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DEVELOPING RESILIENCE IN MEDICAL STUDENTS UNDER WARTIME: A CONCEPTUAL REVIEW AND MULTILEVEL EDUCATIONAL MODEL

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Abstract

Introduction. The full-scale war in Ukraine has transformed medical education into a setting of chronic uncertainty, recurrent disruption, and increased psychological burden. Medical students study amid air-raid interruptions, displacement, altered clinical learning, and persistent information stress, which may undermine academic functioning, professional identity formation, and mental well-being.
Aim. To substantiate resilience in medical students as an integral educational outcome under wartime conditions and to propose a multilevel model for its development in medical universities.
Materials and methods. The authors undertook a problem-oriented conceptual review and theoretical synthesis. They analyzed peer-reviewed publications and official public-health reports relevant to wartime disruption of healthcare and health professions education, psychological functioning of Ukrainian medical students and medical doctoral trainees, contemporary resilience theory, psychophysiological responses to chronic stress, and resilience-supporting educational interventions. The review was purposive rather than systematic; no primary data were collected and no statistical analysis was performed.
Results. Resilience is conceptualised as a dynamic, educationally modifiable capacity that supports sustained learning, professional engagement, and psychological functioning under adversity. A five-component model is proposed, comprising cognitive, emotion-regulatory, value-motivational, social-communicative, and psychophysiological components. A three-level developmental model is also introduced: individual, group, and institutional. Evidence-informed mechanisms include curriculum-level integration of resilience-related outcomes, scenario-based and reflective teaching, formative assessment practices, psychoeducation on stress and sleep, early recognition of distress and somatic warning signs, peer and near-peer support, mentoring, continuity protocols for disrupted learning, and access pathways to psychological help.
Conclusions. In wartime medical education, resilience should not be reduced to individual toughness. It should be treated as a strategic educational outcome jointly shaped by students, learning communities, and institutions. A system-level approach can support academic continuity, professional readiness, and mental well-being under prolonged crisis conditions.

Keywords: **students, medical, adaptation, psychological, stress, psychological, Ukraine, mentoring, peer group, educational measurement**

INTRODUCTION

The war in Ukraine has created a prolonged, system-wide crisis for healthcare and health professions education. By May 2026, the World Health Organization had verified more than 3,000 attacks on healthcare in Ukraine, affecting facilities, medical transport, health workers, and continuity of care [1]. In parallel, wartime medical education has been challenged by interruptions to teaching, safety risks, damaged infrastructure, staff overload, and rapidly changing learning formats [2, 3].

Medical students are therefore trained in a context where educational demands coexist with exposure to chronic insecurity and social trauma. Empirical studies conducted in Ukraine demonstrate a substantial burden of stress, anxiety, depressive symptoms, post-traumatic stress indicators, and reduced academic performance among medical students during the war [4, 5]. Ukrainian medical PhD students have likewise reported class disruptions due to air-raid alarms or shelling, financial and infrastructural constraints, and heterogeneous patterns of adaptation to wartime learning [6]. These findings suggest that the

educational consequences of war extend beyond logistical disruption and directly affect the psychological resources that sustain learning and professional development.

Sleep disturbance, nightmares, hyperarousal, and war-related post-traumatic stress symptoms have also been documented among Ukrainian university students during the invasion [7]. Such data are particularly relevant to medical education, since medical students are already recognised as a population with elevated risk of depression, anxiety, and psychological distress even in non-war conditions [8, 9]. Wartime adversity may therefore amplify pre-existing vulnerabilities inherent to intensive professional training.

Against this background, resilience becomes a core concept for medical education. However, resilience should not be understood as a fixed personal trait or as a rhetorical demand that students simply «cope better.» Contemporary research increasingly conceptualises resilience as a dynamic process that emerges through the interaction of individual capacities, social resources, and institutional conditions [10, 11]. This understanding is especially important for wartime medical education, where the capacity to continue learning and remain professionally engaged depends on both personal self-regulation and the quality of organisational support.

AIM

To substantiate resilience in medical students as an integral educational outcome under wartime conditions, to define its multidimensional structure, and to propose pedagogical, psychological, and organisational mechanisms for its development in medical universities.

MATERIALS AND METHODS

This article is a conceptual review and theoretical synthesis. It was developed to integrate evidence relevant to the formation of resilience in medical students during wartime and to translate that evidence into an educationally applicable framework.

The evidence base was assembled purposively around five domains: (1) official and peer-reviewed sources describing the wartime disruption of healthcare and health professions education in Ukraine; (2) empirical studies on the psychological well-being and academic functioning of Ukrainian medical students and medical PhD students during the war; (3) contemporary theoretical work defining resilience as a dynamic and multilevel process; (4) research on psychophysiological stress responses, sleep, cognition, and somatic symptoms relevant to student functioning; and (5) intervention literature on resilience training, assessment-related educational frameworks, mentoring, near-peer support, and peer-support models in medical or higher education.

The synthesis proceeded in three stages. First, wartime stressors and their educational consequences were identified. Second, recurring resilience-related constructs were grouped into a componential structure relevant to medical students. Third, mechanisms of resilience development were mapped onto individual, group, and institutional levels. The resulting models were iteratively refined to maintain conceptual clarity, educational applicability, and alignment with the current literature. Since the article is conceptual, no statistical analysis was performed.

RESULTS

Wartime stressors and their consequences for medical education

The wartime learning environment differs qualitatively from ordinary academic stress. It combines persistent external threat with uncertainty about educational continuity, professional prospects, personal safety, and the safety of close relatives. Reports from Ukrainian medical schools describe disrupted teaching, altered access to clinical practice, increased faculty workload, resource constraints, and the need for rapid organisational adaptation [3]. Broader wartime reviews of health professional education similarly identify curriculum, personnel, wellness, resources, and oversight as recurring domains of educational vulnerability during armed conflict [2].

For students, this context may be expressed through impaired concentration, reduced learning efficiency, emotional exhaustion, and difficulty maintaining a stable professional trajectory. Korda et al. reported high levels of stress, anxiety, depressive symptoms, and post-traumatic stress indicators among Ukrainian medical students, alongside lower academic performance compared with the pre-war period [4]. Karasevska et al. found higher proportions of depression and anxiety among Ukrainian medical students than among a Croatian comparison group and identified war-related stressors, financial problems, and displacement as relevant predictors [5].

The available evidence also indicates that education itself may function both as a source of burden and as a stabilising structure. In the study of Ukrainian medical PhD students, many participants remained motivated to continue academic and medical careers in Ukraine despite severe wartime pressures, whereas others experienced substantial difficulty coping [6]. This duality is important: structured activity can support meaning and continuity, but without adequate institutional support, it may become an additional stressor.

Sleep and psychophysiological recovery should be considered part of the educational problem. Among Ukrainian university students during the war, war exposure was closely linked to nightmares, insomnia,

and post-traumatic stress symptoms [7]. In medical students more broadly, sleep quality is associated with resilience and daytime functioning, suggesting that sleep should be treated not as a peripheral lifestyle issue but as a modifiable resource that affects learning capacity and stress recovery [14].

Resilience as a dynamic educational outcome

Resilience is often described as the ability to maintain or regain psychological functioning in the face of adversity. Recent work places increasing emphasis on resilience as a dynamic, multilevel process rather than a stable, individual disposition [10, 11]. This shift is essential for medical education, because it redirects attention from student «toughness» alone toward the educational conditions that enable or constrain adaptation.

In wartime medical education, resilience can be defined as an integrative educational outcome that supports the future doctor's capacity to preserve learning activity, professional purpose, ethical orientation, social connectedness, and psychophysiological recovery under prolonged stress. This definition combines personal regulation with contextual support and aligns with the contemporary view that resilience depends on individual, social, and institutional resources [10, 11].

The educational relevance of this perspective is reinforced by intervention studies. A recent meta-analysis of resilience training in medical students found a small-to-moderate positive effect on resilience and a moderate effect on stress reduction, although heterogeneity and risk of bias require cautious interpretation [15]. Educational perspectives likewise argue that resilience should be embedded in formal and informal curricula, assessment practices, and the learning environment rather than delivered as an isolated motivational activity [16].

A five-component model of resilience in medical students

Based on the reviewed evidence and the specific demands of wartime medical education, resilience in medical studentsis proposed as a five-component construct. The model is summarised in Table 1.

Table 1

Proposed components of resilience in medical students under wartime conditions

Component	Core content	Educational significance in wartime medical training
Cognitive	Realistic appraisal, problem-oriented thinking, planning, decision-making under uncertainty, metacognitive monitoring.	Supports continuity of learning, clinical reasoning, and the capacity to act constructively when circumstances are unstable.
Emotion-regulatory	Recognition and modulation of anxiety, tolerance of uncertainty, self-soothing, recovery after acute stress episodes.	Prevents emotional overload from disorganising cognition, motivation, and professional interaction.
Value-motivational	Professional meaning, ethical stability, sense of responsibility, commitment to the social value of medicine.	Protects against demoralisation and supports sustained engagement in education and care-oriented roles.
Social-communicative	Help-seeking, team functioning, giving and receiving support, belonging to a professional community.	Reduces isolation and enables peer, mentor, and faculty resources to function as protective factors.
Psychophysiological	Sleep quality, stress reactivity, autonomic regulation, fatigue recognition, capacity for recovery.	Links resilience to the bodily resources required for attention, learning, and safe professional functioning.

The cognitive component is central because wartime conditions create repeated demands for appraisal, prioritisation, and flexible decision-making. It includes the capacity to distinguish controllable from uncontrollable elements of a situation, maintain realistic planning, and preserve problem-solving behaviour. These processes are closely connected with the broader literature on adaptive responses to crisis and with data indicating that structured educational activity may stabilise functioning under war-related adversity [6, 10].

The emotion-regulatory component concerns the capacity to remain psychologically functional during and after acute stress episodes. This does not imply suppression of distress; rather, it includes recognising emotions, using stabilisation strategies, and preventing anxiety or hyperarousal from overwhelming cognition and interaction. The relevance of this component is supported by evidence of high rates of anxiety, depression, and trauma-related symptoms among Ukrainian medical students [4, 5].

The value-motivational component reflects the future doctor's sense of meaning, ethical commitment, and sustained professional orientation. In the context of war, professional identity and the social importance of medicine may become protective sources of continuity. The persistence of career motivation among many Ukrainian medical PhD students despite adversity illustrates the potential stabilising role of professional meaning, although this resource is not universal and should not be romanticised [6].

The social-communicative component acknowledges that resilience is not an exclusively individual achievement. Access to peers, mentors, faculty, and professional communities supports adaptation, help-seeking, and the reduction of isolation. Evidence from higher education and medical education demonstrates

that peer mentoring, peer learning, and near-peer support can improve selected mental health and resilience-related outcomes [17-20].

The psychophysiological component is included because sustained professional functioning depends on the biological capacity to recover. Chronic stress influences cognition through endocrine and neurobiological pathways, while impaired sleep and somatic symptoms may signal early maladaptation [12-14, 21]. In medical students, somatic symptoms associated with mental ill-health include sleep disturbance, headaches, musculoskeletal pain, and functional gastrointestinal complaints [21]. Recognising these symptoms as relevant to educational functioning may enable earlier support before more severe deterioration occurs.

A three-level model for developing resilience

The proposed five-component structure explains what resilience comprises. A second model is needed to specify where resilience can be developed. For this purpose, a three-level model is proposed: individual, group, and institutional. These levels should not be treated separately; their interaction determines whether resilience-oriented practices become sustainable within medical education.

Table 2

Three-level model for developing resilience in medical students

Level	Primary focus	Illustrative mechanisms
Individual	Self-regulation and personal coping resources.	Psychoeducation on stress and sleep; planning skills; cognitive reframing; awareness of warning signs; safe help-seeking.
Group	Mutual support and professional belonging.	Peer support; near-peer mentoring; small-group reflection; team-based debriefing; culture of non-stigmatising communication.
Institutional	Educational design and organisational responsibility.	Continuity protocols; flexible and asynchronous learning options; curriculum integration; access to counselling; faculty guidance; monitoring of student risk indicators.

At the individual level, the educational task is to strengthen students' self-regulation without placing the entire burden of adaptation on them. Skills such as planning, self-monitoring, emotional stabilisation, sleep awareness, and help-seeking are especially relevant under prolonged uncertainty. Their value lies in supporting functional learning and preventing distress from becoming hidden until it severely interferes with performance.

At the group level, resilience is strengthened through social connection. Peer-learning and peer-mentoring interventions in higher education show encouraging, although not uniform, evidence for stress and anxiety outcomes [17]. Near-peer mentoring in medical students has been associated with improved resilience and maintenance of mental health indicators [18]. Theoretical work on peer teaching also highlights the importance of cognitive and social congruence between learners and near peers [19,20].

At the institutional level, resilience becomes a question of educational governance. Universities influence resilience through the predictability of communication, flexibility of learning formats, fairness of assessment, availability of mental health support, and the extent to which wartime risk is acknowledged rather than normalised. Research on health professional education during war indicates that wellness, resources, curriculum continuity, and oversight must be addressed together [2,3].

Evidence-informed mechanisms for medical universities

The practical implications of the proposed models can be organised into four interacting clusters of action.

Table 3

Practical clusters of resilience-supporting mechanisms in medical universities

Cluster	Recommended educational action	Rationale
Curricular and pedagogical	Integrate resilience-related outcomes into courses; use scenario-based learning, reflective writing, structured debriefing, and formative feedback; align assessment with transparent expectations.	Educational design can reduce avoidable uncertainty and strengthen planning, cognitive control, and professional self-efficacy [16,22].
Psychological and psychophysiological	Provide psychoeducation on stress, trauma responses, sleep, fatigue, and somatic warning signs; offer brief self-regulation practices and referral pathways.	Chronic stress affects cognition and recovery; somatic symptoms and sleep problems may serve as early indicators of maladaptation [7,12-14,21].
Peer and mentor support	Develop peer-support, near-peer mentoring, and mentor-supervised reflection formats; prepare mentors in boundary-setting and referral principles.	Supportive relationships can reduce isolation and contribute to resilience-related outcomes [17-20].
Organisational continuity	Maintain clear wartime learning protocols, asynchronous options, alternative participation routes, and communication standards during disruptions.	War-related disruption requires institutional adaptation rather than ad hoc responses [1-3].

The curricular and pedagogical cluster is particularly important because learning design can either intensify uncertainty or support mastery. The Systematic Assessment for Resilience framework and related educational approaches suggest that assessment structures, communication of expectations, and purposeful learning activities can be aligned with student well-being and resilience development [16, 22]. In wartime settings, such alignment is not a matter of «lowering standards» but of preserving the conditions under which standards can be achieved.

The psychological and psychophysiological cluster requires a non-stigmatising approach. Students should be informed that stress reactions during war may be understandable, but persistent sleep disruption, cognitive exhaustion, somatic symptoms, or an inability to recover warrant attention. This framing reduces moralisation of distress and encourages earlier access to support. Because medical students may interpret bodily distress as either «normal fatigue» or isolated physical illness, basic psychoeducation on stress–somatic links is especially relevant [21].

Peer and mentor support should be structured rather than symbolic. Evidence suggests that peer mentoring and near-peer models can create accessible, relatable forms of support, but they should not substitute for professional psychological services where these are needed [17, 18]. Instead, peer systems are best positioned as one layer of a stepped support architecture within the institution.

Finally, organisational continuity mechanisms are central in wartime Ukraine. Flexible participation routes, asynchronous learning, and predictable communication during safety disruptions reduce uncertainty and preserve students' sense of control. Such measures also communicate institutional recognition of reality, which is itself important for trust and psychological safety [2, 3].

DISCUSSION

This conceptual review argues that resilience in medical students should be treated as a strategic educational outcome in wartime medical education. The proposed framework moves beyond a narrow individual-trait interpretation and instead integrates personal, relational, and organisational determinants of adaptation. Such an approach is consistent with contemporary resilience science, which increasingly emphasises dynamic and multilevel processes [10, 11].

The five-component model extends existing discussions by explicitly including a psychophysiological dimension. In prolonged war, the capacity to learn and function professionally is inseparable from sleep, recovery, autonomic balance, and the cognitive consequences of chronic stress. Evidence on cortisol, chronic stress, cognition, and somatic symptoms in medical students supports the inclusion of this dimension [12-14, 21]. It also offers a practical advantage: universities can monitor relatively observable warning signs, such as recurrent sleep problems, exhaustion, concentration difficulties, and stress-related somatic complaints, as part of early support strategies.

The multilevel developmental model has direct implications for institutional accountability. If resilience is framed exclusively as the student's duty, institutions may overlook preventable contributors to distress. By contrast, a multilevel model recognises that resilience is strengthened when educational design is clear, peer relationships are supportive, mentoring is available, and continuity procedures are reliable. Research on medical education during war and on resilience-oriented interventions supports this systems approach [2, 3, 15-18, 22].

The models proposed here are particularly relevant to Ukraine, but they may also inform crisis-sensitive medical education in other settings affected by armed conflict, displacement, pandemics, disasters, or prolonged institutional instability. Their transferability should nonetheless be evaluated empirically rather than assumed. Context determines which stressors dominate, which support resources are feasible, and which interventions are culturally and organisationally acceptable.

An important practical implication is that resilience-building should be integrated into routine educational processes rather than relegated to optional wellness events. Short psychoeducational modules, reflective teaching methods, structured mentoring, transparent assessment practices, and continuity protocols can operate together as a coherent system. The recent meta-analysis of resilience interventions in medical students suggests that structured programmes can produce meaningful benefits, but heterogeneity in design and outcome assessment remains a challenge [15]. Accordingly, universities should evaluate their own interventions using validated outcome measures and transparent reporting.

CONCLUSIONS

The development of resilience in medical students is a necessary response of medical education to prolonged wartime adversity. In the Ukrainian context, medical students study amid attacks on healthcare, disrupted educational routines, safety threats, and substantial psychological strain. These conditions make resilience relevant not only to well-being but also to academic continuity, professional development, and the long-term sustainability of the healthcare workforce.

Resilience should be conceptualised as a dynamic, educationally modifiable outcome comprising cognitive, emotion-regulatory, value-motivational, social-communicative, and psychophysiological components. Its development requires coordinated action at individual, group, and institutional levels.

Medical universities can support resilience through curriculum integration, scenario-based and reflective pedagogies, fair and transparent assessment, psychoeducation on stress and sleep, early recognition of distress and somatic warning signs, peer and near-peer support, mentoring, and clear continuity protocols during disruptions. Such a system-level approach avoids placing the burden of adaptation solely on students and instead recognises resilience as a shared educational responsibility.

Perspectives for further research. Future research should empirically validate the proposed componential and multilevel models in undergraduate medical students, interns, and medical PhD students in Ukraine. Suitable designs may include cross-sectional model testing, longitudinal monitoring of adaptation trajectories, and intervention studies embedded in university support programmes.

Priority outcomes should include resilience, perceived stress, anxiety, depressive symptoms, post-traumatic stress indicators, sleep quality, fatigue, somatic symptom burden, academic functioning, professional motivation, and help-seeking behaviour. Mixed-methods designs may be particularly valuable for capturing how students interpret resilience and institutional support under wartime conditions.

A further research priority is the evaluation of multi-component interventions that combine pedagogical redesign, psychoeducation, mentoring, and organisational continuity measures. Such studies would help determine which combinations of mechanisms are most feasible, acceptable, and effective in medical universities operating under prolonged crisis.

COMPLIANCE WITH ETHICAL REQUIREMENTS

This conceptual review is based exclusively on analysis of publicly available scientific publications and official reports. No new data involving human participants or animals were collected, and no patient-identifying information was used. Therefore, ethics committee approval and informed consent were not required. The authors adhered to principles of academic integrity, responsible interpretation of sources, and proper citation.

Study limitations. This manuscript is a conceptual review and does not provide a systematic review, meta-analysis, or original empirical validation of the proposed models. The literature was selected purposively to support theoretical synthesis and practical application rather than to estimate pooled effects.

Second, although the article incorporates evidence from Ukraine, some intervention studies and resilience models originate from non-war or non-Ukrainian contexts. Their direct transferability to wartime medical education in Ukraine requires careful adaptation and empirical testing.

Third, the proposed five-component and three-level models are intended as heuristic frameworks.

Primary data and materials. No primary datasets were generated or analysed for this conceptual review. The manuscript is based on publicly available peer-reviewed publications and official reports cited in the reference list.

Declaration of AI use. Generative artificial intelligence tools were used to assist with language editing and structural alignment of the manuscript with the target journal requirements. The authors critically reviewed, verified, and approved the final content and take full responsibility for its accuracy, interpretation, and integrity.

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REFERENCES

1. World Health Organization. (2026, May 8). 3000 attacks on health care in Ukraine verified by WHO since full-scale invasion. https://www.who.int/europe/news/item/08-05-2026-3000-attacks-on-health-care-in-ukraine-verified-by-who-since-full-scale-invasion
2. Dobiesz, V. A., Schwid, M., Dias, R. D., Aiwonodagbon, B., Tayeb, B., Fricke, A., Pham, P., & Erickson, T. B. (2022). Maintaining health professional education during war: A scoping review. Medical Education, 56(8), 793-804. https://doi.org/10.1111/medu.14808
3. Mayer, A., Yaremko, O., Shchudrova, T., Korotun, O., Dospil, K., & Hege, I. (2023). Medical education in times of war: A mixed-methods needs analysis at Ukrainian medical schools. BMC Medical Education, 23, Article 804. https://doi.org/10.1186/s12909-023-04768-2
4. Korda, M., Shulhai, A., Shevchuk, O., Shulhai, O., & Shulhai, A. M. (2025). Psychological well-being and

academic performance of Ukrainian medical students under the burden of war: A cross-sectional study. Frontiers in Public Health, 12, Article 1457026. https://doi.org/10.3389/fpubh.2024.1457026
5. Karasevska, T., Fiialkovska, O., Mostbauer, H., Tsymbalyuk, R., Gambiroža, L., Orlandić, I. N., & Puljak, L. (2025). Medical students' mental health after the first year of war in Ukraine: A cross-sectional study. Journal of Health Psychology, 30(12), 3222-3237. https://doi.org/10.1177/13591053251328916
6. Kuchyn, I., Bielka, K., Lymar, L., & Puljak, L. (2024). Academic performance, perceptions, and motivations of medical PhD students in Ukraine during wartime: A mixed methods study. BMC Medical Education, 24, Article 1421. https://doi.org/10.1186/s12909-024-06400-3
7. Pavlova, I., & Rogowska, A. M. (2023). Exposure to war, war nightmares, insomnia, and war-related posttraumatic stress disorder: A network analysis among university students during the war in Ukraine. Journal of Affective Disorders, 342, 148-156. https://doi.org/10.1016/j.jad.2023.09.003
8. Rotenstein, L. S., Ramos, M. A., Torre, M., Segal, J. B., Peluso, M. J., Guille, C., Sen, S., & Mata, D. A. (2016). Prevalence of depression, depressive symptoms, and suicidal ideation among medical students: A systematic review and meta-analysis. JAMA, 316(21), 2214-2236. https://doi.org/10.1001/jama.2016.17324
9. Quek, T. T. C., Tam, W. W. S., Tran, B. X., Zhang, M., Zhang, Z., Ho, C. S. H., & Ho, R. C. M. (2019). The global prevalence of anxiety among medical students: A meta-analysis. International Journal of Environmental Research and Public Health, 16(15), Article 2735. https://doi.org/10.3390/ijerph16152735
10. Schäfer, S. K., Supke, M., Kausmann, C., Schaubruch, L. M., Lieb, K., & Cohrdes, C. (2024). A systematic review of individual, social, and societal resilience factors in response to societal challenges and crises. Communications Psychology, 2, Article 92. https://doi.org/10.1038/s44271-024-00138-w
11. Waugh, C. E., & Sali, A. W. (2023). Resilience as the ability to maintain well-being: An allostatic active inference model. Journal of Intelligence, 11(8), Article 158. https://doi.org/10.3390/jintelligence11080158
12. James, K. A., Stromin, J. I., Steenkamp, N., & Combrinck, M. I. (2023). Understanding the relationships between physiological and psychosocial stress, cortisol and cognition. Frontiers in Endocrinology, 14, Article 1085950. https://doi.org/10.3389/fendo.2023.1085950
13. Girotti, M., Bulin, S. E., & Carreno, F. R. (2024). Effects of chronic stress on cognitive function: From neurobiology to intervention. Neurobiology of Stress, 33, Article 100670. https://doi.org/10.1016/j.ynstr.2024.100670
14. Zila-Velasque, J. P., Grados-Espinoza, P., Chuquineyra, B. S. C., Diaz-Vargas, M., Sierra Calderón, G. S., Choquegonza, S., Salcedo, I., & Mejia, C. R. (2024). Resilience, sleep quality and sleepiness in Peruvian medical students: A multicenter study. Frontiers in Psychiatry, 15, Article 1284716. https://doi.org/10.3389/fpsyt.2024.1284716
15. Sperling, E. L., Manion, B., Gresner, E., LaBarre, A., Krych, P., & Mallender, Z. C. (2026). The effect of resilience training on resilience and stress in medical students: A systematic review and meta-analysis. BMC Medical Education, 26, Article 7. https://doi.org/10.1186/s12909-025-08171-x
16. Shorbagi, A. I. (2024). Promoting resilience among medical students using the Wadi framework: A clinical teacher's perspective. Frontiers in Medicine, 11, Article 1488635. https://doi.org/10.3389/fmed.2024.1488635
17. Pointon-Haas, J., Waqar, L., Upsher, R., Foster, J., Byrom, N., & Oates, J. (2024). A systematic review of peer support interventions for student mental health and well-being in higher education. BJPsych Open, 10(1), Article e12. https://doi.org/10.1192/bjo.2023.603
18. Pölczman, L., Árva, D., Győrffy, Z., Jámbor, M., Végh, A., Kristóf, G., & Fejes, É. (2025). Enhancing resilience: The impact of a near-peer mentoring program on medical students. Frontiers in Education, 9, Article 1523310. https://doi.org/10.3389/feduc.2024.1523310
19. Lockspeiser, T. M., O'Sullivan, P., Teherani, A., & Muller, J. (2008). Understanding the experience of being taught by peers: The value of social and cognitive congruence. Advances in Health Sciences Education, 13(3), 361-372. https://doi.org/10.1007/s10459-006-9049-8
20. Ten Cate, O., & Durning, S. (2007). Peer teaching in medical education: Twelve reasons to move from theory to practice. Medical Teacher, 29(6), 591-599. https://doi.org/10.1080/01421590701606799
21. Sperling, E. L., Hulett, J. M., Sherwin, L. B., Thompson, S., & Bettencourt, B. A. (2023). Prevalence, characteristics and measurement of somatic symptoms related to mental health in medical students: A scoping review. Annals of Medicine, 55(2), Article 2242781. https://doi.org/10.1080/07853890.2023.2242781
22. Wadi, M., Shorbagi, A., Shorbagi, S., Taha, M. H., & Yusoff, M. S. B. (2024). The impact of the Systematic Assessment for Resilience (SAR) framework on students' resilience, anxiety, depression, burnout, and academic-related stress: A quasi-experimental study. BMC Medical Education, 24, Article 506. https://doi.org/10.1186/s12909-024-05444-9

Резюме

РОЗВИТОК РЕЗИЛЬЄНТНОСТІ СТУДЕНТІВ-МЕДИКІВ В УМОВАХ ВІЙНИ: КОНЦЕПТУАЛЬНИЙ ОГЛЯД І БАГАТОРІВНЕВА ОСВІТНЯ МОДЕЛЬ

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Вступ. Повномасштабна війна в Україні перетворила медичну освіту на простір хронічної невизначеності, постійних переривань навчання внаслідок загрози безпеці та підвищеного психологічного навантаження. Майбутні лікарі навчаються в умовах повітряних тривог, вимушеного переміщення, змін у процесі клінічної підготовки та постійного інформаційного стресу, що може негативно впливати на їхню академічну діяльність, професійну ідентичність і психічне благополуччя.

Мета. Обґрунтувати резильєнтність студентів-медиків як інтегральний освітній результат в умовах війни та запропонувати багаторівневу модель її розвитку в медичних університетах.

Матеріали та методи. Виконано проблемно-орієнтований концептуальний огляд і теоретичний синтез. Проаналізовано рецензовані публікації та офіційні звіти, присвячені впливу війни на охорону здоров'я й медичну освіту, психологічному функціонуванню українських студентів-медиків і здобувачів ступеня доктора філософії медичного профілю, сучасним підходам до розуміння резильєнтності, психофізіологічним реакціям на хронічний стрес та освітнім інтервенціям, спрямованим на підтримку адаптації. Огляд має цільовий, а не систематичний характер; первинні дані не збиралися, статистичний аналіз не проводився.

Результати. Резильєнтність розглянуто як динамічну, освітньо-модифіковану здатність, яка підтримує безперервність навчання, залученість студентів до навчального процесу і психологічне функціонування в умовах тривалого стресу. Запропоновано п'ятикомпонентну модель, яка охоплює когнітивний, емоційно-регуляторний, ціннісно-мотиваційний, соціально-комунікативний і психофізіологічний компоненти. Також представлено трирівневу модель розвитку резильєнтності: індивідуальний, груповий та інституційний рівні.

Висновки. У воєнних умовах резильєнтність не слід зводити до особистої «стійкості» студента. Її доцільно розглядати як стратегічний освітній результат, який спільно формується здобувачами освіти, академічними спільнотами та університетами. Системний підхід сприяє безперервності навчання, професійній готовності майбутніх фахівців і психічному благополуччю майбутніх лікарів.

Ключові слова: **студенти-медики, психологічна адаптація, психологічний стрес, Україна, наставництво, група однолітків, освітнє оцінювання**

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