



# The influence of the educational process on the psychological state of students and teachers in Physics Culture and sports during the war

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## Abstract

**Background and Study Aim.** The relevance of intelligence is determined by the need to find the most effective tools for the formation and development of stress resistance in Ukrainian students and teachers in the process of studying in war conditions. Therefore, the purpose of the article is to compare the impact of online and offline learning formats during the war on the level of stress resistance of students and teachers in the sphere of physical culture and sports.

**Material and methods.** The theoretical basis of the article is the research of domestic and foreign specialists. The study was conducted on the basis of the Lutsk Pedagogical College. 112 students of the specialty 014 Secondary Education (Physical Culture), 017 Physical Culture and Sports and 16 teachers of the department of Physical Education participated in the experiment. In the research process, such methods were used as an experiment, questionnaires according to the PCL-5 method, BASIC Ph testing of the Mooli Lahad method, comparison, statistical analysis (correction, systematization, determination of St'yudenta t-criterion and Pearson's  $\chi^2$  test).

**Results.** The conducted experiment included a comparison of the influence of different formats – online and offline training for the manifestation of symptoms of post-traumatic stress disorder caused by military actions in participants educational process. The observations made it possible to diagnose a high level of manifestation in the participants of the experiment symptoms of post-traumatic stress disorder after the end of the second semester of the 2021/2022 academic year year, when training took place online in connection with the full-scale invasion of the Russian Federation, as well as significant reduction in post-traumatic stress disorder symptoms after the first semester of 2022/2023 academic year, in which learning took place offline. Reliably high expansion rates were recorded of all modalities of combating stress and a reliable increase in the success of students and improvement of rating points in teachers.

**Conclusions.** Positive changes in the psychological state and level of success of the participants were recorded of the educational process in the second semester can be related to the format and features of training in specialties 014 Secondary education (Physical Culture) and 017 Physical culture and sports.

**Key words:** educational process, stress level, symptoms of post-traumatic stress disorder, students, teachers.

## Анотація

**Вплив освітнього процесу на психологічний стан студентів та викладачів з фізичної культури і спорту під час війни**

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**Вступ і мета дослідження.** Актуальність розвідки зумовлена необхідністю пошуку максимально дієвих інструментів протидії проявів симптомів пост травматичного стресового розладу в українських студентів і викладачів у процесі навчання в умовах війни. Отже, мета статті – порівняти вплив форматів (онлайн і офлайн) навчання під час війни на психологічний стан (динаміку симптомів пост травматичного стресового розладу та індивідуальних моделей подолання стресу) студентів і викладачів.

**Матеріал і методи.** Теоретичною основою статті є дослідження вітчизняних та закордонних фахівців.





Дослідження проводилося на базі КЗВО «Луцький педагогічний коледж». В експерименті брали участь 112 студентів спеціальностей 014 Середня освіта (Фізична культура), 017 Фізична культура і спорт та 16 викладачів кафедри фізичної культури. У процесі дослідження використовувалися такі методи, як експеримент, анкетування за методикою PCL-5, тестування BASIC Ph методики Mooli Lahad, порівняння, статистичний аналіз (корекція, систематизація, визначення t-критерію Стьюдента та критерію  $\chi^2$  Пірсона).

**Результати.** Проведений експеримент передбачав порівняння впливу різних форматів – онлайн та офлайн навчання на прояв симптомів пост травматичного стресового розладу, викликаного військовими діями в учасників освітнього процесу. Спостереження дозволили діагностувати в учасників експерименту високий рівень прояву симптомів пост травматичного стресового розладу після завершення другого семестру 2021/2022 навчального року, коли навчання відбувалося онлайн у зв'язку з повномасштабним вторгненням російської федерації, а також достовірне зниження прояву симптомів пост травматичного стресового розладу після першого семестру 2022/2023 навчального року, навчання в якому відбувалось офлайн. Зафіксовано достовірно високі показники розширення всіх модальностей протидії стресу та достовірне підвищення успішності студентів і покращення балів рейтингу у викладачів.

**Висновки.** Таким чином, зафіксовані позитивні зміни психологічного стану і рівня успішності учасників освітнього процесу після першого семестру 2022/2023 навчального року можемо пов'язати з форматом і особливостями навчання на спеціальностях 014 Середня освіта (Фізична культура) та 017 Фізична культура і спорт.

**Ключові слова:** освітній процес, рівень стресу, симптоми пост травматичного стресового розладу, студенти, викладачі.

## Introduction

As a result of the full-scale invasion of Russia into Ukraine, the problem of prevention and correction of adaptation disorders has become particularly relevant for the citizens of our country. The risk group, sensitive to adaptive disorders of psychophysiological functioning, includes, in particular, student youth, whose stress resistance was previously tested by quarantine restrictions during the coronavirus pandemic. Therefore, as experience shows, studying under martial law deepened and complicated the issue of formation and development of stress resistance in students. Currently, the need for new research and, apparently, new conclusions regarding the problem of the influence of the latest stressful factors on the participants of the educational process and ways of solving it is obvious. Many domestic scientists drew attention to the new, sometimes catastrophic, difficulties of students' adaptation to education and contributed to the study of various aspects of this problem. In particular, N. Savelyuk emphasized the specificity of such a type of stress as stress in conditions/during war, stressing that children, teenagers and young people are especially vulnerable. According to the results of her research, at the beginning of the war in Ukraine, student youth experienced primarily intellectual stress, the most pronounced symptoms of which were attention disorders and obsessive negative thoughts [1].

Studying students' resistance to stress in the conditions of the military conflict between Russia and Ukraine, L. Potapyuk identified psychological factors that help students adapt to educational activities. She also emphasized that maintaining or increasing stress resistance is associated with the active use of psychological or adaptive resources. The researcher focused attention on the potential resources of the individual's stress resistance, in particular personal resources,

which are necessary for effective adaptation in crisis situations. At the same time, the scientist claims that in order to maintain and restore mental health and increase stress resistance, special teaching methods are needed at universities [2]. As if continuing the opinion of L. Potapyuk, specialists M. Tymbalyuk and N. Zhigailo proposed an author's program for the development of spiritual values, defining its structure as follows: 1. The concept of «spiritual personality». 2. The author's psychological structure of the spiritual personality. 3. The author's model of the spiritual formation of the personality of young people. 4. Training program for the development of spiritual values of the individual. 5. Criteria for the development of a person's spirituality. 6. Sources of formation of the spirituality of the individual [3]. The proposed program is based on the fact that the stress resistance of the individual is an important factor in self-realization and personalization of the individual, and the formation of psychological safety strategies is an important condition for the professional and personal development of the student. This determines the choice of effective ways to prevent, reduce and overcome the effects of external and internal environmental factors on a person. In this context, despite the pandemic and the war, Ukraine has not given up on the modernization of the higher education system. In view of the dynamic changes taking place in the world, it is indisputable to prepare a competitive specialist, whose important professional characteristic is, in fact, stress resistance, as well as a positive attitude towards activities, emotional stability, predictability of his personality development, etc. The program for the development of spiritual values, developed by Ukrainian scientists, is aimed at this.

At the same time, scientists are studying the problem of ensuring the psychological stability of students during the war. This aspect was analyzed by N. Zhihaylo, O. Sheviakov, I. Burlakova, N. Lozynskyy, R. Karpin-



ska, Y. Slavska, I. Ostapenko, O. Gerasimchuk. They described the psychological essence of stress resistance and psychological stability, and based on a survey, they analyzed the mental state of students of higher education institutions during the war. Scientists have tested various methods of increasing the level of psychological stability of students during studies in wartime conditions and provided practical recommendations for the formation of stress resistance and psychological stability of students during the war period [4].

O. Stolyarchuk established that the extreme conditions of life, which pose powerful threats to the mental and vital health of young people in wartime, provoke them to experience a crisis of loss of a sense of security. The specificity of this personal crisis is a close combination of the reaction to external challenges and activation of mental stressful experiences. The reasons for these experiences are defined as the loss of a sense of security, stability and orderliness, control and predictability of one's own life [5].

Studying the psychological features of students' adaptation to education in wartime conditions, K. Berезyak, O. Nakorchevska, O. Vasyliieva found that the extent of students' adaptation to education depends on certain features, such as phasing, duration, individuality and obligation [6].

At the same time, at one time I. Rusnak, T. Savrasova-Vyun, L. Zayats, O. Dotsenko, analyzing the impact of virtual educational space on stress resistance using the example of philology students, came to the conclusion that the level of stress resistance of future philologists under conditions of traditional learning is higher than the level of stress resistance of students in the conditions of excessive stay in the virtual educational space [7].

Therefore, domestic scientists have already made a significant contribution to research and solving psychological problems the condition of students in war conditions. However, the issue of the influence of the educational process on resistance is insufficiently studied stress during the war. The hypothesis was put forward regarding the influence of online and offline learning forms (formats) on the level of symptom manifestation post-traumatic stress disorder and individual strategies for coping with stress during training war.

**The purpose of the study** is to compare the influence of formats (online and offline) of training during the war on the psychological state (dynamics of symptoms of post-traumatic stress disorder and individual stress coping models) students and teachers.

## Material and Methods

### Participants

The study was conducted on the basis of the «Lutsk Pedagogical College» KZVO. The experiment involved 112 (64 boys and 48 girls) students of the second and third years of the specialty 014 Secondary Education (Physical Culture), 017 Physical Culture and Sports who

studied online and offline since the beginning of the full-scale invasion, as well as 16 (10 men and 6 women) teachers of the department of Physical Education.

### Procedure

The research used such methods as an experiment, a questionnaire using the PCL-5 method, BASIC Ph testing using the Mooli Lahad method, comparison, statistical analysis (correction, systematization, determination of Student's t-criterion and Pearson's  $\chi^2$  test).

At the beginning of the experiment, students and teachers were asked to complete a questionnaire the PCL-5 method [8] to determine possible symptoms of post-traumatic stress disorder, caused by the start of a full-scale invasion.

In order to establish individual strategies for coping with stress, we suggested taking the BASIC Ph test of the Mooli Lahad method [9]. The BASIC Ph effective model for overcoming stress is characterized by 6 channels. The first letter B stands for «belief & values». It is a reliance on faith. This is what can support a person in a moral aspect. «A» from «affect & emotion» is the expression of feelings and emotions. Because very often people close themselves and do not show what is happening to them. If you want to cry, cry, if you want to scream, scream. Release emotions, do not accumulate them in yourself. «S» – «social» – is the support of society. This feeling of being a part of the community, communicating with friends and colleagues, talking with them about problems and worries. «I» is from «imagination» – dreams and imagination. We imagine the future – what it will look like when everything is over. Think about the first thing you will do when the war is over and we are victorious. «C» stands for «cognition & thought» – logic and knowledge. You need to have a certain plan – how to act and what to rely on. Working on a schedule or having a schedule ready for the future is very important. «Ph» is physical activity (exercise, healthy diet, normal sleep, etc.) [9].

The tests were administered at the completion of the online studies of students majoring in 014 Secondary Education (Physical Education) and 017 Physical Culture and Sports, to which the college was transferred after the start of a full-scale invasion until the end of the semester. And for the second time, the students passed the tests after the end of the first semester of the 2022/2023 academic year (studying was part-time).

The level of success of the students was determined by the rating after the second semester (online learning) and after the first semester (offline learning) after the start of the full-scale invasion.

For teachers, rating points were determined in similar periods.

### Statistical analysis

Accumulation, correction, systematization of source information was carried out in Microsoft Office Excel 2023 spreadsheets. Statistical processing of the obtained material was carried out using the statistical



program STATISTICA 12.5 (StatSoft.Inc). Quantitative indicators were assessed for compliance with a normal distribution, using the Shapiro-Wilk test (for  $n < 50$ ) or the Kolmogorov-Smirnov test (for  $n > 50$ ), as well as indicators of asymmetry and kurtosis. The results are presented as mean value and standard deviation ( $M \pm \sigma$ ), number of variants ( $n$ ). Our data met the condition of normal distribution of quantitative variables, therefore, Student's t-test for independent samples was used to compare two groups. Student's t-test for dependent samples was used to compare indicators in dynamics. The association between indicators was assessed using the Pearson correlation analysis method. The results were considered statistically significant at  $p < 0.05$ .

## Results

Upon completion of online studies in the second semester of the 2021/2022 academic year, which began full-scale invasion of Russia, we, having conducted testing among students of specialties 014 Secondary education (Physical culture) and 017 Physical Culture and sport, determined the level of manifestations of post-traumatic symptoms stress disorder and strategies for overcoming them. Similar tests were conducted after the end of the first semester 2022/2023 academic years. The data obtained during the survey of teachers of the department of physical culture are shown in the

tables 1.

A high level of symptoms of post-traumatic stress disorder among teachers, recorded at in the first stage of the experiment  $27.56 \pm 5.64$ , the indicators recorded in the second stage  $17.63 \pm 7.47$  are significantly lower ( $P = 0.000$ ).

After a semester of offline training, we can see a reliable expansion of stress protection strategies, so the biggest changes are observed in the S strategy from  $13.81 \pm 4.85$  in the first stage to  $27.75 \pm 4.12$  in the second ( $P = 0.000$ ). There are also high changes in Ph of the stress coping strategy from  $17.75 \pm 5.53$  in the first stage to  $29.13 \pm 2.85$  in the second stage of the experiment ( $P = 0.000$ ). The only strategy that has not received a reliable expansion of use under the influence of the offline learning process is I (imagination, dreams, memories, creativity).

After the implementation of offline training in the educational institution, the indicators of the rating of teachers increased significantly from 566.25 to 734.4 ( $P = 0.010$ ).

Analyzing the gender specifics of strategies for combating stress, we see a significant difference in A (emotions, feelings). This strategy at the first stage was  $17.50 \pm 17.14$  units for men and  $27.33 \pm 1.63$  for women ( $P = 0.005$ ) and at the second stage it expanded to  $20.50 \pm 6.93$  for men and  $27.33 \pm 1.63$  for women only up to  $28.33 \pm 1.86$  ( $P = 0.018$ ).

**Table 1.** Characteristics of post-traumatic stress disorder symptoms, rating and countermeasures teachers' stress,  $n = 16$

Indexes	Teachers					
	all		men		women	
	before	after	before	after	before	after
The level of symptoms	27,56	17,6*	26,60	15,80*	29,17	20,67*
PTST						
B (beliefs, values)	22,81	25,6*	22,90	25,50*	22,67	25,67
A (emotions, feelings)	21,19	23,4*	17,50	20,50*#	27,33	28,33#
S (social connectins, belonging)	13,81	27,8*	12,70	26,50*	15,67	29,83*
I (imagination, dreams, memories, art)	24,25	25,2	22,60	23,60	27,00	27,83
C (mind, knowledge)	19,00	22,2*	19,80	23,70*	17,67	19,83
Ph (physical activity)	17,75	29,1*	18,70	29,70*	16,17	28,17*
Rating	566,25	734,4*	408,50	465,50*#	829,17	1182,50*#

**Note:** \* –  $P < 0,005$ , reliability of dynamics at the beginning and end of the experiment;

# –  $P < 0,005$ , reliability of indicators between men and women.

**Table 2.** Characteristics of students' stress resistance, success and methods of coping with stress,  $n = 112$

Indexes	Students					
	all		men		women	
	before	after	before	after	before	after
Stress	29,47	22,35*	29,03	22,14*	30,06	22,63*
B (beliefs, values)	21,12	25,96*	19,64	24,83*#	23,08	27,46*#
A (emotions, feelings)	20,18	25,11*	17,55	22,78*#	23,69	28,21*#
S (social connectins, belonging)	13,93	27,76*	15,08	27,80*#	12,40	27,71*
I (imagination, dreams, memories, art)	20,01	25,38*	17,97	23,45*#	22,73	27,94*#
C (mind, knowledge)	19,37	24,48*	21,55	26,31*#	16,46	22,04*#
Ph (physical activity)	16,82	27,91*	16,80	27,80*	16,85	28,06*
Academic performance	80,43	84,35*	78,70	83,02*#	82,73	86,13*#

**Note:** \* –  $P < 0,005$ , reliability of dynamics at the beginning and end of the experiment;

# –  $P < 0,005$ , reliability of indicators between men and women.





A gender feature is also recorded in the rating indicators. After the introduction of offline training at the second stage, the rating indicators for women increased significantly to 1182.50, compared to 465.50 for men ( $P=0.039$ ).

The results of the analysis of indicators among students are shown in Table 2. Among students, we have a significant decrease in stress indicators from  $29.47 \pm 5.47$  at the first stage of the experiment to  $22.35 \pm 4.46$  at the second stage ( $P=0.000$ ).

At the end of the online training, we have low indicators in S (social connections, belonging) of the strategy to combat stress  $13.93 \pm 4.89$  units and in Ph (physical activity) – here the indicator was  $16.82 \pm 4.62$  units. At the same time, the same strategies for combating stress underwent the greatest changes under the influence of offline learning, so S (social ties, belonging) increased to  $27.76 \pm 3.48$  units ( $P=0.000$ ) and Ph strategy indicators significantly increased to  $27.91 \pm 3.44$  ( $P=0.000$ ).

Academic performance also significantly increased under the influence of offline learning from  $80.43 \pm 8.43$  to  $84.35 \pm 7.77$  points ( $P=0.000$ ).

Analyzing the gender features of the transition to offline learning, it is worth noting that the C (mind, knowledge) indicators of stress protection strategies in men at the first stage are  $21.55 \pm 5.35$ , compared to  $16.46 \pm 4.55$  in women ( $P=0.000$ ), and at the second stage  $26.31 \pm 3.92$  men against  $22.04 \pm 3.86$  women ( $P=0.000$ ).

No significant gender differences were found in the stress coping strategies S (social ties, belonging) and Ph (physical activity).

What is interesting is the significantly lower rates of post-traumatic stress disorder symptoms  $17.6 \pm 7.47$  of teachers were recorded at the second stage of the experiment, compared to  $22.35 \pm 4.46$  of students ( $P=0.000$ ) after a semester of offline study. A significant difference in the indicators of the manifestations of post-traumatic symptoms of stress disorder between students and teachers at the first stage of the experiment (upon completion online training) was not detected.

## Discussion

Analysis of the results of the test for stress disorder indicates significantly lower rates of symptom manifestations post-traumatic stress disorder from the use of offline learning: in teachers after an online semester study this indicator was  $27.56 \pm 5.64$ , after a semester of offline study –  $17.63 \pm 7.47$ ; students have an indicator decreased from  $29.47 \pm 5.47$  to  $22.35 \pm 4.46$ . In this regard, there is a need to analyze changes in strategy in more detail counteracting stress under the influence of various training formats.

The low indicators at the first stage of the experiment in such stress coping strategies as S (social ties, affiliation)  $13.93 \pm 4.89$  and Ph (physical activity)  $16.82 \pm 4.62$  are similar to the results obtained by B.

Ogorenko, A. Nikolenko, T. Shusterman, V. Kokashinsky: S –  $15.42 \pm 6.70$  and Ph –  $16.52 \pm 6.37$  [10], as well as O. Bukovska, O. Girchenko, O. Naumenko ( $17.91 \pm 6.52$ ) [11].

The high indicators of strategy C (mind, knowledge) –  $24.48 \pm 4.42$ , demonstrated at the second stage of the experiment, are similar to those obtained by O. Bukovska, O. Girchenko, O. Naumenko  $23.22 \pm 6.76$  [11].

Relatively high indicators of strategy B (beliefs, values) obtained at the first stage of the experiment,  $21.12 \pm 6.76$ , may indicate the importance of this modality for combating stressful situations, which was consistently proven in the work of M. Tsymbalyuk, N. Zhigailo [3].

The results of the comparison of the gender characteristics of male students' strategies for combating stress are similar to the results regarding the high indicators of modality C (mind, cognition) in the work of V. Ogorenko, A. Nikolenko, T. Shusterman, V. Kokashinsky –  $24.16 \pm 7.78$  [10]. At the same time, our results for girls are lower:  $16.46 \pm 4.55$  compared to  $26 \pm 7.80$ .

We recorded a reliable expansion of all modalities ( $P<0.005$ ). The reasons for the significant expansion of almost all strategies to combat stress in the second stage of the experiment, in our opinion, was the influence of offline learning, introduced in the first semester of the 2022/2023 academic year. Based on the results of our research, we share the opinion of B. Lazarevic and D. Bentz [12], A. M. Ruba [13] that distance learning has a negative effect on the psychological state of students.

We consider it an urgent need to use all possible means to expand all modalities of combating stress. Incidentally, we note that the larger the set of tools used by a participant in the full-time educational process, the more constructive and effective the process of overcoming stress and any crisis will be, which, in particular, is also indicated by N. Zhihaylo, O. Sheviakov, I. Burlakova, N. Lozynskyy, R. Karpinska, Y. Slavska, I. Ostapenko, O. Gerasimchuk [4]. In our work, significantly lower success rates were recorded during the online study period compared to the offline semester ( $P<0.005$ ), which coincides with the results obtained by R.M. Oducado, E. Homelo [14].

## Conclusion

Thus, in the second semester of the 2021/2022 academic year, when learning took place online in connection with full-scale invasion of the Russian Federation, participants in the educational process generally had a high level of PTSD symptoms. After the first semester of the 2022/2023 academic year, when learning took place offline, research showed a significant reduction in the level of PTSD symptoms. At the same time, reliably high indicators were recorded expansion of all modalities of stress resistance. It is also obvious that there is a significant increase in the success rate of students and improvement of teacher rating points.



So, we can rightly note that training in an off-line format on specialties 014 Secondary Education (Physical Culture) and 017 Physical Culture and Sports is one of the stabilizing factors in modern Ukrainian realities. We can assume that such studies are about students and teachers other specialties would have different conclusions and results.

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## Supplementary Information

### Article details

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### Conflict of interest

The authors declare that there is no conflict of interest.

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