Creative Education, 2025, 16(6), 887-903
https://www.scirp.org/journal/ce
ISSN Online: 2151-4771
ISSN Print: 2151-4755

Reforming Mental Health Support for International College Students in China: An Evidence-Based Perspective

Ying Guan[1*], Teaway Angeline Patience[2], Kailiang Shen[1], Wenyi Lai[1], Emmanuel Nizeyimana[2], Ileana Kong Zhuo[2], Yuxin Li[3]

[1]Department of Biostatistics, School of Public Health, Southern Medical University, Guangzhou, China
[2]School of International Education, Southern Medical University, Guangzhou, China
[3]International Department, The Affiliated High School of South China Normal University, Guangzhou, China
Email: *guanying@smu.edu.cn

How to cite this paper: Guan, Y., Patience, T. A., Shen, K. L., Lai, W. Y., Nizeyimana, E., Zhuo, I. K., & Li, Y. X. (2025). Reforming Mental Health Support for International College Students in China: An Evidence-Based Perspective. *Creative Education, 16,* 887-903.
https://doi.org/10.4236/ce.2025.166055

Received: May 22, 2025
Accepted: June 27, 2025
Published: June 30, 2025

Abstract

With the expansion of China's Belt and Road Initiative (BRI), the number of international college students in China has increased significantly in recent years. These students often face cultural, academic, and linguistic challenges that may exacerbate psychological distress. Early screening and intervention are crucial; however, mental health support for international college students remains underdeveloped in Chinese higher education policy and research. This study employed a cross-sectional design to assess the mental health status of international college students in China using the Symptom Checklist-90 (SCL-90), a validated psychological screening tool measuring nine symptom dimensions. Demographic and background data were collected to control for confounding variables, including age and duration of residence. Results indicate that the psychological status of international college students differed significantly from established Chinese college norms, U.S., and German norms across all nine SCL-90 dimensions. Strong positive correlations were observed among all symptom domains ($r = 0.720$ - 0.878, $P < 0.01$). Subgroup analyses further revealed gender-based differences in all SCL-90 domains except for psychoticism. This study presented a data-driven early screening model tailored to international students in China, offering novel insights into psychological support mechanisms in higher education institutions. By addressing a critical research gap, the findings contributed to the development of inclusive, high-quality educational environments aligned with global mental health objectives.

Keywords

International College Students, SCL-90, Psychology, Education, Policy

1. Introduction

The policies of higher education for international college students in China have undergone substantial liberalization in recent years. Strategic initiatives such as the "Study in China" plan and the Belt and Road Initiative (BRI) are central to China's effort to reshape global academic mobility and build soft power (Woo, 2022). These policies aim to strengthen China's higher education sector while fostering regional cooperation and people-to-people ties that align with geopolitical and developmental goals. As a result of these initiatives, the number of international college students in China has grown rapidly. Since 2015, students have come from 202 countries and regions. Among these, 93 countries sent 500 or more students, including 36 BRI countries, which together accounted for 46.63% of China's international college student population in those years. By 2018, this figure rose to 53.37%, with 294,953 students from 37 BRI countries, showing sustained growth in numbers of international college students in China (Li & Chen, 2020). This trend positions China as a global academic hub and highlights the need to support this increasingly diverse student population.

The rapid growth of the international college student population in China has been accompanied by increasing mental health concerns within this population. Upon arrival, international college students in China will face multiple adjustment challenges, including cultural adaptation, academic pressure, language barriers, and social isolation. These stressors often intersect to generate acculturative stress, a form of psychological strain described in acculturative stress (Wang et al., 2012). Acculturative stress has been linked to elevated risks of depression, anxiety, somatization, and other mental health problems. Empirical studies suggested that the prevalence of mental health problems among international college students in China ranges from 23% to 42%, significantly higher than domestic student populations (Auerbach et al., 2018). A meta-analysis of 12 Chinese studies (N = 8753) found 34.1% (95% CI [31.6%, 36.7%]) of international college students reported clinically significant psychological distress, nearly double the rate of domestic students (17.9%) (Younis et al., 2021). Approximately 31.7% of international college students in China reported clinically significant depressive symptoms based on Generalized Anxiety Disorder-7 Item Scale (GAD-7 score ≥10) (Michal et al., 2024). Anxiety disorders affect 28.4% of the cohort, with language barriers being the strongest predictor ($\beta = 0.37$, $p < .01$) (Wang et al., 2012). Over 40% exhibited high acculturative stress levels Academic Stressors Scale for International college students (ASSIS score >3.5), particularly among students from non-Asian countries (OR = 2.15) (UNESCO, 2023). Based on Patient Health Questionnaire-9 (PHQ-9, score ≥10), 31.2% of African students and 25.7% of Asian students in Beijing exhibited depressive symptoms. Longitudinal data from 5 universities showed anxiety prevalence increased from 18.9% to 27.4% during the first academic year (GAD-7 ≥8); and 61.3% of non-Asian students scored above the ASSIS clinical cutoff (≥3.4), compared to 37.8% of Asian students ($P < 0.001$). Doctoral students showed 2.3 times higher odds (95% CI [1.7, 3.1]) of suicidal ideation than

undergraduates (Liu et al., 2023; UNESO, 2023).

International college student mobility has grown rapidly in recent years, bringing mental health concerns to the forefront of higher education. When facing to new academic, cultural, and social environments, many students should adapt to increased psychological strain including depression, anxiety, and stress. Early detection and targeted intervention will be crucial to mitigating long-term psychological harm. If left unaddressed, psychological distress will lead to reduced academic performance, lower institutional retention, and weakened social functioning. This not only harms individuals but also threatens the inclusiveness and quality of China's international education strategy, particularly as it expands under the BRI framework. While this issue has been extensively studied in Western contexts such as the U.S. and Germany (Masuda et al., 2012; Lipson et al., 2022), there remains a significant research gap in understanding how international college students experience psychological distress within China. Despite the expansion of China's international education efforts, the psychological well-being of international college students remains insufficiently addressed in both research and policy.

Given the existing gaps in research and the urgency of supporting the mental health of international college student in China mental health, this study want tended to use Symptom Checklist-90 (SCL-90) to early screening the mental health of international college students in China. SCL-90 is a standardized, multidimensional instrument widely used to assess mental health across nine domains, including depression, anxiety, interpersonal sensitivity, and obsessive-compulsive traits and so on (Abbass et al., 2021). It has proven cross-cultural reliability and is easy to administer in diverse populations, including international college students. Recent research suggested the need to update normative data and contextualize the SCL-90 for use in Chinese academic settings (Yu et al., 2020). Based on the SCL-90, our research aimed to assess the psychological well-being of international college students in China and assess how correlation among those psychosocial factors (e.g., depression, social isolation) in international college students in China. By answering these questions, the study will seek to inform institutional and national policies for inclusive and psychologically supportive international education environments.

2. Materials and Methods

2.1. Study Design

This study adopted a cross-sectional design for early screening and assessed the situation of mental health among international college students enrolled in Southern Medical University. The survey link was distributed through the international school of the university, which helped ensure the legitimacy of the research and encourage participation from September to November 2023. The international school disseminated the study invitation via Wenjuanxing (Questionnaire Star), a Chinese online survey platform. Participants will be informed that the survey may

take approximately 15 - 20 minutes to complete and that their participation is entirely voluntary.

2.2. Target Population and Eligibility Criteria

We conducted cluster sampling at Southern Medical University, which had enough international college students. The target population consisted of international college students who had enrolled in degree programs this University. The participants were included in our research according to the following criteria: age were equal or more than 18 years; undergraduate; resident duration in China between 6 months to 24 months. The 24-month cutoff was chosen to focus on students who stilled within the early cultural adaptation window. During this period, international college students faced acute psychological distress due to adjustment stress, language barriers, or academic transitions. We excluded the participants who refused to participate in this survey, provided random answers to the study, or gave us incomplete information on our survey.

2.3. Sample Size Estimation

The minimum sample size was estimated by using the formula for prevalence studies. Since the incidence rate of mental disorders among international college students in China was about 31.7% based on previous research (Michal et al., 2024), we assumed a proportion of 0.317 to estimate the required sample size.

$$n = \frac{Z_{1-\alpha/2}^2 \cdot P(1-P)}{e^2} \quad (1)$$

Where: $Z_{1-\alpha/2}$ = 1.96, P = 0.317 and margin of error e = 0.1, the estimated sample size equaled 84. Due to potential intra-group correlation, we would consider the Design effect (DEFF) which ranged from 1.5 to 2 in calculating the adjusted sample size. Therefore, the sample size from 126 - 168 would be surveyed to ensure adequate statistical power and subgroup analysis capability.

2.4. Measurement Tools

The SCL-90 was employed as the primary assessment tool to assess nine symptom dimensions: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. It consists of 90 self-report items, rated on a 5-point Likert scale (1 = "not at all" to 5 = "extremely"), reflecting the degree of distress experienced over the past seven days. The overall Cronbach's alpha coefficient (α) for the scale in this study was 0.986, indicating excellent internal consistency. Among its nine factors, Cronbach's alpha (α) values ranged from 0.848 to 0.927, further confirming high reliability for each dimension. For validity assessment, factor analysis was conducted, and nine factors were extracted through rotation. The number of items loading onto each factor aligned closely with the theoretically proposed structure. All items demonstrated factor loadings ranging from 0.353 to 0.700, meeting the threshold for meaningful contributions. The questionnaire exhibited robust reli-

ability and validity, supporting its suitability for the intended research context.

2.5. Data Collection Procedure

All data collected using an online structured questionnaire, administered in English to ensure accessibility for international participants. Besides the nine factors in SCL-90, we also collected some demographic characteristics included age, gender, height, weight and resident duration in China.

2.6. Statistical Analysis

Data analysis was conducted using SPSS (version 27.0) and R software, both of which were widely accepted tools for psychological and behavioral research due to their flexibility, statistical power, and reliability. Frequencies and percentages were used for categorical variables (e.g., gender, resident duration), while means and standard deviations was calculated for continuous variables (e.g., age, SCL-90 subscale scores). An unsupervised machine learning technique (cluster analysis) was allowed for the identification of subgroups of students who exhibited similar mental health characteristics based on their SCL-90 responses. Correlation analysis was employed to explore associations among 9 factors of the SCL-90 scale. One-sample t-test was conducted to examine the detection rates of abnormal psychological conditions, and independent samples t-test was performed for subgroup analyses in our study. Assumptions of normality and multicollinearity was tested where applicable. All analyses were conducted with a significance level set at $\alpha = 0.05$, and $P < 0.05$ is set as significantly different.

2.7. Ethics

Before participation, all respondents were required to read an informed consent statement outlining the purpose of the research, the voluntary nature of participation, and their right to withdraw at any point without penalty. Consent was obtained electronically before proceeding with the questionnaire. Anonymity and confidentiality was maintained rigorously.

3. Results

3.1. Description of the Study Population's Demographic Characteristics

Table 1. Demographic characteristics of study population.

Variables	Mean ± SD/n (%)
Age (years)	22.49 ± 4.22
Height (cm)	166.63 ± 8.20
Weight (Kg)	62.11 ± 19.21
Gender	
Male (n, %)	72 (39.6%)

Continued

Female (n, %)	108 (60.4%)
Resident duration	
6 months to 1 year (n, %)	88 (48.8%)
1 year to 2years (n, %)	92 (51.2%)

A total of 194 questionnaires were collected. After excluding 5 duplicate responses, 2 careless/invalid responses, 3 submissions with incorrect student ID information, and 3 incomplete responses, 181 valid questionnaires were retained. The effective questionnaire recovery rate was 93.3%. The cohort comprised 181 participants (mean age = 22 years; mean height = 166 cm) with a male-to-female ratio of 1:1.5 and balanced representation resident duration in China (1:1) as showed in Table 1.

3.2. Cluster Analysis of Multiple Psychological Norms

We performed cluster analysis on four psychological norms using Ward's method in R software. The results were presented in Figure 1. The cluster analysis identified three distinct groups: the first cluster comprised German and American norms, the second cluster included the international college students and the third cluster consisted of the Chinese college student norms. The result demonstrated that psychological profile of the international college students in China differed substantially from both domestic and international (American/German) norms. Also, the international college students showed closer affinity to the Chinese college norms than to American/German) norms.

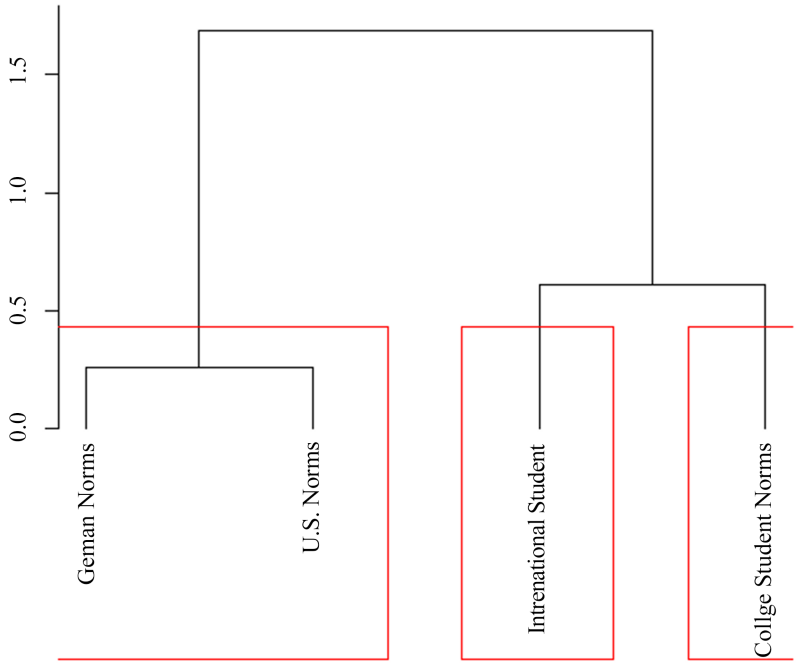

Figure 1. The cluster analysis result of different psychological norms.

3.3. Comparative Analysis of SCL-90 Factors between International College Students in China and Chinese College Student Norms

One-sample t-test was conducted to compare international college students' SCL-90 factor scores against established Chinese college norms. As presented in Table 2. Significant differences emerged across multiple dimensions, and the results indicated elevated psychological symptoms among international students in China in interpersonal sensitivity, anxiety and paranoid ideation ($P < 0.05$). This symptom profile suggested international students experience heighted social evaluation concerns (interpersonal sensitivity), Increased cultural mistrust (paranoid ideation) and elevated anticipatory worry (anxiety).

Table 2. Comparative analysis of SCL-90 factors between international college students in China and Chinese college student norms.

Factors	Mean ± SD	Chinese College Norms	*t*-value	*P*-value
Somatization	1.47 ± 0.56	1.45 ± 0.31	0.456	0.649
Obsessive-Compulsive	1.91 ± 0.75	1.99 ± 0.43	1.824	0.069
Interpersonal Sensitivity	2.08 ± 0.68	1.98 ± 0.39	2.052	0.041
Depression	1.85 ± 0.69	1.83 ± 0.37	0.456	0.649
Anxiety	1.75 ± 0.65	1.64 ± 0.35	2.508	**0.013**
Hostility	1.78 ± 0.59	1.77 ± 0.40	0.921	0.356
Phobic Anxiety	1.48 ± 0.60	1.46 ± 0.29	0.456	0.648
Paranoid Ideation	1.95 ± 0.61	1.85 ± 0.42	2.280	**0.024**
Psychoticism	1.57 ± 0.59	1.63 ± 0.33	1.596	0.112

3.4. Prevalence of Psychological Distress Among International College Students in China

To assess the proportion of participants exhibiting psychological symptoms, we employed a standardized screening approach using the Symptom Checklist-90 (SCL-90). The cutoff for defining psychological abnormality was set using Chinese college student norm mean plus 1.96 standard deviations (SD) for each factor (Jin et al., 1986). The overall mean score of the SCL-90 score higher than 2.06 was classified as psychological abnormality, while scores below this threshold were considered normal. The overall prevalence of abnormality detection rate was 12.16% (n = 22), indicating a non-negligible prevalence of psychological distress appearing in the international college students in China (Table 3). The following SCL-90 factors exhibited particularly high detection rates (all >10.0%) including obsessive-compulsive, interpersonal sensitivity, depression, anxiety, phobic anxiety and psychoticism (Table 3). These findings suggested that international college students might experience heightened stress related to academic pressure, social adaptation, and emotional regulation.

Table 3. Abnormal detection rates of SCL-90 dimensions among international students in China (n = 181).

Factors	Cutoff	Abnormal Cases (n)	Detection Rate
Somatization	2.06	17	9.59%
Obsessive-Compulsive	2.83	26	14.46%
Interpersonal Sensitivity	2.74	22	12.03%
Depression	2.56	20	10.81%
Anxiety	2.33	26	14.19%
Hostility	2.55	13	7.03%
Phobic Anxiety	2.03	25	13.92%
Paranoid Ideation	2.67	14	7.97%
Psychoticism	2.28	22	12.43%
Overall mean	2.06	22	12.16%

3.5. Correlation Relationship among SCL-90 Dimensions in International College Students

Pearson correlation analyses revealed strong positive interrelationships among all nine SCL-90 symptom dimensions (Table 4). All correlations survived rigorous correction for multiple comparisons, and the correlation coefficients ranged from 0.784 to 0.899 (all $P < 0.01$). The strongest correlation emerged between interpersonal sensitivity and anxiety (r = 0.899), indicating interaction between emotion-related dimensions (e.g., depression, anxiety) and cognitive-behavioral dimensions (e.g., obsessive-compulsive symptoms, interpersonal sensitivity) in international college students in China.

Table 4. Inter-correlations among SCL-90 dimensions in international students (n = 181).

	Somatization	Obsessive-Compulsive	Interpersonal Sensitivity	Depression	Anxiety	Hostility	Phobic Anxiety	Paranoid Ideation	Psychoticism
Somatization	1.000	-	-	-	-	-	-	-	-
Obsessive-Compulsive	0.790**	1.000	-	-	-	-	-	-	-
Interpersonal Sensitivity	0.784**	0.883**	1.000	-	-	-	-	-	-
Depression	0.808**	0.876**	0.898**	1.000	-	-	-	-	-
Anxiety	0.867**	0.875**	0.899**	0.896**	1.000	-	-	-	-
Hostility	0.790**	0.784**	0.819**	0.824**	0.850**	1.000	-	-	-
Phobic Anxiety	0.792**	0.793**	0.838**	0.823**	0.842**	0.774**	1.000	-	-
Paranoid Ideation	0.789**	0.808**	0.863**	0.838**	0.866**	0.862**	0.805**	1.000	-
Psychoticism	0.825**	0.835**	0.887**	0.890**	0.916**	0.855**	0.814**	0.886**	1.000

Note: **$P < 0.01$.

3.6. Multiple Linear Regression Results Examining Factors Influencing Psychological Scores (SCL-90)

A multiple linear regression analysis was conducted to examine the associations between demographic/physiological variables and psychological distress, as measured by the SCL-90 Global Severity Index. The model included age, gender (coded as 0 = female, 1 = male), resident duration, and body mass index (BMI) as simultaneous predictors. Regression diagnostics confirmed the normality of residuals (Shapiro-Wilk test, $P = 0.354$) and the absence of multicollinearity (all variance inflation factors (VIFs) < 2.0). The overall model was statistically significant ($F(4, 176) = 4.890$, $P = 0.047$). However, among the individual predictors, only gender showed a significant association with SCL-90 total scores, while age, academic year, and BMI did not reach statistical significance. These findings suggested that, in the current sample, psychological distress levels—as assessed by the SCL-90—were not significantly influenced by the examined demographic and physiological factors, with the exception of gender.

Table 5. Multiple linear regression results examining factors influencing psychological scores.

Variable	*B* (SE)	95% CI	β	*t*-value	*P*-value
Age	0.12(0.08)	[−0.03, 0.27]	0.09	1.421	0.157
Gender	−1.85(0.80)	[−5.98, −2.28]	−0.05	−5.887	0.038
Resident dureation	0.35(0.52)	[−0.67, 1.37]	0.04	0.673	0.504
BMI	0.11(.15)	[−0.18, 0.40]	0.05	0.734	0.468
Constant	65.32	[52.41, 78.23]	-	10.02	<0.001

3.7. Comparison of Mental Health Scores Based on Gender among International College Students in China

The analysis revealed significant gender differences across eight of the nine SCL-90 dimensions, with female students consistently reporting higher scores than their male counterparts ($P < 0.05$). To quantify the difference between the means of two groups in terms of standard deviation units, we employed Cohen's d, a standardized measure of effect size. This metric is widely used in independent samples t-tests and meta-analyses to evaluate not only statistical significance but also the practical significance of research findings. Specifically, female students exhibited elevated levels of somatization (d = 0.29), obsessive-compulsive symptoms (d = 0.28), interpersonal sensitivity (d = 0.26) and depression (d = 0.28). Notably, no significant gender difference was observed for psychoticism ($P = 0.110$) as Table 5 showed. Contrary to expectations, the study found no statistically significant differences in psychological distress levels across varying durations of residence ($P > 0.05$). These results suggested that, in this population, the length of residence alone might not exert a significant influence on mental health outcomes (Table 6).

Table 6. Comparison of SCL-90 score based on gender of international college students in China (n = 181).

	Female	Male	*t*-value	*P*-value	*d*
Somatization	1.66 ± 0.30	1.51 ± 0.75	3.331	0.001	0.29
Obsessive-Compulsive	1.83 ± 0.40	1.65 ± 0.80	3.667	<0.001	0.28
Interpersonal Sensitivity	1.67 ± 0.74	1.44 ± 0.95	5.133	<0.001	0.26
Depression	1.67 ± 0.48	1.50 ± 0.85	3.764	<0.001	0.28
Anxiety	1.62 ± 0.73	1.50 ± 0.62	2.656	0.008	0.19
Hostility	1.70 ± 0.75	1.55 ± 0.75	3.048	0.002	0.20
Phobic Anxiety	1.53 ± 0.95	1.43 ± 0.55	2.540	0.011	0.13
Paranoid Ideation	1.48± 0.81	1.37 ± 0.50	2.442	0.015	0.16
Psychoticism	1.56 ± 0.48	1.49 ± 0.35	1.599	0.110	0.19
Total	14.73 ± 2.04	13.45 ± 1.18	3.314	0.001	-

4. Discussion

4.1. The Overall Mental Health Status of International College Students in Our University

Overall, the current study identified significantly elevated psychological symptoms among international students in China across three key dimensions: interpersonal sensitivity, anxiety and paranoid ideation (**Table 2**). These results aligned with established literature while highlighting unique cultural stressors in the Chinese educational context (Berry, 2006; Pan & Wong, 2011; WHO, 2023). The elevated scores in interpersonal sensitivity might reflect acculturative stress (Berry, 2006), particularly stemming from social evaluation anxiety and social avoidance. International college students studying in China might experience heightened concerns about face-saving and social judgment, thereby exacerbating stress related to social evaluation (Masuda et al., 2012). Moreover, language barriers constituted another significant source of stress, with studies indicating that non-native speakers reported a 2.3-fold higher likelihood of social avoidance compared to their native counterparts (Domínguez et al., 2022). The observed anxiety prevalence of 14.19% was significantly associated with academic pressure, with China's rigorous grading system predicting 1.8 times higher anxiety levels among international college students compared to their domestic counterparts (Visier-Alfonso et al., 2024). Cultural mistrust might contribute to paranoid ideation. Empirical evidence indicated that perceived discrimination significantly correlates with paranoid cognition (Bebbington et al., 2013), suggesting that cross-cultural adaptation challenges might exacerbate psychological distress. Furthermore, international college students with limited social support demonstrated a 1.5-fold increase in paranoid symptom severity (Lamster et al., 2017), underscoring the significant mental health consequences of social isolation. Our findings aligned with global trends in international college student mental health (WHO, 2023),

revealing concerning patterns of psychological distress among this demographic in Chinese higher education institutions. These results underscored the urgent need for Chinese universities to strengthen their internationalization efforts, particularly in addressing the mental health challenges faced by international students.

4.2. High Correlations among SCL-90 Dimensions in International College Students in China

The Symptom Checklist-90 (SCL-90) is a widely used instrument for assessing psychological distress, and its application among international college students in China revealed significant inter-correlations among its subscales (e.g., depression, anxiety, somatization). These strong associations suggested a complex interplay of psychological, cultural, and environmental factors that contributed to a generalized state of distress rather than isolated symptoms. Depression and anxiety, for example, frequently presented together, sharing symptoms such as sleep disturbances, fatigue, and concentration difficulties (Kessler et al., 2015). Similarly, somatization—a prominent issue among international college students—often accompanied mood disorders, particularly in cultures where psychological distress was more likely to manifest as physical symptoms (Lipson et al., 2022). The high correlations between these dimensions might thus reflect the inherent overlap in symptom presentation rather than distinct disorders. Additionally, chronic stress, a common experience among international college students, could lead to a cascade of psychological and physiological responses, simultaneously elevating scores across multiple SCL-90 domains (Michal et al., 2004). This aligned with the general distress factor often identified in factor analyses of the SCL-90, where a single underlying construct accounted for much of the variance across subscales (Pan & Wond, 2011).

International college students in China faced unique stressors, including language barriers, academic pressures, social isolation, and cultural adjustment difficulties. These factors did not operate in isolation but interact synergistically to exacerbate psychological distress across multiple domains (Pebdani et al., 2022). Research on acculturative stress suggested that these challenges often create a diffuse psychological burden, leading to elevated scores across multiple SCL-90 scales rather than a single dominant symptom cluster. Academic stress might trigger anxiety, which in turn contributed to somatic complaints (e.g., headaches, gastrointestinal issues). Social isolation could intensify depressive symptoms while simultaneously heightening interpersonal sensitivity (fear of rejection or judgment).

Cultural dissonance would lead to feelings of alienation, which could manifest as both depressive mood and paranoid ideation (fear of being misunderstood or discriminated against). Cultural background influenced how individuals perceived and reported psychological symptoms. In many non-Western societies, emotional distress was more likely to be expressed somatically rather than through

explicit reports of depression or anxiety (Kirmayer, 2001; Lipson et al., 2022). This tendency might contribute to the strong correlations between somatization and other SCL-90 dimensions, as students from certain cultural backgrounds might interpret psychological stress primarily in physical terms. Moreover, stigma surrounding mental health in some cultures might lead students to underreport mood-related symptoms while endorsing somatic complaints more freely. This could artificially inflate correlations between somatization and other subscales, as students might use physical symptoms as a culturally acceptable proxy for psychological distress.

International college students exhibited distinct anxiety symptoms characterized by episodic panic attacks, unexplained fear episodes, persistent nervousness, and restlessness (He et al., 2022). These manifestations might reflect lingering uncertainty about potential pandemic resurgence despite the absence of current threats. The hostility dimension revealed particularly noteworthy findings: five out of six sub-items showed positive responses (excluding item 74 regarding post-argument experiences). The predominant hostile behaviors included uncontrollable emotional outbursts, heightened irritability and physical aggression impulses (Wang et al., 2022). The sustained presence of clinically significant symptoms—including compulsions, interpersonal sensitivity, anxiety, and hostility strongly suggested that the cumulative stress continued to substantially affect students' academic functioning and daily life (Son et al., 2020).

4.3. Gender Differences in Mental Health among International College Students in China

The analysis revealed a significant gender disparity in the mental health status of international college students ($P < 0.05$). Female students exhibited higher scores across all psychological distress factors except psychoticism, indicating poorer overall mental health compared to their male counterparts. This finding aligned with existing literature documenting heightened psychological vulnerability among female international students (Matud et al., 2019; Zitelny et al., 2022).

The observed patterns might stem from multiple psychosocial and cultural factors. Firstly, female students might face greater difficulties adjusting to life in China due to cultural expectations, social isolation, or gender-specific stressors (Constantine et al., 2005). Research suggested that women often experienced more pronounced acculturative stress when navigating unfamiliar environments (Yan & Berliner, 2011). Secondly, female international students experienced significantly greater stress related to academic performance and career prospects compared to their male peers—a trend well-documented in global higher education research. Empirical research demonstrates that female students consistently internalize greater academic achievement pressures than their male counterparts, attributable to persistent societal expectations and gendered socialization patterns emphasizing diligence and perfection (Graves et al., 2021). These pressures appeared amplified in cross-cultural academic environments where students had to simultaneously navigate language barriers and cultural adaptation challenges. Ca-

reer-related anxieties might disproportionately affect female students, potentially exacerbating anxiety and depressive symptomatology (Borgonovi & Han, 2021). Furthermore, psychological distress among female students frequently presented as psychosomatic symptoms including cardiovascular discomfort, gastrointestinal disturbances, respiratory complaints, cephalalgia, and musculoskeletal pain (Al-Krenawi & Bell, 2023). This population also demonstrated higher prevalence of sleep disturbances and disordered eating patterns—well-established stress responses—aligning with global trends in student mental health disparities (WHO, 2023).

Research has consistently demonstrated that female university students experience significantly higher internalized academic achievement pressures compared to male students, largely attributable to persistent societal expectations and culturally reinforced gendered socialization patterns that emphasize perfectionism. These pressures appear particularly pronounced in cross-cultural academic environments, where female international students must simultaneously navigate language barriers, cultural adaptation challenges, and academic demands (Wang & Yu, 2023; Fahy et al., 2021).

4.4. Recommendations for Enhancing Mental Health Support for International Students in Chinese Universities

Based on our findings and existing literature, we proposed the following evidence-based recommendations to improve mental health services for international college students in Chinese higher education institutions. To foster student well-being, institutions must prioritize the development of comprehensive support systems that mitigate the psychological impacts of geographical isolation and cultural dislocation. Such initiatives should aim to cultivate a strong sense of belonging, which is critical for students navigating the complexities of cross-cultural adaptation. Furthermore, structured programs that enhance resilience and self-efficacy can empower international students to not only adapt but also excel in their academic pursuits abroad.

Firstly, it is essential to provide international college students with the same mental health education platforms available to Chinese students. Universities should ensure international students have equal access to existing mental health infrastructure, such as mandatory psychological screenings during orientation to identify at-risk individuals, multilingual counseling services with culturally competent professionals, anonymous online mental health assessment platforms and so on. Students experiencing psychological distress can seek professional help from counselors to address their concerns and prevent further deterioration. Early identification and intervention significantly will improve mental health outcomes among international student populations.

Secondly, cross-cultural adaptation courses should be implemented to help international college students, such as semester-long orientation courses on cultural adjustment strategies, language partners and cultural mentors programs. Chinese

institutions should encourage international college students to engage more actively with faculty and peers, fostering friendships with both Chinese and international college students to strengthen their social support networks. These initiatives may reduce acculturative stress in international college students.

Thirdly, universities should establish diverse activity platforms and organize distinctive social practice programs. We recommend establishing intercultural student associations with dedicated funding, regular cultural exchange events and city exploration programs. These initiatives can enrich international college students' experiences in China, accelerate cultural exchange and integration. Such programs have also demonstrated success in enhancing social support networks and reducing isolation, and ultimately help international college students make the success of their study abroad journey.

Fourthly, building on our findings of significant gender disparities in mental health outcomes, Chinese universities should develop comprehensive, gender-responsive support systems that address the unique psychosocial needs of female international students. This requires a multi-dimensional approach, such as targeted counseling services addressing female students' unique stressors (e.g., cultural adaptation, social integration), peer support networks to mitigate isolation and foster belonging and workshops on stress management and resilience-building, particularly focusing on somatic symptom reduction. By implementing these targeted interventions, Chinese universities can demonstrate global leadership in international student support in higher education contexts.

By adopting these comprehensive, culturally sensitive measures, Chinese universities can significantly improve international students' mental health outcomes while advancing their internationalization goals.

5. Limitation

Several limitations should be considered when interpreting our findings. First, the study sample did not include sufficient representation across different age groups of international students, potentially limiting the generalizability of our results to specific developmental stages. Second, our analysis did not account for potential variations based on students' countries of origin, which may influence psychological adaptation patterns due to differing cultural distances from China. Third, the duration of stay in China was not adequately considered as a moderating variable. Moreover, the study was confined to a single university (Southern Medical University), potentially limiting the representativeness of the findings.

The cross-sectional design of this study precluded causal inferences about the relationships between risk factors and mental health outcomes.

Future research should employ prospective cohort designs with multiple assessment points to better understand the dynamic nature of international college students' mental health adaptation. Additionally, stratified sampling by nationality, age groups, and duration of stay would provide more nuanced insights into subgroup-specific risk and protective factors.

6. Conclusion

International college students in Chinese universities face significant psychological challenges, including acculturative stress, academic pressure, and social isolation. Early mental health screening and intervention are crucial for their successful adaptation and academic performance. Our findings highlighted the need for comprehensive, culturally sensitive support systems to address these issues in higher education institutions.

Funding

Guangdong Provincial Higher Education Teaching and Reform Project (Guangdong Higher Education Document No. 9 [2024], No. 2023GDJG0543).

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Abbass, K., Corbisiero, S., & Stieglitz, R. D. (2021). Development and psychometric properties of the ADHD-SCL-90-R screening scale for adult ADHD. *Journal of Clinical Psychology, 77,* 1428-1442. https://doi.org/10.1002/jclp.23088

Al-Krenawi, A., & Bell, M. M. (2023). Gender Differences in Syrian Refugees in Jordan: Psychological, Self-Esteem, Family Function, Marital Satisfaction, and Life Satisfaction. *International Journal of Social Psychiatry, 69,* 714-723. https://doi.org/10.1177/00207640221140286

Auerbach, R. P., Mortier, P., Bruffaerts, R., Alonso, J., Benjet, C., Cuijpers, P. et al. (2018). WHO World Mental Health Surveys International College Student Project: Prevalence and Distribution of Mental Disorders. *Journal of Abnormal Psychology, 127,* 623-638. https://doi.org/10.1037/abn0000362

Bebbington, P. E., McBride, O., Steel, C., Kuipers, E., Radovanovic, M., Brugha, T., Jenkins, R., Meltzer, H. I., & Freeman, D. (2013). The Structure of Paranoia in the General Population. *The British Journal of Psychiatry, 202,* 419-427. https://doi.org/10.1192/bjp.bp.112.119032

Berry, J. W. (2006). Acculturative Stress. In P. T. P. Wong, & L. C. J. Wong (Eds.), *Handbook of Multicultural Perspectives on Stress and Coping* (pp. 287-298). Springer US. https://doi.org/10.1007/0-387-26238-5_12

Borgonovi, F., & Han, S. W. (2021). Gender Disparities in Fear of Failure among 15-Year-Old Students: The Role of Gender Inequality, the Organisation of Schooling and Economic Conditions. *Journal of Adolescence, 86,* 28-39. https://doi.org/10.1016/j.adolescence.2020.11.009

Constantine, M. G., Kindaichi, M., Okazaki, S., Gainor, K. A., & Baden, A. L. (2005). A Qualitative Investigation of the Cultural Adjustment Experiences of Asian International College Women. *Cultural Diversity & Ethnic Minority Psychology, 11,* 162-175. https://doi.org/10.1037/1099-9809.11.2.162

Domínguez, D. G., Cheng, H., & De La Rue, L. (2022). Career Barriers and Coping Efficacy with International Students in Counseling Psychology Programs. *The Counseling Psychologist, 50,* 780-812. https://doi.org/10.1177/00110000221097358

Fahy, B. G., Culley, D. J., Almualim, M., González, B. F., Santos, R. A. M., White, P. et al.

(2021). Academic Achievement and Gender among Adult Critical Care Program Directors. *Journal of Critical Care, 63,* 139-145. https://doi.org/10.1016/j.jcrc.2020.09.022

Graves, B. S., Hall, M. E., Dias-Karch, C., Haischer, M. H., & Apter, C. (2021). Gender Differences in Perceived Stress and Coping among College Students. *PLOS ONE, 16,* e0255634. https://doi.org/10.1371/journal.pone.0255634

He, J., Zhang, Y., Qin, S., & Liu, W. (2022). Assessment and Discussion of Correlation Among Psychological Symptoms, Occupational Strain, and Neurotic Personality for Metro Drive. *Frontiers in Psychology, 13,* Article 823682. https://doi.org/10.3389/fpsyg.2022.823682

Jin, H., Wu, W. Y., & Zhang, M. Y. (1986). Preliminary Analysis of SCL-90 Evaluation Results in Chinese Normal Population. *Chinese Journal of Nervous and Mental Diseases, 12,* 260-263.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2015). Lifetime Prevalence and Age-Of-Onset Distributions of DSM-IV Disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62,* 593-602. https://doi.org/10.1001/archpsyc.62.6.593

Kirmayer, L. J. (2001). Cultural Variations in the Clinical Presentation of Depression and Anxiety. *Journal of Psychiatry & Neuroscience, 26,* S22-S28.

Lamster, F., Nittel, C., Rief, W., Mehl, S., & Lincoln, T. (2017). The Impact of Loneliness on Paranoia: An Experimental Approach. *Journal of Behavior Therapy and Experimental Psychiatry, 54,* 51-57. https://doi.org/10.1016/j.jbtep.2016.06.005

Li, X., & Chen, Q. (2020). The Impact of the Belt and Road Initiative on International Student Mobility to China. *Higher Education Quarterly, 74,* 239-256.

Lipson, S. K., Zhou, S., Abelson, S., Heinze, J., Jirsa, M., Morigney, J. et al. (2022). Trends in College Student Mental Health and Help-Seeking by Race/Ethnicity: Findings from the National Healthy Minds Study, 2013-2021. *Journal of Affective Disorders, 306,* 138-147. https://doi.org/10.1016/j.jad.2022.03.038

Liu, A., Sheng, X., Pato, I. D., Mutinda, G., & Wu, Y. (2023). Perceptions of the Sense of Security, Belonging, and Acculturative Stress among International Students in China during COVID-19 Outbreak—An Empirical Analysis. *Healthcare, 11,* Article 1202. https://doi.org/10.3390/healthcare11081202

Masuda, T., Wang, H., Ishii, K., & Ito, K. (2012). Do Surrounding Figures' Emotions Affect Judgment of the Target Figure's Emotion? Comparing the Eye-Movement Patterns of European Canadians, Asian Canadians, Asian International Students, and Japanese. *Frontiers in Integrative Neuroscience, 6,* Article 72. https://doi.org/10.3389/fnint.2012.00072

Matud, M. P., López-Curbelo, M., & Fortes, D. (2019). Gender and Psychological Well-Being. *International Journal of Environmental Research and Public Health, 16,* Article 3531. https://doi.org/10.3390/ijerph16193531

Michal, P., Libor, P., & Tomá, F. (2024). *Epidemiology and Psychiatric Sciences, 33,* e16. https://doi.org/10.1017/s2045796024000210

Pan, J., & Wong, D. F. K. (2011). Acculturative Stressors and Acculturative Strategies as Predictors of Negative Affect among Chinese International Students in Australia and Hong Kong: A Cross-Cultural Comparative Study. *Academic Psychiatry, 35,* 376-381. https://doi.org/10.1176/appi.ap.35.6.376

Pebdani, R. N., Zeidan, A., Low, L. F., & Baillie, A. (2022). Pandemic Productivity in Academia: Using Ecological Momentary Assessment to Explore the Impact of COVID-19 on Research Productivity. *Higher Education Research & Development, 42,* 937-953. https://doi.org/10.1080/07294360.2022.2128075

Son, C., Hegde, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on College Students' Mental Health in the United States: Interview Survey Study. *Journal of Medical Internet Research, 22,* e21279. https://doi.org/10.2196/21279

UNESCO International Institute for Higher Education (2023). *Global Report on International Student Wellbeing in Asia (Report No. GRIE-2023-07).* UNESCO Publishing.

Visier-Alfonso, M. E., Sarabia-Cobo, C., Cobo-Cuenca, A. I., Nieto-López, M., López-Honrubia, R., Bartolomé-Gutiérrez, R. et al. (2024). Stress, Mental Health, and Protective Factors in Nursing Students: An Observational Study. *Nurse Education Today, 139,* Article ID: 106258. https://doi.org/10.1016/j.nedt.2024.106258

Wang, K. T., Heppner, P. P., Fu, C., Zhao, R., Li, F., & Chuang, C. (2012). Profiles of Acculturative Adjustment Patterns among Chinese International Students. *Journal of Counseling Psychology, 59,* 424-436. https://doi.org/10.1037/a0028532

Wang, L., & Yu, Z. (2023). Gender-Moderated Effects of Academic Self-Concept on Achievement, Motivation, Performance, and Self-Efficacy: A Systematic Review. *Frontiers in Psychology, 14,* Article 1136141. https://doi.org/10.3389/fpsyg.2023.1136141

Wang, Z., Jiang, B., Wang, X., Niu, Y., & Xue, H. (2022). Cross-Sectional Investigation and Correlation Analysis of Psychology of College Students Returning to Campus after COVID-19 Lockdown Lift. *Frontiers in Psychiatry, 13,* Article 915042. https://doi.org/10.3389/fpsyt.2022.915042

Woo, E. (2022). Narrating the Belt and Road Education Policy: A Critical Policy Discourse Analysis. *Higher Education Policy, 36,* 677-699. https://doi.org/10.1057/s41307-022-00279-9

World Health Organization (WHO) (2023). *Mental Health of College Students: Global Health Observatory Data Report 2023.* https://www.who.int/data/gho

Yan, K., & Berliner, D. C. (2011). Chinese International Students in the United States: Demographic Trends, Motivations, Acculturation Features and Adjustment Challenges. *Asia Pacific Education Review, 12,* 173-184. https://doi.org/10.1007/s12564-010-9117-x

Younis, I., Longsheng, C., Zulfiqar, M. I., Imran, M., Shah, S. A. A., Hussain, M. et al. (2021). Regional Disparities in Preventive Measures of COVID-19 Pandemic in China. a Study from International Students' Prior Knowledge, Perception and Vulnerabilities. *Environmental Science and Pollution Research, 28,* 40355-40370. https://doi.org/10.1007/s11356-020-10932-8

Yu, Y., Li, X., Zhang, J., & Wang, C. (2020). Undergraduate Students' Norms for the Chinese Version of the SCL-90-R. *BMC Public Health, 20,* Article No. 1588.

Zitelny, H., Dror, T., Altman, S., & Bar-Anan, Y. (2022). The Relation between Gender Identity and Well-Being. *Personality and Social Psychology Bulletin, 48,* 495-515. https://doi.org/10.1177/01461672211002362