

Educating Health Professionals During a Crisis: Learning from Ukrainian Educators in a Time of War

Iryna Popova, PhD, Bukovinian State Medical University; **Anna Kryshchyshyn-Dylevych, PhD, DSc**, Danylo Halytsky Lviv National Medical University; **Tetiana Bilous, PhD, DSc**, Bukovinian State Medical University; **Taras Boychuk, PhD, DSc**, Bukovinian State Medical University; **Danylo Kaminsky, PhD**, Danylo Halytsky Lviv National Medical University; **Jonathan Amiel, MD**, New York-Presbyterian Hospital and Stanford University School of Medicine; and **Deborah Powell, MD**, University of Minnesota Medical School

January 7, 2025

Overview

When COVID-19 struck, health professional educators around the globe were in the unsettling position of having to maintain educational continuity in a highly disrupted learning environment. Learning from and with colleagues and peers became the cornerstone of innovation during those trying times. Providers, faculty, and students shared anecdotes, experiences, data, and materials in free online discussions and postings. It was a time of breakthrough technology and unprecedented sharing. The same technology that opened doors for new collaborations during the pandemic continues to support cross-cultural learning from and among health professional educators around the world (Babbar and Gupta, 2021; Montegriconi et al., 2023; NASEM, 2024). Learning from global colleagues actively experiencing different crises such as natural disasters and other calamities must continue to ensure that all health professional educators are better prepared for any crisis regardless of its origins and cause.

This discussion paper is one of those opportunities. In it, Ukrainian health professional educators share personal perspectives on life and work following the full-scale invasion of their country by Russia in February 2022. The invasion occurred just as in-person education was beginning to open up after the COVID-19 pandemic forced educators to create virtual learning environments and manage the psychological effects of social isolation due to lockdowns. Some of the lessons learned and infrastructure built for online learning during the pandemic could be immediately used by Ukrainian educators and are described in the discussion paper; however, challenges of war go beyond loneliness as students and professors must unite not only for education but for survival under missile attacks, the threat of nuclear explosion, and blackouts. It is

important to note that at the time of writing of this discussion paper, the war *has not yet concluded*. What this means is there are places in the text where the present tense should be used to emphasize the fluidity of the situation; however, to enhance clarity, only the past tense is used throughout the different sections of this thematically designed discussion paper. Some of these major themes include understanding the need for military service of health professionals during wartime; recognizing the impact of war on the Ukrainian people as well as its educational institutions; and learning in real-time how to manage educational crises in order to adapt to new realities for Ukrainian health professional educators. The discussion paper begins with an overview of Ukraine's geography and describes where the country sits on the map in relation to its neighbors.

Situating Ukraine on the Map

The Chernivtsi and Lviv regions are located in the western part of Ukraine in Eastern Europe (see *Figure 1* and *Figure 2*). The Chernivtsi region borders Romania and Moldova, and the Lviv region borders Poland, making these regions a relatively safe place that welcomes internally displaced people, students, and professors from other cities impaired by war. Nevertheless, two years of intense and aggressive fighting has impacted all facets of life, including higher medical education—even in relatively safe regions. As Ukrainian health professional educators, the authors of this discussion paper are in a position to share their experiences from Bukovinian State Medical University (BSMU) and Danylo Halytsky Lviv National Medical University (LNMU) so that others can learn from their efforts aimed at creating a stable and reliable educational environment for future health professionals forced to learn under difficult circumstances.

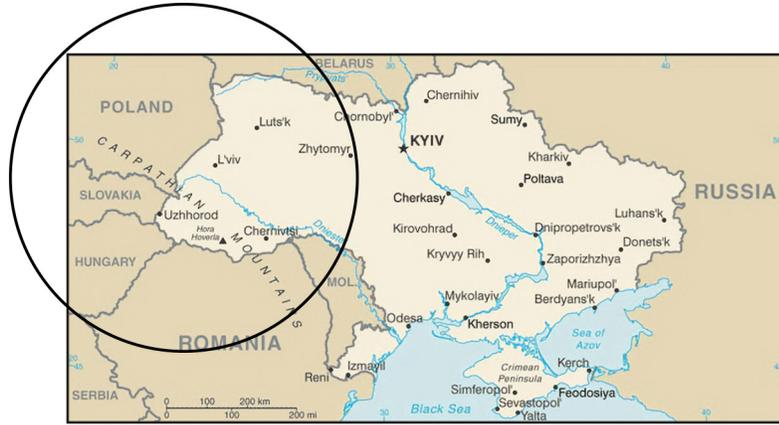


FIGURE 1 | Map of Ukraine

SOURCE: United States Department of State. 2017. *Ukraine map*. Available at: <https://2009-2017.state.gov/p/eur/ci/up/87013.htm> (accessed July 6, 2024).



FIGURE 2 | Map of Ukraine in Europe

SOURCE: Map adapted from Mappr.co. 2024. *Where is Ukraine?* Available at: <https://www.mappr.co/location/ukraine/> (accessed November 20, 2024). Used under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

Changes in Ukrainian Health Professional Education Due to War

War has affected multiple parts of the higher educational system in Ukraine. For health professionals who are needed for physical rehabilitation of injured soldiers and to assist the war effort, their service has become compulsory. While some educators teach during combat missions, others work to prepare students to be competent health professionals despite sometimes overwhelming circumstances.

Military Service

In Ukraine, graduates of medical faculties may opt to continue their studies by acquiring primary specialties through a civilian internship or by completing studies in military medicine through a reserve officer training program. Those who successfully complete the officer training receive a primary officer rank, which is in high demand during the war. The system of military departments at universities was common years ago. It allowed the reserve officer to receive a military rank of junior lieutenant and to enroll in the medical service reserve while studying at the university. This system had been discontinued before the war only to be reinstated in recent years out of necessity. Now, the Ukrainian law known as Resolution No. 1487 requires all citizens, including women, with medical and pharmaceutical degrees aged 18 to 60 to register for military service (Cabinet of Ministers of Ukraine, 2022). This means that starting in 2022, all doctors and pharmacists, including those in academic fields, have undergone data reconciliation—to verify who is available for service—and military commissions as reservists.

Although military service is compulsory, since 2022, students and professors from Ukrainian universities have also volunteered to serve in the army. The universities attempted to provide all the necessary educational requirements needed for their service and offered additional support during the war. Seeing students and professors on the front line providing medical care for soldiers inspired undergraduate students to pursue similar professional paths and to support the troops in new ways. For example, student councils at BSMU and LNMU organized countless charity events and free master classes on basic life support (BLS) for local community members. These initiatives increased awareness of emergency care for non-medical Ukrainians, which is of highest importance in the present situation, and helped raise money for extra supplies for doctors on the front line.

Didactic Education

Immediately after the invasion and during the months that followed, educators' main task was to facilitate daily outreach to every student through a team of tutors, teachers, and

administrators mainly within the dean's offices. Educators wanted to ensure that all students were safe and had access to basic needs and medicine. This period resembled the first months of the COVID-19 pandemic, except that now, students staying at home meant they remained under a death threat, particularly those living in close proximity to active military confrontations. A high percentage of students were located in cities with constant shelling, so for them, the universities had to set up individually adjusted plans of study or flexible schedules due to power cuts and network inaccessibility when being forced to take cover in bomb shelters.

Didactic education was delivered in 2022 after the invasion, using mostly virtual platforms. However, in the 2023–2024 academic year, many classes returned to in-person studies, but only in those buildings that had the necessary facilities, such as bomb shelters, needed for safety purposes during air raid alarms or other emergencies. Because of such disruptions, educators were (and continue to be) routinely forced to put off exams and lectures, unless the classes were conducted in an actual bomb shelter. It is worth noting that despite the challenges, academic continuity was maintained so that all students—even those in the frontline regions—graduated on time, with the exception of students in the occupied Donetsk region, which remains under Russian occupation at the time of writing this discussion paper.

Institutional Challenges and Opportunities

Like other universities around the world, Ukrainian educational institutions faced intense challenges during the COVID-19 pandemic. In some ways, this helped prepare their faculty for many of the disruptions caused by the war, including the shift to online education (see Box 1). Departments in medical universities were ready to face challenges of forced and rapid change to mixed or remote educational formats at a moment's notice based on the regional military situation. "Eventually, universities had to face new challenges at times of war, which couldn't be predicted in advance even from pandemic experience," said Olexandr Petryshen, Associate Dean of Medical Faculty №3 at BSMU, adding that "we believe the issues and solutions we identified may be common for those working in countries that are also suffering from armed conflicts and emergencies" (Personal communication, Olexandr Petryshen, BSMU, September 15, 2023).

The 36 medical schools in Ukraine are united by a common aim to preserve qualified education (WFME, 2024). Communities within and outside of Ukraine can learn from each other about how to survive during life-threatening situations and how to continue providing professional education in ways that benefit individuals and the entire country. Ukrainian

problems, efforts, and hopefully solutions can be brought to the rest of the world, as has been demonstrated throughout the region's long history of enduring the adverse effects on health, health care, and medical education caused by war (Arnold, 1919; Long, 1946; Takoutsing, 2023).

While the quality of health care education in Ukraine has been threatened, experiences shared by students in war zones

demonstrate how institutions can continue to educate even during the most difficult circumstances (Mayer et al., 2023; Zaliska et al., 2022). Shifting to online education was one way of overcoming logistical difficulties after the invasion, but there are other, more difficult challenges facing health professional educators in Ukraine. A number of these are outlined in the following sections.

BOX 1 | Ukrainian Universities During the Crisis Period

Challenges to functioning

- Frequent urgent need to transfer to an online learning format
- Need to gain experience for the future recovery of the educational process after a full-scale invasion
- An acute problem of safety in regions both far from and close to Russia (regular rearrangements and repairs in regions suffering from bombing)
- Lowering of the threshold barrier for higher education institution (HEI) entrance admissions campaigns (2022–2023), which resulted in poor academic performance of students who entered university during the first year of war^a
- The gap in specialized exams (i.e., the rescheduling of final exams in 2022) and challenges associated with providing students who are abroad with the opportunity to undertake exams in an online format

SOURCE: Popova, I., A. Kryshchyn-Dylevych, T. Bilous, T. Boychuk, D. Kaminsky, J. Amiel, and D. Powell. 2025. Educating health professionals during a crisis: Learning from Ukrainian educators in a time of war. *NAM Perspectives*. Discussion Paper, National Academy of Medicine, Washington, DC. <https://doi.org/10.31478/202501a>.

^aIn 2024, entrance requirements for HEIs returned to prewar levels.

Stress and Burnout

Mental health struggles have become obvious since September 2022, especially for students from Eastern and Central Ukraine where the bombing has been ongoing. However, the recent shelling of Lviv, which caused significant destruction of infrastructure and a residential complex during the summer of 2023 and later in 2024, makes it impossible to continue considering the western regions as a safe home front. Besides impaired psychological conditions, there is also the influence of what has been termed acoustic terror due to constant announcements of an air alert warning of real or potential (radio-electronic warfare) risks, as well as the sounds of permanent explosions, mainly in the eastern part of Ukraine (both nearby and at a distance of several dozen kilometers) (Zubar, 2022). The continuous stimulation of the senses leads to a state of constant stress and psycho-emotional exhaustion; it also results in maladaptive stress states and reduced learning ability.

In times of war, keeping in close contact with students through multiple forms of communication is paramount not only for maintaining the continuity of education but also for providing psychological and other forms of support. Those involved in education, including teachers, tutors, and administrative staff, often receive requests to solve social, medical, and even legal challenges faced by students who remain in their own homes or are internally displaced. These issues are more often solved by a team of tutors among all the university faculties. For BSMU, solutions came from the BSMU Medical-Psychological Center, where specialists in medical psychology and psychiatry are united to provide professional psychological support and guidance free of charge. Whenever any individual within the academic community, regardless of their background (e.g., students or educators, people working at the battlefield, those who are internally displaced), feels overwhelmed, they can get professional psychological support at the BSMU Medical-Psychological Center in any accessible format,

including anonymous interactions (BSMU, n.d.a). Besides residents of BSMU, this center has led an expansive volunteer program reaching over 7,000 Ukrainians who have sought psychological support since February 2022.

Lack of Educators

According to a 2024 UNESCO report, “Analyses of War Damage to the Ukrainian Science Sector and Its Consequences,” 6.3 percent of all Ukrainian-based scientists and educators have emigrated abroad since the start of the full-scale invasion in February 2022. Thanks to international support of educational institutions, educators from Ukraine have opportunities to continue conducting research and pursuing professional career paths (De Rassenfosse et al., 2023). However, the issue of educators fleeing to safer regions created a temporary lack of health professional educators in Ukrainian universities from 2022 to 2023, although in 2024 the student to teacher ratio became more balanced. The improved ratio was due to both a decrease in the number of students, which was a consequence of the country’s population decline, and the return of many health professional educators to Ukraine.

Overcoming Academic Deficits of Incoming Students

Students’ ability to maintain high academic achievement during the war has been a major challenge, especially due to reduced access to facilities (NAQA, 2023). This is reflected in the caliber of the applications received at the universities both in the country as a whole and in the medical specialties specifically (Bychko et al., 2023). It appears the level of preparation of applicants has significantly decreased, indicating a systemic crisis for the country. While the crisis started during the COVID-19 pandemic, it has continued to intensify after the full-scale invasion. The constant blackouts further affect students’ ability to work and concentrate on their studies, on top of their efforts to manage the psychological impacts of war. Although higher education admissions departments noted diminished scores upon entering their universities, Ukrainian professors have intensified their efforts to ensure that graduates of their programs leave with the knowledge, skills, and abilities needed to be competent health professionals.

Financial Sustainability of Universities and Programs

A steep drop in the number of foreign students at the universities and the obvious dominance of military needs means that state universities like BSMU and LNMU have faced diminished

financial support from the government. Perspectives on resolving this issue include creating professional development courses, establishing university clinics, and seeking external financing for scientific projects by applying for international grants.

Enrolling (Foreign) Students

War has drastically impaired foreign student enrollment and the ability to retain those already in the system. Before 2022, BSMU and LNMU were among the leading universities in Ukraine in terms of the number of international students enrolled. BSMU had over 2,000 international students per academic year at undergraduate and postgraduate levels. Many of the learners sought to acquire specialist degrees in medicine and pharmacy disciplines. “Due to emergencies arising from the full-scale invasion, students express reluctance to stay in a country experiencing an active armed conflict,” said Petryshen, who guided foreign students in their emergency departure in 2022 (Personal communication, Olexandr Petryshen, BSMU, September 15, 2023). Nevertheless, BSMU is maintaining a community of international students who undertake their studies in an offline format even during the war. The Ministry of Education of Ukraine provides opportunities for international students to enroll even under war conditions.

Accreditation Systems Changes

In the first months of the war, the accreditation processes (provided by the National Agency of Higher Education Quality Assurance) were completely suspended for education programs, including health professional education programs. In the months that followed, the work was resumed in a remote format with the option of conditional accreditation, which was granted for one year only upon submission of an application by the university (the term of a certificate of accreditation is usually five years). All forms of accreditation in 2022 were postponed, not canceled, but currently in 2024, the accreditation processes are fully restored.

Disruption of Assessment of Learning Outcomes

After a two-week gap following the invasion, Ukraine’s medical education programs resumed practical classes, lectures, exams, and other primary functions. Some licensing exams (e.g., KROK licensing exams) had to be postponed while others substituted with remote objective structured practical (clinical) exams in 2022. Accommodations for taking the exams included online options so that the tests could be taken from other cities within or outside of Ukraine, as well as in shelters and at simulation centers. Virtual examinations were especially important for students in territories close to active

hostilities. Air raid alarms and other emergency situations could disrupt the test not only in these regions but also in other parts of the country, and while adjustments were necessary due to the war, the tests and other assessments of learning remained rigorous.

For postgraduates in practice, and specifically doctors' specialist certificates (i.e., licenses), the licenses that had expired in 2022–2023 (after a validity period of 5 years) were extended. Certification was renewed in 2023 in full for postgraduate education. The following year, after the start of the full-scale invasion, complete compliance with national quality standards for graduate medical education was restored.

Adaptation to New Realities

Societal changes require adaptation to new realities. This was the case both during the COVID-19 pandemic and for those living in Ukraine after the invasion, where adjustments, modifications, and adaptations remain a reality for everyone (see Box 2). Educators and administrators working in health professional education in this region have found ways to adapt to the changes they experienced and share insights outlining the ways in which they did so.

One unexpected reality was the increase in the number of male education seekers born in 1964–1994 who entered HEIs in 2021–2023, which is related to the regulatory and legal basis of involvement in mobilization processes. According to data from the State Education Quality Service of Ukraine (2024), an increase of such a contingent up to 19 times was

noted in 2022. However, due to the regulatory nature of the training for specialists in the medical field, this phenomenon did not affect the function of higher educational institutions.

Another adaptation was the increase in volunteerism at all levels of education including students, teachers, and specialists in the health care system. Done with intentionality, volunteering has become a reflection of the actual implementation of the education system in the formation of a citizen as well as the formation of general competencies, worldviews, and civic position among the Ukrainian youth. Unfortunately, it has turned out to be one of the most stressful and shortest ways to develop much-needed skills such as empathy, compassion, and partnership.

Developing Extra Specialties in the Health Professions

The Decree of Ukraine's Cabinet of Ministers from 2015 is an example of government support for health professional education within needed specialty areas of rehabilitation, such as physical therapy, occupational therapy, and speech therapy (Golyk, 2021). Ukrainian medical universities provide a spectrum of specialties in the field of health care at graduate and postgraduate levels. However, during times of war, the most popular areas include physical therapy and ergotherapy for graduates as well as physical rehabilitation, emergency medicine, and medical psychology for all enrollees. Additionally, a new program named *prosthetist-orthotist* (under the specialty of *technology of medical diagnosis and treatment*)

BOX 2 | Impacts of War as Seen by Ukrainian Educators

- Ongoing need for a mixed format of education
- Difficulties with communicative and soft skills (e.g., empathy, compassion, and partnership) in students as a result of distance education
- Involvement of the senior students to help in pharmacies and hospitals during the war
- Participation of a large number of students in the volunteer movements (e.g., sorting medical humanitarian aid)
- Increased volunteerism at all levels of education
- Stimulating the development of telemedicine and digital medicine
- Establishing simulation centers and changing the emphasis on simulation training of specialists, which became the prerogative of Ukrainian higher educational institutions of medical direction
- Actualization of a series of specialties that are in urgent need for overcoming the consequences of war and shortages in human resources in the health professions and education

SOURCE: Popova, I., A. Kryshchyn-Dylevych, T. Bilous, T. Boychuk, D. Kaminsky, J. Amiel, and D. Powell. 2025. Educating health professionals during a crisis: Learning from Ukrainian educators in a time of war. *NAM Perspectives*. Discussion Paper, National Academy of Medicine, Washington, DC. <https://doi.org/10.31478/202501a>.

is being prepared. Despite the war, new professional standards have been created and updated by the International Society for Prosthetics and Orthotics (ISPO, 2024). The creation of a centralized web portal listing vacant positions in both large state and smaller communal health care institutions was an important step for facilitating the hiring of interns.

Creating Space and Opportunities for Continuing Education

Continuing education for doctors in Ukraine is regulated by the Order of the Ministry of Health Protection of Ukraine (2021). According to UNESCO (2024), 30 percent of all Ukrainian scientists are still forced to work remotely, and 5.5 percent of all scientists and educators are internally displaced. Additionally, there has been an increase in the number of postgraduate Ukrainian student scientists enrolled in foreign educational institutions. In the short term, foreign-trained Ukrainian scientists can contribute to the strengthening of domestic HEIs only if there is a quick end to the war; however, in the case of a long-term war scenario, there is a high probability that the students will not return to Ukraine. In either case, Ukrainian scientists who are trained outside of the country improve the likelihood of future international scientific cooperation.

Leveraging Free Open-Source Software for Online Course Design

As previously described, many Ukrainian educators during the COVID-19 pandemic were challenged both technically and emotionally while managing online classes. These challenges were eventually resolved through the collaborative work of educators at each of the departments and faculties with the help of feedback from students. But after February 2022, Ukrainian universities, which had already developed all facilities for online studies after the pandemic period, realized that during the time of war this preparation was not enough. Due to constant power outages and active military events, educators had to supply their own equipment for teaching online courses, adjust schedules in accordance with regional emergency events, and ensure equal access to education for each student despite the technical challenges faced by learners while in the bomb shelters or at home. As a result, universities leveraged a free open-source software program designed to help educators create effective online course material. Educators also developed extra databases with medical illustrations and interactive materials. At BSMU, with assistance from international agencies, it was possible to develop virtual patient cases. For example, BSMU worked with the German Academic Exchange Service (DAAD) to develop a project titled, "Ukraine Digital - Clinical Reasoning

in Medical Education" (DAAD, n.d.). The project was a collaboration with the University of Augsburg, Germany, and set up a curriculum for mapping and learning through virtual patients. Subscriptions to this and other educational websites were made available to students at any time through this collaboration with DAAD.

Leveraging Simulations

A great number of practical skills and competencies for senior students at medical HEIs are gained in hospitals or at simulation centers. During times of war, as well as during the COVID-19 pandemic, having a university's facilities for simulation technologies allowed medical specialties to continue their experiential learning. BSMU has an extensive Center of Simulation Medicine and Innovative Technologies (COSMIT), which is one of the largest in Ukraine (BSMU, n.d.b). The COSMIT opened on April 11, 2019, with support from the Ukrainian-Swiss Project (2024). The purpose of the Center was to improve the quality of medical education by creating a highly effective learning environment with conditions as close as possible to a real clinic without risking the safety of patients during training.

At COSMIT, students can sharpen their skills in pediatric care, obstetrics procedures, BLS protocols, and teamwork. The Center includes stations for practical team and individual work, with over 20 stations on general medical and dentistry protocols, zones for debriefing, and space for conducting observed structured clinical examinations (OSCEs). COSMIT is also a centerpiece for other training such as BLS, tactical military medicine for emergencies during the war for those with no formal medical training, and continuous professional development courses for nurses and doctors. As described by Vitaliy Smandrych, the head of COSMIT, "we are proud to provide continuous professional medical education for doctors and nurses who seek high-quality courses from emergency assistance instructors (certified by European Resuscitation Council) of COSMIT even during war" (Smandrych, 2023).

New Collaborations

Times of crisis are also times of opportunities for different groups to work and learn together. These interactions emphasize equal partnership relations with bi-directional learning so that partners learn from and with each other, particularly in the areas of trauma, polytrauma, PTSD therapy, and tactical medicine. As examples, in Ukraine, there are projects such as the SuperHumans Center and UNBROKEN in which modern prosthetics and rehabilitation centers help people injured in the war live a full life (Superhumans Center, n.d.; National Rehabilitation Center, 2024). Both rehabilitation

centers are active partners of the medical universities and include international collaborations (Baylor College of Medicine, 2022).

International Collaborations

Currently, international collaborations support the sustainability of science in Ukraine through partnerships with organizations in the European Union and the United States. The international grant projects focus on different aspects of in-person, virtual, and simulated medical education capacity, including clinical reasoning, tactical medicine, quality of medical care and communication, basic and advanced life support, and emergency care. BSMU is now running over 10 international grant projects aimed at providing medical education through different academic approaches. One of these programs is a collaboration between Ukraine and Switzerland known as the Ukrainian-Swiss Project Medical Education Development, and another is the aforementioned DAAD project, a collaboration with Germany (Ukrainian-Swiss Project, 2024; DAAD, n.d.). These and other programs, including Simulation Medicine and Scenario-based Learning for Emergency Care (SimS) and Saving Lives: Reorganizing of Basic/Extended Life Support through Learning with Innovative Digital Materials, ensure that training continues for emergency and tactical medicine and that support for scientific research endures despite the war (NAQA, 2024; SaveLife, 2024). Additional projects such as Recovering Past Stories for the Future: A Synergistic Approach to Textual and Oral Heritage of Small Communities support continuous scientific research in Ukraine; and still others such as the European Institute of Innovation and Technology's Innovation Hub and the Innovation for Knowledge Intensive Entrepreneurship (HIVE) project provide opportunities for medical students to develop ideas aimed at rebuilding Ukraine (EIT, 2023; EIT 2024; European Commission, 2024).

Partner universities in Ukraine have joined the United States Agency for International Development (USAID) program Development of a Sustainable Public Health System to strengthen the capacity of the Government of Ukraine to anticipate, identify, and respond to threats to public health (TNMU, 2024). A key aim of the program is to ensure the performance of critical public health functions during a crisis period and to protect the health of all Ukrainians—including vulnerable and marginalized groups—while expanding the provision of mental health services to war-affected populations. A secondary aim of this USAID program, and the other international projects, is to equip Ukrainian citizens who possess no formal medical education with basic skills in emergency medicine. It is the responsibility of the Ukrainian participants of the projects to work with local, non-medical Ukrainians in an effort to maintain cohesion and resilience during the war.

LNMU is actively working on the creation of the National Rehabilitation Center for Reconstructive Surgery within the joint Ukrainian-Austrian intergovernmental project signed in 2022. The center will be built near the Lviv Regional Hospital for War Veterans and Repressed People.

Conclusion

Providing education during any crisis presents challenges to health professional educators, but for those in Ukraine, the reality of living, working, and learning in an active war zone creates unique challenges. There is the constant threat of shelling, drone attacks, and the risk of nuclear explosion causing untold stress while blackouts and air raid sirens disrupt concentration and the ability to work and learn. Despite having to manage the rigors of war, Ukrainian educators have found ways to cope and offer courses using the techniques they relied upon during the COVID-19 pandemic and some that they learned following the invasion. It is hard to say that war creates opportunities, but as the proverb goes, *necessity is the mother of invention*.

The war has shown the importance of partnerships and collaborations both within and across the Ukrainian borders to facilitate continued learning during stressful times. Having been forced to set up distance learning during the COVID-19 pandemic, health professional educators in Ukraine—like others around the world—are in a better place when faced with the need to shift to online education. But the lessons learned during the war go beyond technological innovations. The Ukrainian people have also learned to reach outside the health professional education silo and engage all of society. For example, those with medical expertise teach BLS skills to fellow Ukrainians with no medical training in an effort to maintain social cohesion and resilience during the war. Taking care of each other mentally, physically, educationally, and emotionally is a lesson that can be applied to all educational institutions regardless of location or situation. Through continued partnerships and sharing of experiences, health professionals and educators can understand both the challenges faced by others and how those challenges can be leveraged into opportunities. In this way, educators can be better prepared to continue the critical work of educating the next generation of health professionals no matter the crises they face.

References

1. Arnold, H. D. 1919. Effect of the war on medical education. *JAMA* 73(7):466-469. <https://doi.org/10.1001/jama.1919.02610330004002>.
2. Babbar, M., and T. Gupta. 2021. Response of educational institutions to COVID-19 pandemic: An inter-country comparison. *Policy Futures in Education* 20(4),469-

491. <https://doi.org/10.1177/14782103211021937>.
3. Baylor College of Medicine. 2022. *Beyond our border*. Available at: <https://give.bcm.edu/partnering-to-provide-care-and-rehabilitation-services-for-wartime-victims-in-eastern-europe/> (accessed July 5, 2024).
 4. BSMU (Bukovinian State Medical University.) n.d.a. *BSMU Medical-Psychological Center*. Available at: <https://mpc.bsmu.edu.ua/> (accessed July 5, 2024).
 5. BSMU. n.d.b. *Center of Simulation Medicine and Innovative Technologies*. Available at: <https://www.bsmu.edu.ua/en/education/center-of-simulation-medicine/> (accessed July 5, 2024).
 6. Bychko, G., T. Vakulenko, T. Lisova, M. Mazorchuk, V. Tereshchenko, S. Rakov, V. Goroch, et al. 2023. *H 35 National report on the results of an international study on the quality of education PISA-2022*. Kyiv, UA: Ukrainian Center for Educational Quality Assessment. Available at: https://pisa.testportal.gov.ua/wp-content/uploads/2023/12/PISA-2022_Naczionalnyj-zvit_povnyj.pdf (accessed July 5, 2024).
 7. Cabinet of Ministers of Ukraine. 2022. *Resolution of the Cabinet of Ministers of Ukraine of December 30, 2022 No. 1487*. Available at: <https://cis-legislation.com/document.fwx?rgn=147547> (accessed July 5, 2024).
 8. DAAD (German Academic Exchange Service). n.d. *Ukraine digital: Ensuring academic success in times of crisis*. Available at: <https://www.daad-ukraine.org/en/2023/04/26/ukraine-digital-securing-study-success-in-times-of-crisis/> (accessed July 5, 2024).
 9. De Rassenfosse, G., T. Murovana, and W. H. Uhlbach. 2023. The effects of war on Ukrainian research. *Humanities and Social Sciences Communications* 10(1): 1-11. <https://doi.org/10.1057/s41599-023-02346-x>.
 10. EIT (European Institute of Innovation and Technology). 2023. *New innovation hub opens in Ukraine: EIT continues to strengthen support for Ukrainian Innovators*. Available at: <https://eit.europa.eu/news-events/news/new-innovation-hub-opens-ukraine-eit-continues-strengthen-support-ukrainian> (accessed July 5, 2024).
 11. EIT. 2024. *HIVE: Higher education initiative (HEI) innovation for knowledge intensive entrepreneurship*. Available at: <https://eit-hei.eu/projects/hive/> (accessed July 5, 2024).
 12. European Commission. 2024. *Recovering past stories for the future: A synergistic approach to textual and oral heritage of small communities*. Available at: <https://cordis.europa.eu/project/id/101132781> (accessed July 5, 2024).
 13. Golyk, V., O. Syvak, K. Grabljevec, P. Tederko, C. Gutenbrunner, and B. Nugraha. 2021. Five years after development of the National Disability, Health and Rehabilitation Plan for Ukraine: Achievements and challenges. *Journal of Rehabilitation Medicine* 53(3):jrm00160. <https://doi.org/10.2340/16501977-2792>.
 14. IPSO (International Society for Prosthetics and Orthotics). 2024. *Standards & Guidelines*. Available at: <https://www.ispoint.org/resources/standards-guidelines/> (accessed July 5, 2024).
 15. Long, P. H. 1946. Medical progress and medical education during the war. *JAMA* 130(15):983-990. <https://doi.org/10.1001/jama.1946.02870150001001>.
 16. Mayer, A., O. Yaremko, T. Shchudrova, O. Korotun, K. Dospil, and I. Hege. 2023. Medical education in times of war: A mixed-methods needs analysis at Ukrainian medical schools. *BMC Medical Education* 23(1):804. <https://doi.org/10.1186/s12909-023-04768-2>.
 17. Ministry of Health Protection of Ukraine. 2021. *Some issues of continuous professional development of doctors*. ORDER 08/18/2021 No. 1753. Available at: <https://zakon.rada.gov.ua/laws/show/z1338-21#n2> (accessed July 5, 2024).
 18. Montegrigo, J., J. Cornelius, C. Downing, E. C. Fradelos, F. Machuca-Contreras, R. M. Oducado, and R. W. Resna. 2023. International nurse education research collaboration during the COVID-19 pandemic: Researchers' perspectives. *Nurse Education Today* 120(2023):105606. <https://doi.org/10.1016/j.nedt.2022.105606>.
 19. NAQA (National Agency for Higher Education Quality Assurance). 2023. *Report on higher education quality in Ukraine and its compliance with the tasks of sustainable innovative development of society in 2022*. Available at: <https://en.naqa.gov.ua/wp-content/uploads/2024/03/REPORT-ON-HIGHER-EDUCATION-QUALITY-IN-UKRAINE-IN-2022.pdf> (accessed November 22, 2024).
 20. NAQA. 2024. *SimS: Simulation medicine and scenario-based learning for emergency care*. Available at: <https://en.naqa.gov.ua/?p=2399> (accessed July 5, 2024).
 21. NASEM (National Academies of Sciences, Engineering, and Medicine). 2022. *Exploring the role of health professional students and trainees as members of the health workforce during crises: Proceedings of a workshop*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/26695>.

22. NASEM. 2024. *Exploring strategies and outcomes of admissions processes in health professions education: A workshop*. Available at: https://www.nationalacademies.org/event/41656_03-2024_exploring-strategies-and-outcomes-of-admissions-processes-in-health-professions-education-a-workshop (accessed July 5, 2024).
23. Savelife. 2024. *Saving lives: Reorganizing of basic/extended life support through learning with innovative digital materials*. Available at: <https://avesis.yildiz.edu.tr/proje/67d50b17-9c32-458f-a295-f0ed2e60cc3a/save-life-reorganizing-basic-advanced-life-support-training-through-the-use-of-innovative-digital-materials> (accessed July 5, 2024).
24. Silverstein, J. 2021. The global impact of George Floyd: How Black Lives Matter protests shaped movements around the world. CBS News, June 4. Available at: <https://www.cbsnews.com/news/george-floyd-black-lives-matter-impact/#:~:text=But%20the%20movement%20went%20far,custody%20on%20May%2025%2C%202020> (accessed July 5, 2024).
25. Smandrych, V. 2023. *Medical simulation - a look into the future*. Presentation at Bukovinian State Medical University, February 17, 2023. Chernivtsi, Ukraine.
26. State Education Quality Service of Ukraine. 2024. *Admission to study and organization of higher education institutions of the educational process for applicants of draft age: A comprehensive study has been launched*. Available at: <https://sqe.gov.ua/priyom-na-navchannya-ta-organizaciya-zak/> (accessed July 5, 2024).
27. Superhumans Center. n.d. *We return Ukrainians super opportunities*. Available at: https://superhumans-com.translate.google/?_x_tr_sl=uk&_x_tr_tl=en&_x_tr_hl=en&_x_tr_pto=sc (accessed July 5, 2024).
28. Takoutsing, B. D., M. A. Găman, J. C. Puyana, and F. J. Bonilla-Escobar. 2023. The silent casualties: War's impact on medical students and medical education. *International Journal of Medical Students* 11(4):254-258. <https://doi.org/10.5195/ijms.2023.2476>.
29. TNMU (Horbachevsky Ternopil National Medical University). 2024. *TNMU hosted meeting of partner universities members within the "Development of a Sustainable Public Health System" USAID project*. Available at: <https://www.tdmu.edu.ua/en/blog/2024/04/30/u-tnmu-vidbulasya-zustrich-predstavnykiv-universytetiv-partneriv-v-ramkah-proyektu-usaid-rozbudova-stijkoyi-systemy-gromadskogo-zdorov-ya/> (accessed November 22, 2024).
30. Ukrainian-Swiss Project. 2024. *Medical education development*. Available at: <https://mededu.org.ua/en/> (accessed July 5, 2024).
31. UNBROKEN National Rehabilitation Center. 2024. *Treatment. Prosthesis. Rehabilitation for Ukrainians in Ukraine*. Available at: <https://unbroken.org.ua/> (accessed July 5, 2024).
32. UNESCO (United Nations Educational, Scientific and Cultural Organization). 2024. *Analysis of war damage to the Ukrainian science sector and its consequences*. Paris, France: UNESCO. Available at: <https://ukrainet.eu/wp-content/uploads/2024/03/388803eng.pdf> (accessed July 5, 2024).
33. WFME (World Federation for Medical Education). 2024. *World Directory of Medical Schools*. Available at: <https://search.wdoms.org/> (accessed July 5, 2024).
34. Zaliska, O., O. Oleshchuk, R. Forman, and E. Mossialos. 2022. Health impacts of the Russian invasion in Ukraine: Need for global health action. *The Lancet* 399(10334):1450-1452. [https://doi.org/10.1016/S0140-6736\(22\)00615-8](https://doi.org/10.1016/S0140-6736(22)00615-8).
35. Zubar, N., S. Petrov, and V. Pushkar. 2022. *Acoustic terror of the Russian Federation*. Available at: <https://maidan.org.ua/en/2022/07/akustychnyy-terror-rf/> (accessed July 5, 2024).

DOI

<https://doi.org/10.31478/202501a>

Suggested Citation

Popova, P., A. Kryshchshyn-Dylevych, T. Bilous, T. Boychuk, D. Kaminsky, J. Amiel, and D. Powell. 2025. Educating health professionals during a crisis: Learning from Ukrainian educators in a time of war. *NAM Perspectives*. Discussion Paper, National Academy of Medicine, Washington, DC. <https://doi.org/10.31478/202501a>.

Author Information

Iryna Popova, PhD, is Associate Professor, Department of Histology, Cytology and Embryology, Bukovinian State Medical University. **Anna Kryshchshyn-Dylevych, PhD, DSc**, is Professor, Department of Pharmaceutical, Organic and Bioorganic Chemistry, Danylo Halytsky Lviv National Medical University. **Tetiana Bilous, PhD, DSc**, is Professor, Department of Pediatrics and Children's Infectious Diseases, Head of the Grant Policy Department, Bukovinian State Medical University. **Taras Boychuk, PhD, DSc**, is Professor, Department of Histology, Cytology and Embryology, Bukovinian State Medical University. **Danylo**

Kaminsky, PhD, is Associate Professor, Department of Pharmaceutical, Organic and Bioorganic Chemistry, Dean of the Pharmaceutical Department at Danylo Halytsky Lviv National Medical University. **Jonathan Amiel, MD**, is Director of the Office of Professionalism and Inclusion at New York-Presbyterian Hospital and Adjunct Lecturer of Psychiatry and Behavioral Sciences at Stanford University School of Medicine. **Deborah Powell, MD**, is Dean Emerita and Professor, Department of Laboratory Medicine and Pathology, University of Minnesota Medical School.

Jonathan Amiel, MD, and **Deborah Powell, MD**, are members of the Global Forum on Innovation in Health Professional Education at the National Academies of Sciences, Engineering, and Medicine.

Acknowledgments

Patricia A. Cuff, EdD, MS, MPH, Senior Program Officer at the National Academies of Sciences, Engineering, and Medicine, provided valuable support for this paper. **Lyuba Konopasek, MD**, Executive Director, FAIMER, SVP Intealth, provided valuable support for this paper.

Conflict-of-Interest Disclosures

None to disclose.

Correspondence

Questions or comments should be directed to Patricia Cuff at pcuff@nas.edu.

Sponsor(s)

This work was conducted without financial support.

Disclaimer

The views expressed in this paper are those of the authors and not necessarily of the authors' organizations, the National Academy of Medicine (NAM), or the National Academies of Sciences, Engineering, and Medicine (the National Academies). The paper is intended to help inform and stimulate discussion. It is not a report of the NAM or the National Academies. Copyright by the National Academy of Sciences. All rights reserved.