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Mapping the Evidence of Academic Stress and Mental Toughness Among College Students: A Scoping Review

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Abstract

Academic stress is a prevalent issue in higher education and is associated with negative psychological and academic outcomes among college students. Identifying protective factors that support effective stress management is therefore essential. Mental toughness has emerged as a relevant construct; however, evidence regarding its relationship with academic stress and stress management practices remain fragmented. This scoping review aimed to map existing literature on the relationship between academic stress, stress management strategies, and mental toughness among college students. Following the Arksey and O'Malley framework and PRISMA 2020 guidelines, searches were conducted across Scopus, Web of Science, PubMed, and PsycINFO. After screening and eligibility assessment, 21 studies were included for qualitative synthesis. Findings identified three primary pathways linking mental toughness to academic stress management: (1) structured and demanding activities such as competitive sports; (2) lifestyle-based interventions including physical activity and meditation; and (3) self-regulatory and emotional skills such as mindfulness, self-compassion, and emotional intelligence. Overall, mental toughness functioned as a protective psychological resource that enhanced resilience, adaptive coping, and emotional regulation. These findings support the integration of mental toughness–building strategies within higher education contexts.

Keywords: academic stress; mental toughness; stress management; coping strategies; college students

INTRODUCTION

Academic stress is a prevalent issue among students, especially those enrolled in rigorous and highly competitive fields. The intense academic workload, high expectations, and demanding curriculum contribute to significant levels of stress, which can have adverse effects on students' overall well-being (Salazar Echeagaray et al., 2024). Prolonged exposure to academic stress can lead to severe mental health challenges, including heightened anxiety, depressive symptoms, chronic fatigue, and emotional burnout (Sánchez et al., 2023). Additionally, students experiencing excessive stress often struggle with sleep disturbances, concentration difficulties, and diminished academic performance. If left unmanaged, these negative effects can impair both their mental and physical health, ultimately impacting their academic success and personal growth (Younes & Sadler, 2020).

Common sources of academic stress among students include excessive workload, frequent assessments, intense competition with peers, financial responsibilities, and challenges related to social interactions and emotional well-being (Barongo, 2023). These stressors can significantly impact students' mental health, leading to increased anxiety, burnout, and difficulties in maintaining academic performance and personal stability (Andargeery et al., 2025).

Given these concerns, it is crucial to explore effective stress management practices that can help students cope with stress and enhance

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their mental toughness. Educational institutions play a crucial role in alleviating student stress by implementing structured stress management programs, offering mental health resources, and fostering an environment that promotes well-being (Singh et al., 2023).

Mental toughness is a complex, multidimensional psychological trait that describes individuals who exhibit resilience, determination, and perseverance when confronted with challenges, adversities, and stressors (Su et al., 2024). Those with high mental toughness demonstrate the ability to remain focused, motivated, and persistent, even in difficult situations, allowing them to overcome obstacles and maintain performance under pressure. This construct involves not only emotional regulation and confidence but also the capacity to adapt and push through stress while sustaining effort toward achieving long-term goals (Su et al., 2024).

Mental toughness plays a vital role in helping students adjust to new environments and effectively cope with the challenges of transitioning to university life. Key components of mental toughness include commitment, which drives students to stay focused on their goals; control of life, enabling them to navigate stressors and uncertainties with resilience and emotional control, allowing them to manage their emotions during difficult situations; and confidence in abilities, which fosters a belief in their capacity to succeed and overcome obstacles (St Clair-Thompson et al., 2017). These attributes collectively enhance students' ability to adapt, perform under pressure, and maintain well-being during the transition to higher education.

Moreover, mental toughness is strongly linked to improved resilience and more effective coping strategies, both of which are essential for managing academic stress and preventing burnout (Silva-Lorente, 2024). Students with high levels of mental toughness are better equipped to handle the pressures of academic life, such as heavy workloads, deadlines, and performance expectations. Their resilience allows them to bounce back from setbacks, while their coping strategies help them manage stress in healthy ways. This combination of mental toughness and adaptive coping mechanisms plays a vital role in maintaining mental and physical well-being, ensuring that students can sustain their academic performance without getting burnout (Silva-Lorente, 2024).

Higher levels of mental toughness are associated with better mental health outcomes, including reduced levels of depression and anxiety (Lin et al. 2017). In their study, they discovered that individuals with greater mental toughness tend to handle stress and adversity more effectively, leading to a greater sense of emotional stability. This ability to manage challenges not only lowers the risk of mental health issues but also contributes to overall psychological well-being as it fosters a more positive outlook, enhances self-efficacy, encourages good stance and promotes adaptive coping strategies, all of which are key factors in maintaining and sustaining good mental health (Lin et al. 2017).

Given the increasing awareness of student stress and its consequences, this scoping study aims to explore and map existing literature and empirical evidence on the relationship between stress management strategies and mental toughness in higher education. The study also intends to identify key trends, concepts, and gaps in current research that could inform future interventions or policy development. The following research questions guided this scoping review:

1. What is currently known about the stress management practices employed by college students?

2. How is mental toughness conceptualized and measured in relation to academic stress?

3. What is the relationship between stress management practices and mental toughness in the context of higher education?

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4. What gaps exist in the current literature regarding the development and enhancement of mental toughness through stress management interventions?

This scoping research will provide a foundation for more targeted studies or interventions in the future, including the potential development of institutional programs or support systems that promote resilience and mental well-being among students.

METHODOLOGY

Research Design. This study adopts a scoping review methodology guided by the methodological guidance developed by Arksey and O'Malley (2005) and further refined by Levac et al. (2010). This approach is particularly appropriate for examining the breadth and depth of available evidence on topics that have not yet been comprehensively reviewed or systematically mapped (Jaleniauskiene & Lisaite, 2023). The study follows a methodologically transparent process by adhering to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) 2020 recommendations for the design, conduct, and reporting of scoping reviews (Page et al., 2021). PRISMA provides structured guidance for documenting the search strategy, screening and eligibility procedures, inclusion and exclusion decisions, and reporting of results. By integrating PRISMA principles, the study enhances the clarity, consistency, and replicability of the review process, ensuring that findings are presented in a systematic and credible manner. The scoping review process involves defining the research questions, identifying relevant studies, selecting studies based on predefined eligibility criteria, charting the data, and collating and summarizing the results (Pollock et al., 2024).

In this research, the scoping review process began with the identification of the research questions. This stage involved clarifying the scope and focus of the inquiry and ensuring that the questions were sufficiently broad to capture relevant literature while remaining aligned with the central areas of interest. The review then progressed to identifying relevant studies, which entailed systematically searching academic databases and other credible sources using predetermined keywords and search strategies. This approach allowed the researchers to gather a comprehensive body of literature related to academic stress, mental toughness, and stress management among college students.

Study selection followed, during which the collected records were evaluated using predefined inclusion and exclusion criteria. Only studies that aligned with the review objectives and provided adequate methodological detail were retained. Once the eligible studies were identified, data charting was undertaken, and key information such as study design, population characteristics, conceptual definitions, and major findings was extracted and organized into a structured format to support analysis. The review then moved into a stage of collating, summarizing, and reporting the results, during which the extracted data were synthesized using narrative and thematic approaches. This process highlighted common patterns, conceptual connections, and research gaps. The intention of the analysis was not to appraise the quality of individual studies but to map the breadth of existing knowledge and identify areas and aspects that required deeper exploration.

Data extraction was carried out using a structured charting form designed to systematically capture essential information from each included study. The form included authorship, publication year, country of origin, study design, sample characteristics, definitions and measures of academic stress and mental toughness, stress management strategies, and key findings (Büchter, Weise, & Pieper, 2020). Notes on research gaps and limitations reported within the studies were also documented. To ensure accuracy and consistency, two reviewers completed the charting independently, and any differences in extraction were resolved through discussion or consultation with a third reviewer.

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Following data extraction, the findings were synthesized to identify recurring themes, conceptual definitions, and relationships among academic stress, mental toughness, and stress management. A basic qualitative content analysis approach was utilized, which is well suited to synthesizing diverse forms of evidence in scoping reviews (Pollock et al., 2024). This approach enabled the identification of thematic categories and conceptual patterns across the included studies. Through iterative coding and constant comparison, the synthesis revealed how academic stress and mental toughness had been conceptualized, measured, and linked within higher education contexts. This analytic strategy supported a transparent and rigorous interpretation of the evidence while also clarifying research gaps and potential directions for future inquiry.

Sources of Evidence. Studies included in this scoping review were drawn from major academic databases known for their breadth and scholarly reliability. Scopus, Web of Science, PubMed, and PsycINFO were used to locate peer-reviewed articles across psychology, education, health sciences, and related fields. This multi-database strategy ensured broad coverage of both foundational and recent studies concerning academic stress, mental toughness, and stress management among college students.

Keywords used in the search included academic stress, mental toughness, stress management, coping strategies, resilience, college students, and higher education. Both peer-reviewed journal articles and relevant gray literature published within the last five years were considered. Search results were exported into Mendeley for duplicate removal and organization prior to screening. Screening was conducted through a combination of manual review and software-assisted filtering.

Eligibility Criteria. The inclusion criteria for this review focused on ensuring that selected studies contributed meaningfully to understanding academic stress and mental toughness in higher education. The criteria highlighted relevance to undergraduate or graduate student populations, alignment with the conceptual focus on academic stress, mental toughness, or stress management, and substantive contribution through empirical or theoretical insights. Only full-text articles were included to ensure transparency and allow thorough data extraction.

The exclusion criteria served to refine the scope by removing studies involving non-academic populations, research unrelated to stress or resilience within academic settings, and articles lacking accessible full texts. Together, these criteria established a transparent and methodologically sound foundation that supported relevance, conceptual clarity, and adequate detail for evidence mapping.

Data Charting and Analysis. A structured data charting form was used to extract and organize key details, including authorship, publication year, country, research design, population characteristics, sample size, definitions and measures of academic stress and mental toughness, stress management strategies, and significant findings. Once charting was completed, the extracted information was synthesized narratively, providing a broad summary of the literature. Thematic analysis was conducted to identify recurring patterns, particularly those illustrating how stress management practices relate to mental toughness and academic experiences.

Ethical Considerations. This study obtained ethical clearance from the appropriate institutional ethics review board prior to commencement. Although the review relied exclusively on secondary data from publicly available sources, ethical approval was secured to ensure compliance with institutional research governance standards. AI-assisted tools (e.g., ChatGPT) were used solely for language polishing and formatting support. All substantive and essential review processes, including searching, screening, reviewing, eligibility assessment, data extraction, and analysis, were conducted manually by the authors.

RESULTS

Figure 1 presents the PRISMA flow diagram of the review. A total of 1,461 records were initially retrieved through the Scopus database search. After 12 duplicate records were removed, 1,449 unique studies remained for title and abstract screening. During this initial screening phase, studies were excluded for not meeting the predefined inclusion criteria, specifically those that focused on populations outside the higher education setting, those that did not address academic stress or mental toughness, and those that were theoretical or editorial in nature rather than empirical research.
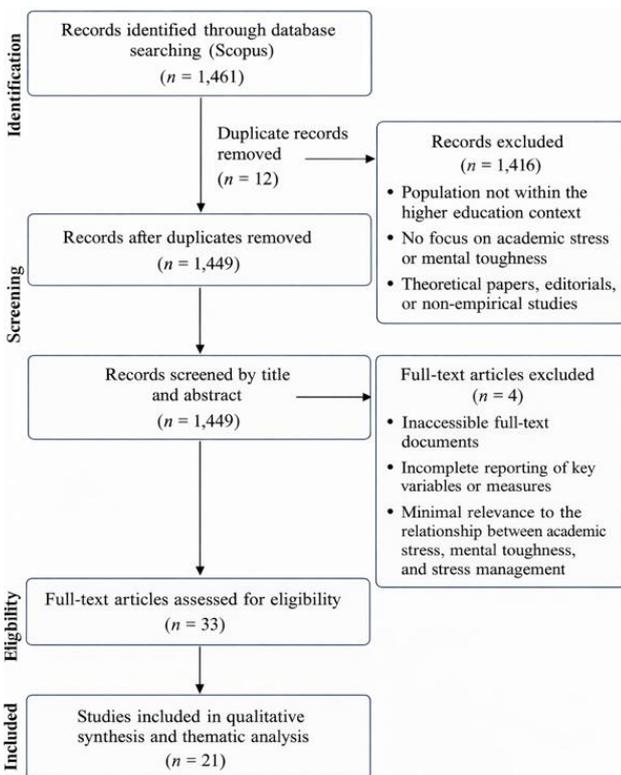

Figure 1
PRISMA flow diagram illustrating the study selection process for the scoping review on academic stress and mental toughness.

After screening, 33 articles were selected for full text evaluation. Each article was reviewed in relation to the core variables of interest, the target population, and the presence of relevant outcomes. During the eligibility phase, 4 full text articles were excluded. These exclusions were due to inaccessible complete documents, incomplete reporting of key measures, or minimal relevance to the link between academic stress, mental toughness, and stress management among college students.

In the final stage, 21 studies were included for synthesis and thematic analysis. These retained articles provided substantive empirical insights into how academic stress is measured, how mental toughness is conceptualized among college learners, and what strategies are reported to support students in managing psychological and academic pressures. Collectively, the final set of studies offers a comprehensive overview of current evidence while also revealing areas in which research, inquiry and investigation on resilience and coping in the higher education context remain limited.

Characteristics of Included Studies. The included studies were published between 2020 and 2025 and represented diverse geographical contexts, including Asia, Europe, the Middle East, Africa, and Latin America.

Table 1
Summary of Studies of Academic Stress and Mental Toughness Landscape

Author(s), Year	Country	Study Design	Participants	Main Focus / Variables
Andargeery et al. (2025)	Saudi Arabia	Cross-sectional	Nursing students (n=286)	Academic burnout; self-efficacy; psychological distress; learning experience
Atta et al. (2025)	Not specified	Cross-sectional, multi-campus	Nursing scholars (n=1494)	Research self-efficacy; AI concerns; psychological distress
Campbell et al. (2025)	USA	Mixed methods	Undergraduate physiology students	Academic stress; perceived stress; coping
Chen & Chen (2025)	China	FSQCA	College students (n=314)	Academic burnout; academic stress; anxiety; self-efficacy; internet addiction; loneliness
García-Pérez et al. (2025)	Spain	Quasi-experimental intervention	University students (n=136)	Physical activity; meditation; well-being; resilience
Hendra et al. (2025)	Indonesia	Cross-sectional	University students (n=218)	Perfectionism; academic stress; workload; self-efficacy; academic fatigue
Li et al. (2024)	China/Korea	Multivariate analysis	Student athletes	Sports participation; mental toughness; coping; well-being
Liu et al. (2025)	China	Mediation analysis	College students (n=955)	Physical exercise; perceived stress; rumination; sleep
McGuinness & Nordstokke (2023)	Canada	Cross-sectional	First-year undergraduates (n=177)	Mindful self-care; resilience; flourishing
Nuriyyatiningrum et al. (2023)	Indonesia	Cross-sectional; Path analysis	College students (n=400)	State anxiety; academic stress; self-control; quality of life
Nurkamto et al. (2024)	Indonesia	SEM	EFL students (n=280)	Academic stress; writer's block; mental resilience; writing competence
Owusu et al. (2024)	Ghana	Cross-sectional	Distance education students (n=231)	Academic stress; burnout
Rahiman et al. (2023)	Not specified	Mediation analysis	Students	Academic stress; exam anxiety; coping
Ramos-Vera et al. (2024)	Peru	Cross-sectional predictive	Adolescents (n=387)	Academic stressors; stress symptoms; emotional exhaustion; coping

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Sajid et al. (2024)	Saudi Arabia	Cross-sectional	Medical students	Coping strategies (faith, humor, social support)
Shih & Tu (2024)	Taiwan	Cross-sectional	University students (n=535)	Self-regulation; academic stress; coping; mindfulness; resilience
Singh et al. (2023)	India	Cross-sectional	College Students	Academic stress; emotional adjustment
Wu et al. (2021)	Not specified	Cross-sectional	College athletes (n=101)	Mindfulness; psychological skills; mental toughness
Yuting & Rashid (2025)	Not specified	PLS-SEM	College students (n=502)	Academic stress; depressive symptoms; sleep; school belonging; physical activity
Zhang (2025)	China	Moderated mediation	University students (n=1223)	COVID-19 victimization; emotional intelligence; academic burnout
Zhang & Chen (2025)	China	PLS-SEM	University students (n=723)	Arts activities; emotional intelligence; perceived stress; well-being

Most studies employed cross-sectional designs, with fewer longitudinal or intervention-based approaches. The populations primarily consisted of undergraduate students, with a number of studies focusing on specific and defined subgroups such as athletes, nursing students, or medical students.

RQ 1: Stress Management Practices Commonly Employed by College Students.
Academic stress is a pervasive experience across higher education. High academic demands, workload pressure, performance expectations, and time constraints all contribute to elevated levels of stress among students (Owusu et al., 2024; Campbell et al., 2025; Singh et al., 2023). Prolonged exposure to these stressors is associated with academic burnout, emotional exhaustion, psychological distress, and reductions in academic engagement and performance (Chen & Chen, 2025; Hendra et al., 2025). At the same time, research consistently shows that academic stress interacts with students' psychological resources. These resources influence how academic demands are perceived and managed, and include coping skills, emotional regulation, and resilience (Bedewy & Gabriel, 2015; Shih & Tu, 2024).

Across the included studies, college students employed varied stress management practices that can be grouped into three major categories: structured coping, lifestyle-based interventions, and self-regulatory and emotional skills.

Structured Coping.
Participation in organized or competitive activities, particularly sports, supports students in developing stronger coping capacities. Studies on university athletes indicate that competitive sports environments promote routine, discipline, and exposure to manageable stressors that build mental toughness and coping effectiveness (Li et al., 2024; Wu et al., 2021). These environments also offer goal-focused training and strong social support. Li et al. (2024) reported that competitive athletes demonstrated approximately 34 percent greater coping effectiveness than non-competitive athletes, which suggests that structured and demanding settings cultivate coping skills that transfer to academic situations.

Lifestyle-Based Interventions and Resilience.
Lifestyle interventions, especially physical activity, sleep regulation, and meditation, play an important role in strengthening resilience and reducing perceived stress. Liu et al. (2025) found that physical exercise was linked to better sleep quality and lower stress, with reductions in rumination acting as a key mechanism. Similarly, García-Pérez et al. (2025) showed that programs combining physical activity and meditation improved resilience, reduced depressive symptoms, and enhanced overall psychological well-being. These practices disrupt maladaptive cognitive patterns and promote recovery, which in turn reinforce emotional stability and mental toughness.

Self-Regulatory and Emotional Skills.
Self-regulation and emotional skills are central psychological processes through which students manage academic stress. Shih and Tu (2024) identified self-compassion and mindfulness as factors that support engagement coping and academic resilience. These skills allow students to regulate emotional responses, manage self-critical thoughts, and maintain engagement during academic challenges. Emotional intelligence also plays a protective role. Studies by Zhang (2025) and Zhang and Chen (2025) show that emotional intelligence reduces the impact of stress on burnout, emphasizing its importance for emotional regulation. Nuriyyatiningrum et

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al. (2023) found that self-control partially mediated the effect of state anxiety on quality of life, indicating its significance within the broader stress management process.

Taken together, these findings show that students employ a range of coping practices. These practices act through behavioral, emotional, and cognitive pathways that help maintain resilience and psychological stability in the face of academic stress.

RQ 2: Conceptualization and Measurement of Mental Toughness in Academic Context. Mental toughness, across the included studies, was conceptualized as a multidimensional psychological resource that supports sustained goal-directed behavior, emotional regulation, and performance under academic pressure. Rather than being treated as a single trait, mental toughness was described as a composite of resilience, perseverance, perceived control, confidence, and emotional stability. This perspective aligns with broader theoretical work that characterizes mental toughness as involving cognitive and emotional regulation as well as behavioral persistence in demanding contexts (St Clair-Thompson et al., 2017; Lin et al., 2017).

Direct Measurement. A small number of studies used validated mental toughness scales, most notably versions of the Mental Toughness Questionnaire (MTQ). These instruments operationalize mental toughness through components such as commitment, control, challenge, and confidence (Denovan et al., 2024). These studies provided assessments of mental toughness and facilitated examination of its relationship to academic stress.

Indirect Measurement. Most studies did not measure mental toughness directly. Instead, related constructs were used as proxies. These included, resilience (García-Pérez et al., 2025; McGuinness & Nordstokke, 2023); emotional intelligence (Zhang & Chen, 2025; Zhang, 2025); self-efficacy (Hendra et al., 2025; Andargeery et al., 2025); self-regulatory skills and mindfulness (Shih & Tu, 2024); and coping strategies (Sajid et al., 2024; Rahiman et al., 2023).

These constructs represent aspects of emotional and cognitive control that relate to mental toughness, but their use produces conceptual inconsistency.

Several studies integrated mental toughness within models of burnout, academic fatigue, writer's block, or quality of life (Chen & Chen, 2025; Nurkamto et al., 2024; Nuriyyatiningrum et al., 2023). In these cases, mental toughness was acknowledged but positioned indirectly within larger constructs.

The lack of consistent measurement limits comparability across studies. It also restricts the ability to draw precise conclusions about the unique role of mental toughness in academic contexts. There is a need for future research to apply validated mental toughness tools more consistently to strengthen conceptual clarity in the field.

RQ 3: Relationship Between Stress Management Practices and Mental Toughness. Academic stress remains a persistent challenge in higher education, with well-documented consequences for students' psychological well-being and academic functioning. Increasingly, research has shifted from viewing students as passive recipients of stress toward examining the psychological resources that enable adaptive functioning under pressure. Mental toughness has emerged as a particularly relevant construct in this regard, as it encompasses resilience, emotional regulation, adaptive flexibility, and effective coping in demanding contexts.

Structured environments such as competitive sports provide recurring exposure to controlled stress, disciplined routines, and performance feedback. These conditions strengthen psychological flexibility, perseverance, and emotional stability (Li et al., 2024; Wu et al., 2021). Such coping experiences are transferable to academic contexts.

Regular physical activity, improved sleep, and meditation programs contribute to greater stress recovery and reduce cognitive strain (Liu et al., 2025; García-Pérez et al., 2025). These practices reduce perceived stress and promote emotional balance. As a result, they support the development of mental toughness by improving students' ability to recover quickly from academic challenges.

Skills such as mindfulness, self-compassion, emotional intelligence, and self-regulation strengthen students' ability to cope with academic pressure (Shih & Tu, 2024; Zhang & Chen, 2025). These skills help students sustain engagement, regulate emotions, and interpret stressors in adaptive ways.

Combined, these pathways show that mental toughness emerges from repeated interactions between structured experiences, lifestyle practices, and emotional regulation processes.

RQ 4: Gaps in the Development of Mental Toughness Through Stress Management Interventions.

The existing literature indicates that mental toughness plays a critical role in shaping how academic stress affects students' psychological well-being and academic functioning. However, research remains fragmented. Many studies focused on specific groups, including nursing students, medical students, athletes, or distance learners (Andargeery et al., 2025; Sajid et al., 2024; Owusu et al., 2024). This limits generalizability to the broader student population.

The mental toughness is also being indirectly examined, often assessed through proxy constructs rather than direct measures, which reduces conceptual precision (Silva-Lorente et al., 2024; Rahiman et al., 2023). Thus, few intervention studies focus explicitly on mental toughness (García-Pérez et al., 2025; Liu et al., 2025). The majority of studies used cross-sectional designs, which constrain the ability to understand how mental toughness develops over time (Singh et al., 2023; Owusu et al., 2024).

Conclusion. Collectively, the evidence indicates that mental toughness plays a pivotal role in shaping how students respond to academic stress, functioning as a protective capacity that supports adaptive coping, emotional regulation, and resilience. Engagement in structured activities such as competitive sports fosters mental toughness through repeated exposure to manageable stressors, disciplined routines, and social support, which enhances students' stress management capabilities. Lifestyle-based interventions, including physical activity and meditation, further strengthen this capacity by reducing perceived stress and maladaptive cognitive patterns while promoting recovery and resilience. In parallel, self-regulatory and emotional skills such as mindfulness, self-compassion, and emotional intelligence underpin mental toughness by enabling students to regulate emotional responses and maintain academic engagement under pressure. Taken together, these findings underscore the multifaceted nature of mental toughness and highlight its significance as a key mechanism linking academic stress to psychological and academic outcomes. This synthesis supports the need for educational and counseling interventions that intentionally cultivate mental toughness as a means of promoting sustainable student well-being in high-demand academic environments.

Based on the reviewed evidence, future research should prioritize the explicit examination of mental toughness as a central construct in models of academic stress, rather than treating it solely through related proxies such as resilience or coping. Longitudinal and mixed-methods studies are recommended to examine how mental toughness develops over time and how it interacts with chronic academic stress across different stages of students' academic trajectories. Such approaches would provide stronger causal insights into the protective role of mental toughness and its sustainability under prolonged academic demands.

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Intervention-based research is also recommended to design, implement, and evaluate programs that intentionally cultivate mental toughness within academic settings. These interventions may incorporate structured physical activity, mindfulness-based practices, and skills training focused on emotional regulation, self-compassion, and adaptive coping. Experimental and quasi-experimental designs would allow for clearer evaluation of the effectiveness of these approaches in reducing academic stress and preventing burnout.

From an institutional perspective, higher education institutions are encouraged to integrate mental toughness-building strategies into student support services, counseling programs, and co-curricular activities. Structured sports programs, accessible wellness initiatives, and psychoeducational workshops that emphasize emotional intelligence and self-regulation may serve as practical avenues for strengthening students' capacity to manage academic stress. Additionally, fostering supportive academic environments that promote school belonging and social support may enhance the effectiveness of individual-level interventions.

Finally, future studies should expand the scope of inquiry to include diverse student populations and academic disciplines to improve generalizability. Particular attention should be given to non-athlete students and those in high-risk academic environments, where targeted mental toughness interventions may yield significant benefits. Advancing this line of research will contribute to evidence-based educational and counseling practices aimed at promoting sustainable academic engagement and psychological well-being.

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