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Learning Environment and Mental Health Among Medical Students in Teaching Hospitals a Systematic Review of Organizational Determinants and Evidence Based Interventions

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A R T I C L E I N F O

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A B S T R A C T

Medical students in teaching hospitals face a complex learning environment that has the potential to affect mental health and academic functioning. This study aims to analyze the relationship between organizational determinants in the learning environment and mental health outcomes and identify evidence-based interventions. Systematic review was conducted following PRISMA 2020 through a search of scientific databases, with 18 studies meeting the inclusion criteria and analyzed using narrative and thematic synthesis. Results show that high workload, inadequate supervision, mistreatment, competitive climate, and low institutional support are associated with stress, anxiety, depression, and burnout. Interventions in the form of mentoring, peer support, workload modification, supportive supervision, and psychological services showed benefits. The findings confirm the importance of organizational strategies to create a healthier clinical learning environment

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INTRODUCTION

The mental health of medical students has become an important concern in medical education because the educational process takes place in an intensive, competitive academic and clinical environment, and demands adaptation to learning loads, clinical responsibilities, exposure to patient suffering, and professional hierarchies. Globally, Jahrami et al. (2023) through an umbrella review of 32 meta-analyses found the combined prevalence of psychological and behavioral symptoms in medical students at 30.3%, with the prevalence of stress at 41.7%, burnout at 35.8%, and anxiety and depression at around 32.5%, respectively. This high burden shows that student mental health cannot be seen solely as a matter of individual vulnerability, but also needs to be placed in the context of the educational environment in which students learn and carry out clinical activities. The teaching hospital environment is important because students must balance academic demands with clinical interaction, supervision, performance evaluation, and adaptation to the culture of healthcare organizations (Jahrami et al., 2023).

The Indonesian context shows a similar problem. Lili et al. (2022), in a survey of 1,729 medical students from 29 universities in Indonesia, reported that 93% of respondents experienced disengagement, 95% experienced fatigue, and 74% were identified as having mild psychiatric disorders. Another study by Cipta et al. (2022) on 1,947 medical students from 27 universities found a prevalence of burnout of 35.5%, accompanied by a fairly high level of emotional fatigue and depersonalization. Although some of the data was collected in the context of the pandemic and has not specifically separated students' experiences in teaching hospitals, the findings show the vulnerability of Indonesian medical students' mental health as well as the need to identify environmental factors that can be modified. Thus, attention is not enough directed to students' ability to manage stress, but also to how educational institutions and hospitals shape learning experiences that support or worsen students' psychological well-being (Lili et al., 2022; Cipta et al., 2022).

Theoretically, the relationship between the learning environment and mental health can be understood through a balance between the demands of education and the psychological and organizational resources available. Environments with high workloads, evaluation pressure, mistreatment, poor communication, and lack of supervisor support can increase psychological demands, while supportive supervision, autonomy, positive interpersonal relationships, belonging, and psychological safety can serve as protective resources. Dyrbye et al. (2021), in a longitudinal study of 14,126 medical students in the United States, showed that mistreatment experiences are associated with burnout and career regret at the next stage of education, while positive learning environment experiences are associated with lower burnout and higher empathy. In line with the perspective of Self-Determination Theory, the need for autonomy, competence, and relatedness is also an important basis for student motivation and well-being. Puranitee et al. (2022) showed that sense of belonging, engagement, and collegiality are related to burnout, while McClintock

et al. (2022) found that supportive relationships, clear expectations, autonomy, and feedback can shape psychological safety in a clinical setting.

Evidence on interventions suggests that the problem can be modified, although the effectiveness of available strategies still varies. Lu et al. (2024), through a systematic review and meta-analysis of mindfulness-based interventions in health professional students, found a moderate effect in reducing stress (standardized mean difference = 0.60), but also emphasized the need for careful interpretation due to the risk of bias in the available studies. At the curriculum level, Till et al. (2024) found that face-to-face seminars on stress management were related to reducing several aspects of burnout and stress as well as increasing knowledge about sources of help. The findings show the potential for psychological and curricular interventions, but individual-oriented interventions alone do not necessarily address the source of system-borne stress. Therefore, strategies such as supportive supervision, improved learning climate, strengthening peer support, access to psychological services, and adjusting academic demands need to be considered as part of a more comprehensive organizational approach.

Although the literature on the mental health of medical students is growing rapidly, there are still important scientific gaps. Jahrami et al. (2023) mainly map the magnitude of psychological problems globally, while the research of Dyrbye et al. (2021), Puranitee et al. (2022), and McClintock et al. (2022) focuses on specific components of the learning environment or is conducted in specific institutional and country contexts. Meanwhile, intervention studies such as Lu et al. (2024) and Till et al. (2024) evaluate more individual or curricular strategies and have not systematically linked the effectiveness of interventions to the organizational determinants that are the source of the problem. In fact, Martinussen et al. (2025) show that the concept of psychological safety in clinical learning environments is still used in a variety of ways and needs to be understood as a process that continues to be shaped by relationships, power structures, and organizational practices. Thus, there is still limited systematic review that integrally identifies organizational determinants in teaching hospitals, maps their relationship with stress, anxiety, depression, burnout, and psychological well-being, and links them to relevant evidence-based interventions.

Based on these gaps, this study aims to systematically analyze the relationship between organizational determinants in the learning environment in teaching hospitals and the mental health outcomes of medical students, as well as identify evidence-based interventions that can be used to reduce the negative impacts of these environments. Theoretically, this research is expected to produce a synthesis that integrates organizational demands—such as workload, academic pressure, mistreatment, and competitive climate—with protective resources in the form of supervision, institutional support, psychological safety, and social support in explaining students' mental health. Practically, the research findings are expected to provide a basis for medical faculties and teaching hospitals to design strategies that not only improve individual coping skills, but also improve supervision, learning culture, psychological support, curriculum

structure, and organizational systems so as to create a healthier, safer, and sustainable clinical learning environment for medical students.

LITERATURE REVIEW

Clinical Learning Environment as an Organizational Determinant

The clinical learning environment in a teaching hospital is a system that includes learning opportunities, student readiness to enter clinical practice, quality of supervision, workplace interaction, social participation, and inclusive treatment. Thus, the quality of the learning environment is determined not only by the number of clinical case exposures, but also by how the organization integrates students into the service team. Benamer et al. (2023) showed that students may gain greater patient exposure to certain service settings, but still give lower ratings on readiness, workplace interaction, inclusion, and equity of treatment. This suggests that high clinical burden and opportunity do not automatically result in a positive educational environment if it is not accompanied by adequate organizational support and interpersonal relationships.

Workload, Mistreatment, and Neglect in Clinical Education

Academic and clinical demands can be a source of stress when students face high workloads, unclear expectations, strong hierarchies, and limited opportunities to meaningfully engage in patient care. In addition to explicit forms of mistreatment, neglect is a problem that is often underpaid. Kloos et al. (2023) define neglect in medical education as the lack of meaningful student involvement by clinical service teams so that it negatively impacts learning and well-being. Conditions such as not being involved in clinical activities, lack of guidance, or unclear roles can increase feelings of helplessness and isolation. Therefore, strategies such as longitudinal student-supervisor relationships, clarity of teaching expectations, proportional distribution of responsibilities, and mistreatment reporting systems are an important part of improving the organizational environment of teaching hospitals.

Psychological Safety, Supervisi, dan Sense of Belonging

Psychological safety is an important mechanism that connects organizational characteristics with students' psychological experiences. A psychologically safe environment allows students to ask questions, admit ignorance, ask for help, and make mistakes as part of the learning process without fear of being humiliated or punished. Scoping review by McClintock et al. (2023) shows that psychological safety in medical education is influenced by factors at the organizational and team level and has the potential to support learning, well-being, and a sense of belonging. These findings are reinforced by Leep Hunderfund et al. (2025), who found that a sense of belonging to the organization is strongly correlated with burnout; Social support, quality of relationships with faculty, leadership representation, and an inclusive learning climate are all modifiable environmental factors. Thus, supportive supervision and a sense of acceptance as a team member can serve as a protective resource against the pressures of clinical education.

Learning Environment and Mental Health Outcomes

The consequences of an unsupportive educational environment can appear as prolonged stress, anxiety, emotional exhaustion, burnout, decreased well-being, and reduced academic engagement. Klein and McCarthy (2022) emphasize that medical students' well-being issues are formed through a combination of academic, personal, social, and structural stressors; Therefore, institutional responses should not be solely oriented towards improving the coping ability of individuals. In the context of teaching hospitals, the relationship can be understood as an interaction between demands—such as clinical burden, evaluation pressure, competition, and mistreatment—and resources in the form of supervision, social support, autonomy, access to psychological help, and a sense of belonging. The imbalance between those demands and resources may explain why students in the same clinical setting may exhibit different levels of stress and burnout.

Evidence-Based Interventions: Individual hingga Organizational Level

Interventions to improve student mental health show benefits, but their effectiveness depends on the level of problem targeted. At the individual level, Fazia et al. (2023) in a randomized trial of 362 medical students showed that mindfulness-based interventions significantly reduced perceived stress and improved mental well-being, emotion regulation, and resilience. A meta-analysis by Hathaisaard et al. (2022) also showed that mindfulness-based interventions were effective in reducing the stress of medical students, including at a six-month follow-up, although the evidence on burnout was still limited. The findings suggest that improved psychological regulatory ability is beneficial, but does not completely eliminate the structural factors that produce distress. At the interpersonal and organizational level, mentorship and peer support can strengthen social connections and access to help. Graves et al. (2022) show that medical student peer support often occurs informally through established social relationships, but its implementation can be hampered by stigma, concerns about confidentiality, lack of competence, and unclear role boundaries. Meanwhile, a scoping review of Preovolos et al. (2024) which included 20 studies and 4,591 participants found psychosocial, academic, and professional benefits of peer/near-peer mentoring, especially when the program has a matching process, orientation, clear goals, and mentor training. Therefore, a more comprehensive intervention should integrate individual psychological support with improved supervision, mentoring, peer support, curriculum structure, learning load, and organizational culture. This multilevel approach is more consistent with the view that students' mental health is the result of an interaction between individual characteristics and the environment in which education takes place.

Conceptual Synthesis

Based on this literature, the learning environment in teaching hospitals can be understood through three interrelated components. First, organizational demands, including academic and clinical loads, evaluation pressure, mistreatment, neglect, and hierarchical structures. Second, organizational resources, which include supportive supervision, psychological safety, belongingness, peer support, mentoring, inclusion, and access to mental health services. Third, mental health outcomes, especially stress, anxiety, depression, burnout, and psychological well-being. This framework supports the assumption that interventions that only strengthen students' coping skills are inadequate if the organizational determinants underlying distress remain unchanged. Therefore, this systematic review places the determinants of organization and evidence-based interventions within a single framework to identify the strategies that are most relevant to the creation of a healthy and supportive clinical education environment.

METHODOLOGY

Types of Research

This study is a secondary study with a systematic review approach that aims to analyze the relationship between organizational determinants in the learning environment and the mental health outcomes of medical students in teaching hospitals, as well as identify relevant evidence-based interventions. The implementation and reporting of systematic reviews follows the guidelines of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020. PRISMA 2020 was used to improve transparency in the process of identifying, selecting, and reporting studies included in the systematic review (Page et al., 2021a, 2021b). The research synthesis approach is qualitative through narrative synthesis and thematic synthesis, so that there is no statistical combination of effects through meta-analysis.

Population and Sample

The research population is in the form of scientific articles that discuss the learning environment, organizational determinants, mental health of medical students, and relevant interventions in the context of teaching hospitals. In contrast to primary research, systematic reviews did not use respondents or participants who were recruited directly. The unit of research analysis is a scientific study obtained through a search of scientific databases. The selection of studies was carried out based on the suitability of the research objectives and inclusion criteria that have been set, so that it uses a criterion-based study selection approach and not probability sampling as in survey research. After going through the selection process, as many as 18 studies met the inclusion criteria and became a sample of the evidence analyzed. A criteria-based selection approach is an important component of systematic review to ensure that the synthesised study is relevant to the research question (De Cassai et al., 2025).

Research Instruments

The research instruments are in the form of scientific article documents and data extraction sheets that are used to organize information from each study that meets the inclusion criteria. The extracted data were focused on research characteristics and findings related to organizational determinants of the learning environment, mental health outcomes, and the form and outcomes of interventions. Because this study was a systematic review and did not directly measure respondents, the use of questionnaires, interviews, and testing the validity and reliability of psychometric instruments was not applied. Consistency of information collection is maintained through the use of the same extraction component across the analyzed articles.

Data Collection Procedure

Data collection is carried out systematically through literature search in scientific databases relevant to the focus of the research. The selection stage follows the PRISMA 2020 flow, which includes the identification, screening, eligibility, and inclusion processes. Articles obtained at the identification stage were first selected based on their suitability with the focus of the research. Furthermore, screening and feasibility assessments are carried out to determine studies that meet the inclusion criteria. The process resulted in 18 studies which were then used as the main data source in the systematic review. The study selection flow was then reported through the PRISMA 2020 flow diagram to show the evidence selection process in a transparent and systematic manner (Page et al., 2021a).

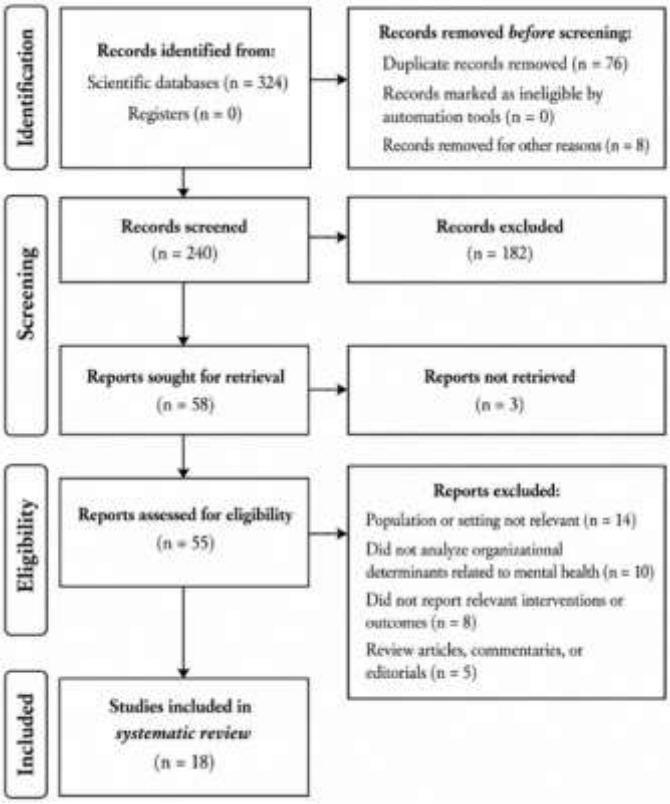


Figure 1. Collection Procedure

Data Analysis Techniques

Data from 18 studies were analyzed using a combination of narrative synthesis and thematic synthesis. Narrative synthesis was used to compare and explain the pattern of findings between publications regarding the relationship between the learning environment and the mental health of medical students. Furthermore, thematic synthesis is used to group findings that have conceptual similarities, especially with regard to organizational determinants, mental health outcomes, and evidence-based interventions. The results of the synthesis were directed to identify patterns of relationships between learning environment characteristics and stress, anxiety, depression, and burnout, while mapping interventions such as mentoring, peer support, workload modification, supportive supervision, and psychological services. The narrative approach was chosen because it allows evidence from different studies to be compiled systematically without conducting statistical pooling (De Cassai et al., 2025). Because the research abstract does not specify a specific analysis software, this study does not list the use of specific software in the analysis process.

RESULTS AND DISCUSSION

Characteristics of the Studies Analyzed

Based on the PRISMA 2020 selection process, as many as 18 studies met the inclusion criteria and were analyzed using narrative and thematic synthesis. The included studies include research published in the period 2021–2025 in the context of medical education in the United States, Indonesia, China, Thailand, Australia, South Africa, Italy, the United Arab Emirates, and the United Kingdom. The sample size of the study varied widely, ranging from 10 participants in the qualitative study to 14,126 students in the multicenter cohort study. The diversity of designs includes cross-sectional studies, longitudinal cohorts, mixed-methods, qualitative research, randomized controlled trials, and pilot interventions. The heterogeneity of design and output measurement supports the use of narrative and thematic synthesis rather than meta-analysis.
Overall, the results of the extraction showed three main groups of evidence, namely: (1) organizational demands, which mainly included academic and clinical load, time pressure, mistreatment, microaggressions, competitive climate, and unsupportive learning environment; (2) organizational resources, in the form of quality supervision, psychological safety, sense of belonging, peer support, institutional support, and access to mental health services; and (3) mental health outcomes, especially burnout, stress, anxiety, depression or psychological distress, emotional exhaustion, and psychological well-being. The pattern is consistent with the research objective of integrating organizational determinants with mental health outcomes and interventions that can be applied to the medical education environment.

Table 1. Extraction Of Study Data Included In Systematic Review

Study	Study Characteristics	Focus and Exterior	Key Findings
Dyrbye et al. (2021)	AS; cohort; n=14.126; 140 medical schools	Mistreatment dan learning environment → burnout, empathy, career regret	Mistreatment related to burnout and career regret; A positive environment is protective.
Chisholm et al. (2021)	AS; cross-sectional; n=217	Racial microaggressions dan institutional resources → burnout, learning impairment	Microaggression is more often experienced by the URM group and is related to burnout.
Puranitee et al. (2022)	Thailand; mixed-methods; 763 surveys, 20 interviews	Belongingness, engagement, collegiality, psychological safety → burnout	High engagement and sense of belonging are associated with lower burnout.
Yu et al. (2022)	Tiongkok; cross-sectional; n=2.031	School psychological environment dan school identity → learning burnout	A positive psychological environment is associated with lower burnout through school identity and self-esteem.
Liu & Cao (2022)	Tiongkok; cross-sectional; n=807	Stress dan social support → academic burnout, resilience	Stress increases burnout, while social support works through resilience.
Lili et al. (2022)	Indonesia; cross-sectional; n=1.729; 29 universitas	Educational pressure and support system → burnout, psychiatric distress	Disengagement, exhaustion, and psychological distress are found in a high proportion of college students.
Cipta et al. (2022)	Indonesia; cross-sectional; n=1.947; 27 universitas	Educational pressure during the pandemic → burnout	Burnout was found in 35.5% of college students.
Graves et al. (2022)	Australia; qualitative interviews; n=10; dua medical schools	Peer support → psychological distress, help-seeking	Peer support is beneficial, but it is hampered by stigma, secrecy, and role boundaries.
Boyd & Alexander (2022)	Afrika Selatan; randomized trial; n=45	Online mindfulness dan supportive counselling → stress, well-being, resilience	Mindfulness and counselling improve stress and well-being.
Benamer et al. (2023)	Public–private healthcare settings; cross-sectional; 38 evaluations out of 76 eligible students	Preparedness, interaction, inclusion, clinical exposure → clinical learning environment	High clinical exposure does not always accompany a better learning environment.
Fez et al. (2023)	Italia; randomized study; n=362	Mindfulness-based intervention → stress,	Mindfulness lowers stress and increases

		well-being, emotion regulation, resilience	well-being and resilience.
Collins et al. (2023)	AS; cross-sectional; n=312; University of Michigan	Schedule, access to mental health services, stigma → burnout, emotional well-being	High burnout and access to mental health services is time-constrained and stigma.
Ditton et al. (2023)	Australia; RCT; n=143	App-delivered psychological flexibility training → burnout, well-being, distress	Digital interventions did not show a consistent reduction in burnout.
Yu et al. (2023)	Tiongkok; cross-sectional; n=2.411	School climate dan collective self-esteem → academic burnout	Positive school climate is associated with lower academic burnout.
Moran et al. (2023)	Australia; pilot mixed-methods; n=13; clinical placements	Group clinical supervision → burnout, reflection, professional support	Group supervision enhances a sense of security, reflection, and professional support.
Prendergast et al. (2024)	Inggris; curriculum-based mixed intervention	Reflection-based burnout education → burnout awareness, coping	Interventions raise awareness of burnout, but system changes are still needed.
Himmelberger et al. (2024)	AS; cross-sectional; n=4.180	Growth mindset-supportive learning environment → flourishing, resilience, burnout	An environment that supports a growth mindset related to well-being is better.
Leep Hunderfund et al. (2025)	AS; cross-sectional; 1.261 learners, termasuk 319 medical students	Organizational belonging, social support, faculty relationships → burnout, organizational outcomes	Belongingness and social support are associated with lower burnout.

Organizational Determinants in Learning Environment and Mental Health

Thematic synthesis shows that **high academic and clinical burden are the most consistent determinants of risk**. This burden is not only reflected in the number of tasks or clinical activities, but also from limited time for psychological recovery, unclear expectations, performance pressure, and difficulty maintaining personal life. Collins et al. found that 43% of college students rated their schedules as not providing enough time for personal or family life. Students in the core clinical phase also reported more time limitations than those who had entered clinical electives. These findings support the interpretation that workload becomes problematic when the demands of education exceed the resources, recovery time, and control that students have.

These results have special implications in the context of teaching hospitals. Higher clinical exposure is not necessarily synonymous with a better learning environment. Benamer et al. showed that students in public healthcare settings had higher variations and case volumes, but rated preparedness, workplace interaction, social participation, inclusion, and equal treatment lower than in private settings. The findings show that there is a trade-off between **clinical exposure** and **quality of learning environment**. Thus, increasing the amount of

unsupervised clinical experience, team integration, and protection of student welfare can increase demands without providing commensurate educational resources.

The second determinants that stand out are **mistreatment, microaggressions, and an unsafe interpersonal environment**. A longitudinal study by Dyrbye et al. showed that experiences of mistreatment in the early stages of education predicted burnout and career regret in the later stages, while positive experiences in the learning environment were associated with lower burnout and higher empathy. Chisholm et al. reinforce this pattern by showing that racial microaggressions have a disproportionate impact on underrepresented student groups in medicine. In this group, 62% stated that microaggressions contributed to burnout, compared to 29% in the non-URM group. Thus, mental health is not only related to the intensity of the task, but also to how students are treated in the social structure and hierarchy of the institution.

Supervision, Psychological Safety, and Sense of Belonging as Protective Factors

On the contrary, the synthesis shows that supportive supervision, psychological safety, engagement, and sense of belonging are the most consistent protective organizational resources. Puranitee et al. found an inverse relationship between burnout and engagement, the fulfillment of basic psychological needs, and a sense of belonging. The qualitative findings of the study also show that safety in the learning environment, relationships with teachers and peers, relevance of assignments, and program design are elements that shape collegiality and student involvement.

A similar pattern was found in larger-scale studies. Yu et al. (2022) found that the quality of the school psychological environment has a negative effect on learning burnout and that some of these relationships are explained through school identity and collective self-esteem. In a subsequent study of 2,411 college students, school climate again showed a significant negative association with academic burnout, with collective self-esteem playing a substantial mediating role. Meanwhile, Leep Hunderfund et al. showed that learners who had a sense of belonging to programs and organizations had lower burnout, and in the group of medical students, social support was a very strong factor in the formation of belongingness.

The findings make it clear that the link between the environment and mental health is not always straightforward. Some environmental effects work through psychological mechanisms such as belongingness, collective self-esteem, resilience, and engagement. This is also seen in Liu and Cao, who found that social support did not have a significant direct effect on academic burnout, but provided a protective effect through increased resilience. This distinction is important because it explains why increasing social support alone does not necessarily immediately reduce burnout if students have not felt the support as a resource that increases adaptability.

Mental Health Outcomes

Burnout was the most consistent outcome found in 18 studies, especially in the form of emotional exhaustion, disengagement, cynicism, and decreased academic efficacy. In addition to burnout, the study also reported stress, anxiety, psychological distress, decreased well-being, and problems with help-seeking. The findings from Indonesia show the magnitude of the problem in the local context. Lili et al. reported that 93% of students experienced disengagement, 95% of exhaustion, and 74% met the screening of mild psychiatric illness in 1,729 students from 29 universities. Meanwhile, Cipta et al. reported a prevalence of burnout of 35.5% in 1,947 students from 27 universities, which has been used in the introduction to this paper.

The difference in prevalence between the two Indonesian studies should not be seen as a contradiction because the constructs and measurement criteria used are different. Exhaustion or disengagement is a dimension of burnout, while the overall prevalence of burnout generally requires a combination of certain criteria. Therefore, high exhaustion does not automatically mean that the overall prevalence of burnout has the same number. The findings also explain why global literature reviews can produce different estimates of burnout, depending on the instrument, cutoff, educational phase, and characteristics of the institution being studied.

The study by Collins et al. adds an important dimension regarding access to care. About two-thirds of respondents reported mental health concerns, but 37% of college students who experienced it had never sought treatment. The main barriers include time constraints, concerns that a history of treatment will affect a career, as well as cost. Students want more flexible schedules, changes at the curriculum and system levels, more accessible psychological services, and guarantees of confidentiality. Thus, the formal availability of mental health services is not enough; Accessibility, confidentiality, scheduling, stigma, and institutional trust determine whether the service is actually used.

Effectiveness of Evidence-Based Interventions

Intervention studies showed results that were generally positive, but not uniform. Fazia et al. provided relatively strong evidence through a randomized study of 362 college students. Mindfulness-based interventions significantly reduce perceived stress and improve mental well-being, emotion regulation, resilience, and attentional control. Boyd and Alexander also found that both online mindfulness and supportive counselling for six weeks resulted in improvements in well-being, perceived stress, and subjective stress management. However, the specific advantage of mindfulness is mainly seen in the improvement of mindfulness itself.

Not all individual interventions provide equally strong effects. Ditton et al. found that the application of psychological flexibility training could be applied to medical students, but did not produce significant changes compared to waitlists in most domains of burnout, including exhaustion and cynicism. These findings are an important difference from the results of Fazia et al. and show that digital accessibility does not automatically result in clinical or psychological effectiveness. The intensity of the engagement, the components of

the intervention, the human facilitation, the context of implementation, and the appropriateness of the intervention to the source of stress are likely to influence the outcome.

At the interpersonal and organizational levels, results show potential for supervision and peer support. Moran et al. found that group clinical supervision had a 100% attendance rate and was rated as a safe space to process clinical experiences, gain validation, reduce feelings of isolation, and connect with trusted clinical supervisors. However, because the sample was only 13 students, the findings were stronger as evidence of feasibility and acceptability than definitive evidence of reducing burnout. Graves et al. also show that peer support has potential, but its success depends heavily on interpersonal trust. Stigma, concerns about confidentiality, unclear role boundaries, and feelings of incompetence can actually hinder formal peer support programs.

Interventions at the curriculum level have also shown benefits. Prendergast et al. found that tutorials and reflection activities on burnout help students recognize the signs of burnout and think about prevention strategies. However, students explicitly assess that most of the causes of burnout are beyond individual control and require changes at the curriculum level. The findings are in line with the results of Collins et al., where students prefer schedule flexibility, time for personal life, reduced activities that are considered "busy work", and system changes rather than just adding wellness activities.

Thus, the evidence for workload modification in this study set comes more from student needs, determinant analysis, and curricular interventions than from randomized trials that specifically test workload reduction. Therefore, the results should be interpreted as strong support for the relevance of workload as an intervention target, but the causal evidence for the effectiveness of workload reduction is still more limited than the evidence for psychological interventions such as mindfulness.

Determinant Synthesis and Interventions

Table 2. Thematic Synthesis of Organizational Determinants, Impacts, and Interventions

Organizational Determinants	**Identified Impacts**	**Protective Factors/Relevant Interventions**	**Synthesis of Findings**
Academic/clinical load and time constraints	Stress, exhaustion, burnout, penurunan work-life balance	Schedule flexibility, curriculum modification, protected personal time	Consistent as a risk factor; Evidence of direct intervention is still limited
Inadequate supervision	Insecurity, isolation, burnout, rendahnya engagement	Supportive/group clinical supervision	Supervisor support enhances a sense of security, validation, and connectedness
Mistreatment dan microaggression	Burnout, distress, impaired	Anti-mistreatment mechanisms, inclusive climate, safe reporting	Relatively consistent negative relationships, including longitudinal evidence

	learning, career regret		
Competitive climate/negative learning climate	Academic burnout, rendahnya well-being	Growth-oriented and supportive learning climate	Positive environment is associated with lower burnout
Rendahnya belongingness	Burnout, disengagement	Collegiality, peer connection, inclusion	Belongingness emerges as an important protective mechanism
Limitations of social support	Burnout through low resilience	Peer support, mentoring, social connection	Effects can be indirect through resilience/belongingness
Barriers to mental health services	Mental health concerns are not addressed	Confidential psychological services, flexible access	Access is affected by time, cost, stigma, and career concerns
Distress individual	Stress, anxiety, rendahnya well-being	Mindfulness, counselling, psychological flexibility	Positive effects mainly on stress and well-being; The effects on burnout are not always consistent

Integrated Discussion

Overall, the results of the systematic review support the view that the mental health of medical students is the result of an interaction between organizational demands and organizational resources. Workload, evaluation pressure, mistreatment, microaggression, time constraints, and an unsupportive climate function as demands that drain psychological resources. On the other hand, supervision, psychological safety, belongingness, collegiality, social support, and access to psychological assistance act as resources that can reduce the impact of these demands. This pattern explains why college students with similar academic or clinical exposure may exhibit different levels of burnout.

The findings of this study are consistent with the description in the introduction that students' mental health cannot be understood only as a matter of individual coping ability. The study by Dyrbye et al. showed a longitudinal relationship between the quality of the learning environment and subsequent burnout, while Puranitee et al., Yu et al., and Leep Hunderfund et al. showed that belongingness, engagement, and a supportive psychological environment were associated with better outcomes. The findings expand on the literature that previously focused heavily on the prevalence of mental health problems by pointing out potential organizational mechanisms for modification.

However, the results of the review also show important differences with approaches that place resilience or mindfulness as the main solution. Fazia et al. and Boyd and Alexander showed the benefits of the intervention against stress and well-being, but Ditton et al. did not find a consistent reduction in burnout through the application of psychological flexibility. This difference supports the interpretation that individual interventions can improve students' ability to manage demands, but their effectiveness will be limited if the organizational demands that produce distress remain unchanged. The findings on social support are also not entirely uniform. Puranitee et al. and Leep Hunderfund et al. showed that sense of belonging and social support were associated with lower

burnout, whereas Liu and Cao found no direct effect of social support on burnout after the resilience mechanism was taken into account. These differences are not proof that social support is not important, but it does suggest that the effects can occur through indirect channels. Social support that does not increase a sense of security, belongingness, or resilience may not be enough to directly affect burnout.

Another important finding is that more clinical exposure does not necessarily mean a better learning environment. Benamer et al. showed that settings with higher numbers and variations of patients may have lower interaction and inclusion scores. This is very relevant for teaching hospitals, because the target of increasing competence through intensification of clinical experience needs to be balanced with supervisor capacity, integration of students into clinical teams, opportunities to get feedback, psychological safety, and recovery time.

Based on this synthesis, the most rational intervention approach is not a single program, but **a multilevel strategy**. At the organizational level, institutions need to evaluate workloads, schedule structures, hierarchical cultures, mistreatment reporting mechanisms, and access to mental health services. At the interpersonal level, the quality of supervision, mentorship, collegiality, and peer support needs to be strengthened. At the individual level, interventions such as mindfulness, counselling, reflective practice, and psychological flexibility can be used as a complement to improve students' ability to manage demands that cannot be completely eliminated.

Thus, the main contribution of this review is to show that the relationship between the learning environment and mental health cannot be reduced to a simple relationship between "academic stress" and burnout. The results show a more complex pattern: organizational demands increase the risk of distress and burnout, while organizational resources moderate or mediate these impacts through psychological safety, belongingness, engagement, and resilience. Individualized interventions show benefits primarily against stress and well-being, but the available evidence supports the need for structural and organisational changes for benefits to be sustained over the long term. These findings reinforce the need for medical faculties and teaching hospitals to view student well-being as an indicator of the quality of the educational environment, rather than solely as the individual responsibility of students.

CONCLUSIONS AND RECOMMENDATIONS

This study shows that the mental health of medical students in teaching hospitals is influenced by the interaction between organizational demands and supporting resources in the learning environment. High academic and clinical load, mistreatment, microaggressions, time constraints, and unsupportive learning climate are related to increased stress, psychological distress, and burnout. On the other hand, supportive supervision, psychological safety, sense of belonging, collegiality, social support, and access to psychological services play a protective role. Interventions such as mindfulness and counselling have shown benefits for stress and well-being, but outcomes for burnout are not

always consistent, so individual interventions alone are not enough to address the source of organizational problems.

Based on these findings, medical faculties and teaching hospitals are advised to implement a multilevel approach that includes structuring workloads and schedules, strengthening supervision and mentoring, developing psychological safety, improving peer support, preventing mistreatment, and providing mental health services that are easily accessible and ensure confidentiality. Efforts to increase student resilience and coping are still needed, but should be placed as a complement to curriculum and organizational changes so that mental health improvements can take place more sustainably.

FURTHER STUDY

Further research is recommended using longitudinal studies and multicenter interventions to evaluate the causal relationship between organizational determinants and the mental health of medical students. Future studies also need to compare the effectiveness of individual, interpersonal, and organizational interventions with standardized indicators and assess the sustainability of their impact in the long term.

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