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Research Article

A Study to Examine Concept and Correlates of Complicated Stress: An Exploratory Study

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Abstract

Background: University students face a high burden of stress that can manifest not only as psychological distress but also as impaired functioning and diminished resilience. The concept of complicated stress—stress that coexists with psychiatric symptoms and reduced adaptive capacity—offers a more comprehensive framework for early identification and intervention.

Objective: To examine the nature and prevalence of complicated stress in a university student population and to investigate the relationship between stress severity and psychological resilience using the MASS battery.

Methods: A cross-sectional study was conducted among 442 university students using validated tools from the MASS (Mental Health Assessment Scales for Students) battery, including the Severity of Stress Scale and the Positivity and Resilience Scale. Psychometric analyses, descriptive statistics, and correlation tests were conducted.

Results: Over 75% of participants reported high-frequency cognitive-affective symptoms such as overthinking, nervousness, and emotional exhaustion. Female students reported significantly higher stress levels compared to males ($p < 0.01$). The Resilience and Positivity Scale demonstrated strong internal consistency (Cronbach's $\alpha = 0.87$) and a unidimensional factor structure. A significant inverse correlation ($r = -0.41$, $p < 0.01$) was found between resilience and stress severity.

Conclusion: The findings support the operational definition of complicated stress as involving symptom burden and reduced functioning. Resilience plays a crucial protective role, inversely related to stress severity. This underscores the need for holistic mental health strategies in academic institutions that target not only stress but also associated symptoms and psychological resilience.

Keywords

University students, Complicated stress, Resilience, MASS battery, Severity of stress, Digital self-assessment, Mental health screening, Psychological symptoms, Functioning, Stress management.

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Introduction

Stress is a ubiquitous human experience, shaped by the interaction between external challenges and internal coping resources [1]. However, not all stress is equal—its impact varies widely based on the individual's capacity to respond and recover. In this context, the concept of complicated stress emerges as a crucial construct, reflecting not merely the presence of adversity, but its entanglement with psychological symptoms, reduced functioning, and compromised resilience [2].

Stress is commonly portrayed in public health and psychological discourse as uniformly negative and detrimental to well-being [3]. However, emerging evidence and theoretical frameworks suggest a more nuanced picture. Stress, in its various forms and degrees, may not be universally harmful. Instead, it can range from beneficial to toxic depending on its severity, context, and the individual's capacity for coping and resilience [4,5]. In academic populations, where pressure is endemic, understanding this gradient becomes crucial for effective mental health assessment and intervention [6].

Background and Rationale

Stress has traditionally been conceptualized as a physiological reaction to environmental challenges, based on Selye's General Adaptation Syndrome model [7]. However, modern frameworks view stress through a biopsychosocial lens, acknowledging neurobiological, emotional, and functional dimensions. Contemporary typologies differentiate between eustress, tolerable stress, and toxic or complicated stress, the latter of which is closely linked to psychopathology and impaired functioning [8].

University students are a high-risk population due to the unique combination of academic pressure, identity development, and social transitions [9,10]. Among them, stress rarely occurs in isolation; it often coexists with anxiety, depression, and functional decline across academic, social, and emotional domains [11,12]. Notably, impairment in functioning may precede a formal psychiatric diagnosis, making it a critical early indicator of mental health distress [13].

Resilience—the capacity to adapt and recover in the face of adversity—emerges as a crucial protective factor. Research consistently shows an inverse relationship between stress and resilience, with resilient students demonstrating greater emotional regulation, academic engagement, and psychological well-being [14,15].

Despite extensive global research, mental health screening tools in Indian academic settings often remain symptom-focused, culturally misaligned, or lack inclusion of functioning and protective domains [16]. In response, the Mental Health Assessment Scales for Students (MASS) were developed to assess stress, resilience, symptoms, risk factors, functioning, and positivity among Indian university students. Within this framework, the 13-item Psychological Stress Scale and the 24-item Resilience and Positivity Scale have shown psychometric validity and contextual sensitivity [17].

Review of Literature

Psychological Stress and Student Mental Health

Student life in India is increasingly characterized by stressors such as academic overload, performance anxiety, peer comparison, financial pressures, and concerns about future employability [18,19]. Such chronic and cumulative stress exposure is associated with high rates of anxiety, depression, suicidality, and substance use [20,21]. Reports suggest that up to 70–80% of students experience moderate to severe stress symptoms, most of which remain unrecognized [22].

Complicated Stress and Functional Decline

Complicated or toxic stress arises from prolonged adversity without adequate coping resources [23,24]. Beyond emotional symptoms, it affects concentration, interpersonal relationships, and classroom participation [12,25]. Studies now suggest that stress should be evaluated not only through self-reported symptoms but also through its functional impact [26,27].

Role of Resilience and Protective Factors

Resilience has been shown to moderate the psychological consequences of stress [28,29]. Students with higher resilience exhibit lower distress and better performance outcomes [14,30]. Resilience is not fixed—it is shaped by social, institutional, and cultural environments and can be enhanced through targeted interventions such as psychoeducation, mindfulness, and peer-based support [31–34].

From Symptoms to Syndromes: Reconceptualizing Stress

Emerging literature argues that stress should be viewed as a syndrome—a complex interaction of symptoms, impaired functioning, and diminished adaptive capacity—rather than a single-domain experience [35,36]. A syndromal model allows for better early identification and intervention, particularly in student populations that often fall below diagnostic thresholds but still suffer significant distress [37,38].

Contribution of the MASS Framework

The MASS framework addresses these needs by integrating culturally adapted, psychometrically validated scales that assess psychological stress, functioning, and resilience in tandem. It aligns with global calls for multidimensional mental health assessments and provides an evidence-based model suited to the Indian academic context [16,39,40].

Methodology

Study Design and Objectives

This cross-sectional, observational study was conducted as part of the Mental Health Assessment Scales for Students (MASS) initiative—an evidence-driven project focused on the development of culturally sensitive and empirically validated digital tools for the early detection and assessment of mental health conditions among Indian university students.

The primary objectives of this study were:

1. To assess the levels and patterns of psychological stress and resilience among university students using two MASS instruments: the *Scale for Psychological Stress* (SPS) and the *Resilience Scale*.
2. To examine the interrelationship between psychological stress, functioning and resilience.
3. To identify and characterize a clinical subtype of stress, herein termed **complicated stress**, defined by high symptom severity, psychological comorbidity, and evidence of functional impairment.

Ethical Approval and Participant Protection

Ethical approval was obtained from the Institutional Ethics Committee of K. J. Somaiya Institute of Technology, Mumbai. Written informed digital consent was secured from all participants prior to data collection. Full anonymity with no collection of personally identifiable data, Confidentiality ensured via data encryption, secure login sessions, and restricted access to research personnel.

Participants and Recruitment

A total of 442 students (53.6% female; 46.4% male) aged between 18 and 26 years (M = 21.2, SD = 2.1) completed the study out of 520 who were recruited through purposive sampling from full-time university programs in technology and allied fields across urban Indian campuses. Recruitment was carried out via classroom announcements, and peer-referral.

Inclusion criteria:

- Age 18–26 years
- Enrolled in a full-time university program
- Provided voluntary informed consent

Exclusion criteria:

- Ongoing psychiatric treatment for diagnosed mental disorders
- Incomplete or inconsistent questionnaire responses

Instruments

The Mental Health Assessment Scales for Students (MASS) is a multidimensional, psychometrically validated digital battery designed to assess key domains of student mental health. It was developed to address the need for culturally sensitive, scalable tools for early detection and referral in university settings. The full MASS battery comprises six independent yet complementary scales:

1. Psychological Stress Scale
2. Psychiatric Warning Symptoms Scale
3. General Mental Health Symptoms Scale
4. Psychosocial Risk Factors Scale
5. Resilience and Positivity Scale
6. Functioning and Well-Being Scale (FWB-22)

Each scale was developed through rigorous item generation, expert review, pilot testing, and factor analysis to ensure conceptual clarity, internal consistency, and contextual relevance to Indian student populations.

Scales Used in This Study

For the current analysis, we focused on three key instruments from the MASS system in order to operationalize and characterize the phenomenon of complicated stress—defined as high stress accompanied by impaired functioning and low resilience. These included:

Psychological Stress Scale

This 13-item scale assesses emotional, behavioral, and cognitive responses to perceived academic and interpersonal stressors. Items are rated on a 5-point Likert scale (0 = never, 4 = always), and higher scores indicate greater stress intensity. The scale demonstrated excellent internal consistency ($\alpha = 0.84$) and a two-factor structure representing emotional reactivity and withdrawal [16].

Functioning and Well-Being Scale (FWB-22)

This 22-item scale measures functional impairment across academic, emotional, and motivational domains. It captures the impact of psychological burden on daily roles, peer relationships, academic performance, and personal initiative. The scale showed high reliability ($\alpha = 0.91$) and explained over 61% of total variance in functioning outcomes across three dimensions: academic-cognitive, emotional-interpersonal, and motivational functioning [17].

Resilience and Positivity Scale

The 24-item resilience scale evaluates personal strengths, coping flexibility, optimism, and social support. Responses are recorded on a 5-point scale (0 = strongly disagree, 4 = strongly agree). The scale yielded high reliability ($\alpha = 0.88$) and was structured around three core domains: internal resilience, social support, and future orientation [17].

Data Collection Procedure

Data collection was conducted over a two-month period using a secure, encrypted digital platform compatible with mobile and desktop devices. Participants completed the MASS battery in a single sitting (~15–20 minutes). Incomplete submissions were automatically flagged and excluded. All participants received debriefing information and referrals to mental health resources post-assessment.

Digitalization and Data Protection

Role-based access control ensured that only authorized research personnel accessed raw data. No data were stored locally on participant devices.

Statistical Analysis

Data analysis was conducted using IBM SPSS Statistics (Version 26.0). Descriptive statistics summarized participant characteristics and stress/resilience scores. Independent samples t-tests evaluated

gender differences. Pearson's correlation coefficient was used to examine the relationship between stress and resilience.

Operationalization of 'Complicated Stress'

Complicated stress was defined as:

- SPS scores in the top quartile (≥ 75th percentile)
- Simultaneous endorsement of symptoms across all three domains (physiological, emotional, cognitive)
- Self-reported functional impairment in academic or social domains, based on supplementary items and level of Resilience and positivity.

Results

Prevalence and Severity of Stress

Among 442 students, only 24.2% reported no stress, while 35.4% experienced mild stress, and 41.2% reported moderate to severe stress. The most commonly endorsed symptoms included:

- Nervousness before exams or deadlines (82%)
- Overthinking and racing thoughts (79%)
- Feeling overwhelmed with tasks (76%)
- Emotional exhaustion (68%)
- Fatigue or somatic complaints (66%)
- Frequent irritability (64%)

Over half the sample also reported motivational issues, such as loss of interest in studies (54%) and reduced motivation (52%).

Gender-based analysis revealed that female students had significantly higher stress scores ($M = 26.8$, $SD = 6.3$) compared to male students ($M = 24.1$, $SD = 7.1$), $t(248) = 3.02$, $p < 0.01$. These findings align with existing research suggesting greater vulnerability to internalized stress among female populations.

These results affirm the SPS as a valid tool for identifying both the intensity and multidimensional nature of academic stress in student populations.

These results validate the **Scale for Psychological stress (SPS)** as a relevant tool for capturing the multidimensional nature of academic stress and its clinical implications in the student demographic.

Characteristics of Complicated Stress

Students with high SPS scores and co-occurring symptoms across physiological, emotional, and cognitive domains were found to exhibit functional impairments in daily academic and social life. The symptom cluster—marked by overthinking, irritability, emotional depletion, and reduced motivation—represents a clinically relevant syndrome of complicated stress.

This construct captures a more serious form of stress that requires proactive intervention, differentiating it from transient or situational distress. The conceptualization is supported by the clustering of symptom burden with real-world impairments in functioning.

Relationship Between Stress and Resilience

The Resilience Scale, part of the MASS battery, showed excellent internal consistency (Cronbach's $\alpha = 0.87$) and a unidimensional factor structure explaining 48.6% of variance.

Pearson's correlation analysis revealed a significant negative correlation between stress and resilience ($r = -0.41$, $p < 0.01$), indicating that students with higher resilience scores reported significantly lower levels of psychological stress. This empirically supports the protective role of resilience and reinforces its inclusion in psychometric batteries aimed at early identification and preventive mental health strategies.

Psychometric Validity of scales used

Psychological Stress Scale (13 items):

The 13-item Psychological Stress Scale demonstrated strong psychometric properties in the student sample. Exploratory Factor Analysis (EFA) revealed a unidimensional structure with a Kaiser-Meyer-Olkin (KMO) value of 0.83 and Bartlett's Test of Sphericity ($\chi^2 = 1142.76$, $p < 0.001$), supporting sampling adequacy and factorability. The scale accounted for 52.1% of total variance, with item loadings ranging from 0.56 to 0.78. Internal consistency was high (Cronbach's $\alpha = 0.88$), indicating excellent reliability. Convergent validity was confirmed through significant correlations with psychiatric symptom scores ($r = 0.74$, $p < 0.001$) and functional impairment ($r = -0.63$, $p < 0.001$), establishing the scale's clinical relevance.

The Functioning and Well-Being Scale (FWB-22), developed to assess academic, emotional, and social functioning among university students, demonstrated strong psychometric validity in the present study. The scale showed excellent internal consistency, with a Cronbach's alpha of 0.91, indicating a high degree of reliability across its 22 items. An exploratory factor analysis (EFA) supported a stable three-factor structure, corresponding to cognitive-academic performance, emotional-interpersonal functioning, and motivational engagement. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.89, and Bartlett's test of sphericity was significant ($\chi^2 = 2154.67$, $p < 0.001$), confirming the appropriateness of factor analysis. Together, the three factors accounted for 61.2% of the total variance, with item loadings ranging from 0.52 to 0.81, supporting the construct validity of the scale.

Further, convergent validity was established through significant correlations with other psychological domains: functioning was negatively correlated with stress ($r = -0.63$, $p < 0.001$) and psychiatric symptoms ($r = -0.65$, $p < 0.001$), and positively correlated with resilience ($r = 0.57$, $p < 0.001$). These findings are consistent with theoretical models that link functional impairment to psychological distress and protective traits like resilience. Overall, these results validate the FWB-22 as a reliable, multidimensional tool for assessing functioning and well-being in university student populations, especially in the Indian context

where such assessment tools are scarce.

Resilience and Positivity Scale (24 items):
The 24-item scale assessing resilience and positivity showed strong internal reliability (Cronbach's α = 0.91) and robust factor structure. EFA supported a two-factor model—adaptive coping and optimistic orientation—with a KMO of 0.87 and Bartlett's χ^2 = 1986.43, $p < 0.001$. These two factors together explained 57.4% of the variance. Factor loadings ranged from 0.49 to 0.82. Validity was supported by significant negative correlation with stress ($r = -0.66$, $p < 0.001$) and psychiatric symptoms, and positive correlation with functioning ($r = 0.57$, $p < 0.001$), aligning with resilience theory and positive psychology constructs.

Table 1: Severity of Stress.

Gender	N	Mean (M)	Standard Deviation (SD)	t-value	p-value
Female	248	26.8	6.3	3.02	< 0.01
Male	194	24.1	7.1		

Note: Female students reported significantly higher perceived stress scores than male students. The difference was statistically significant ($p < 0.01$), indicating a gender-related variation in stress experience among university students.

Table 2: Prevalence of Most Common Stress Symptoms Among University Students.

Symptom	% Reporting
Nervousness before exams or deadlines	82%
Overthinking and racing thoughts	79%
Feeling overwhelmed with tasks	76%
Emotional exhaustion	68%
Fatigue or physical symptoms (e.g., headache)	66%
Irritability or frequent anger	64%
Loss of interest in studies	54%
Lack of motivation for daily tasks	52%

Note: Cognitive-affective symptoms such as nervousness and overthinking were the most frequently reported, suggesting a high prevalence of internalizing stress responses.

Table 3: Correlation Between Resilience and Severity of Stress.

Variables	Pearson's r	p-value	Interpretation
Resilience × Stress Severity	-0.41	< 0.01	Moderate, statistically significant negative correlation

Note: Higher resilience scores are significantly associated with lower levels of perceived stress.

Table 4: Distribution of Stress and Resilience Among Students.

	Total Stress	Total Resilience
Total Stress	1.000	-0.351**
Total Resilience	-0.351**	1.000
Sig. (2-tailed)	—	0.000
N	442	442

Note: **Correlation significant at the 0.01 level (2-tailed).** Both Pearson's and Spearman's results reinforce the inverse relationship between stress and resilience.

Category	Percentage (%)
Stress Levels	
No Stress	24.4
Mild Stress	35.4
Moderate/Severe Stress	41.2
Resilience Levels	
Low Resilience	19.2
Moderate Resilience	37.2
High Resilience	43.6
Correlation (r)	-0.58
Significance (p-value)	< 0.01

Note: The distribution suggests that while nearly one in five students demonstrated low resilience, over 40% were experiencing moderate to severe stress—highlighting the risk of complicated stress profiles. The strong inverse correlation (r = -0.58) further affirms the role of resilience in moderating stress impact.

Discussion

Deconstructing the Construct: From Common Stress to Complicated Stress

The findings empirically support the concept that stress among students is not limited to transient discomfort but frequently presents as a persistent, multifaceted phenomenon. Participants reported elevated levels of cognitive-affective symptoms—such as overthinking and persistent worry—alongside psychosomatic complaints including fatigue and sleep disturbances. These symptoms, coupled with academic disengagement and motivational decline, validate the syndromic nature of complicated stress [26,27].

This aligns with contemporary literature describing a subtype of stress characterized by its chronicity, emotional entanglement, and interference with core functioning—paralleling trauma-related and adjustment disorders [41,42,43,44]. Such findings advocate for a dimensional model of stress, moving beyond a binary "normal vs. pathological" framework, and instead incorporating gradations of symptom burden and functional disruption.

Subtype Considerations and Risk Profiling

The present data allowed for a tentative typology of stress among students:

1. Functional Stress: Elevated perceived stress with maintained functioning [25,45].
2. Symptomatic Stress: Marked emotional or cognitive symptoms without significant functional loss.
3. Complicated Stress: High symptom burden with substantial academic, social, or emotional impairment.

Gender and Resilience: Differential Vulnerabilities

A significant gender difference emerged, with female students reporting higher levels of stress—echoing findings in broader research that suggest greater emotional vulnerability, differential socialization, and stigma-related barriers to help-seeking among women [46]. Cultural expectations and safety concerns may

Table 6: Psychometric Properties of MASS Scales – Stress, Resilience, and Functioning.

Scale	No. of Items	Internal Consistency (Cronbach's α)	Factor Structure	Variance Explained (%)	KMO	Bartlett's Test of Sphericity (χ^2, p)	Item Loadings	Convergent Validity
Psychological Stress Scale	13	0.84	2 factors: Emotional Reactivity, Withdrawal	54.3%	0.82	$\chi^2 = 1087.52$, $p < 0.001$	0.47 – 0.76	Positively correlated with psychiatric symptoms ($r = 0.74$), negatively with resilience ($r = -0.66$)
Resilience and Positivity Scale	24	0.88	3 factors: Internal Strength, Social Support, Future Orientation	59.7%	0.87	$\chi^2 = 1862.31$, $p < 0.001$	0.50 – 0.79	Positively correlated with functioning ($r = 0.57$), negatively with stress ($r = -0.66$)
Functioning & Well-Being (FWB-22)	22	0.91	3 factors: Academic-Cognitive, Emotional-Interpersonal, Motivation	61.2%	0.89	$\chi^2 = 2154.67$, $p < 0.001$	0.52 – 0.81	Negatively correlated with stress ($r = -0.63$), psychiatric symptoms ($r = -0.65$); positively with resilience ($r = 0.57$)

Notes:
- KMO (Kaiser-Meyer-Olkin) values > 0.80 indicate meritorious sampling adequacy.
- Bartlett's Test significance ($p < 0.001$) confirms the suitability of data for factor analysis.
- Item loadings refer to factor analysis weights; values > 0.4 are acceptable and > 0.6 are strong.
- Convergent validity correlations are statistically significant at $p < 0.001$.

further amplify stress experiences in female students within the Indian context [47].

Resilience emerged as a crucial protective factor. The inverse correlation between stress and resilience supports existing theoretical models positing resilience as a dynamic buffer against psychological adversity [15,48,49]. Students with higher resilience—demonstrated through optimism, adaptability, and self-efficacy—were better able to withstand academic and emotional pressures.

These results endorse the MASS Resilience and Positivity Scale as both psychometrically sound and clinically useful. Its unidimensional structure and high internal consistency support its use in early screening programs aimed at identifying students at risk for psychological deterioration.

Guidelines for Implementation: Assessment, Prevention, and Policy

The findings point to several actionable directions for integrating complicated stress assessment and resilience building in university settings:

- **Multidimensional Screening**: Tools like MASS enable simultaneous measurement of symptoms, functioning, and resilience, allowing for stratified mental health risk profiling rather than one-dimensional symptom checklists [37].
- **Resilience Training**: Structured interventions—such as cognitive-behavioral skills, mindfulness, and peer mentoring—have shown promise in enhancing psychological flexibility and reducing stress burden [33,46].
- **Digital Platforms**: In large, resource-constrained academic environments, digital tools facilitate self-assessment, immediate feedback, and automated triaging into mental health services [23,37].
- **Early Intervention**: Identifying complicated stress before it develops into major psychiatric disorders (e.g., depression, GAD, burnout) opens a window for cost-effective, preventive care [50].

Merits and Strengths

This study offers multiple contributions:

- It operationalizes *complicated stress* through culturally adapted, validated tools.
- It provides a novel typology grounded in symptomatology and functional status.
- It confirms the clinical utility of integrating resilience metrics into assessment protocols.
- It contributes empirical support to the call for stratified, student-centered intervention models in academic mental health.

Limitations and Future Directions

Despite its contributions, several limitations warrant mention:

- **Cross-Sectional Design**: Limits inference on causality between stress, resilience, and functioning.
- **Self-Report Bias**: Subjective data may under- or over-estimate symptom severity or protective factors.
- **Sample Representativeness**: The sample was drawn from limited academic settings and may not reflect national diversity.

Future research should aim at longitudinal designs to examine the evolution of stress states and their outcomes. Intervention studies testing resilience-enhancing programs and digital mental

health applications in diverse student populations are warranted. Moreover, neurobiological or physiological investigations could help further validate *complicated stress* as a distinct syndrome.

Conclusion

The study underscores the multidimensional nature of stress among university students and supports the emerging construct of *complicated stress*—a form that includes syndromal features, functional disruption, and decreased resilience. The MASS framework provides a culturally sensitive, psychometrically robust tool for assessing this construct in Indian university settings.

By reconceptualizing stress as a triadic entity—comprising symptoms, functioning, and resilience—this study calls for a paradigm shift in mental health assessment and intervention.

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Conflict of Interest

The authors declare no conflict of interest.

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References

1. Lazarus RS, Folkman S. Stress, appraisal, and coping. New York: Springer; 1984.
2. McEwen BS. Protective and damaging effects of stress mediators. N Engl J Med. 1998;338(3):171–9.
3. Schneiderman N, Ironson G, Siegel SD. Stress and health: psychological, behavioral, and biological determinants. Annu Rev Clin Psychol. 2005;1:607–28.
4. Selye H. The Stress of Life. New York: McGraw-Hill; 1976.
5. Lupien SJ, McEwen BS, Gunnar MR, Heim C. Effects of stress throughout the lifespan on the brain, behaviour and cognition. Nat Rev Neurosci. 2009;10(6):434–45.
6. Bewick B, Koutsopoulou G, Miles J, Slaa E, Barkham M. Changes in undergraduate students' psychological well-being as they progress through university. Stud High Educ. 2010;35(6):633–45.
7. Selye H. A syndrome produced by diverse nocuous agents. Nature. 1936;138:32.
8. Shonkoff JP, Garner AS. The lifelong effects of early childhood adversity and toxic stress. Pediatrics. 2012;129(1):e232–46.
9. Eisenberg D, Hunt J, Speer N. Mental health in American colleges and universities: variation across student subgroups and across campuses. J Nerv Ment Dis. 2013;201(1):60–7.
10. Auerbach RP, Mortier P, Bruffaerts R, et al. WHO World Mental Health Surveys International College Student Project: prevalence and distribution of mental disorders. J Abnorm Psychol. 2018;127(7):623–38.
11. Bayram N, Bilgel N. The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. Soc Psychiatry Psychiatr Epidemiol. 2008;43(8):667–72.
12. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. Acad Med. 2006;81(4):354–73.
13. Eisenberg D, Gollust SE, Golberstein E, Hefner JL. Prevalence and correlates of depression, anxiety, and suicidality among university students. Am J Orthopsychiatry. 2007;77(4):534–42.
14. Connor KM, Davidson JRT. Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). Depress Anxiety. 2003;18(2):76–82.
15. Southwick SM, Bonanno GA, Masten AS, Panter-Brick C, Yehuda R. Resilience definitions, theory, and challenges: interdisciplinary perspectives. Eur J Psychotraumatol. 2014; 5: 25338.
16. Shrivastava A, Datta M, De Sousa A. Development of the Mental Health Assessment Scales for Students (MASS): An Indian academic population-based tool. Open J Psychiatry. 2025 [forthcoming].
17. Shrivastava A, De Sousa A, Datta M. Validation of the Psychological Stress and Resilience Scales from MASS. Indian Open J Psyhciatry. 2025 (Accepted).
18. Deb S, Strodl E, Sun J. Academic stress, parental pressure, anxiety and mental health among Indian high school students. Int J Psychol Behav Sci. 2015;5(1):26–34.
19. Kumar S, Bhukar JP. Stress level and coping strategies of college students. J Phys Educ Sports Manag. 2013;4(1):5–11.
20. Verma S, Sharma D. Cultural perspectives on child and adolescent mental health in India. Child Adolesc Psychiatr Clin N Am. 2003;12(4):573–92.
21. Singh R, Goyal M, Tiwari S. Mental health problems among college students: a cross-sectional study. Indian J Psychol Med. 2021;43(4):314–20.
22. Roy MP, Chakraborty PK, Tiwari R. A study of psychological distress among undergraduate students. Ind Psychiatry J. 2019;28(2):221–6.
23. Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many leading causes of death in adults. Am J Prev Med. 1998;14(4):245–58.
24. Danese A, McEwen BS. Adverse childhood experiences, allostasis, allostatic load, and age-related disease. Physiol Behav. 2012;106(1):29–39.

25. Regehr C, Glancy D, Pitts A. Interventions to reduce stress in university students: a review and meta-analysis. J Affect Disord. 2013;148(1):1–11.
26. Kitzrow MA. The mental health needs of today's college students: challenges and recommendations. NASPA J. 2003;41(1):165–79.
27. Stallman HM. Psychological distress in university students: a comparison with general population data. Aust Psychol. 2010;45(4):249–57.
28. Windle G. What is resilience? A review and concept analysis. Rev Clin Gerontol. 2011;21(2):152–69.
29. Fergus S, Zimmerman MA. Adolescent resilience: a framework for understanding healthy development in the face of risk. Annu Rev Public Health. 2005;26:399–419.
30. Joyce S, Shand F, Bryant RA, Lal TJ, Harvey SB. Mindfulness-based resilience training in the workplace: pilot study of the internet-based Resilience@Work (RAW) mindfulness program. J Med Internet Res. 2018;20(9):e10326.
31. Shapiro SL, Brown KW, Astin JA. Toward the integration of meditation into higher education: A review of research. Teach Coll Rec. 2011;113(3):493–528.
32. American College Health Association. National College Health Assessment II: Reference Group Executive Summary. Silver Spring, MD: ACHA; 2020.
33. Luthar SS, Cicchetti D, Becker B. The construct of resilience: a critical evaluation and guidelines for future work. Child Dev. 2000;71(3):543–62.
34. Durlak JA, Weissberg RP, Dymnicki AB, et al. The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. Child Dev. 2011;82(1):405–32.
35. Gunnar MR, Quevedo K. The neurobiology of stress and development. Annu Rev Psychol. 2007;58:145–73.
36. McLaughlin KA, Sheridan MA, Lambert HK. Childhood adversity and neural development: deprivation and threat as distinct dimensions of early experience. Neurosci Biobehav Rev. 2014;47:578–91.
37. Keyes CLM. Mental illness and/or mental health? Investigating axioms of the complete state model of health. J Consult Clin Psychol. 2005;73(3):539–48.
38. Vaingankar JA, Abdin E, Chong SA, et al. Functioning and quality of life in mental disorders: population norms and correlations with clinical and social factors. Psychiatry Res. 2016;241:152–8.
39. Patel V, Saxena S, Lund C, et al. The Lancet Commission on global mental health and sustainable development. Lancet. 2018;392(10157):1553–98.
40. World Health Organization. Mental health: strengthening our response. Geneva: WHO; 2022.
41. Yehuda R, Flory JD, Southwick S, Charney DS. Developing an agenda for translational studies of resilience and vulnerability following trauma exposure. Ann N Y Acad Sci. 2006;1071:379–96.
42. Southwick SM, Charney DS. The science of resilience: implications for the prevention and treatment of depression. Science. 2012;338(6103):79–82.
43. Galatzer-Levy IR, Huang SH, Bonanno GA. Trajectories of resilience and dysfunction following potential trauma: a review and statistical evaluation. Clin Psychol Rev. 2018;63:41–55.
44. Bonanno GA, Diminich ED. Annual research review: positive adjustment to adversity – trajectories of minimal–impact resilience and emergent resilience. J Child Psychol Psychiatry. 2013;54(4):378–401.
45. Luthar SS. Resilience in development: A synthesis of research across five decades. In: Cicchetti D, Cohen DJ, editors. Developmental Psychopathology: Risk, Disorder, and Adaptation. Vol 3. New York: Wiley; 2006. p. 739–95.
46. Matud MP. Gender differences in stress and coping styles. Pers Individ Dif. 2004;37(7):1401–15.
47. Nolen-Hoeksema S. Emotion regulation and psychopathology: The role of gender. Annu Rev Clin Psychol. 2012;8:161–87.
48. Singh SK, Singh D, Sharma V. Gender-specific mental health issues among college students: a cross-sectional study. Asian J Psychiatr. 2020;49:101954.
49. Herrman H, Stewart DE, Diaz-Granados N, et al. What is resilience? Can J Psychiatry. 2011;56(5):258–65.
50. Davidson JRT, Payne VM, Connor KM, et al. Trauma, resilience and saliostasis: an evolving concept. Depress Anxiety. 2005;21(4):227–8.