

Mental Health Challenges and Psychological Protective Resources among Medical Students in Zhejiang Province, China

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ABSTRACT

Medical students experience substantial psychological demands arising from intensive academic workloads, competitive learning environments, clinical responsibilities, and uncertainty about professional development. Depression, anxiety, and suicidal ideation are therefore important but distinct mental health concerns in medical education. Although resilience, social support, and mindfulness have each been associated with more favourable psychological outcomes, these resources are often examined separately, limiting understanding of how they may jointly protect medical students. This conceptual paper synthesises recent evidence on mental health challenges and psychological protective factors among medical students, with particular attention to the educational context of Zhejiang Province, China. Guided by Conservation of Resources theory, it proposes an integrated protective resource framework in which resilience represents adaptive personal capacity, social support represents relational and institutional resources, and mindfulness represents attentional and self-regulatory capacity. These resources are conceptualised as complementary mechanisms that may help students preserve, obtain, and regulate resources when facing sustained academic and clinical demands. The framework also emphasises that student mental health cannot be addressed solely through individual-level interventions. Medical schools should coordinate resilience development, peer and faculty support, accessible counselling, mindfulness provision, psychologically safe learning environments, and clear referral procedures for students at risk. However, the proposed relationships remain theoretical and require empirical examination through longitudinal, multicentre, and intervention studies. By integrating individual and contextual protection, this paper provides a theoretically grounded basis for future research and for developing coordinated mental health strategies within medical education in Zhejiang and comparable settings.

Keywords: medical students; mental health challenges; psychological protective factors; resilience; social support; mindfulness; Zhejiang Province

INTRODUCTION

Mental Health Challenges in Medical Education

University students encounter academic, financial, and developmental pressures; however, medical students face demands arising from intensive curricula, high-stakes assessment, clinical responsibility, and uncertainty about professional competence. Evidence identifies depression, anxiety, stress, burnout, sleep disturbance, and suicidal ideation as coexisting concerns in medical education (Jahrami et al., 2023). Comparative evidence from China further indicates a significantly higher pooled prevalence of depression among medical students than among non-medical university students, at 38.3% and 33.7%, respectively (Lin et al., 2025). These findings suggest that psychological problems may be particularly pronounced in medical students, although differences can vary across outcomes and educational contexts.

At the national level, Chinese medical students experience substantial depression, anxiety, and suicidal ideation across training settings (Wang et al., 2023). Their psychological burden reflects not only general

university pressures but also prolonged training, clinical exposure, limited recovery time, and expectations of professional resilience. Evidence from Zhejiang documents depressive symptoms, sleep problems, suicidal ideation, post-pandemic distress, and uncertainty during clinical training (Zhao et al., 2021; Ru et al., 2025; Wang et al., 2025). Here, psychological protective resources refer to personal capacities and interpersonal or educational supports that may reduce vulnerability to distress or facilitate adaptation under academic and clinical demands.

The Zhejiang Medical Education Context

Medical students in Zhejiang are educated within China's multilevel medical education system, which includes five-year undergraduate, 5+3 integrated, and eight-year training pathways that connect university study with clinical training and postgraduate selection (Tie et al., 2024). Across these pathways, students face intensive coursework, graduation requirements, clinical competence expectations, licensing examinations, and competition for further training and employment; these pressures frequently overlap (Zhang et al., 2024). Zhejiang provides a relevant regional case because it shares these national structures while encompassing varied universities, medical institutions, and teaching hospitals. Its designation as a common-prosperity demonstration zone also gives the province a reform role: national policy positions Zhejiang to advance educational reform within the broader goal of equitable public services (Ministry of Education of China, 2022). Medical curriculum innovation within Zhejiang further demonstrates this experimental capacity (Chen et al., 2024). Studying Zhejiang may therefore generate context-sensitive insights relevant to similarly developed regions and broader national medical education reform.

Gaps in Existing Research on Mental Health Challenges and Protective Resources

Research on medical student mental health has identified depression, anxiety, stress, burnout, sleep disturbance, and suicidal ideation, yet these challenges are commonly examined as separate outcomes. This problem-specific organisation can obscure their shared academic, clinical, and social contexts and limits understanding of how different difficulties may coexist across training stages.

Research on protective resources is similarly distributed across distinct constructs. Resilience, adaptive coping, mindfulness, self-compassion, social support, belonging, and supportive learning environments are often investigated independently rather than as complementary resources. A scoping review found that medical student resilience is shaped by both personal and institutional factors, although existing research has concentrated disproportionately on individual attributes (Azim et al., 2025). Students also describe peer and teacher support as important resources for navigating academic adversity, demonstrating that protection extends beyond personal psychological capacities (Saad & Ali, 2025).

Within Zhejiang, relevant evidence remains dispersed across institutions, student groups, outcomes, and explanatory mechanisms. For example, a three-wave study involving first-year students from four medical universities examined learning burnout through core self-evaluation, anxiety-related distress, and problematic digital media use (Yang et al., 2026). Such studies provide valuable findings but do not yet offer an integrated account of protective resources. A context-sensitive synthesis is therefore needed to organise personal, interpersonal, and educational resources and clarify their collective relevance to medical students' mental health in Zhejiang.

Aim and Contribution of the Paper

Although mental health challenges encompass a broader range of psychological and behavioural difficulties, this paper focuses on depression or depressive symptoms, anxiety or anxiety symptoms, and suicidal ideation. Psychological protective resources are examined through resilience, social support, and mindfulness. This paper aims to synthesise evidence on these three challenges and resources among medical students in Zhejiang Province. Resilience may support adaptation to academic and clinical stress, social support may provide emotional and instrumental assistance, and mindfulness may reduce maladaptive reactivity through present-moment awareness. Existing evidence supports the relevance of these resources to medical students' psychological health (Yusefi et al., 2025; Darvishi et al., 2024; Kaisti et al., 2024). By integrating these bodies

of evidence, the paper develops a context-sensitive framework and identifies priorities for research and student support in Zhejiang.

LITERATURE REVIEW

Conceptualisation of Mental Health Challenges and Psychological Protective Resources

Mental health is broader than the absence of mental disorder and includes the capacity to cope, learn, work, and participate meaningfully in society (World Health Organization, 2022). Within medical education, mental health challenges therefore encompass a wide spectrum of psychological and behavioural difficulties. This paper narrows that spectrum to depressive symptoms, anxiety symptoms, and suicidal ideation. Depression and anxiety may denote diagnosed disorders or symptom severity; because medical-student research commonly relies on screening scales rather than clinical interviews, symptom-based terminology is generally more precise (First et al., 2023; Lin et al., 2024). Suicidal ideation refers to thoughts, wishes, or plans concerning death by suicide. It is related to, but conceptually distinct from, depression, anxiety, suicide attempts, and suicide mortality (Mateen et al., 2024).

Psychological protective resources are personal or relational assets that may reduce vulnerability to distress or support adaptation under demanding conditions. Resilience is not merely a stable trait; it is increasingly conceptualised as a dynamic process of positive adaptation involving personal capacities and access to contextual resources (Donnellan et al., 2024). Social support is a multidimensional interpersonal resource that may include emotional, informational, instrumental, and appraisal assistance from family, peers, teachers, or other significant relationships (Li et al., 2025). Mindfulness refers to intentional, receptive, and non-judgmental awareness of present-moment experience, enabling thoughts and emotions to be observed without immediate reactive engagement (da Silva et al., 2023). These resources are distinct but potentially complementary: resilience concerns adaptation, social support supplies relational assistance, and mindfulness supports attentional and emotional regulation.

Major Mental Health Challenges among Medical Students

Depression and Depressive Symptoms

Depression is one of the most consistently reported mental health problems in medical education. Recent syntheses show that estimates vary substantially across countries, study periods, and screening instruments, but the overall burden remains high. A scoping review of reviews published between 2021 and 2025 found that reported prevalence estimates ranged from 18.1% to 50.0% for depressive symptoms and from 17% to 54% for anxiety symptoms, indicating both substantial burden and marked contextual variation (Agyapong-Opoku et al., 2026). During the COVID-19 period, a meta-analysis of 201 studies involving approximately 198,000 medical students estimated pooled prevalences of 41% for depression and 38% for anxiety, although the authors cautioned that most included studies were cross-sectional and heterogeneous (Peng et al., 2023).

Depressive symptoms among medical students may include persistent low mood, loss of interest, fatigue, impaired concentration, hopelessness, self-criticism, and reduced motivation. These symptoms can interfere directly with the sustained attention, memory, and self-regulation required by intensive medical curricula. In a prospective study, depression, anxiety, and stress were negatively associated with academic engagement, while greater distress was linked to stronger intentions to discontinue medical training (Sinval et al., 2025). Chinese evidence similarly connects depressive symptoms with academic functioning. Among medical students with previous examination failure, depression was more prevalent than among their peers and was associated with poorer academic adjustment under stressful life events (Guo & Qiu, 2024).

Depression also rarely occurs in isolation. A study of students from four medical universities in Anhui Province found that depressive symptoms, poor sleep quality, and state-trait anxiety were closely associated, illustrating how emotional and behavioural difficulties may reinforce one another (Chen et al., 2022). The prevalence and expression of depression may also vary across training stages. First-year students have reported more depressive symptoms than fifth-year students, possibly reflecting adjustment difficulties, unfamiliar

academic expectations, and initially limited coping experience (Alshehri et al., 2023). Conversely, later years can introduce clinical responsibility, licensing preparation, research requirements, and career uncertainty. Depression should therefore be understood as a fluctuating challenge shaped by the interaction between individual vulnerability and changing educational demands.

Anxiety and Anxiety Symptoms

Anxiety is characterised by excessive worry, apprehension, tension, and physiological arousal. Within medical education, its content may be specifically connected to examinations, academic performance, clinical competence, patient safety, future employment, and fear of making mistakes. Anxiety can sometimes motivate preparation when it remains limited and manageable; however, persistent or severe symptoms may impair concentration, decision-making, sleep, confidence, and participation in clinical learning. Curriculum design may also matter: students following problem-based and lecture-based tracks have shown different patterns of emotional exhaustion and psychological distress, suggesting that anxiety is experienced within, rather than independently of, the learning environment (Jestin et al., 2023).

Chinese medical students experience anxiety within a training environment that combines demanding academic work with progressive exposure to clinical practice. After the adjustment of national COVID-19 policies, a survey of 947 Chinese medical students found anxiety symptoms in 37.8% and depressive symptoms in 39.3%; higher-grade and rural-background students showed greater vulnerability to several mental and cognitive symptoms (Cheng et al., 2023). Such findings demonstrate that risk cannot be assigned uniformly to either junior or senior students. Early-stage students may struggle with transition and workload, whereas advanced students may face clinical encounters, postgraduate selection, licensing examinations, and uncertain career pathways. Anxiety and depression are also highly comorbid, and their overlap may indicate greater severity and functional impairment than either condition alone. Their co-occurrence can also complicate recognition because somatic and cognitive symptoms may overlap substantially.

Suicidal Ideation

Suicidal ideation represents the most serious challenge considered in this paper. It ranges from passive wishes not to live to active thoughts, intentions, or plans concerning suicide. Although suicidal ideation does not inevitably progress to an attempt, it is clinically important because it can mark escalating psychological distress and future suicide risk. A recent scoping review of systematic reviews and meta-analyses concluded that suicidal behaviours remain a significant global problem among medical students and are associated with depression, academic stress, burnout, substance use, and other interpersonal and situational factors (Agyapong-Opoku et al., 2025).

Large Chinese studies confirm that suicidal ideation is not a marginal concern. Among 6,643 medical students in Hebei Province, 11.5% reported suicidal ideation; stressful life events, childhood maltreatment, relationship disruption, and selected demographic characteristics were associated with higher risk (Huang et al., 2024). Another study of 4,882 Chinese medical college students found that anxiety and depression were strongly associated with suicidal ideation, suicide planning, and suicide attempts, alongside poor parental relationships and health-risk behaviours (Li et al., 2022). These findings also show why suicidal ideation should not be treated simply as a severe form of depression: it has overlapping but distinct psychological, interpersonal, developmental, and behavioural correlates.

Longitudinal evidence provides further insight into its development. New-onset perceived entrapment strongly predicted first-onset suicidal ideation among Chinese medical students, supporting the importance of feeling unable to escape difficult circumstances (Wang et al., 2023). Sleep and circadian patterns may also contribute. In a retrospective cohort, short sleep duration and eveningness before the pandemic were associated with incident suicidal ideation during follow-up, even after adjustment for baseline anxiety and depression scores (Zheng et al., 2024).

Collectively, the literature indicates that depression, anxiety, and suicidal ideation are interconnected but non-equivalent challenges. Their coexistence, changing expression across training stages, and implications for

academic progress, clinical development, relationships, and personal safety justify examining protective resources that may reduce vulnerability or support adaptation.

Factors Contributing to Mental Health Challenges

Mental health challenges among medical students arise from interacting individual, educational, interpersonal, and institutional conditions rather than from a single source.

Individual Factors

At the individual level, vulnerability may be influenced by intolerance of uncertainty, anxiety sensitivity, low self-efficacy, maladaptive self-evaluation, and difficulties regulating behaviour under pressure. Among first-year medical students, lower socioeconomic status was associated with greater anxiety sensitivity and intolerance of uncertainty, while self-efficacy appeared to counterbalance these responses (Gellisch et al., 2024). Lifestyle patterns may further intensify distress. In a study of 618 medical students, insomnia, smoking, eating-related difficulties, and high stress were associated with depression and anxiety, whereas greater physical activity was associated with lower depression risk (Dodin et al., 2024). These findings suggest that personal vulnerability is shaped by both psychological tendencies and daily health behaviours.

Academic and Clinical Training Factors

Academic demands remain a central source of strain. A review of reviews identified academic pressure, institutional influences, personality characteristics, social relationships, and financial stress as recurring drivers of medical-student stress (Jeyapalan & Blair, 2024). Large volumes of material, frequent examinations, grade expectations, fear of failure, limited recovery time, and competition for postgraduate opportunities can operate simultaneously. In final-year Chinese dental students, mental health scores varied with academic and social conditions, including university level, region, internship satisfaction, career prospects, and peer relationships (Fang et al., 2025). In China, pressure may intensify around postgraduate selection. A follow-up study of 613 medical students found that the proportion reporting mental health problems declined from 12.1% during the postgraduate entrance-examination period to 4.4% six months later, highlighting high-stakes transitions as time-sensitive stressors (Chen et al., 2022). Clinical training introduces additional uncertainty through patient contact, performance observation, ethical responsibility, fear of errors, and dependence on supervisors' evaluations. Mistreatment during clinical education may compound these demands; a national Thai study found that mistreated clinical-year students had lower academic motivation and greater amotivation (Hiranwong et al., 2025). Clinical learning may also generate moral distress when students recognise an ethically appropriate action but feel constrained by hierarchy, limited authority, institutional rules, or competing patient-care demands (Ong et al., 2022).

Interpersonal and Family Factors

Interpersonal environments can either relieve or magnify pressure. Medical students depend on family, peers, teachers, supervisors, and clinical teams for emotional reassurance, practical assistance, feedback, and belonging. Conflict, comparison, exclusion, weak mentoring, and separation from established support networks may therefore increase vulnerability. A longitudinal study of international medical-sciences students found that sociocultural adjustment and family support were associated with later anxiety, illustrating the complexity of support during adaptation to a new environment (Razgulin et al., 2024). Qualitative evidence also shows that peer relationships can involve both collaboration and competitive comparison, while students regard accessible psychological and financial support as important features of a constructive learning environment (Almansour & Almoayad, 2024).

Institutional and Sociocultural Factors

Institutional and socioeconomic conditions shape the context in which these individual and interpersonal processes occur. Curriculum organisation, assessment practices, faculty communication, psychological safety, available counselling, and responses to mistreatment can influence whether educational demands become

sustained distress. Financial strain is another structural concern: medical students reporting financial worries had substantially higher odds of impaired mental health in a German study (Jenet et al., 2025). Institutional cultures may also discourage disclosure when students anticipate stigma, confidentiality breaches, or academic and professional consequences, thereby delaying access to timely professional support (Sheldon et al., 2024). These factors may be particularly consequential in prolonged programmes where students face delayed earnings and dependence on family resources.

Overall, depression, anxiety, and suicidal ideation should be understood as outcomes emerging from accumulated pressures across multiple levels. The relative importance of each factor may vary by training stage, institution, and social background, making regional context-sensitive interpretation essential for Zhejiang medical education.

Integrated Relationships between Mental Health Challenges and Psychological Protective Resources

Resilience in Relation to Depression, Anxiety, and Suicidal Ideation

Resilience is consistently associated with depression and anxiety, whereas evidence concerning suicidal ideation is less extensive. Among 521 medical students, greater resilience was associated with lower odds of depression, anxiety, burnout, and their co-occurrence (Healy et al., 2023). During pandemic-related educational disruption, resilience was inversely associated with depressive symptoms after perceived stress was considered (Chakeeyanun et al., 2023). Evidence for suicidal ideation suggests a conditional pattern. In Korean medical students, ego-resiliency buffered the associations of depressive and social-anxiety symptoms with suicidal ideation, although it was not an independent predictor in the final model (Seo et al., 2022). Resilience may therefore modify responses to distress rather than uniformly prevent outcomes.

Social Support in Relation to Depression, Anxiety, and Suicidal Ideation

Social support may influence mental health through reassurance, assistance, belonging, and opportunities to disclose difficulties. Among Chinese postgraduate medical students, support was associated with lower anxiety and higher subjective well-being, with anxiety partially explaining this relationship (Huang et al., 2021). Another Chinese study found that family, friend, and significant-other support was associated with fewer mental health problems and mediated relationships between coping styles and mental health (Dai et al., 2023). Its relevance to suicidal ideation may be interpersonal. Japanese medical students reporting infrequent conversations during the COVID-19 pandemic had higher odds of suicidal ideation, although directionality was uncertain (Yamazaki et al., 2022). Support sources and perceived quality should therefore be considered separately.

Mindfulness in Relation to Depression, Anxiety, and Suicidal Ideation

Mindfulness appears related to depression and anxiety through reduced automatic reactivity, rumination, and experiential avoidance, but medical-student evidence remains uneven. A systematic review of online mindfulness interventions identified only two eligible studies and found insufficient evidence for effects on depression or anxiety (Yogeswaran & El Morr, 2021). Direct evidence concerning suicidal ideation is limited. Among medical students, dispositional mindfulness was negatively correlated with suicidal ideation, but the association appeared to operate through social dysfunction rather than independently (Nowakowska-Domagala et al., 2023). An overview of systematic reviews likewise reported inconsistent findings for mindfulness-based approaches across mental health outcomes (Aljuwaiser et al., 2024). Mindfulness should therefore be viewed as a regulatory resource, not a stand-alone suicide-prevention mechanism.

Comparative Synthesis

Taken together, resilience, social support, and mindfulness are complementary but non-interchangeable. Resilience concerns adaptation under adversity; social support provides access to reassurance, information, and assistance; and mindfulness supports regulation of internal experience. Evidence is stronger for depression and anxiety, whereas direct evidence for suicidal ideation is limited and often depends on psychological or

interpersonal processes. Protective relevance may also vary by training stage, stress exposure, resource availability, and cultural setting. An integrated framework should avoid assuming identical pathways or equal effects. Instead, it should examine how the resources may operate together while preserving their conceptual distinctions. This perspective is important for Zhejiang, where evidence across these resources and outcomes remains dispersed rather than jointly synthesised.

DISCUSSION

Interpretation of the Integrated Evidence

The reviewed evidence supports a resource-based interpretation of medical-student mental health rather than a model in which each protective resource acts independently on a single outcome. Resilience reflects adaptation under sustained demands, social support provides assistance and belonging, and mindfulness facilitates awareness and regulation of internal experience. Their functions may overlap and reinforce one another. In Chinese medical students, social support was related to resilience, which explained part of the association with academic burnout (Liu & Cao, 2022). Resilience and social support also jointly weakened the relationship between academic procrastination and anxiety symptoms, suggesting that external support may strengthen internal adaptive capacity (Li et al., 2024).

The evidence is nevertheless uneven across outcomes. Associations are more consistently documented for depressive and anxiety symptoms than for suicidal ideation. Broader university evidence indicates that resilience and social support may reduce vulnerability to depressive symptoms and suicidal ideation, but these resources do not remove the effects of prior mental illness, conflict, isolation, or serious risks (Selak et al., 2024). Suicidal ideation should therefore remain a distinct safety concern requiring assessment and professional response, rather than being interpreted solely as insufficient resilience, support, or mindfulness.

The protective value of these resources is also likely to depend on cultural fit, training stage, and accessibility. Development of a mindfulness programme for Indonesian medical students showed the importance of adapting content to educational and cultural circumstances (Gunawan et al., 2025). For Zhejiang, the three resources are best understood as complementary and context-dependent, not interchangeable or universally sufficient.

A Protective Resource Framework for Medical Student Mental Health

Building on the integrated evidence discussed above, the proposed framework conceptualises resilience, social support, and mindfulness as complementary resources that may protect medical students from depressive symptoms, anxiety symptoms, and suicidal ideation. The framework distinguishes the principal function of each resource while recognising that students may draw on several resources simultaneously. Resilience represents adaptive capacity, social support represents relational access to assistance and belonging, and mindfulness represents attentional and emotional self-regulation. Their protective relevance is expected to vary across outcomes, training stages, and educational environments.

Resilience may contribute to mental health by strengthening flexible coping, perceived competence, persistence, and recovery after adversity. It should be understood as a dynamic capacity that is shaped by both personal characteristics and opportunities provided by the learning environment. A quasi-experimental study showed that integrating resilience-oriented assessment practices into medical education was accompanied by increased resilience and reduced anxiety and depressive symptoms (Wadi et al., 2024). Within the framework, resilience is therefore expected to show its strongest and most consistent relationships with depression and anxiety. Its relationship with suicidal ideation remains clinically relevant but less directly established, and should not be interpreted as implying that low resilience alone explains suicide-related thoughts.

Social support operates through interpersonal processes. Emotional reassurance may reduce isolation, informational and instrumental support may help students manage difficulties, and trusted relationships may facilitate earlier disclosure and professional help-seeking. Among medical students, higher social support has been associated with fewer depressive and anxiety symptoms (Hadaki et al., 2025). Evidence from allied-

health trainees and postgraduate doctors also indicates that social and institutional resource support may be linked to lower emotional exhaustion, insomnia, and suicidal ideation (Huang et al., 2024). The framework consequently treats the availability, perceived accessibility, and quality of support as distinct considerations rather than assuming that the mere presence of family, peers, or teachers is sufficient.

Mindfulness may protect mental health through present-moment awareness, reduced rumination, improved recognition of emotional states, and less automatic reaction to distressing thoughts. A randomized controlled trial found that online mindfulness-based stress reduction improved depression and anxiety among medical students, with greater adherence associated with stronger improvement in anxiety (Yay-Pence et al., 2025). These findings support pathways linking mindfulness with depression and anxiety, whereas evidence regarding suicidal ideation remains comparatively limited. Mindfulness should therefore complement, rather than substitute for, clinical assessment and treatment.

Taken together, the framework proposes that the three resources contribute through adaptive, relational, and regulatory processes. Their contributions may be cumulative, but they are not interchangeable. Applied to Zhejiang, the framework directs attention to the relative importance of each resource, differences across academic years and clinical stages, and whether students can access and activate these resources when difficulties emerge within Zhejiang's varied institutional settings.

Implications for Medical Education in Zhejiang

The protective resource framework suggests that medical schools in Zhejiang should adopt a coordinated approach that develops students' adaptive capacities, strengthens relational support, and improves access to psychological care. Interventions should not be limited to optional wellness activities offered after distress becomes severe. A systematic review of Chinese undergraduate mental health interventions identified social support and coping-oriented strategies across university, family, professional, and digital channels, indicating the value of combining individual and institutional provision (Shan et al., 2022). International guidance likewise recommends accessible counselling, mentorship, peer support, transition-focused assistance, and culturally appropriate services within medical education institutions (World Federation for Medical Education, 2025).

Resilience development can be embedded across the curriculum through structured reflection, coping-skills education, mentorship, and opportunities to practise responding flexibly to academic and clinical difficulties. Delivery should be matched to training stage: junior students may require transition and study-adjustment support, whereas clinical students may benefit from supervision, debriefing, and guidance after difficult patient encounters. Resilience programmes should complement improvements in the learning environment rather than placing responsibility for distress solely on students. Psychological safety is relevant here because lower perceived safety has been associated with greater burnout among medical students, suggesting that supportive faculty behaviour and respectful learning relationships are necessary conditions for resource development (Bitar et al., 2025).

Social support should be organised as a connected system rather than left to informal relationships. Zhejiang medical schools could establish trained peer mentors, accessible faculty advisers, confidential counselling pathways, and referral links with affiliated hospitals. Peer mentoring can provide academic, psychosocial, and professional benefits, although programme success depends on mentor preparation, role clarity, matching, supervision, and continuing evaluation (Preovolos et al., 2024). Brief universal check-ins may further normalise contact with mental health professionals and identify students who would not independently seek assistance (Young & Juliani, 2023). However, recent meta-analytic evidence indicates that help-seeking initiatives have low-certainty and short-lived effects, so accessibility, confidentiality, follow-up, and institutional trust require attention alongside mental health literacy (Manley et al., 2026).

Mindfulness training may be offered as one component within this broader system. Online delivery can increase reach, but benefits may be modest and may diminish without sustained practice; an Australian medical-student trial found short-term improvements in mindfulness and self-compassion, with limited between-group differences at follow-up (Moore et al., 2024). Participation should therefore be voluntary,

culturally adapted, and supported by qualified facilitators. For suicidal ideation, peer and mindfulness programmes must operate within explicit escalation procedures. A medical-school peer-support initiative improved suicide-related knowledge and confidence in approaching peers, but such programmes remain gateways to, not replacements for, professional assessment (Balson et al., 2024). Zhejiang institutions should pilot these components across universities and training stages, evaluate uptake and outcomes, and use student feedback to refine implementation.

Limitations and Directions for Future Research

This conceptual paper has several limitations that define priorities for future research. First, much of the integrated evidence is cross-sectional, preventing conclusions about temporal ordering or mediation. Studies should employ at least three timed waves and longitudinal mediation models to examine whether academic stress precedes changes in resilience, social support, mindfulness, and subsequent mental health outcomes (Di Maria & Didelez, 2024). Second, evidence specific to Zhejiang remains limited; multicentre studies across universities, programmes, and academic years are needed to test generalisability and identify stage-specific patterns. Third, the framework treats the three protective resources as parallel mechanisms, although reciprocal, sequential, or interactive relationships may occur. Future analyses should compare competing models and assess confounding and sensitivity assumptions (Rijnhart et al., 2021). Finally, intervention studies should evaluate not only symptom change but also uptake, equity, implementation fidelity, sustainability, and cost, while establishing explicit procedures for students reporting suicidal ideation (Skivington et al., 2021).

CONCLUSION

This conceptual paper has examined the mental health challenges faced by medical students in Zhejiang Province and proposed an integrated protective resource framework for understanding how these challenges may be reduced. Depression, anxiety, and suicidal ideation are treated as distinct but interconnected outcomes that may arise from sustained academic demands, clinical training pressures, interpersonal difficulties, and institutional conditions. Drawing on Conservation of Resources theory, the framework positions resilience, social support, and mindfulness as complementary resources that may help students preserve adaptive capacity, obtain relational assistance, regulate attention, and respond more flexibly to stress.

The framework extends existing discussions by integrating individual and contextual protection rather than locating responsibility solely within students. Resilience training, peer and faculty support, accessible counselling, and appropriately delivered mindfulness programmes may contribute to prevention, but their effectiveness depends on psychologically safe learning environments, manageable educational demands, confidentiality, and reliable referral pathways. Support should therefore be coordinated across curriculum, student services, faculty systems, and affiliated clinical settings, with particular attention to differences between preclinical and clinical stages.

The proposed relationships remain theoretically derived and should not be interpreted as established causal mechanisms. Longitudinal, multicentre, and intervention studies are required to determine whether changes in protective resources precede improvements in mental health and whether the framework operates consistently across institutions and training stages. Future evaluations should also examine implementation quality, accessibility, equity, sustainability, and procedures for responding to suicidal ideation. Overall, the paper argues that protecting medical student mental health requires more than isolated wellness activities. A coordinated resource-based approach that strengthens students while also improving the educational environment offers a more comprehensive foundation for research, policy, and practice in Zhejiang medical education. Such an approach may also provide a transferable model for other medical education contexts facing similar tensions between demanding professional preparation and student well-being globally.

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