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ORIGINAL PAPER

Psychological support for teachers in extreme conditions

Iryna Savka[1] · **Iryna Kozlovska**[2] · **Andrii Tsiupryk**[3] · **Marianna Havryliuk**[4] · **Maria Busko**[4]

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Abstract

Extreme conditions, such as the COVID-19 pandemic and the Russian attack on Ukraine, cause major disruptions, with teachers struggling to uphold educational provision. The study presented here aimed to substantiate and experimentally confirm the effectiveness of providing teachers with psychological support in extreme situations in order to optimise the balance of the psychological and pedagogical components in their professional activity. Regular teacher training in Ukraine includes a standard course, "Pedagogy and Psychology", which provides teachers with basic knowledge of pedagogical psychology. Building on this basic course, the authors of this article developed an advanced training course entitled "Psychological support for teachers in extreme conditions". A supplementary course of this kind is especially important in extreme conditions such as a war, as it is designed to clarify the methods of professional activity in practice, based on updated and expanded psychological knowledge. The authors piloted the course with a group of 190 teachers (80% female, 20% male) from a wide range of backgrounds in terms of age, years of experience, subject field, type of institution etc. They compared the effect with a control group of 190 teachers (85% female, 15% male) who had only taken the basic course. Findings of the pilot study suggest that awareness of the importance of psychological knowledge in education increases in proportion to the teacher's experience. A key issue is the teachers' motivation to engage in psychological training: they must clearly understand how and where they can apply the acquired psychological knowledge in their professional activity. Having conducted their pilot study in conditions of martial law in Ukraine, the authors conclude that improving teachers' psychological readiness for extreme conditions not only preserves the quality of the educational process, but also helps to preserve the psyche of students in conditions of war.

Keywords Professional teacher training · Extreme conditions · Psychological support · Education in emergencies · Ukraine

Extended author information available on the last page of the article

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Résumé
Le soutien psychologique des enseignants dans des conditions extrêmes – Les situations extrêmes, telles que la pandémie de COVID-19 et l'attaque de l'Ukraine par les Russes, occasionnent d'importantes perturbations, obligeant les enseignants à lutter pour maintenir l'offre éducative. La présente étude vise à étayer et confirmer de manière expérimentale l'efficacité d'un soutien psychologique aux enseignants dans des conditions extrêmes afin d'optimiser l'équilibre entre les éléments psychologiques et pédagogiques sur lesquels se fondent leur activité professionnelle. La formation ordinaire des enseignants en Ukraine comprend un volet standard intitulé « Pédagogie et psychologie », permettant aux enseignants d'acquérir des bases en psychologie pédagogique. En s'appuyant sur ce cours de base, les auteurs de l'article ont développé une formation avancée intitulée « Soutien psychologique aux enseignants dans des conditions extrêmes ». Ce type de cours supplémentaire est particulièrement important dans des conditions extrêmes, par exemple en temps de guerre, car il est conçu de façon à clarifier les méthodes d'activité professionnelle dans la pratique, en s'appuyant sur des connaissances psychologiques actualisées et élargies. Les auteurs l'ont expérimenté auprès d'un groupe de 190 enseignants (80 % de femmes, 20 % d'hommes) d'horizons très divers quant à l'âge, l'ancienneté, la discipline, le type d'établissement, etc. Ils ont comparé ses effets à l'aide d'un groupe de contrôle de 190 enseignants (85 % de femmes, 15 % d'hommes) qui avaient juste suivi le cours de base. Les résultats de l'étude pilote indiquent que la prise de conscience de l'importance des connaissances psychologiques dans l'éducation augmente proportionnellement à l'expérience de l'enseignant. La motivation des enseignants pour s'engager dans une formation psychologique est décisive : ils doivent clairement comprendre comment et où appliquer les connaissances psychologiques acquises dans le cadre de leur activité professionnelle. Après avoir mené leur étude pilote dans le contexte de la loi martiale en vigueur en Ukraine, les auteurs concluent qu'améliorer la préparation psychologique des enseignants à travailler dans des conditions extrêmes permet non seulement de sauvegarder la qualité du processus éducatif, mais aussi de préserver le psychisme des étudiants en temps de guerre.

Introduction

Modern social life is characterised by the constant occurrence of extreme situations at both global and local/regional levels. The global crises include the COVID-19 pandemic, and the local/regional ones include the Russian attack on Ukraine, which triggered a war in the centre of Europe. These challenges require the reaction of educational institutions at short notice, because in conditions of quarantine or martial law, there are major disruptions to educational provision. Classes often have to be conducted online, or broken off in the middle of

a lesson during an air alarm to evacuate teachers and students to bomb shelters. In Ukraine, teachers and students have had to negotiate such extreme conditions almost every day in the last two years.[1]

The danger of extreme situations, especially for teachers who work with children, is not limited to physical hazards. Teachers' unpreparedness can also cause psychological overload (stress, mental tension, disruption of mental activity), negative emotions and states (anxiety, fear, timidity, indecision, panic, hysteria, numbness, etc.), which significantly reduce the quality of professional teaching and learning activities. At the same time, the same situation may be perceived by some people as intolerable, by others as difficult, by other ones again as normal. What is crucial here is personal psychological readiness, especially in the face of multiple emergencies. Ukrainian teachers were doubly burdened when the extreme global situation caused by the COVID-19 pandemic was further complicated by Russia's attack on Ukraine at the beginning of 2022.

In the scientific literature on education in emergencies (EiE), many studies have focused on teacher training in the context of war. However, the current Russian–Ukrainian war, being a combination of armed invasion and propagandistic flooding of the media and other information spaces, requires a special study which takes into account the peculiarities of such a war. This war has no precedent in world history, because the current situation is significantly different from all previous wars in terms of information transmission and fundamentally new opportunities for mass media due to the rapid development of computer technology. Complementing preparatory research we had already carried out October–December 2021, we conducted further research and ran our pilot study in Ukraine in the period between February and July 2022.

Psychological effects of extreme situations: a need for enhanced teacher training

Changes in the processes of personality development of both teachers and children in extreme circumstances are associated with the abnormality of the situation, constant anxieties related to air raids, fear for their own fate and the fate of relatives. After all, one way or another, the child receives a lot of negative information which is not typical for their usual development at their age. However, management of children's reaction to the events of military reality is very difficult, because the adults around them also have to endure significant psychological stress. A two-way activity is necessary. To protect the child's psyche from negative information which may be overwhelming for the child, the teacher needs to be prepared. In this situation, the teacher's psychological readiness to help the child (or teenage student) in difficult situations becomes of primary importance.

To train and prepare for education in emergencies, teachers need to engage in professionally oriented study of the main topics of general psychology. Offering tailor-made courses designed to improve teachers' qualification in this field involves

[1] This article was originally drafted in 2022.

the selection of topics which are close to the extreme conditions of modern times, in order to increase the level of teachers' psychological readiness to work in extreme situations. Based on the laws and mechanisms of human mental development, personal growth, psychological connections and dependencies, pedagogy offers effective ways and means that lead to the desired resilience of the inner world and changes in human behaviour.

Bearing in mind the relationship between educational and emotional processes of the teacher's activities, timely psychological support can somewhat alleviate the stress level caused by the extreme situation and facilitate the work of the teacher, thereby increasing the efficiency of the educational process, while also to helping to preserve the mental health of both teachers and students in conditions of a pandemic and war.

The teacher must not only know about human psychology in general, but also how it works in a particular professional activity. Therefore, in our study, we focused on teachers' actual awareness in terms of the psychological characteristics, content and structure of their professional activities. Professionally oriented study of the main topics of general psychology and their inclusion in dedicated courses designed to improve and enhance the skills of teachers provides them with a choice of topics which are close to the content of their educational activities. Engaging in this kind of study can improve the level of psychological support teachers are provided with, which they can then draw on when the necessity arises. The teachers have to know how to conduct a lesson in a shelter during the air alarm, how to behave and how to calm the students down in case of explosions.

Our study

Our study set out to investigate the viability of the following general hypothesis (*H 1*):

H 1 The availability of psychological support developed for a specific profile of pedagogical activity improves the quality of teachers' work if all their professional activities are unified under the scheme "goal – knowledge – skills – values – practice".

We subdivided this hypothesis into the following four assumptions (partial hypotheses *H 1a–H 1d*). For the improvement of the quality of teachers' work, it is necessary to

H 1a identify a motivation for psychological training and the relationship between the success of professional activities and teachers' psychological training;

H 1b develop a special course (e.g. "Psychological support for teachers in extreme conditions"), which ensures the establishment of an optimal balance between psychological and pedagogical components of psychological support for teachers;

H 1c ensure the unity of psychological and pedagogical components in the teachers' professional activity on the basis of an integrative approach, that is, a parallel mastering of the basics of psychopedagogy and pedagogical psychology;

H 1d ensure the availability of several levels of psychological support within the proposed course (ranging from minimum to optional), taking into account the importance of psychological and pedagogical knowledge for all specific types of pedagogical activities (delivery of higher education, secondary and primary-level education, working in military schools, working with children with special needs, working in extreme conditions, etc.); and

H 1e separate universal and professional values based on psychological and pedagogical knowledge, as well as the main directions of development of their applied aspects and the integration of general and professional culture, thereby including the axiological (value-related) aspect in the provision of psychological support for teachers.

Literature review

Our study differs from other research into education in emergencies in that it contains a specific teacher training methodology which was tested in practice in Ukraine in the period of February–July 2022. Our review of relevant literature included information on the following topics: factors contributing to teachers' job stress; teachers' burnout; psychological stress and vocal symptoms (e.g. hoarseness) among university professors; and physical activity for the prevention of depression (see Table 1).

As far as we know, no study has been published so far which would have considered detailed ways of implementing psychological support in conditions of a modern-context conflict such as the current Russian–Ukrainian war. This study aims to fill this gap.

Table 1 Literature review

Topic	Literature
Factors contributing to teachers' job stress	Abdullah and Ismail (2019)
	De la Fuente et al. (2020)
	Malik et al. (2017)
	Moreno et al. (2004)
Teachers' burnout	Arias et al. (2019)
	Betoret (2006)
Psychological stress and vocal symptoms among university professors	Besser et al. (2020)
	Ozamiz-Etxebarria et al. (2020)
Physical activity for the prevention of depression	Amatriain-Fernández et al. (2020)
	Aperribai et al. (2020)
	Bogaert et al. (2014)

The purpose of our study was to identify conditions for the effectiveness of the methods of psychological support for teachers, presented in the form of a teacher training course "Psychological support for teachers in extreme conditions" we designed to improve teachers' preparedness for education in emergencies.

Methodology

We deliberately selected our participants among teachers of various profiles (primary- and secondary-level schools, vocational schools, schools for gifted children, etc.) to account for both the invariant part of the content of psychological support for all teachers, and a variable part, which significantly depends on the profile of the school. The selection of teachers was carried out in several ways: (1) through the administration of the educational institution; (2) through the analysis of teachers' participation in teacher conferences or meetings; and (3) through consultations in institutes of postgraduate education. We held conversations with the selected teachers, which then led to either inclusion or exclusion of a specific teacher in our pilot study.

Ninety per cent ($n = 162$) of the teachers who participated in phase 1 remained in phase 2, we recruited the rest through interviews.

Our research comprised two phases. The first phase, which we conducted October–December 2021 (i.e. during the COVID-19 pandemic), was preparatory. It served to ascertain teachers' state of practice using a questionnaire survey and interviews, involving 180 teachers (80% self-identified as female, 20% as male) from secondary and vocational schools in Lviv and Lviv region. The measurement methods we used for this phase were based on Pearson's classical test to compare theoretical and empirical data, as well as several empirical distributions of the same feature.

The second phase, which lasted from February to July 2022 (i.e. under conditions of war), involved 380 teachers (80% self-identified as female, 20% as male) from the same secondary schools and vocational education institutions in Lviv and Lviv region. This phase had two components. Phase 2a served to conduct further complementary research (February–June 2022), while phase 2b (April–July 2022) served to pilot our tailor-made course, "Psychological support for teachers in extreme conditions", among half of the participants ($n = 190$), comparing the effect with a control group (the other half, $n = 190$).

Phase 1: Ascertaining teachers' state of practice in terms of applying psychological knowledge

Data collection and coding

We designed a questionnaire and sent it out to a total of 400 teachers experiencing disruptions to their teaching due to the COVID-19 pandemic whom we had selected as participants for phase 1 of our study. We distributed the questionnaires in two ways: (1) in the real educational process, when the researcher comes to the

educational institution, distributes questionnaires printed on paper, then collects them and then processes them; and (2) through electronic means: e-mail, groups in networks, and in some cases individually.[2] 390 questionnaires were returned to us (a response rate of 97.5%), of which 180 were complete and satisfied our criteria for inclusion in our evaluation. We also drafted guidelines for semi-structured interviews, which we conducted with selected participants. The interviews were conducted online, lasted on average five minutes, and were audio-recorded and transcribed.[3]

To code the data collected through the survey and the interviews, we numbered participants and assigned each number an initial three-digit code, which contained data about their place of work (M = city school, S = rural school, P = vocational school),[4] work experience (I = up to 5 years, II = 5–15 years, III = 15–25 years, IU = more than 25 years) and their level of personal psychological readiness to work in extreme situations (1 = low, 2 = medium, 3 = high). Thus the code S-III-2, for example, stood for a participant with 15–20 years of teaching experience working in a rural school whose personal confidence in being able to teach in extreme situations was at medium level.

Phase 2a: Preparing the design of our tailor-made course, "Psychological support for teachers in extreme conditions"

We began with the formulation of the null hypothesis. According to it, the sample data are obtained from statistically identical populations, and therefore, any difference between the pilot and control groups is a random variation. The second step is to calculate the theoretical frequencies based on observational data. This step is necessary to determine the minimum sample size for obtaining a viable result.

The primary task of designing and piloting a course was to establish the optimal balance of psychological and pedagogical components of psychological support for future teachers, as well as identifying the relationship between professional success and psychological and pedagogical training.

On this basis, we developed the following indicators of the levels of psychological and pedagogical training of teachers:

- attitude to psychological support;
- formation of knowledge;
- formation of beliefs;
- possession of a set of certain skills;

[2] A hyperlink to an English translation of the phase 1 selection questionnaire is provided under "Data availability" at the end of this article.

[3] A hyperlink to an English transcription of some phase 1 selection interview responses is provided under "Data availability" at the end of this article.

[4] In conditions of war, teaching in different environments in terms of location and type of school acquired a new meaning. A massive missile strike is much more dangerous in urban schools than in small villages. We therefore introduced this differentiation for our sample in phase 2.

- focus on self-improvement;
- formation of certain qualities;
- formation of motives; and
- ability to perform correction and self-correction.

Our sampling procedure provided for cooperation with the widest possible contingent of teachers (educational institutions in large cities, medium-sized and rural communities; teachers of different ages, with different experiences; teachers of different disciplines).

The sample size was determined at the stage of measuring the requirements for the use of Pearson's test, and at the stage of establishing the state of practice – by involving at least 5 participants for each of the above categories of teachers.

To adequately assess the effect of the active pedagogical factor, we introduced the following three coefficients: success rate of psychological knowledge (C); success rate of pedagogical knowledge (P); and complex coefficient of psychological and pedagogical knowledge (K).

Success rate of psychological knowledge (C)

The success rate of psychological knowledge (C) served to determine the level of acquired psychological and pedagogical knowledge in our pilot study. It can vary from zero to one: 0 = knowledge is lacking, and 1 = teacher is fluent in the material. Within this assessment, we categorised participant teachers into four levels of success in psychological knowledge:

- 1st level C (very low) – success rate 0–0.15;
- 2nd level C (low) – success rate 0.16–0.45;
- 3rd level C (average) – success rate 0.46–0.75; and
- 4th level C (high) – success rate 0.76–1.

Thus, with the help of the coefficient of success of psychological knowledge, it is possible to track trends in teachers' migration between different levels.

Since the purpose of our course was to improve the professional level of teachers, we also added the coefficient of success of pedagogical knowledge, based on the results of questionnaires, interviews and coding.

Success rate of pedagogical knowledge (P)

Success rate of pedagogical knowledge (P) served to assess the level of acquired professional knowledge. It can vary from zero to one: 0 = knowledge is missing and 1 = teacher is fluent in the material. Within this assessment, we categorised participant teachers into four levels of professional success:

- 1st level P (very low) – success rate 0–0.15.
- 2nd level P (low) – success rate 0.16–0.45.
- 3rd level P (average) – success rate 0.46–0.75.

- 4th level P (high) – success rate 0.76–1.

Furthermore, to determine the impact of psychological and pedagogical knowledge on teacher training, it was necessary to introduce a coefficient that would reflect this impact.

Complex coefficient of psychological and pedagogical knowledge (K)

The complex coefficient of psychological and pedagogical knowledge (K) served to assess the impact of C on the level of acquired professional knowledge. We defined it as the arithmetic mean of the two previous coefficients. To assess the Integrated Success Ratio (ISR), we categorised participant teachers into the following four levels:

- 1st level K (very low) – success rate 0–0.15.
- 2nd level K (low) – success rate 0.16–0.45.
- 3rd level K (average) – success rate 0.46–0.75.
- 4th level K (high) – success rate 0.76–1.

Thus, the use of three coefficients enabled us to study the impact of active pedagogical factors at all stages of implementation of our course.

Phase 2b: Piloting the course

Building on "Pedagogy and Psychology", the standard teacher training course on basic pedagogical psychology completed by all Ukrainian teachers as part of their regular qualification, we designed a supplementary course entitled "Psychological support for teachers in extreme conditions". This pilot course consists of two parts: the main component and the variable component. The main component (10 hours) is designed for the acquisition of basic knowledge by all teachers without exception. The variable component (20 hours) comprises three tailor-made modules to choose from and is designed to develop additional knowledge in accordance with the profile of pedagogical activities. After studying the basic component, each teacher choses one of the three modules on offer in the variable component which is best suited to their needs to engage in further training.

Based on our data collection during this study, we assessed participants' actual level of psychological and pedagogical knowledge, as well as their desire to update their own professional activities. We grouped participants according to the requirements of their different pedagogical specialties. For each group, the level of psychological and pedagogical knowledge has its own characteristics. In terms of determining teachers' initial level of knowledge, we based their allocation to a group on the following criteria:

- type of educational institution where the teacher works (general school, vocational school, college, etc.); and

- teacher's teaching experience: short (up to 3 years), medium (up to 10 years), long (more than 10 years) and very long (more than 20 years).

The purpose of creating these groups was to ensure that none of the participants would need to study unnecessary material, but at the same time already had a sufficient level of knowledge necessary for the chosen profession which they could build on.

We conducted our study during October–December 2021 (during COVID-19) and February–July 2022 (after the onset of the Russian–Ukrainian war) in educational institutions of the Lviv, Vinnytsia and Zakarpattia regions of Ukraine. Our study was subdivided into two phases (ascertaining and formative). We conducted the ascertaining part during October–December 2021 to identify the significance of psychological support in teachers' pedagogical activities and the state of practice in terms of teachers' application of psychological knowledge. The formative part was conducted during February–July 2022.

Results

Phase 1: Ascertaining participants' state of practice in terms of applying psychological knowledge

From theoretical and practical research it is known that psychological and pedagogical knowledge occupies an important place in the professional activities of teachers. Not much is known about the extent to which teaching practitioners are aware of this fact. Many teachers have inflated ideas about the level of their psychological readiness, especially in extreme situations. Our study confirmed that teachers needed more knowledge on how to work in extreme conditions such as a war.

An important issue is the teachers' readiness to engage in training to obtain thorough psychological and pedagogical knowledge. While teachers' interest in pedagogical disciplines is explained by their professional necessity, not everyone is aware that applied psychological knowledge is also deeply relevant for specialised pedagogical fields. Therefore, in the framework of the ascertaining stage of our study, it was important for us to investigate the level of the ratio of extant psychological and pedagogical knowledge among our participants. To do this, we investigated teachers' intensity of engagement in psychological training, and the degree of their intention to use psychological support in future professional activities. We obtained the information using and adapting questionnaires developed by A. A. Vostrykov (1991) and O. T. Dzherelyuk (1997), both of which are classic standards used in pedagogy and psychology, as is the Rokeach Values Survey (Rokeach 1973). The results of the survey of 100 (main participant) teachers[5] are presented in Table 2.

[5] We had 100 main participants plus 80 extras. The purpose of this was to refine the experiment before the main study began, helping us to identify potential issues. The extras were only involved in discussions to provide qualitative data which complement the quantitative findings from the main participants.

Table 2 Teachers' application of psychological and pedagogical knowledge in their professional practice

Application of	always (%)	often (%)	seldom (%)	never (%)
Knowledge and skills in pedagogy	57	35	8	0
Knowledge and skills in psychology	20	31	44	5
Integrated (complex) psychological and pedagogical knowledge and skills	2	12	6	18

Note: The figures in the last row do not add up to 100 because the calculations were carried out separately, and the main row is presented first, while the rest was of an auxiliary nature and was used to clarify the main result.

Additional analyses showed that the inequality of pedagogical and psychological components in the minds of many teachers (more than 65%) is quite pronounced. The importance of the psychological component is sometimes ignored by beginning teachers (up to 23%). However, integrated psychological and pedagogical knowledge and skills find significant support from teachers who have been practising for more than 10 years (up to 88%). Research investigating these three aspects was conducted separately, so each of these results relate to a separate study.

In general, participants with long or very long teaching experience gave significantly higher marks to the importance of psychological and pedagogical knowledge, while the rating of psychological knowledge was low for teachers with medium and short experience. We think this might be due to a vague idea of the importance of psychological support, although we identified no cases of denial of its significance. It seems reasonable to conclude that the awareness of the importance of psychological knowledge in teaching grows in proportion to the experience of the teacher.

The next conclusion is that teachers do recognise the need for psychological support of pedagogical activities, but there are significant differences in terms of its scope and content. Therefore, in the training methodology of the course we designed, one of the key issues is teachers' motivation to engage in psychological training: they must be clearly aware of how and where they can apply the acquired psychological knowledge in professional activities.

Our next task was to identify the main reasons that motivate teacher's study of psychological and pedagogical disciplines. We proposed a list of five motives which might encourage the study of psychological and pedagogical disciplines, and asked our 180 participants to evaluate these on a 100-point scale. From this survey, these five motives' order of importance emerged as follows:

(1) insufficient preparation for work in extreme situations (74%);
(2) fear of a negative impact on students due to their unbalanced behaviour caused by extreme situations (28%);
(3) insufficient emotional balance in extreme situations (25%);
(4) fear of emotional breakdown and inappropriate treatment of students (15%); and
(5) fear of stress and physical health in an extreme situation (19%).

These five main motives formed the basis for our development of the advanced course for teachers who work in extreme conditions and need extra knowledge. Again, in order of importance, we ranked their needs as follows:

(1) the importance of psychological knowledge for the application of teachers' pedagogical knowledge (48%);
(2) the need for psychological support for the teacher's specific professional tasks (37%);
(3) the expediency of the unity of pedagogical and psychological disciplines (35%);
(4) the integration of psychological and pedagogical knowledge with each other (29%); and
(5) the development of pedagogical activity with psychological support (19%).

This ranking allowed us to draw the important conclusion that most teachers do not seem to have a vision of the practical application of psychological knowledge in their professional activities, and, as a consequence, they do not see the direct benefit of studying psychology. We know from previous research that if teachers see the need for a pedagogical component, the psychological component is often a formality. This creates a violation of the optimal balance of psychological and pedagogical components in the process of teachers.

Phase 2: Piloting our tailor-made course, "Psychological support for teachers in extreme conditions"

The results we obtained during the first phase confirmed the viability of the hypothesis guiding our study and made it possible to move on to the formative phase which we conducted during October–December 2021 and April–June 2022. The purpose of this phase was to study the effectiveness of the introduction of active pedagogical factors through piloting our course "Psychological support for teachers in extreme conditions". Since the course involved training at different levels, we divided the teachers into two groups:

- Control group (190 participants) – this group's teacher training was conducted in the usual way according to the existing standard course "Pedagogy and Psychology".
- Pilot group (190 participants) – this group's teacher training was conducted through our course "Psychological support for teachers in extreme conditions".

The main tasks of both components of phase 2 of our study were to

- establish the relationship between teachers' professional skills and their psychological training;
- determine the role of psychological support for teachers after studying the basic part of the main course;

- study the distribution of teachers according to their level of readiness to engage in psychological training;
- study the impact of the course "Psychological support for teachers in extreme conditions" on participants' level of readiness to engage in psychological training; and
- establish the impact of the course on teachers' professional activity and its connection with the teachers' choice of the level of psychological support.

Participants in both the control and pilot groups studied basic psychology and pedagogy, but in different programmes. After mastering the main programme, the teachers of the control group continued their studies according to the existing programmes, while the teachers of the pilot group studied in a special mode. This regime allowed teachers in the pilot group to freely choose the modules of their further curriculum.

At each stage of piloting our course, we gathered information (twice a month) about changes in the learning process and compared them with control groups. In phase 1, we conducted a survey among 180 teachers to find out their actual readiness to teach in extreme conditions in terms of their ability to apply psychological knowledge. Based on the results of this survey, we grouped participating teachers according to the levels of psychological knowledge they were already applying (during COVID-19 disruptions to their teaching practice). In parallel, we conducted another survey among 100 teachers. Based on the obtained results of this second survey, we compared the actual distribution with the desired one of teachers in terms of their readiness to engage in thorough psychological and pedagogical training to support their work in emergency conditions.

In phase 2, our sample comprised 380 participants, 190 in a control group and 190 in a pilot group. Teachers of the control group studied the usual "Psychology and Pedagogy" course, and teachers of the pilot group studied the basic part of the course "Psychological support for teachers in extreme conditions" (see Table 3). At the same time, we conducted diagnostic tests on teachers' wishes regarding the future choice of topics and level of education. We then compared the results obtained at this stage with the previous ones.

After studying the basic part of the course "Psychological support for teachers in extreme conditions", participants in the pilot group chose their modules from a new curriculum, according to the profile of their professional activities. Each teacher tried to choose the level of knowledge which most fully reflected their needs. At the same time, the teachers of the control group continued their studies choosing modules from general existing programmes (see Table 3).

We repeated our diagnostic tests to identify the level of psychological and pedagogical knowledge and skills of participants in the pilot group after reading the additional part of the course, and also included a comparison of the results of all diagnostic tests.

Finally, at the end of phase 2, we investigated the reliability of our results using Pearson's test. Starting with the initial diagnostic test conducted in phase 1, to identify the level of psychological support after a series of diagnostic activities, we arrived at a distribution of teachers by level of their psychological and pedagogical

Table 3 Piloting the course "Psychological support for teachers in extreme conditions"

	October–December 2021 (pre-war state; during the COVID-19 pandemic)	April–June 2022 (state of war)
Control group ($n = 190$)	Standard Ukrainian teacher training course "Pedagogy and psychology"	Standard choice of 3 existing Ukrainian teacher training modules
Pilot group ($n = 190$)	Pilot course part 1: Basic psychology and pedagogy (10 hours) covering traditional extreme situations related to the educational process itself	Pilot course part 2: Choice of individual specialist modules (e.g. 3.1, 3.2) (20 hours) covering traditional extreme situations related to the educational process itself as well as extreme situations related to martial law: air raids during classes, night air raids, physical and moral damage from bombings, spiritual experiences of teachers and students whose loved ones are at the front, stress related to injuries and deaths of military personnel etc.

knowledge. We found the results obtained at the end of phase 2 to be in good agreement with the results obtained during phase 1. The data obtained served as a reference for subsequent studies, enabling comparison of all subsequent results with those already obtained.

The distribution of teachers by levels of psychological and pedagogical knowledge indicates a significant overestimation of teachers' self-assessment in terms of their psychological readiness for professional activity, and an underestimated real level of knowledge. We determined this by comparing the third indicator of the code (level of personal psychological readiness to work in extreme situations) with the results of our pilot study.

Given that teachers already acquire basic knowledge of psychological and pedagogical disciplines during the years of study and previous stages of professional development, we divided teachers according to their levels of psychological knowledge. We assessed their level of knowledge according to their average success rates in answering the questionnaire questions correctly. The obtained results indicated the need to increase the level of psychological and pedagogical knowledge of teachers.

The next step in our study was for all participants in the pilot group to study the main part of our pilot course. The distribution of teachers by levels of psychological knowledge after reading the part of our course indicate a positive trend. That is, there were fewer teachers with lower levels, and the number of teachers with higher levels of knowledge increased. However, at this point it was important for us to merely record the distribution of teachers, since detailed conclusions would only be possible at the very end of our study.

It should be noted that the results of teachers' self-assessment changed dramatically in both control and pilot groups after studying their respective main courses. This is due to the fact that all participants gained the opportunity to re-evaluate their abilities by acquiring new knowledge. Nevertheless, we found a big gap between self-assessment and the real distribution of teachers, the direct consequence of which is the underestimation of a number of teachers of the importance and value of psychological knowledge for their professional activities. As a result of studying the main course, the attitude of teachers to the importance of psychological support of their professional activity changed significantly in a positive direction.

The next task was to study the cause of such changes based on the coefficients of the effectiveness of teachers' knowledge. Our study is the first to assess psychological knowledge based on the success rate of C (psychological knowledge). The results of our study showed that the teachers of the pilot group who studied the basic part of the pilot course presented significantly higher rates of psychological knowledge than participants in the control group who studied the standard course. This may be due to certain shortcomings in the approaches to structuring the content of educational material.

Next, we assessed professional knowledge on the basis of coefficient K (complex coefficient of psychological and pedagogical knowledge). This coefficient was calculated as a result of the success of the teacher due to studying the standard teacher training course, "Pedagogy and Psychology". The results of this assessment are presented in Figure 1.

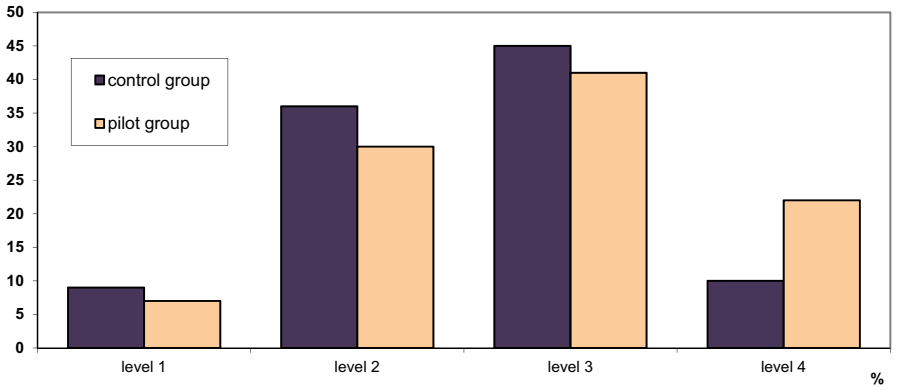

Figure 1 Assessment of psychological knowledge of teachers after studying the standard basic teacher training course "Pedagogy and Psychology". *Notes:* level 1 = very low; level 2 = low; level 3 = average; level 4 = high

To determine the impact of psychological support on teacher training, we compared the results in the control and pilot groups and found that at this point of our study they did not differ significantly. This finding suggests that the standard basic "Pedagogy and Psychology" course does not have a significant impact on teacher training. However, based on our results, it is reasonable to infer that the basic course does seem to provide teachers with basic information and help them to further determine their required level of psychological and pedagogical knowledge. We also assessed participants' level of knowledge according to the average success rates at this stage. Next, the teachers of the pilot group, based on the acquired basic knowledge, determined the level of psychological support they required for the profile of their specialty.

Next, the pilot group studied an additional part of pilot course. This time, as shown in Table 3, the teachers of the control group were engaged in the usual mode. At this point, we were able to compare the results of the pilot group with those of the control group obtained during the previous diagnostic tests. After conducting a series of further diagnostic activities, we arrived at a distribution of teachers according to the four levels of coefficient C (success rate of psychological knowledge). The dynamics of the distribution indicate a lack of awareness of the real level of knowledge among participants in both groups at the beginning, and a significant positive trend in its awareness, again, in both groups, at the end of our pilot study.

In particular, the results of teachers' self-assessment in the pilot group changed after studying the additional course. This is due to the fact that by gaining new knowledge, these participants were able to further reassess their capabilities. In this case, the gap between self-assessment and the actual distribution of teachers' knowledge narrowed significantly and became approximately the same, indicating an increase in the level of knowledge in relation to the necessary conscious choice of psychological support.

The study of the coefficients of efficiency of teachers' knowledge was a further logical step in order to identify changes in the teachers' psychological and

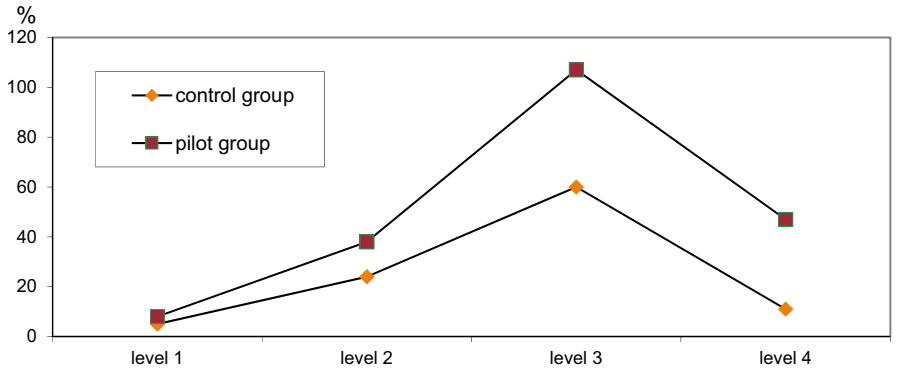

Figure 2 Assessment of teachers' professional knowledge after studying one of the additional modules of part 2 of the pilot course. *Notes:* level 1 = very low; level 2 = low; level 3 = average; level 4 = high

pedagogical training. Both after the main course and after the additional course, we assessed the level of knowledge of teachers according to the average success rates.

As shown in Figure 2, teachers' level of professional knowledge increases with the benefit of psychological support. Thus, the level of teachers' psychological and pedagogical knowledge in the pilot group is higher than the level in the control group. It is also important to note that the level of knowledge in the pilot group also increased compared to the results obtained in the second diagnostic test. Therefore, it is reasonable to argue that psychological and pedagogical knowledge is an integral part of the process of forming the knowledge of teachers in general, including professional skills.

After a thorough analysis, we came to the important conclusion that through a more detailed study of psychology, and especially pedagogy, teachers begin to better understand the need to study them in the process of general training. Since one of the points of general activity is professional training, which constantly requires thorough knowledge of psychology and pedagogy, teachers show a higher interest in the study of disciplines, which leads to increased success.

At each stage of the formative phase, we obtained information about changes in the educational process of the pilot and control groups and compared them with the initial data. Coefficient K (complex coefficient of pedagogical and psychological knowledge) allowed us to determine the levels of acquired psychological, pedagogical and professional knowledge, respectively, as well as trends in migration of teachers between different levels (Table 4).

The results indicate that the null hypothesis is denied, which suggests an increase in the level of acquired psychological, pedagogical and professional knowledge for teachers in their respective specialty through the introduction of the pilot course "Psychological support for teachers in extreme conditions".

Table 4 Dynamics of distribution of teachers by levels of psychological and pedagogical training (in %)

Stage	Level 1		Level 2		Level 3		Level 4	
	PG	CG	PG	CG	PG	CG	PG	CG
Before completing the main course	27	28	52	54	17	14	4	4
After completing the main course	5	15	31	52	45	27	19	6
After completing the additional course	2	11	16	39	51	43	31	7

Notes: level 1 = very low; level 2 = low; level 3 = average; level 4 = high; PG = pilot group; CG = control group

Discussion

Although both situations (a pandemic and a war) in which we conducted our study are extreme, they differ significantly, especially in terms of unpredictability and difficulty in forecasting. While the government can manage the situation effectively enough during a pandemic, in conditions of war, the unpredictability of shelling, attacks, events at the front line and sabotage significantly increases the level of stress of the population in general. To train and prepare for education in emergencies, teachers need to engage in professionally oriented study of the main topics of general psychology.

Throughout our study, we monitored the relationship between teachers' professional skills and their psychological training according to the criteria of effectiveness we had developed and the indicators of the levels of their psychological and pedagogical training. These indicators included the teachers' attitude to the psychological support of their professional activity; their level of knowledge acquisition; their level of belief formation; their possession of a set of skills; their focus on self-improvement; the formation of their motives for improving psychological training, etc. The primary task of the "Psychological support for teachers in extreme conditions" course was to establish the optimal ratio of psychological and pedagogical components in teacher training. The piloting of our course confirmed the relationship between professional success and teachers' level of psychological and pedagogical training.

We determined the role of psychological support of teachers' professional activity by comparing the actual level of teachers' psychological and pedagogical knowledge, their desire to update their own professional activity, as well as the requirements of the educational process in extreme conditions. Our initial survey showed that teachers' interest in pedagogical disciplines was motivated by professional necessity, but an interest in psychological knowledge, which has a deep applied significance for pedagogical specialties, was not realised by all teachers. In general, we found that teachers with more experience rated the importance of psychological knowledge significantly higher than did teachers with medium and little teaching experience.

The perceived readiness of teachers to provide psychological support to pupils acquires special importance in conditions of war, as evidenced by the results of our

conversations and interviews with teachers. At the end of our study, teachers' awareness of the importance of psychological knowledge of teachers had increased (from 48% to 68%); the need for psychological support for specific professional tasks of a teacher had grown (from 37% to 72%); the appreciation of the expediency of the unity of pedagogical and psychological disciplines had risen (from 35% to 55%), the need to integrate psychological and pedagogical knowledge had risen (from 29% to 47%); and the need to develop pedagogical activities with psychological support had also increased (from 19% to 58%).

The influence of the "Psychological support for teachers in extreme conditions" course on teachers' readiness to provide psychological support to students turned out to be quite significant. Notably, the results of teachers' self-assessment changed after familiarisation with the main course in both the control and pilot groups. This is due to the fact that the participants, having acquired new knowledge, took the opportunity to re-evaluate their own pedagogical experience. Nevertheless, we discerned a gap between self-assessment and the real distribution of teachers in terms of knowledge levels, the direct consequence of which is the underestimation by a number of teachers of the importance and value of psychological knowledge for the teachers' professional activity, especially in war conditions. As a result of studying the main course, the teachers' attitude towards the importance of psychological support of their professional activity changed significantly in a positive direction. At the same time, the gap between self-assessment and the real distribution of teachers' knowledge decreased significantly, which indicates that an increase in the level of knowledge encourages the necessary conscious choice of psychological support for professional activity.

At the beginning of our study, many teachers did not have a vision of the practical application of psychological knowledge in their professional activities, and, as a result, they did not see a direct benefit from studying psychology. However, in extreme conditions, the awareness of the significance of the teacher's psychological knowledge occurs very quickly.

Unfortunately, in modern conditions, no one is completely safe from war, and even less from extreme situations such as the COVID-19 pandemic. Therefore, we believe our method can be useful for teachers and scientists in other countries of the world.

Conclusions and recommendations regarding further professional development courses

Our findings lead us to conclude that teachers' awareness of the importance of psychological knowledge in education increases in proportion to their experience. Teachers also recognise the need for psychological support of their pedagogical activity, but there are significant differences in terms of its scope and content.

Our pilot study confirmed the general initial hypothesis (*H 1*) of our research, which postulated that the availability of psychological support developed for a specific profile of pedagogical activity improves the quality of teachers' work if all their professional activities are unified under the scheme "goal – knowledge

– skills – practice". The *goal,* here, includes ensuring the teacher's ability to act in extreme conditions, maintaining both their own mental balance and that of their students. In this context, *knowledge* refers to information on how to behave in extreme conditions which are not a regular part of the educational process (bombing, air raids, information about tragic events at the front and in destroyed areas, personal morale, teachers' and students' physical injuries, etc.). The *skills* include the teacher's ability to automatically switch to handling an extreme situation and act optimally to minimise its harmful effect on their students' psyche. Finally, *practice* refers to the transformation of these goals, knowledge and skills into the permanent practice of the teacher's work in the real educational process.

Our first three partial hypotheses (*H 1a–H 1c)* were also fully confirmed (the necessity of identifying teachers' motivation for psychological training and the relationship between professional success and psychological training of a teacher; of the development of a special course "Psychological support for teachers in extreme conditions"; and of ensuring an optimal balance of psychological and pedagogical components in the professional activity of a teacher on the basis of an integrative approach). The revised fourth partial hypothesis (*H 1d*), namely, the necessity of the availability of several levels of psychological support (from minimal to optional) in the proposed course, proved to be highly important for vocational schools and less important for secondary schools.

We see significant potential for offering supplementary courses of the kind we piloted in our study, since our first attempts to apply it under martial law proved successful. In the provision of psychological support and training for teachers, the value component in extreme conditions of pedagogical activity needs to be further investigated, which is the subject of our future research.

Data availability Data in Ukrainian are available upon request from the corresponding author. An English translation of the phase 1 selection questionnaire; an English transcription of some phase 1 selection interview responses; an English translation of the methods of assessment of teachers' professional qualities based on the work of A. A. Vostrykov; and an English translation of the questions of the written questionnaire "Willpower in professional activity" according to the method of O. T. Dzherelyuk are available here: https://docs.google.com/document/d/1Yng0XTngKJK3rlPeHqCTAXTRCD0aJ6Zp/edit?usp=drive_link&ouid=116981062041713715013&rtpof=true&sd=true.

Declarations

Ethical approval The research was approved by the Academic Council of Volodymyr Dahl East Ukrainian National University (Minutes No. 2 of 30 August 2016) and agreed with the Interdepartmental Council for the Coordination of Scientific Research in Pedagogical and Psychological Sciences in Ukraine (Protocol No. 6 of 27 September 2016).

The research conformed to the ethical guidelines of the International Declaration of Helsinki.

Informed consent Participation in the study was voluntary, and informed written consent was obtained from the participants before data collection commenced. Participants were allowed to end their participation at any time.

The pilot study was conducted according to the protocols of Volodymyr Dahl East Ukrainian National University, the Centre for the Coordination of Research in Pedagogy and Psychology, with the participation of voluntary students of Volodymyr Dahl East Ukrainian National University. The essence of the pilot study is purely psychological, pedagogical and educational, and the pilot study was conducted purely with the

voluntary consent of the participants. The results of the study are implemented in the work of the Scientific and Practical Centre for Medical, Social and Psychotechnologies (Certificate No. 238/36 of 10.02.2022); in the Educational and Scientific Activities of the East Ukrainian Volodymyr Dahl East Ukrainian National University (Certificate No. 233/15.17 of 08.02.2022), Lviv State University of Internal Affairs (Certificate No. 33 of 16.06.2022), Lviv State University of Security (Act of 25.10.2021), Vasyl Stefanyk Precarpathian National University (Certificate No. 01-23/146 of 08/12/2022).

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Iryna Savka holds a Doctorate of Pedagogical Sciences and is a Professor of the Faculty of Foreign Languages, Department of Foreign Languages for the Humanities at Ivan Franko National University of Lviv, Ukraine. She has authored and co-authored many articles, educational textbooks, manuals and monographs and presented papers at many international conferences. Her research interests include methodology, vocational training, an integrative approach to studying, bilingual studying, innovative methods in teaching, etc.

Iryna Kozlovska holds a Doctorate of Pedagogical Sciences and is a Leading Researcher of the International Institute of Education, Culture and Relations with the Diaspora at Lviv Polytechnic National University, Ukraine. Her research interests include methodology, vocational training, an integrative approach to studying, etc.

Andrii Tsiupryk holds a Doctorate of Pedagogical Sciences and is an Associate Professor in the Department of Practical Psychology and Pedagogy at Lviv State University of Life Safety in Ukraine. His research interests include methodology, vocational training, an integrative approach to studying, psychological aspects in teaching, etc.

Marianna Havryliuk is an Associate Professor, CSc (Education), in the Department of Foreign Languages at the Institute of the Humanities and Social Sciences at Lviv Polytechnic National University in Ukraine. Her research interests include methodology, vocational training, an integrative approach to studying, bilingual studying, etc.

Maria Busko is an Associate Professor, CSc (Education), in the Department of Foreign Languages at the Institute of the Humanities and Social Sciences at Lviv Polytechnic National University in Ukraine. Her research interests include methodology, vocational training, an integrative approach to studying, bilingual studying, etc.

Authors and Affiliations

Iryna Savka[1] · Iryna Kozlovska[2] · Andrii Tsiupryk[3] · Marianna Havryliuk[4] · Maria Busko[4]

✉ Iryna Savka
savka68@meta.ua

Iryna Kozlovska
irinakozlovska476@gmail.com

Andrii Tsiupryk
tsarob@ukr.net

Marianna Havryliuk
marianna.v.havryliuk@lpnu.ua

Maria Busko
mariya.b.busko@lpnu.ua

[1] Department of Foreign Languages for the Humanities, Faculty of Foreign Languages, Ivan Franko National University of Lviv, Lviv, Ukraine

[2] International Institute of Education, Culture and Relations with the Diaspora, National University "Lviv Polytechnic", Lviv, Ukraine

[3] Department of Practical Psychology and Pedagogy, Lviv State University of Life Safety, Lviv, Ukraine

[4] Department of Foreign Languages, Institute of the Humanities and Social Sciences, Lviv Polytechnic National University, Lviv, Ukraine