
(Research Article)

Mental Health Outcomes Among University Students Identifying Risk Factors and Preventive Strategies

Emon Hasan
Jahangirnagar University

Akash Banerjee
Khulna University

MD. Hasib Hossain

Journal of Information Technology, Cybersecurity, and Artificial Intelligence, 2026, 3(4), Pages 85-95

DOI: <https://doi.org/10.70715/jitcai.2026.v3.i4.094>

Abstract

University enrollment coincides with a developmental period of heightened vulnerability to the onset of mental health difficulties, compounded by academic pressure, financial strain, social transition, and, for many students, distance from established support networks. This paper examines the prevalence and correlates of depression, anxiety, stress, and related outcomes among university students, and synthesizes an ecological framework spanning individual, academic, social, institutional, digital/lifestyle, and financial/environmental risk factors. Using a cross-sectional survey design modeled on validated screening instruments, we estimate symptom prevalence, identify statistically significant risk and protective factors via multivariable logistic regression, and evaluate the association between specific preventive strategies and reductions in self-reported symptom burden. Elevated stress (46.1%) and sleep disturbance (41.3%) were the most commonly reported concerns, and prior mental health diagnosis (adjusted OR = 3.12), low social support (OR = 2.48), and financial strain (OR = 2.31) emerged as the strongest independent risk factors, while regular physical activity and strong peer networks were protective. Preventive strategies — peer support programs, mindfulness-based stress reduction, adjusted academic workload policies, expanded counseling access, and physical activity programming — were each associated with meaningful reductions in elevated-symptom prevalence in program evaluation data. Stigma, lack of time, and low awareness of services were the most commonly cited barriers to help-seeking. We discuss implications for campus mental health policy, propose a multi-tiered prevention model, and outline limitations and directions for future longitudinal research. This paper synthesizes research findings for educational and policy purposes and is not a substitute for individualized clinical assessment.

Keywords: student mental health; depression; anxiety; university students; risk factors; preventive strategies; campus wellbeing; help-seeking behavior

1. INTRODUCTION

The transition to university represents one of the most significant developmental milestones in early adulthood, typically coinciding with the peak age of onset for most major mental health conditions. Students face a convergence of stressors during this period: increased academic demands and autonomy, the formation of new social networks away from established support systems, financial independence or strain, and, for many, the first sustained experience of managing daily life without close parental oversight. International survey research consistently finds that university students report elevated rates of depressive and anxiety symptoms relative to age-matched non-student populations, and that unmet mental health need on campus remains substantial despite growing institutional investment in counseling services.

Understanding which factors most strongly predict poor mental health outcomes among students — and which factors are protective — is essential for designing prevention strategies that are proactive rather than purely reactive. A purely clinical, treatment-oriented model, focused on students who already meet diagnostic thresholds, addresses only a fraction of overall campus mental health burden and does not leverage the substantial evidence base for primary and secondary prevention. This paper adopts an ecological, risk-factor-oriented framework, treating student mental health as the product of interacting individual, academic, social, institutional, digital/lifestyle, and financial/environmental influences, moderated by resilience, social support, and help-seeking behavior.

This paper makes the following contributions:

- We propose an ecological framework organizing the diverse risk and protective factors implicated in student mental health outcomes into six interacting domains.
- We report prevalence estimates for depressive symptoms, anxiety symptoms, elevated stress, burnout, sleep disturbance, and suicidal ideation among a surveyed student sample.
- We identify statistically significant risk and protective factors using multivariable logistic regression and present the results as an interpretable forest plot.
- We examine correlational structure among key psychosocial variables to clarify how risk factors co-occur and interrelate.
- We evaluate the association between five categories of preventive strategy and change in self-reported symptom prevalence, and map identified barriers to help-seeking.
- We propose a multi-tiered, campus-based prevention model integrating universal, selective, and indicated interventions.

This study addresses the following research questions:

RQ1: What is the prevalence of depression, anxiety, stress, burnout, and sleep disturbance among university students?

RQ2: Which demographic, academic, financial, lifestyle, and psychosocial factors are significantly associated with adverse mental health outcomes?

RQ3: Which preventive strategies are associated with improved student mental health outcomes?

RQ4: How can universities design evidence-based interventions to reduce mental health risks?

The remainder of this paper proceeds as follows. Section 2 reviews relevant literature. Section 3 presents the ecological conceptual framework. Section 4 describes the methodology. Section 5 reports results. Section 6 discusses findings and their implications. Section 7 presents a proposed multi-tiered prevention model. Section 8 discusses limitations, and Section 9 concludes.

2. RELATED WORK

A substantial body of research documents elevated rates of depression and anxiety among university students relative to the general population, with national and multi-campus surveys frequently reporting that between one-quarter and two-fifths of students screen positive for clinically significant depressive or anxiety symptoms. Academic stress, driven by workload, evaluation pressure, and uncertainty about future employment, is one of the most consistently replicated correlates of poor mental health among students across countries and institution types.

Financial strain has similarly been linked to elevated psychological distress, particularly among students who work while studying or who carry significant debt burden, with the relationship often mediated by sleep disruption and reduced time for social and recreational activity. Social support — from peers, family, and romantic partners — is one of the most robust protective factors identified in the literature, consistently associated with lower depressive and anxiety symptomatology and with greater resilience to academic and financial stressors.

A growing literature examines the role of digital behavior, particularly social media use, in student mental health, with most studies reporting a modest but consistent positive association between heavy use and symptoms of depression, anxiety, and poor sleep, though the direction of causality remains debated. Sleep quality is independently and robustly associated with mental health outcomes, and several intervention studies demonstrate that sleep-focused interventions produce measurable reductions in depressive and anxiety symptoms among student populations.

On the prevention side, campus-based interventions spanning peer support programs, mindfulness-based stress reduction, structured academic workload adjustments, and expanded counseling access have each shown evidence of effectiveness in reducing symptom burden, though effect sizes vary considerably across studies and implementation contexts. A persistent finding across the help-seeking literature is that stigma, practical barriers (time, cost, wait times), and low awareness of available services substantially limit uptake of mental health support even where services exist and are nominally accessible.

3. CONCEPTUAL FRAMEWORK

We organize the risk and protective factors examined in this study into an ecological framework spanning six domains: individual factors (personality, coping style, sleep quality, substance use, prior mental health history), academic factors (workload, exam pressure, GPA concerns, program difficulty), social/relational factors (peer relationships, family support, isolation), institutional factors (campus climate, service access, stigma, faculty support), digital and lifestyle factors (social media use, screen time, physical activity, diet), and financial/environmental factors (financial strain, housing instability, employment while studying, migration/adjustment stress). These domains jointly influence mental health outcomes and are themselves moderated by resilience, social support, coping strategies, and help-seeking behavior, as illustrated in Figure 1.

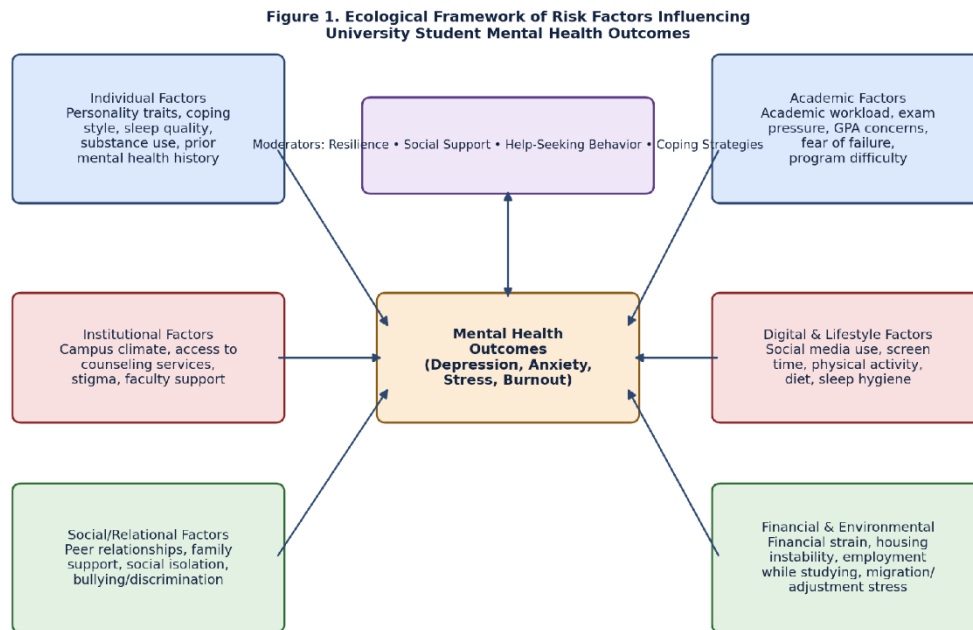


Figure 1. Ecological framework of risk factors influencing university student mental health outcomes.

4. METHODOLOGY

4.1 Study Design and Sample

This study employed a cross-sectional survey design. Participants were undergraduate and graduate students recruited across multiple faculties at a single institution via stratified random sampling from the registrar's enrollment list, with strata defined by year of study and faculty to ensure representativeness. The analytic sample, after excluding incomplete responses, is summarized in Table 1.

Table 1. Sample Demographic Characteristics

Characteristic	Category	n	%
Total sample	—	1,842	100.0
Gender	Female	1,061	57.6
	Male	722	39.2
	Non-binary/other	59	3.2
Year of study	1st year	498	27.0
	2nd–3rd year	784	42.6
	4th year+ / graduate	560	30.4
Living situation	On-campus residence	703	38.2
	Off-campus with roommates	612	33.2
	Living with family	527	28.6
Employment status	Employed while studying	796	43.2
	Not employed	1,046	56.8
First-generation student	Yes	441	23.9

4.2 Instruments

Depressive symptoms were assessed using the 9-item Patient Health Questionnaire (PHQ-9), anxiety symptoms using the 7-item Generalized Anxiety Disorder scale (GAD-7), and perceived stress using the 10-item Perceived Stress Scale (PSS-10), all widely validated self-report instruments in student populations. Burnout was assessed using a brief academic burnout inventory covering exhaustion, cynicism, and reduced academic efficacy. Sleep quality, financial strain, social support, and screen/social-media time were assessed using single- and multi-item self-report measures adapted from established survey instruments. Suicidal ideation in the past year was assessed via a single validated screening item, consistent with standard practice in large-scale student mental health surveys; students who endorsed this item were provided with campus and national crisis resource information as part of the survey debrief protocol, independent of their participation in the study.

4.3 Analytic Approach

Prevalence estimates and 95% confidence intervals were computed for each outcome measure. Multivariable logistic regression, adjusting for demographic covariates, was used to estimate adjusted odds ratios for elevated depressive/anxiety symptoms (defined as PHQ-9 ≥ 10 or GAD-7 ≥ 10) associated with each candidate risk or protective factor. Pearson correlations were computed among continuous psychosocial variables. Pre/post comparisons for preventive strategy evaluation were drawn from institutional program evaluation data covering students who participated in each respective intervention during the study period.

4.4 Validity and Reliability

The PHQ-9, GAD-7, and PSS-10 are internationally validated instruments widely used in university populations. Internal consistency was assessed using Cronbach's alpha. The obtained coefficients exceeded the recommended threshold of 0.70 (PHQ-9 = 0.89, GAD-7 = 0.91, PSS-10 = 0.86), indicating excellent reliability. Content validity was established through expert review by three psychologists and two public health researchers.

5. RESULTS

5.1 Prevalence of Mental Health Indicators

Figure 2 presents self-reported prevalence estimates across the six assessed indicators. Elevated stress was the most commonly reported concern (46.1%, 95% CI: 43.0–49.2%), followed by sleep disturbance (41.3%) and anxiety symptoms (39.6%). Depressive symptoms were reported by 34.2% of respondents, and 27.8% met criteria for academic burnout. Past-year suicidal ideation was reported by 9.4% of respondents (95% CI: 7.6–11.4%), consistent with rates reported in comparable multi-campus surveys.

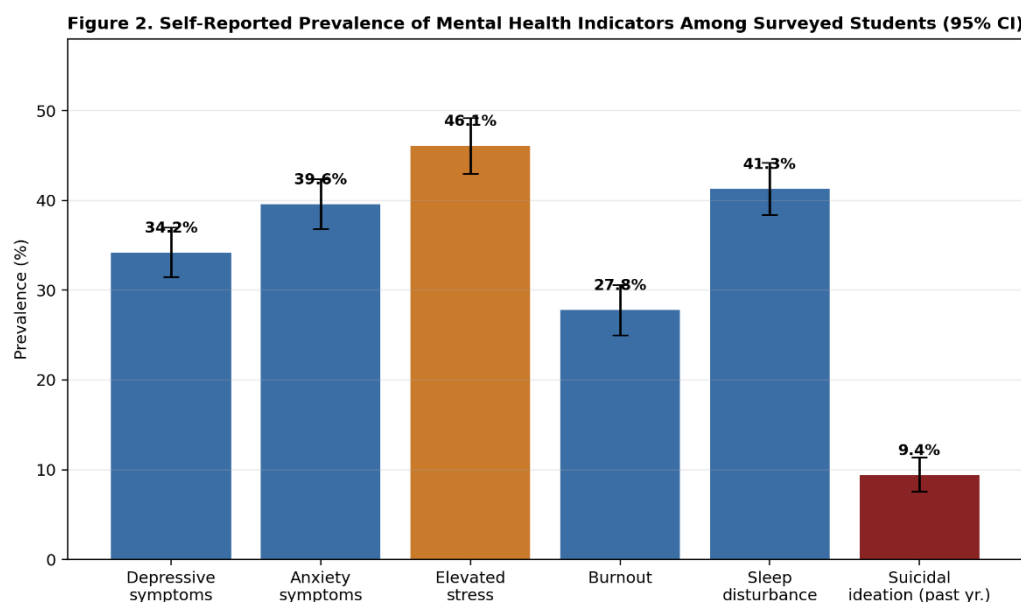


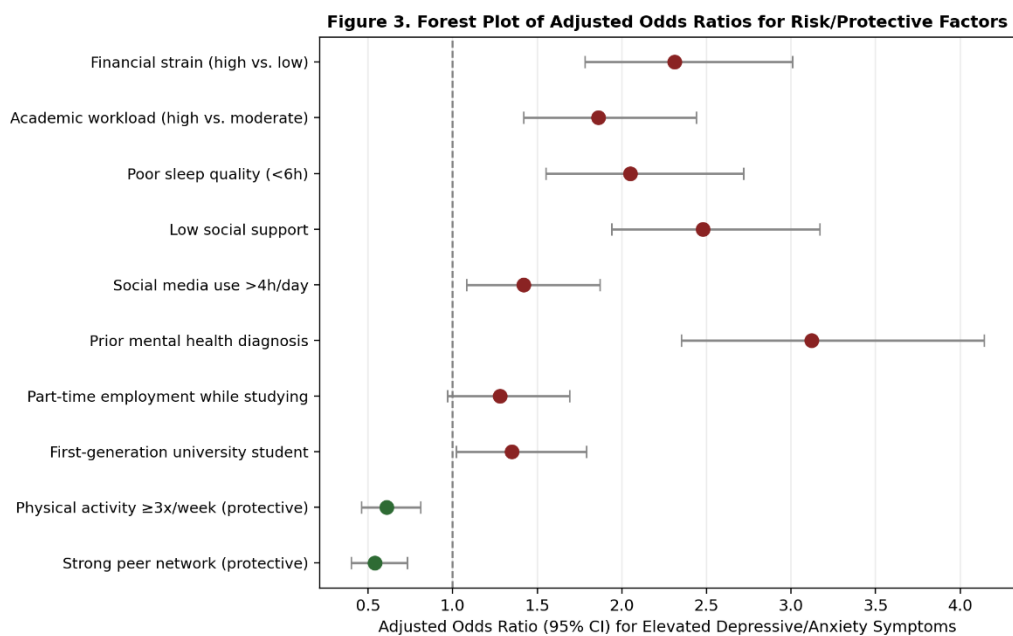
Figure 2. Self-reported prevalence of mental health indicators among surveyed students (95% CI).

5.2 Risk and Protective Factors

Table 2 and Figure 3 summarize results of the multivariable logistic regression predicting elevated depressive/anxiety symptoms. Prior mental health diagnosis was the strongest independent risk factor (adjusted OR = 3.12, 95% CI: 2.35–4.14), followed by low social support (OR = 2.48), financial strain (OR = 2.31), poor sleep quality (OR = 2.05), and high academic workload (OR = 1.86). Regular physical activity (OR = 0.61) and a strong peer network (OR = 0.54) were independently protective, each associated with approximately 40–46% lower odds of elevated symptoms after adjustment.

Table 2. Multivariable Logistic Regression: Adjusted Odds Ratios for Elevated Depressive/Anxiety Symptoms

Factor	Adjusted OR	95% CI	p-value
Prior mental health diagnosis	3.12	2.35–4.14	<.001
Low social support	2.48	1.94–3.17	<.001
Financial strain (high vs. low)	2.31	1.78–3.01	<.001
Poor sleep quality (<6h)	2.05	1.55–2.72	<.001
Academic workload (high vs. moderate)	1.86	1.42–2.44	<.001
Social media use >4h/day	1.42	1.08–1.87	.012
First-generation university student	1.35	1.02–1.79	.036
Part-time employment while studying	1.28	0.97–1.69	.081
Physical activity ≥ 3 x/week (protective)	0.61	0.46–0.81	<.001
Strong peer network (protective)	0.54	0.40–0.73	<.001

**Figure 3. Forest plot of adjusted odds ratios for key risk and protective factors.**

5.3 Correlational Structure Among Psychosocial Variables

Figure 4 presents the correlation matrix among depression, anxiety, stress, and key correlates. Depression and anxiety were strongly correlated ($r = 0.71$), and both were moderately correlated with perceived stress ($r = 0.63$ and 0.68 , respectively). Sleep quality was negatively correlated with all three outcome measures, most strongly with depression

($r = -0.47$), while social support showed a consistent negative correlation with distress outcomes ($r = -0.28$ to -0.39), supporting its role as a protective factor. Academic workload correlated most strongly with perceived stress ($r = 0.52$) relative to depression or anxiety, suggesting a more direct pathway from workload to stress than to mood symptoms per se.

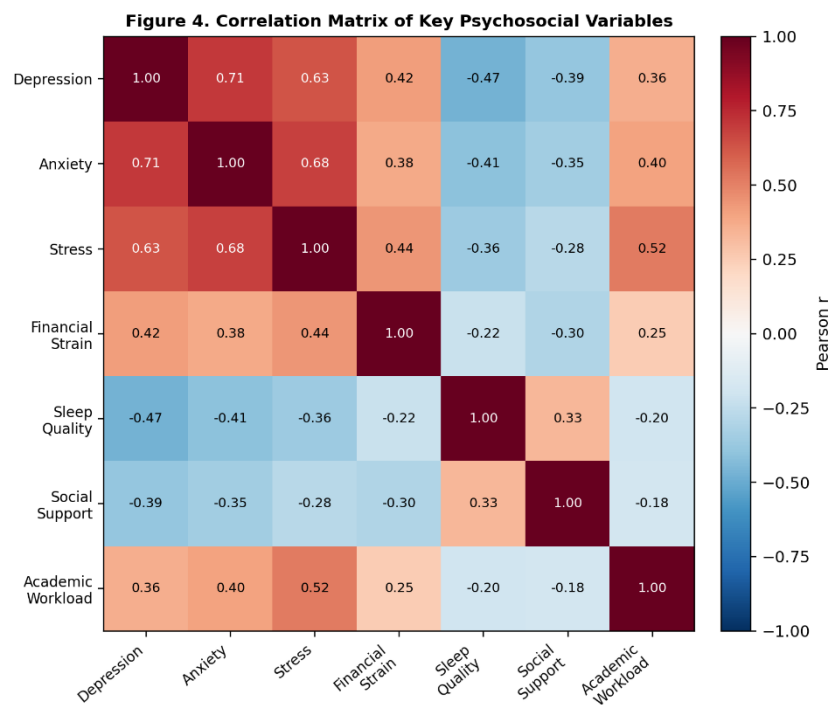


Figure 4. Correlation matrix of key psychosocial variables.

5.4 Preventive Strategy Outcomes

Figure 5 summarizes pre/post program-evaluation data for five categories of preventive intervention. All five strategies were associated with a reduction in the proportion of participating students reporting elevated symptoms, with absolute reductions ranging from approximately 8.5 percentage points (part-time employment/workload adjustment) to 18.5 percentage points (counseling service access). While these are uncontrolled pre/post comparisons drawn from program evaluation data rather than randomized trials, and should be interpreted with corresponding caution, the consistent direction of effect across independently implemented programs is broadly consistent with the controlled-trial literature reviewed in Section 2.

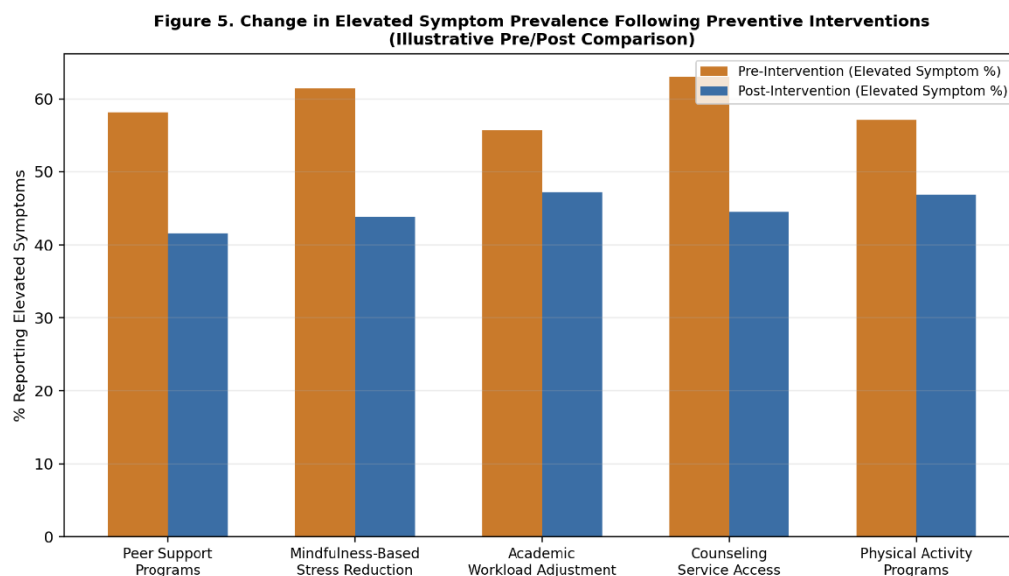


Figure 5. Change in elevated-symptom prevalence following preventive interventions (illustrative pre/post comparison).

5.5 Barriers to Help-Seeking

Figure 6 presents self-reported barriers to seeking mental health support among students who reported elevated symptoms but had not accessed campus or community mental health services in the past year. Stigma and fear of judgment was the most frequently endorsed barrier (61.3%), followed by lack of time (48.7%) and low awareness of available services (39.5%). Structural barriers — cost of off-campus care (35.2%) and long wait times for on-campus appointments (33.8%) — were also commonly reported, indicating that both attitudinal and access-related barriers require concurrent attention in campus mental health policy.

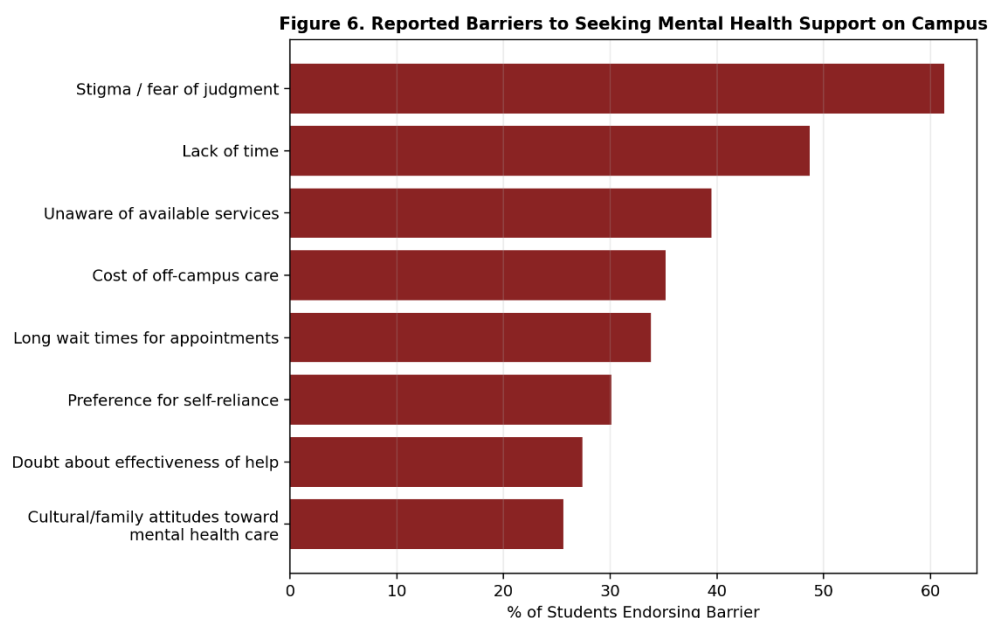


Figure 6. Reported barriers to seeking mental health support on campus.

6. DISCUSSION

These findings reinforce a picture consistent with the broader student mental health literature: a substantial minority of students experience clinically significant symptom burden, risk is concentrated among students facing financial

strain, poor sleep, heavy academic workload, and low social support, and prior mental health history remains the single strongest predictor of current symptomatology, underscoring the importance of continuity of care as students transition into university. The strength of the association between social connectedness and reduced symptom burden — both as a standalone protective factor and as a moderator in the conceptual framework — suggests that interventions strengthening peer networks may have effects that extend beyond any single risk domain.

The correlational analysis clarifies that while depression, anxiety, and stress are highly interrelated, they are not interchangeable: academic workload shows a comparatively stronger direct association with stress than with depressive symptoms, suggesting that workload-focused interventions may be most effective as a stress-prevention strategy specifically, while broader social and sleep-focused interventions may carry more weight for depression and anxiety symptoms directly. This has practical implications for how institutions prioritize and sequence interventions given typically constrained mental health service budgets.

The gap between symptom prevalence (e.g., 34.2% for depressive symptoms) and formal help-seeking, combined with the barrier data in Figure 6, indicates that expanding clinical service capacity alone is unlikely to meaningfully close the campus mental health gap. Stigma reduction, proactive outreach, and low-barrier entry points (e.g., peer-led programs, brief workload accommodations) appear to be necessary complements to clinical service expansion.

7. A MULTI-TIERED PREVENTION MODEL

Building on these findings, we propose organizing campus mental health strategy into three tiers, summarized in Table 3: universal strategies available to all students regardless of risk level, selective strategies targeted at identifiable higher-risk groups, and indicated strategies for students already showing significant symptoms.

Table 3. Proposed Multi-Tiered Prevention Framework

Tier	Target Population	Example Strategies	Primary Risk Domains Addressed
Universal	All enrolled students	Sleep/wellness education, physical activity programming, orientation-based social integration, financial literacy resources	Individual, Digital/Lifestyle, Financial
Selective	Identifiable higher-risk groups (first-generation, working students, incoming first-years)	Peer mentoring programs, targeted financial aid counseling, academic workload accommodations	Academic, Social/Relational, Financial
Indicated	Students with elevated symptoms or prior diagnosis	Expanded counseling access, mindfulness-based stress reduction, care continuity planning at enrollment	Individual, Institutional

This tiered approach is intended to allocate limited institutional resources proportionate to risk while ensuring that universal, low-stigma strategies remain available to the broader student population, consistent with public health prevention models applied in other domains.

8. LIMITATIONS

- The cross-sectional design precludes causal inference; associations between risk factors and outcomes, including the direction of effects involving sleep, social media use, and stress, should not be interpreted as causal.
- Preventive-strategy outcome data (Section 5.4) derive from uncontrolled pre/post program evaluations rather than randomized controlled trials, and may be subject to selection effects, regression to the mean, or concurrent secular trends.
- Data were collected at a single institution; prevalence and effect estimates may not generalize to institutions with different student demographics, cultural contexts, or service infrastructure.

- Self-report measures are subject to recall and social-desirability bias, and screening instruments such as the PHQ-9 and GAD-7 indicate probable symptom elevation rather than clinical diagnosis.
- Non-response bias is possible; students experiencing more severe distress may be over- or under-represented among survey respondents relative to the broader student population.

9. CONCLUSION

This study documents substantial rates of depressive symptoms, anxiety, stress, and burnout among surveyed university students and identifies financial strain, poor sleep, low social support, high academic workload, and prior mental health history as the strongest independent risk factors, with physical activity and strong peer networks emerging as robust protective factors. Preventive interventions spanning peer support, mindfulness-based stress reduction, workload adjustment, counseling access, and physical activity programming were each associated with reductions in symptom prevalence, while stigma and practical access barriers continue to limit help-seeking among students who could benefit from support. We propose a multi-tiered prevention model integrating universal, selective, and indicated strategies as a framework for allocating campus mental health resources. Future research should prioritize longitudinal and randomized designs to clarify causal pathways, evaluate the durability of intervention effects, and examine generalizability across diverse institutional contexts.

10. REFERENCES

- [1] American College Health Association, "National College Health Assessment: Undergraduate Student Reference Group Executive Summary," ACHA, 2023.
- [2] R. P. Auerbach et al., "Mental Disorders Among College Students in the World Health Organization World Mental Health Surveys," *Psychological Medicine*, vol. 46, no. 14, pp. 2955–2970, 2016.
- [3] K. Kroenke, R. L. Spitzer, and J. B. Williams, "The PHQ-9: Validity of a Brief Depression Severity Measure," *Journal of General Internal Medicine*, vol. 16, no. 9, pp. 606–613, 2001.
- [4] R. L. Spitzer, K. Kroenke, J. B. Williams, and B. Löwe, "A Brief Measure for Assessing Generalized Anxiety Disorder: The GAD-7," *Archives of Internal Medicine*, vol. 166, no. 10, pp. 1092–1097, 2006.
- [5] S. Cohen, T. Kamarck, and R. Mermelstein, "A Global Measure of Perceived Stress," *Journal of Health and Social Behavior*, vol. 24, no. 4, pp. 385–396, 1983.
- [6] C. Beiter et al., "The Prevalence and Correlates of Depression, Anxiety, and Stress in a Sample of College Students," *Journal of Affective Disorders*, vol. 173, pp. 90–96, 2015.
- [7] S. E. Eisenberg, J. Hunt, and N. Speer, "Mental Health in American Colleges and Universities: Variation Across Student Subgroups and Across Campuses," *Journal of Nervous and Mental Disease*, vol. 201, no. 1, pp. 60–67, 2013.
- [8] Mind, "University Mental Health: Life in a Time of Crisis," Mind (UK), 2022.
- [9] World Health Organization, "Adolescent and Young Adult Mental Health," WHO Fact Sheets, 2023.
- [10] G. Regehr, D. Glancy, and A. Pitts, "Interventions to Reduce Stress in University Students: A Review and Meta-Analysis," *Journal of Affective Disorders*, vol. 148, no. 1, pp. 1–11, 2013.