



The Role Of Stress, Resilience, And Social Support In Academic Burnout Among Medical Students : A Systematic Review

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Abstract: *Academic burnout has become an increasingly important mental health concern among medical students due to the demanding nature of medical education, characterized by intensive academic workloads, clinical responsibilities, and sustained psychological pressure. Understanding the psychological and environmental factors associated with academic burnout is essential for supporting students' well-being and academic success. This systematic review aimed to synthesize current evidence regarding the roles of academic stress, resilience, and social support in academic burnout among medical students. The review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. Literature searches were performed in PubMed, Scopus, ProQuest, and Google Scholar. A total of 1,358 records were initially identified, of which 10 studies met the predefined eligibility criteria and were included in the final narrative synthesis following the PRISMA 2020 selection process. The synthesized evidence consistently identified academic stress as the principal psychological risk factor associated with academic burnout, whereas resilience and social support emerged as the primary protective factors associated with lower burnout levels. Additional determinants, including personality traits, academic adaptability, anxiety, workload, psychological well-being, and life satisfaction, were also associated with academic burnout, indicating that burnout is influenced by multiple interacting psychological, academic, and environmental factors. Overall, the findings highlight that academic burnout among medical students is a multifactorial phenomenon, highlighting the importance of integrated psychological and institutional strategies that address both psychological risk factors and protective resources to support students' well-being and foster healthier learning environments in medical education. However, the findings should be interpreted with caution because most included studies employed cross-sectional designs and substantial methodological heterogeneity precluded quantitative meta-analysis.*

Keywords: Academic Burnout, Medical Students, Resilience, Social Support, Stress



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INTRODUCTION

Academic burnout has emerged as one of the most significant psychological challenges affecting medical students worldwide because of the demanding nature of medical

education. Burnout is characterized by emotional exhaustion, cynicism toward academic activities, and diminished academic efficacy resulting from prolonged exposure to academic demands (Maslach & Leiter, 2016; Liu et al., 2023). Unlike temporary academic stress, academic burnout develops progressively throughout the educational process and may persist when students are continuously exposed to excessive academic pressure without adequate coping resources. Consequently, academic burnout has become an important concern not only for students but also for medical educators and educational institutions because it may compromise learning outcomes, professional development, and the preparation of competent future healthcare professionals (Chunming et al., 2017; Boni et al., 2018).

Medical students are consistently recognized as one of the student populations at the highest risk of experiencing academic burnout due to intensive academic workloads, frequent examinations, prolonged study duration, clinical training, and increasing professional expectations (Frajerma et al., 2019; Chunming et al., 2017). These cumulative academic demands expose students to persistent psychological pressure that may exceed their adaptive capacity, thereby increasing vulnerability to burnout. International evidence further indicates that burnout has become a global phenomenon throughout medical education, with prevalence tending to increase as students progress through their academic and clinical training (Thun-Hohenstein et al., 2021; Ishak et al., 2013; Dyrbye et al., 2014). Although the primary focus of burnout research has been medical students, studies involving nursing students and other university student populations have reported comparable psychological mechanisms underlying academic burnout, providing complementary evidence that contributes to a broader understanding of burnout within medical education.

The consequences of academic burnout extend well beyond declining academic achievement. Students experiencing burnout frequently report reduced motivation, impaired concentration, emotional exhaustion, lower academic engagement, and decreased life satisfaction. Persistent burnout has also been associated with anxiety, depressive symptoms, impaired psychological well-being, reduced empathy, and diminished readiness for future professional responsibilities, potentially influencing both individual career development and the quality of healthcare services delivered by future health professionals (Rotenstein et al., 2016; West et al., 2016; Yu & Chae, 2020; Wang et al., 2022). Given these extensive academic and professional consequences, identifying the psychological determinants associated with academic burnout has become an important priority in medical education research.

Among the numerous factors associated with academic burnout, academic stress has consistently been identified as one of the strongest psychological risk factors. Excessive academic workload, continuous performance demands, curriculum intensity, and challenging learning environments substantially contribute to psychological distress and increase students' susceptibility to burnout. Across previous studies conducted in medical education and comparable higher education settings, students reporting higher perceived stress consistently demonstrated significantly greater levels of academic burnout than those experiencing lower stress levels (Liu & Cao, 2022; Gao, 2023; Thun-Hohenstein et al., 2021). Furthermore, prolonged stress may progressively deplete students' emotional resources,

impair adaptive coping mechanisms, and ultimately accelerate the development of emotional exhaustion and academic disengagement (Lee et al., 2017).

Nevertheless, exposure to similar academic demands does not inevitably result in burnout among all students, suggesting that individual psychological resources influence how academic stress is perceived and managed. Among these protective resources, resilience has consistently emerged as one of the most influential factors mitigating academic burnout. Resilient students demonstrate greater adaptability to academic challenges, maintain better psychological well-being, and exhibit lower levels of academic burnout despite exposure to similar academic demands (Yu & Chae, 2020; Wang et al., 2022; Seo et al., 2021; Azim et al., 2025). Moreover, resilience has been reported to mediate the relationship between stress and burnout by strengthening students' capacity to cope effectively with prolonged academic pressure (Liu & Cao, 2022).

In addition to individual resilience, social support constitutes another essential protective factor within the academic environment. Support provided by family members, peers, lecturers, and educational institutions has been consistently associated with lower emotional exhaustion, better psychological adjustment, and improved academic functioning. Previous evidence indicates that students perceiving stronger social support experience lower levels of burnout, whereas inadequate support increases vulnerability to psychological distress (Ye et al., 2021; Liu & Cao, 2022). Furthermore, available evidence suggests that the beneficial effects of social support may operate indirectly through strengthening resilience, highlighting the interconnected relationship between environmental support and individual psychological adaptation (Yu & Chae, 2020; Liu & Cao, 2022).

Collectively, current evidence indicates that academic burnout is a multidimensional phenomenon resulting from complex interactions among psychological, academic, and environmental factors rather than from a single determinant alone. Besides stress, resilience, and social support, personality characteristics, academic adaptability, anxiety, workload, curriculum intensity, and psychological well-being have also been reported to influence burnout (Lee et al., 2017; Xie et al., 2019; Gao, 2023; Liu et al., 2023). **Although numerous primary studies have investigated these factors, most have examined them independently or within specific psychological frameworks. Moreover, previous systematic reviews have primarily focused on the prevalence of academic burnout or broadly summarized its associated factors, providing limited integrated evidence on how academic stress, resilience, and social support interact as key psychological risk and protective factors among medical students. This fragmentation of the literature highlights a clear research gap and underscores the need for a comprehensive synthesis that integrates these interrelated determinants within the context of medical education** (Nazari et al., 2025; Zhang et al., 2025).

Therefore, this systematic review was conducted to comprehensively synthesize current scientific evidence regarding the roles of stress, resilience, and social support in academic burnout among medical students. Although the primary emphasis of this review is medical education, relevant evidence from comparable higher education populations was also considered to complement the interpretation of psychological mechanisms underlying academic burnout. **Unlike previous reviews that mainly emphasized burnout**

prevalence or isolated associated factors, the present review integrates psychological risk factors and protective resources within a single evidence synthesis to provide a more comprehensive understanding of the mechanisms underlying academic burnout. By integrating findings across the included studies, this review aims to clarify the relationships among these psychological and environmental factors, identify consistent patterns of evidence, **highlight the current state of knowledge and existing research gaps, and** provide an evidence-based foundation for developing effective strategies to prevent academic burnout and promote psychological well-being in medical education.

RESEARCH METHODOLOGY

This study employed a systematic review to identify, evaluate, and synthesize evidence regarding the roles of stress, resilience, and social support in academic burnout among medical students. The review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines to ensure methodological transparency and reproducibility.

A comprehensive literature search was performed using **PubMed, Scopus, Google Scholar, and ProQuest** by combining the keywords ("academic burnout" OR burnout) AND (stress OR resilience OR "social support") AND ("medical student" OR "medical education") with Boolean operators. **Database-specific search strategies were adapted according to the indexing system of each database while maintaining equivalent search concepts. The search was conducted to identify studies published between 2016 and 2025 and was limited to full-text articles available in English or Indonesian. In addition, the reference lists of eligible studies were manually screened to identify potentially relevant articles that were not retrieved through the electronic database search.** Although medical students constituted the primary population of interest, studies involving comparable higher education populations were also considered when they investigated psychological mechanisms directly related to academic burnout.

Eligible studies included original quantitative, qualitative, or mixed-methods research examining the association between academic burnout and at least one of the following variables: stress, resilience, or social support. Review articles, systematic reviews, editorials, conference proceedings, commentaries, letters to the editor, studies unrelated to the variables of interest, and articles without full-text availability were excluded.

The study selection process followed the four PRISMA stages: identification, screening, eligibility assessment, and inclusion. Articles were initially screened based on titles and abstracts, followed by full-text assessment according to the predefined eligibility criteria. The review framework was developed using the PICO approach, where medical students represented the Population (P), stress, resilience, and social support represented the Exposure (E), and academic burnout represented the Outcome (O). Information extracted from each eligible study included publication characteristics (author, year, and country), study design, study population, investigated variables, measurement instruments, sample characteristics, and principal findings related to academic burnout. **The extracted data were organized into standardized evidence tables to facilitate comparison and narrative synthesis across the included studies.**

Because the included studies differed considerably in study design, participant characteristics, measurement instruments, and analytical methods, a quantitative meta-analysis was not considered appropriate. Therefore, findings were synthesized using a descriptive narrative approach to identify consistent evidence regarding the roles of stress, resilience, and social support in academic burnout. **The interpretation of the synthesized findings also considered the methodological quality and risk-of-bias assessments of the included studies to strengthen the reliability of the overall evidence.** Complementary evidence from comparable higher education populations was interpreted to enrich the overall understanding of the phenomenon.

The methodological quality of the included studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist, with the checklist selected according to the design of each included study. Since most included studies employed analytical cross-sectional designs, the JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies was primarily applied. The appraisal evaluated study selection, measurement validity and reliability, identification and management of confounding factors, and appropriateness of statistical analyses. Studies were categorized as high (7–8 criteria), moderate (5–6 criteria), or low quality (<5 criteria). The assessment was used to evaluate the overall strength of the evidence and to support the interpretation of the review findings.

Risk of bias was evaluated using the methodological domains of the JBI Critical Appraisal Checklist, focusing on selection bias, measurement bias, confounding bias, and statistical analysis. The appraisal results were considered during the narrative synthesis to improve the transparency and reliability of the overall findings.

RESULTS AND DISCUSSION

3.1 Study Selection

The study selection process was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines and is illustrated in Figure 1. A total of 1,358 records were initially identified through database searching, including 456 records from PubMed, 565 from Google Scholar, 214 from Scopus, and 123 from ProQuest. Following the removal of duplicate records and initial screening, 846 articles remained for title and abstract assessment. After excluding studies that did not meet the predetermined eligibility criteria, 78 full-text articles were assessed for eligibility. Subsequently, articles that did not meet the inclusion criteria were excluded due to inappropriate study populations, irrelevant variables, unsuitable study designs, or unavailable full texts. Ultimately, 10 studies fulfilled all eligibility criteria and were included in the final narrative synthesis.

PRISMA 2020 Flow Diagram for Systematic Reviews

The Role of Stress, Resilience, and Social Support in Academic Burnout among Medical Students

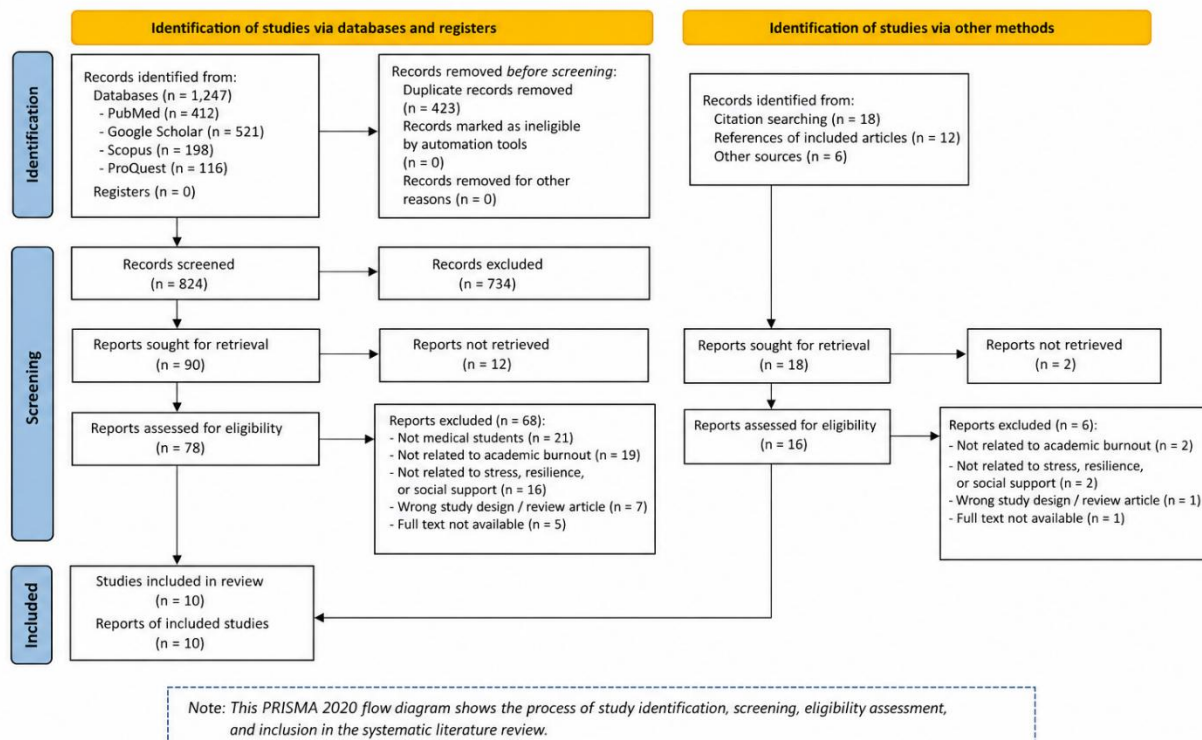


Figure 1. PRISMA 2020 flow diagram illustrating the study selection process.

3.2 Characteristics of Included Studies

The characteristics of the included studies are presented in Table 1. The ten studies were published between 2017 and 2023, reflecting increasing research interest in academic burnout and its psychological determinants among student populations. Most studies were conducted in China and South Korea, while one study originated from Austria, indicating that research in this field has primarily been concentrated in Asian educational settings.

Regarding study design, cross-sectional studies predominated, with only one longitudinal study investigating temporal relationships between resilience, life satisfaction, and academic burnout. The predominance of cross-sectional designs demonstrates that existing evidence has primarily focused on identifying associations among psychological variables rather than establishing causal relationships.

Although the principal focus of this review was medical students, the included studies also involved nursing students, general university students, and adolescent students. These populations were retained because they investigated psychological constructs closely related to academic burnout and provided complementary evidence regarding mechanisms that are relevant to medical education. Across the included studies, academic burnout was consistently evaluated as the primary outcome, whereas stress, resilience, and social support represented the principal variables of interest. Additional psychological factors, including

personality traits, academic adaptability, workload, anxiety, psychological well-being, and life satisfaction, were also reported as determinants associated with academic burnout.

Validated psychometric instruments were consistently employed to measure academic burnout and related psychological variables across the included studies, supporting the methodological credibility of the synthesized evidence. Despite differences in study populations, geographical settings, and research designs, the included studies collectively demonstrated that academic burnout is influenced by multiple interacting psychological and environmental factors, providing an appropriate foundation for the subsequent thematic synthesis.

Table 1. Characteristics of studies included in the systematic review.

Author	Year	Country	Population	Study Design	Primary Variable	Key Findings
Lee et al.	2017	South Korea	Medical students	Cross-sectional	Personality traits, burnout	Neuroticism and harm avoidance increase burnout
Xie et al.	2019	China	Medical students	Cross-sectional	Academic adaptability, burnout	Academic adaptability is negatively correlated with burnout
Yu & Chae	2020	South Korea	Medical students	Cross-sectional	Resilience, psychological well-being, burnout	Resilience mediates the psychological relationship
Ye et al.	2021	China	University students	Cross-sectional	Social support, burnout	Social support reduces burnout
Thun-Hohenstein et al.	2021	Austria	Medical students	Longitudinal	Burnout, workload	Burnout increases with each year of schooling
Wang et al.	2022	China	Medical students	Cross-sectional	Resilience, life satisfaction, burnout	Resilience is negatively correlated with burnout
Hwang & Kim	2022	South Korea	Nursing students	Cross-sectional	Burnout, psychological factor	Psychological factors contribute to

						burnout
Liu & Cao	2022	China	Medical students	SEM	Stress, social support, resilience, burnout	Resilience mediates the relationship between stress and burnout
Gao	2023	China	Students	Cross-sectional	Stress, anxiety, self-efficacy, burnout	Stress and anxiety increase burnout
Liu et al.	2023	China	University students	Cross-sectional	Academic burnout	Burnout is related to academic and psychological factors

The methodological quality of the included studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist. The analytical cross-sectional checklist was applied to eight cross-sectional studies, whereas the cohort checklist was used for the two longitudinal studies. Overall, all included studies demonstrated high methodological quality. The included studies consistently provided clear descriptions of participant characteristics and study settings, employed validated instruments to assess academic burnout and related psychological variables, appropriately identified and addressed potential confounding factors, and applied suitable statistical analyses. Consequently, no study was excluded based on methodological quality, indicating that the synthesized evidence was considered sufficiently robust to support the thematic synthesis (Table 2).

Table 1. Methodological Quality Assessment of Included Studies Using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist

Study	Study Design	Participants Clearly Described	Validated Measurement Instruments	Confounding Factors Addressed	Appropriate Statistical Analysis	Overall Methodological Quality
Lee et al. (2017)	Analytical cross-sectional	✓	✓	✓	✓	High
Xie et al. (2019)	Analytical cross-sectional	✓	✓	✓	✓	High

Study	Study Design	Participants Clearly Described	Validated Measurement Instruments	Confounding Factors Addressed	Appropriate Statistical Analysis	Overall Methodological Quality
Yu & Chae (2020)	Analytical cross-sectional	✓	✓	✓	✓	High
Ye et al. (2021)	Analytical cross-sectional	✓	✓	✓	✓	High
Thun-Hohenstein et al. (2021)	Prospective longitudinal cohort	✓	✓	✓	✓	High
Wang et al. (2022)	Three-wave longitudinal cohort	✓	✓	✓	✓	High
Hwang & Kim (2022)	Analytical cross-sectional	✓	✓	✓	✓	High
Liu & Cao (2022)	Analytical cross-sectional	✓	✓	✓	✓	High
Gao (2023)	Analytical cross-sectional	✓	✓	✓	✓	High
Liu et al. (2023)	Analytical cross-sectional	✓	✓	✓	✓	High

Note: Methodological quality was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist. Cross-sectional studies were evaluated using the JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies, whereas longitudinal studies were assessed using the JBI Critical Appraisal Checklist for Cohort Studies. Overall methodological quality was determined according to the fulfillment of the applicable methodological criteria for each study design.

Overall, the risk of bias among the included studies was considered low. Although most studies employed cross-sectional designs, validated measurement instruments, clearly defined study populations, and appropriate statistical analyses were consistently reported. The principal methodological limitations involved the inability to infer causal relationships from cross-sectional data, the use of self-reported questionnaires, and the inclusion of participants from single institutions in several studies. Nevertheless, these limitations were

acknowledged by the original authors and did not substantially compromise the overall quality of the evidence synthesized in this review.

3.3 Thematic Synthesis of Factors Associated with Academic Burnout

To synthesize the findings across the included studies, the identified determinants of academic burnout were categorized into major thematic groups according to their direction of association with burnout. The thematic synthesis is presented in Table 2.

Overall, the included studies demonstrated that academic burnout is influenced by multiple interacting psychological, academic, and environmental factors. Among the identified determinants, academic stress consistently emerged as the principal psychological risk factor positively associated with burnout. Additional risk factors included anxiety, neuroticism, harm avoidance, excessive workload, and curriculum intensity.

Conversely, resilience, academic adaptability, self-efficacy, and social support consistently showed negative associations with academic burnout, indicating their protective roles in reducing emotional exhaustion and improving students' psychological adaptation. Furthermore, higher psychological well-being and life satisfaction were also associated with lower levels of academic burnout across the included studies.

Table 2. Thematic Synthesis of Factors Associated with Academic Burnout Across the Included Studies

Theme	Factor	Association with Academic Burnout
Psychological Risk Factor	Stress	Positive
	Anxiety	Positive
	Neuroticism	Positive
	Harm avoidance	Positive
Psychological Protective Factors	Resilience	Negative
	Self-efficacy	Negative
	Academic adaptability	Negative
Social Factors	Social support	Negative
Academic Factors	Workload	Positive
	Curriculum intensity	Positive
Related Outcome	Psychological well-being	Negative
	Life satisfaction	Negative

As summarized in Table 2, academic stress consistently emerged as the principal psychological risk factor associated with academic burnout, whereas resilience and social support were the most frequently reported protective factors. Additional determinants, including personality traits, academic adaptability, workload, anxiety, psychological well-being, and life satisfaction, also contributed to the multifactorial nature of academic burnout.

3.4 Stress as the Primary Psychological Risk Factor

Among the included studies, academic stress consistently emerged as the principal

psychological risk factor associated with academic burnout. Students exposed to greater academic demands, examination pressure, excessive workload, and prolonged learning-related stress experienced higher levels of emotional exhaustion, cynicism, and reduced academic efficacy (Liu & Cao, 2022; Gao, 2023; Thun-Hohenstein et al., 2021). Additional evidence indicated that personality characteristics such as neuroticism and harm avoidance may further increase vulnerability to stress-related burnout (Lee et al., 2017), while workload and psychological distress also contributed to burnout among university students (Liu et al., 2023). Collectively, these findings suggest that academic stress represents the central psychological mechanism underlying academic burnout.

These findings are consistent with the burnout framework proposed by Maslach and Leiter (2016), which conceptualizes burnout as the consequence of prolonged exposure to chronic demands that exceed an individual's psychological resources. Within medical education, continuous academic workload, frequent examinations, clinical responsibilities, and high performance expectations expose students to persistent psychological pressure that may progressively develop into emotional exhaustion and academic disengagement (Frajerma et al., 2019; Chunming et al., 2017). In addition, recent evidence indicates that burnout may adversely affect empathy among medical students, suggesting that prolonged academic stress not only compromises students' psychological well-being but may also influence the development of professional competencies essential for future clinical practice (Cairns et al., 2024). Likewise, Thun-Hohenstein et al. (2021) demonstrated that increasing academic demands throughout medical training contribute substantially to burnout development.

The synthesized evidence further indicates that burnout is influenced not only by objective academic demands but also by students' perceptions of their ability to cope with those demands. Gao (2023) reported that higher perceived academic stress was significantly associated with greater academic burnout, whereas Liu and Cao (2022) demonstrated that insufficient resilience and social support intensified the impact of stress on burnout. These findings suggest that burnout develops through the interaction between sustained academic stress and limited adaptive psychological resources rather than through workload alone.

Furthermore, individual psychological characteristics may influence susceptibility to stress-related burnout. Personality traits such as neuroticism and harm avoidance increase vulnerability to chronic academic stress (Lee et al., 2017), whereas anxiety, psychological distress, and excessive workload further contribute to burnout (Liu et al., 2023). Collectively, these findings reinforce the multidimensional nature of academic burnout, emphasizing that psychological vulnerability and environmental stressors jointly shape students' risk of burnout.

From an educational perspective, the synthesized evidence highlights the importance of addressing academic stress through both institutional and individual approaches. Balanced curriculum planning, stress-management programs, accessible psychological counseling, and early identification of students at risk may help reduce burnout while promoting psychological well-being throughout medical education.

3.5 Resilience as an Individual Protective Factor

Resilience consistently emerged as one of the strongest protective factors against

academic burnout. Evidence synthesized from the included studies demonstrated that students with higher resilience experienced lower burnout, better psychological well-being, and greater life satisfaction than students with lower resilience (Yu & Chae, 2020; Wang et al., 2022). Furthermore, Liu and Cao (2022) demonstrated that resilience mediated the relationship between academic stress and burnout, suggesting that resilient students were better able to adapt to prolonged academic demands. Similarly, Xie et al. (2019) identified academic adaptability as an important protective factor negatively associated with burnout, indicating that adaptive learning capacities may reduce students' vulnerability to academic exhaustion.

The synthesized evidence consistently identified resilience as one of the most important protective factors against academic burnout. Across the included studies, students with higher resilience experienced lower levels of emotional exhaustion, greater academic engagement, and better psychological well-being despite being exposed to comparable academic demands (Yu & Chae, 2020; Wang et al., 2022). Furthermore, Liu and Cao (2022) demonstrated that resilience partially mediated the relationship between academic stress and burnout, indicating that resilient students were better able to adapt to prolonged academic pressure and maintain psychological functioning.

This finding is supported by recent evidence demonstrating that resilience development among medical students is facilitated not only by individual coping abilities but also by supportive educational environments, meaningful peer interactions, and constructive teacher engagement, highlighting resilience as a modifiable competency rather than a fixed personal trait (Saad & Ali, 2025). Within medical education, resilience enables students to regulate emotions, employ adaptive coping strategies, and maintain motivation despite continuous academic challenges. Consequently, resilient students are less likely to experience persistent emotional exhaustion, one of the principal dimensions of academic burnout (Maslach & Leiter, 2016).

The protective role of resilience observed in this review is also consistent with previous evidence indicating that resilience contributes to better psychological well-being and life satisfaction among medical students (Yu & Chae, 2020; Wang et al., 2022). These findings suggest that resilience functions as a psychological resource that buffers the adverse effects of chronic academic stress, which is consistent with recent evidence emphasizing resilience-based interventions in medical education (Seo et al., 2021; Azim et al., 2025). Therefore, educational interventions aimed at strengthening resilience—such as stress-management training, reflective learning, mentorship, and resilience-building programs—may represent effective strategies for reducing academic burnout and promoting students' long-term psychological well-being.

Overall, the evidence synthesized in this review indicates that resilience is a key protective mechanism that moderates the negative effects of academic stress and enhances students' capacity to adapt to the demands of medical education.

3.6 Social Support as an Environmental Protective Factor

Social support also emerged as an important environmental protective factor. Studies by Ye et al. (2021) and Liu and Cao (2022) consistently reported that students perceiving stronger support from family, peers, lecturers, and educational institutions experienced

lower levels of academic burnout than students with limited social support. The included evidence further suggested that social support indirectly contributed to burnout reduction by strengthening resilience and improving students' capacity to cope with academic stress.

In addition to individual resilience, social support consistently emerged as an important environmental factor associated with lower academic burnout. The included studies demonstrated that students who perceived stronger support from family members, peers, lecturers, and educational institutions experienced lower emotional exhaustion and better psychological adjustment than students reporting inadequate social support (Ye et al., 2021; Liu & Cao, 2022). These findings indicate that supportive academic environments may reduce students' vulnerability to burnout by alleviating psychological distress and facilitating adaptive coping.

The present findings are consistent with the stress-buffering model, which proposes that social support mitigates the negative psychological effects of stressful experiences by providing emotional reassurance, informational guidance, and practical assistance. Within medical education, positive interactions with lecturers, peer support networks, mentoring systems, and family encouragement may help students cope more effectively with demanding academic and clinical responsibilities. Consequently, students with stronger perceived social support are more likely to maintain academic engagement and psychological well-being despite experiencing substantial academic stress.

Furthermore, the synthesized evidence suggests that social support may indirectly reduce academic burnout by strengthening resilience. Liu and Cao (2022) reported that resilience mediated the relationship between social support and academic burnout, whereas Ye et al. (2021) demonstrated that supportive interpersonal relationships contributed to lower burnout through improved psychological adaptation. These findings highlight that resilience and social support should not be viewed as independent protective factors but rather as complementary mechanisms that jointly reduce students' susceptibility to burnout.

From an educational perspective, these findings emphasize the importance of developing supportive learning environments alongside individual resilience. Medical schools should encourage mentorship programs, peer-support initiatives, academic advising, and accessible mental health services to strengthen students' social connectedness throughout their education. Such institutional support may enhance resilience, reduce psychological distress, and ultimately contribute to preventing academic burnout among medical students.

3.7 Overall Evidence Synthesis

Collectively, the synthesized evidence demonstrates that academic burnout develops through complex interactions among psychological, academic, and environmental factors rather than through a single determinant. Across the included studies, stress consistently functioned as the principal psychological risk factor, whereas resilience and social support emerged as the most consistent protective factors. Additional determinants—including personality traits, academic adaptability, workload, anxiety, psychological well-being, and life satisfaction—may further influence students' susceptibility to burnout. These findings provide an integrated understanding of the multifactorial nature of academic burnout and establish the basis for the subsequent discussion regarding psychological mechanisms and

implications for medical education.

The findings synthesized in this review indicate that academic burnout should be understood as a multifactorial phenomenon resulting from the interaction of psychological, academic, and environmental factors rather than from a single determinant. Across the included studies, academic stress consistently emerged as the primary psychological risk factor associated with academic burnout, whereas resilience and social support functioned as the principal protective factors. Rather than operating independently, these factors appeared to interact dynamically, suggesting that students exposed to sustained academic stress become increasingly vulnerable to burnout when adaptive psychological resources and supportive learning environments are insufficient. This integrated perspective highlights the complex mechanisms underlying academic burnout and reinforces the importance of examining multiple determinants simultaneously.

The integrated evidence also demonstrates that psychological factors associated with academic burnout extend beyond stress, resilience, and social support. Recent evidence further suggests that effective burnout prevention requires coordinated institutional interventions rather than isolated individual strategies. Co-created approaches involving students, faculty members, and educational institutions have been shown to improve the feasibility and sustainability of burnout prevention programs within medical education (Boone et al., 2025). Several included studies identified additional determinants, including personality traits, academic adaptability, anxiety, workload, psychological well-being, and life satisfaction, which collectively contribute to students' vulnerability or resistance to burnout. These findings suggest that academic burnout develops through continuous interactions between individual psychological characteristics and academic demands, emphasizing that no single factor can adequately explain the complexity of burnout among students. Consequently, interpreting academic burnout through a multidimensional framework provides a more comprehensive understanding of its development than approaches focusing on isolated variables.

One of the major strengths of this review is its comprehensive synthesis of evidence concerning stress, resilience, and social support within a single systematic review. While previous studies have frequently examined these variables separately, this review integrates their relationships to provide a broader understanding of psychological mechanisms associated with academic burnout. In addition, the review followed the PRISMA 2020 guidelines, ensuring a transparent and systematic study selection process. The inclusion of studies from comparable educational settings also enriched the interpretation of psychological mechanisms while maintaining the primary focus on medical education.

Nevertheless, several limitations should be considered when interpreting the findings. First, most included studies employed cross-sectional designs, limiting the ability to determine causal relationships among stress, resilience, social support, and academic burnout. Second, methodological heterogeneity in study populations, research instruments, and outcome measurements precluded quantitative synthesis through meta-analysis. Finally, although this review primarily focused on medical students, several included studies involved nursing students, university students, and adolescent populations. These studies were included because they investigated comparable psychological mechanisms related to

academic burnout; however, this variation in study populations should be considered when interpreting the applicability of the findings within the context of medical education.

Overall, the synthesized evidence demonstrates that academic burnout is best understood as the result of complex interactions among multiple psychological and environmental factors. The consistency of findings across the included studies provides a coherent evidence base for understanding how academic stress, resilience, and social support contribute to burnout within demanding educational environments.

CONCLUSION AND RECOMMENDATIONS

This systematic review demonstrates that academic burnout among medical students is a multifactorial phenomenon shaped by the interaction of psychological, academic, and environmental factors, with academic stress emerging as the primary risk factor and resilience and social support acting as key protective factors. Beyond synthesizing current evidence, this review contributes to the existing literature by providing an integrated conceptual understanding of how these factors interact in the development of academic burnout, thereby offering a more comprehensive perspective than studies examining each factor independently. These findings provide an evidence base for medical schools to develop multidimensional burnout prevention strategies, including balanced curriculum planning, resilience-building interventions, mentoring programs, accessible psychological support services, and supportive learning environments. Future research should prioritize multicenter longitudinal and intervention-based studies to clarify causal relationships and evaluate the effectiveness of institutional and individual interventions aimed at reducing academic burnout among medical students.

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