

Forty-three factors were extracted. The factors were categorized into individual, interpersonal, community, and societal levels (Table 2).

At the individual level, the demographic determinants of mental health include age, gender, education level, sexual orientation, and geographical

location. Some studies (Feng et al., 2021; Song et al., 2021; Yu et al., 2023) have identified older age and higher educational levels as risk factors, whereas others (Lin et al., 2022; Tan et al., 2022; Q. Zhao & Guo, 2022) have reported that younger CISs with lower education levels are more susceptible to mental health problems. Bi et al. (2022) reported that older age was associated with higher depression scores. In contrast, graduate-level education was linked to lower anxiety and depression, demonstrating mixed associations between demographic characteristics and mental health outcomes. Three studies (Bi et al., 2022; Deng et al., 2021; Xia & Duan, 2020) reported a higher prevalence of depression and anxiety among female CISs, and two (Song et al., 2021; Q. Zhao & Guo, 2022) highlighted the vulnerability of male CISs. Nonheterosexual CISs presented greater depression rates than their heterosexual counterparts did (Bi et al., 2022). Living in metropolitan areas (Tan et al., 2022) and having a shorter duration abroad (Q. Zhao & Guo, 2022) were also identified as risk factors. Protective personality traits included higher self-esteem, higher self-efficacy, positive coping strategies, higher resilience, wise reasoning, decreased negative perfectionism, and a willingness to seek professional support (Bi et al., 2022; Y. Chen et al., 2021; English et al., 2022; Lin et al., 2022; Liu et al., 2022; Xia & Duan, 2020; Zhaoyang et al., 2022). Health-related risk factors included mental illness history, worse physical health, poor sleep quality, substance use, an abnormal diet, less preventive behavior, and less physical activity (Deng et al., 2021; M. Li et al., 2021; M. Li et al., 2022; Lin et al., 2022; Nam et al., 2021; Nie et al., 2023; Song et al., 2021; Xia & Duan, 2020; Yu et al., 2023; B. Zhang et al., 2022; B. Zhao et al., 2021). Cognitive aspects, such as fear of infection, limited understanding of quarantine policies, and misconceptions about COVID-19, also negatively impacted mental health (Y. Chen et al., 2021; Deng et al., 2021; English et al., 2022; Jiang et al., 2022; M. Li et al., 2021; Liu et al., 2022; Ma & Miller, 2021; Xia & Duan, 2020; B. Zhang et al., 2022; B. Zhao et al., 2021; Zhaoyang et al., 2022).

At the interpersonal level, studies have addressed the influence of social support and interaction with others. Risk factors include concern about family and friends, homesickness, parents' overconcern, language barriers, reduced socialization, social network fatigue, and double-bind dilemmas (Ke et al., 2023; Lin et al., 2022; Liu et al., 2022; Ma & Miller, 2021; Nam et al., 2021; Tan et al., 2022; Xia & Duan, 2020; B. Zhao et al., 2021). Social support has emerged as a key protective factor (Bi et al., 2022; Y. Chen et al., 2021; Ke et al., 2023; Lin et al., 2022; Liu et al., 2022; Ma & Miller, 2021; Q. Zhao & Guo, 2022).

At the community level, studies have explored the role of educational institutions and local resources. Risk factors include dissatisfaction with information and online learning, reduced access to university facilities and resources, and insufficient life necessities (Bi et al., 2022; English et al., 2022; Jiang et al., 2022; Liu et al., 2022; Tan et al., 2022; Xia & Duan, 2020; B. Zhao et al., 2021). Some studies have identified academic, job-seeking, and financial stress as risk factors (English et al., 2022; Lin et al., 2022; Song et al., 2021; Xia & Duan, 2020; Yu et al., 2023; Q. Zhang & Chen, 2022).

At the societal level, studies have considered broader influences such as cultural norms, discrimination, and government policies. Discrimination is the leading risk factor (Bi et al., 2022; English et al., 2022; Jiang et al., 2022; Liu et al., 2022; Ma & Miller, 2021; Nam et al., 2021; Xia & Duan, 2020). Cultural adaptation also poses challenges (Liu et al., 2022; Q. Zhang & Chen, 2022), whereas Chinese cultural beliefs play a protective role (Xia & Duan, 2020). Four studies reported risk factors related to government policies, including lockdown experiences, challenges extending visas owing to changes in immigration policies, concerns about medical costs and insurance, and travel restrictions (English et al., 2022; Liu et al., 2022; Nam et al., 2021; Xia & Duan, 2020).

Table 2: Factors associated with Chinese international students’ mental health during the COVID-19 pandemic

Level	Risk factors	Protective factors
Individual	Demographics: <ul style="list-style-type: none"> • Older age • Female • Higher education level • Nonheterosexual • Living in metropolitan area • Shorter time staying abroad 	Demographics: <ul style="list-style-type: none"> • Older age • Female • Higher education level
	Health related factors: <ul style="list-style-type: none"> • Poor physical health • Having mental illness history • Poor sleep quality • Substance use • Abnormal diet • Less preventive behavior • Less physical activity 	Personality traits: <ul style="list-style-type: none"> • Self-esteem/self-efficacy • Positive coping strategy • Resilience • Wise reasoning • Low negative perfectionism • Willing to seek professional support
	Cognition factors: <ul style="list-style-type: none"> • Fear of infection • Not understanding the quarantine policy • Not understanding the etiology of COVID-19 	
Interpersonal	Communication and interaction factors: <ul style="list-style-type: none"> • Concern on family and friends • Homesickness • Parents’ overconcern • Double bind/dilemma • Social network fatigue • Language barriers 	Social support

Level	Risk factors	Protective factors
Community	Stress exacerbated by COVID-19: <ul style="list-style-type: none"> • Academic stress • Job-seeking stress • Financial pressure <hr/> Institutional factors: <ul style="list-style-type: none"> • Low information satisfaction • Low satisfaction with online learning • Reduced access to institutional facilities and resources • Insufficient life necessities 	
Societal	Sociocultural factors: <ul style="list-style-type: none"> • Discrimination/racism • Acculturative stress <hr/> Government policies: <ul style="list-style-type: none"> • Lockdown experience • Challenges extending visas due to immigrant policy changes • Concern about medical cost and insurance • Travel restrictions 	Sociocultural factors: <ul style="list-style-type: none"> • Chinese cultural beliefs

DISCUSSION

Prevalence of depression and anxiety

The prevalence rates of depression and anxiety among CISs during the COVID-19 pandemic were 51% (95% CI: 36%–65%) and 48% (95% CI: 35%–62%), respectively. The pooled prevalence rates of depression and anxiety were more than twice those reported among local Chinese students during the same period, with prevalence rates of 24% for depression and 22% for anxiety (Y. Zhang et al., 2021). Similarly, Salari et al. (2020) reported that the prevalence rates of anxiety and depression among the general population during the COVID-19 pandemic were 32% and 30%, respectively. Moreover, a cohort study conducted in Australia reported that international students experienced disproportionately higher rates of depression and anxiety during the COVID-19 pandemic than local students did (Russell et al., 2023). Collectively, these findings indicate that CISs experienced increased rates of depression and anxiety symptoms during the pandemic. Sensitivity analyses indicated robust pooled estimates, as the prevalence rates for both depression and anxiety remained within $\pm 5\%$ of the initial pooled values when individual studies were sequentially omitted. However, substantial heterogeneity ($I^2 > 99\%$) was observed. The heterogeneity may be partially attributed to differences in measurement tools used

across studies, as the PHQ-9 and GAD-7 scales produced higher prevalence estimates than the HADS scale did. Measurement discrepancies, coupled with cultural differences in symptom expression and reporting, continue to challenge the accurate assessment of depression and anxiety among CISs. Previous studies have highlighted the importance of culturally adaptive screening tools to improve diagnostic accuracy (Mughal et al., 2020). This calls for further research to investigate the effectiveness of mental health measurements in the CIS population and mixed-cultural context.

Factors associated with mental health

Concerning the associated factors, fear of infection, family conflicts, dilemmas, and discrimination were among the risk factors that negatively impacted CISs' mental health during the pandemic. Positive personality traits, social support, institutional support, and Chinese cultural beliefs were identified as potential protective factors.

At the individual level, the conflicting results regarding demographic factors such as age, gender, and education warrant further investigation into potential moderators and mediators that might explain the discrepancies. Personality traits such as self-esteem, self-efficacy, resilience, and wise reasoning have emerged as protective factors, aligning with the literature that has recognized the role of these traits in buffering mental health problems for international students (Edara, 2018; Versteeg & Kappe, 2021). Health-related risk factors, such as physical health, sleep quality, substance use, and an abnormal diet, align with the interconnection between physical and mental health (Sarris et al., 2014) and reflect the holistic perspective of care (Jasemi et al., 2017).

Fear of infection and family-related anxieties were among the most salient stressors affecting CISs' mental health during the pandemic. As a cognitive factor, fear of infection reflects a widespread psychological response during the early stages of COVID-19, underscoring how uncertainty and inadequate information contribute to emotional distress (Berhe et al., 2022). This fear often interacts with interpersonal concerns, particularly those related to family. CISs experienced heightened pressure from parents abroad who were deeply concerned about their children's safety, which intensified feelings of guilt, homesickness, and emotional conflict. These findings align with those of J. Li et al. (2016), who identified family conflict as a key issue among CISs seeking counseling in the U.S. The "double bind" phenomenon (Bateson et al., 2007) — receiving conflicting expectations from family members — was exacerbated by the pandemic's polarized political and cultural narratives (Ma & Miller, 2020). Furthermore, as students increasingly rely on digital platforms to maintain contact with family, physical separation becomes more pronounced, reinforcing feelings of disconnection and stress (Mao & Lee, 2024; Tian & Lu, 2022). Together, these findings highlight how cognitive and relational factors jointly shaped the psychological experiences of CISs during the pandemic.

At the community level, the importance of a supportive institutional environment, satisfactory online learning experiences, and accurate information

during crises is evident. During the pandemic, international students are highly dependent on institutions' timely and appropriate crisis management to protect their health and safety and continue academic activities (Du, 2022). Universities play a crucial role in shaping the mental health outcomes of international students. Institutions that provide culturally responsive and inclusive mental health support tend to improve international students' well-being (Sakız & Jencius, 2024).

At the societal level, the issue of discrimination has emerged prominently in the literature. The pandemic has seen a surge in Sinophobia and racism toward individuals of Chinese descent (Cheah et al., 2023). External societal attitudes not only exacerbate feelings of isolation but also directly impact mental health. A strong cultural identity can provide a sense of belonging and stability, especially during periods of uncertainty and change. Xia and Duan (2020) indicated that Chinese culture influenced CISs' coping strategies during the pandemic. For example, concepts such as "seeing self-protection as a contribution to society" from Confucianism's belief in social responsibility and "when an epidemic comes, accept it is influenced by Taoism" may lead to greater stress tolerance and help individuals rebuild appropriate cognitions regarding the meaning of stress, thereby reducing psychological discomfort. Finally, the challenges associated with extending visas, medical costs, and travel restrictions highlight the vulnerabilities of not only CISs but also all students living outside their country of origin in the face of rapid policy changes during uncertain times (Hamza et al., 2021). Postpandemic immigration policies continue to influence the mental health trajectories of international students. Strict visa regulations and uncertainties about residency status have been identified as significant stressors that contribute to the psychological distress of international students (Akiba et al., 2024).

Limitations

The interpretation of the results of this study should consider the following limitations. First, most studies in this systematic review employed a cross-sectional design, restricting the analysis to a temporal snapshot of the CISs' mental health; this is inadequate given the rapid changes in policy and circumstances during the pandemic. Future research should explore CISs' evolving experiences and the pandemic's long-term impacts. Second, although we conducted subgroup analyses and used the random effects model to avoid the effect of heterogeneity, the heterogeneity was still significant. We could not conduct further moderating analyses, such as age groups, gender, and host regions, owing to the lack of detailed information from the included articles; this should be analyzed in the future when there is sufficient evidence. Third, we could not compare the prevalence results and associated factors among CISs and other international student groups owing to the lack of existing research evidence. Thus, we call for further attention to the mental health of not only CISs but also international students from other countries. Finally, the studies included in this systematic review reported outcomes of multiple mental health outcomes without distinctively reporting the associated factors for each outcome. Future studies should aim to dissect the associated factors for each mental health condition

distinctly to enable more tailored and nuanced public health strategies and mental health interventions.

Implications for practice

The findings of this study highlight the urgent need for health service practitioners, researchers, policymakers, and stakeholders to address the mental health challenges faced by CISs during global health crises such as the COVID-19 pandemic. Healthcare practitioners, particularly mental health professionals, should prioritize culturally sensitive interventions. Programs that incorporate Chinese cultural beliefs, such as Confucianism and Taoism, can enhance resilience and promote positive coping mechanisms among CISs. Practical, culturally sensitive strategies may include providing counseling services in Mandarin or Cantonese, utilizing culturally adapted screening tools, organizing peer support groups led by senior Chinese students, and offering psychoeducational workshops on topics such as academic stress and mental health stigma. These interventions should be embedded within student services and delivered in ways that are sensitive to cultural norms, such as face savings and respect for authority. Nurses and counselors, in particular, should be trained to integrate cultural dimensions into their practice to foster trust and engagement. Policymakers must develop strategies that mitigate racial discrimination and xenophobia. Anti-discrimination campaigns, combined with supportive immigration policies during crises, can help alleviate stressors such as visa uncertainties and feelings of alienation. Educational institutions and stakeholders should create supportive environments and robust systems to help international students cope with immediate challenges during the pandemic. They should also support students in adapting to hybrid learning and navigating ongoing changes in international regulations. Practical strategies include accessible mental health services, peer support networks, and dedicated resources for addressing academic and financial challenges. Enhanced communication strategies, along with tailored crisis management plans, can help institutions ensure accurate and timely information during crises, thereby safeguarding the well-being of international students. For health services researchers, the findings emphasize the need to explore the long-term impacts of global health crises on international student populations. Future research is needed to evaluate the effectiveness and accessibility of these practical strategies, including culturally informed approaches, in supporting the mental well-being of CISs.

CONCLUSION

This systematic review and meta-analysis revealed that the pooled prevalence rates of depression and anxiety symptoms among Chinese international students during the COVID-19 pandemic were 51% (95% CI: 36%–65%) and 48% (95% CI: 35%–62%), respectively, indicating a high mental health burden in this population. A wide range of factors have been identified in relation to the mental health of CISs, spanning individual, interpersonal, community, and societal levels.

Frequently reported risk factors include fear of infection, family-related stressors, sociocultural adjustment challenges, and experiences of discrimination. Protective factors, including positive personality traits, institutional and social support, and cultural beliefs rooted in Chinese traditions, were also documented. Although the pandemic exacerbated challenges, stressors such as family conflicts and discrimination were prevalent before the pandemic and may continue postpandemic. Continued research is essential to monitor the evolving mental health needs of CISs and to guide the development of culturally sensitive, evidence-based interventions that foster resilience and mental well-being in the face of global health crises.

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APPENDIX

The appendices are available online as supplemental material.

