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Comprehensive assessment of the long-term stressful event impacts on the mental health of medical students

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of the article

The aim of the study was to examine the impact of long-term exposure to stressful events (the COVID-19 pandemic and prolonged martial law) on the mental health of medical students.

Material and methods. The study was conducted among 4th–5th-year education applicants at Dnipro State Medical University (DSMU), specialty 222 "Medicine". Group 1 consisted of 67 students examined in 2019, and Group 2 comprised 61 students examined in 2024. Clinical-anamnestic, clinical-psychopathological and psychodiagnostic examinations were conducted. The following psychometric scales were used: PHQ-9 health questionnaire, Dutch Eating Behavior Questionnaire (DEBQ), State-Trait Anxiety Inventory (STAI; C. D. Spielberger, Y. L. Hanin), Michigan Alcoholism Screening Test (MAST), Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q).

Results. The data obtained have shown a statistically significant difference in alcohol screening indicators between the two groups of examinees. According to the questionnaire, students surveyed in 2024 have reported consuming less alcohol. In general, the findings from both groups have revealed normal weight, restrained and emotional eating behavior (EB) traits, absence of alcoholism, and a moderate level of the quality of life index (QOL). However, mild depression, a tendency towards externalizing EB, and a moderate level of trait anxiety have been found among the examinees. The statistical analysis results have shown a weak effect of high trait anxiety (0.135) on the development of clinically significant depression. An analysis of relative risks and odds ratios has found increased relative risks and odds ratios for poor QOL indices and clinically significant depression among individuals examined in 2024 based on a several-fold increase in these values for the indicator "High trait anxiety".

Conclusions. Our study has demonstrated an increased strength of associations between factors (emotional eating, high trait anxiety) that influenced the onset of clinically significant depression and an increase in relative risks and odds ratios of its development among the students surveyed in 2024. A small effect of long-term stressful events (the COVID-19 pandemic and prolonged martial law) on the factors of clinically significant depression has been found. In such extreme conditions, medical students of DSMU have demonstrated a high level of stress resilience in the conditions of long-term exposure to extreme stressful events, which was confirmed by our study results revealing no significant deterioration in the mental health and quality of life in 2024 student sample compared to 2019 one.

Keywords: mental health, stress, anxiety, depression, eating behavior, medical students.

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Комплексне оцінювання впливу пролонгованих стресових подій на психічний стан студентів-медиків

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Мета роботи – вивчення впливу пролонгованих стресових подій (пандемія COVID-19 і тривалий воєнний стан) на психічний стан студентів-медиків.

Матеріали і методи. Дослідження здійснили за участю здобувачів освіти 4–5 курсів Дніпровського державного медичного університету (ДДМУ) за спеціальністю 222 «Медицина». До першої групи залучили 67 студентів, обстежених у 2019 році, до другої – 61 студента, яких обстежили в 2024 році. Здійснили клініко-анамнестичне, клініко-психопатологічне та психодіагностичне дослідження. Використали психометричні шкали: анкету про стан здоров'я PHQ-9, голландський опитувальник харчової поведінки (DEBQ), тест «Дослідження тривожності» (опитувальник Спілбергера), Мічиганський скринінговий тест на алкоголь (MAST), опитувальник для оцінювання якості життя (Q-LES-Q).

Результати. Між двома групами обстежених встановили статистично значущі відмінності за показниками алкогольного скринінгу. Студенти, опитані в 2024 році, повідомили, що вживали менше алкоголю. Загалом, отримані дані в обох групах свідчили про нормальну вагу, обмежувальну й емоціогенну направленість харчової поведінки, відсутність алкоголізму та середній рівень якості життя. Однак в обстежених діагностували депресію легкого рівня, виявили схильність до екстернальної направленості харчової поведінки та особистісну тривожність помірного рівня. Результати статистичного аналізу свідчили про слабкий ефект факторів впливу високої особистісної тривожності (0,135) на розвиток клінічно значущої депресії. У результаті аналізу відносних ризиків і шансів встановлено, що в пацієнтів, обстежених у 2024 році, визначено підвищення відносних ризиків і шансів щодо низької якості життя та клінічно значущої депресії. Так, показник «Висока особистісна тривожність» у них свідчив про збільшення відносних ризиків і шансів у кілька разів.

Висновки. Виявили збільшення сили зв'язків між факторами (емоційне харчування, висока особиста тривожність), що впливали на виникнення клінічно значущої депресії, зростання відносних ризиків та шансів розвитку клінічно значущої депресії в обстежених у 2024 році. Визначили слабкий ефект пролонгованих стресових (пандемія COVID-19 і тривалий воєнний стан) подій на фактори виникнення клінічно значущої депресії. У студентів-медиків ДДМУ виявили високий рівень

Ключові слова: психічне здоров'я, стрес, тривога, депресія, харчова поведінка, студенти-медики.

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стресостійкості в умовах пролонгованої дії надзвичайних стресових подій. Це підтверджено результатами дослідження, що здійснили, – не виявлено суттєвого погіршення ментального стану та якості життя студентів у вибірці 2024 року порівняно з вибіркою 2019 року.

The World Health Organization (WHO) highlights that between January 2020 and April 2022, at least one in four healthcare professionals experienced symptoms of anxiety, depression, or exhaustion. These elevated stress levels and widespread burnout among medical staff reflect ongoing challenges within healthcare systems. Such reactions are a natural consequence of workforce shortages, insufficient payment, unsafe and suboptimal or high-stress working environments, and the absence of essential workplace protections [1].

The majority of individuals affected by emergencies experience stress, which may manifest as anxiety, sadness, hopelessness, sleep disturbances, fatigue, irritability, anger, pain, or changes in eating habits. These reactions are considered normal, and for most people, such symptoms gradually resolve on their own without requiring intervention. However, during humanitarian crises, the prevalence of mental disorders, such as depression and anxiety, is expected to more than double, and the quality of life (QOL) index is projected to decrease [2,3].

The burden of mental disorders among the conflict-affected population is extremely high: WHO's review of 129 studies in 39 countries has found that among people experienced war or other conflict in the past 10 years, 1 in 5 people (22 %) will have depression, anxiety, post-traumatic stress disorder, bipolar disorder, or schizophrenia. In crisis situations, depression and anxiety increase with age. Depression is more common in women than in men [2,3].

Since the population of our country is affected by long-term stressful events, such as the COVID-19 pandemic and prolonged martial law, healthcare professionals are the most vulnerable group in society, bearing a particular burden of difficult time. Medical students are a separate group at risk, experiencing significant stress while studying and working in the current uncertain environments.

Aim

The aim of the study was to examine the impact of long-term exposure to stressful events (the COVID-19 pandemic and prolonged martial law) on the mental health of medical students.

Materials and methods

The study was conducted among 4th–5th-year education applicants at Dnipro State Medical University (DSMU), specialty 222 "Medicine". Group 1 consisted of 67 students examined in 2019, and Group 2 comprised 61 students examined in 2024. Students surveyed in 2019 were not exposed to prolonged stressful events, such as the COVID-19 pandemic and military actions on the territory of Ukraine (which had lasted for two years by the time of surveying Group 2 students). This served as the rationale for comparing them with students surveyed in 2024, who had experienced the impact of these factors.

All respondents gave their personal written informed consent to participate in the study. The study was conducted with strict adherence to the principles of bioethics, in accordance with the Ethical Principles for Medical Research Involving Human Subjects contained in the Declaration of Helsinki, developed by the World Medical Association; the UNESCO's Universal Declaration on Bioethics and Human Rights [4,5].

Clinical-anamnestic, clinical-psychopathological and psychodiagnostic examinations were conducted. The following psychometric scales were used: PHQ-9 health questionnaire [6], Dutch Eating Behavior Questionnaire (DEBQ) [7], State-Trait Anxiety Inventory (STAI; C. D. Spielberger, Y. L. Hanin) [8], Michigan Alcoholism Screening Test (MAST) [9], Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q) [10].

The PHQ-9 is a nine-item questionnaire designed to assess depressive symptoms over the past two weeks, with each item scored on a scale from 0 to 3. The total score ranges from 0 to 27, where scores of 0–4 indicate no depressive symptoms, 5–9 – mild depression, 10–14 – moderate depression, 15–19 – moderately-severe depression, and 20 or higher – severe depression.

The DEBQ is a questionnaire that assesses eating behaviors by three categories: restrictive eating behaviors (questions 1–10), emotional eating behaviors (questions 11–23), and external eating behaviors (questions 24–33). Each question is scored on a scale from 1 to 5, and an average score is calculated for each subscale. The normative scores for restrictive eating behavior are 2.4 points; for emotional eating behavior – 1.8 points; and for external eating behavior – 2.7 points. If a score exceeds these normative values in any category, the corresponding type of eating disorder can be diagnosed.

The STAI questionnaire assesses levels of both trait and state anxiety. In our study, we focused on measuring the level of trait anxiety. Based on their scores, participants were classified as having low anxiety (0 to 30 points), moderate (31 to 45 points) and high anxiety (above 45 points).

MAST is a test used to evaluate the presence of problems related to alcohol use. Total scores ranging from 0 to 4 points indicate non-dependence, 5 to 7 points suggest probable alcohol dependence; and more than 7 points indicate alcoholism.

Q-LES-Q is a questionnaire that assesses life satisfaction and QOL across various domains. The questionnaire consists of 36 questions related to satisfaction in the following categories of private life: work, personal achievements, health, family relationships, support (both internal and external – social), optimism, tension (physical or psychological discomfort), self-control, and negative emotions (mood). Each statement is scored on a 10-point assessment scale, with normative scores ranging from 4 to 10 points indicating very poor QOL; 11 to 20 points – poor QOL; 21 to 29 points – medium QOL; and 30 to 40 points – high QOL.

To classify patients' weight and determine the degree of obesity, body mass index (BMI) was calculated using the formula: BMI = body weight (kg) / height (m^2). BMI <18.5 – underweight, 18.5–24.9 – normal weight, 25.0–29.9 – overweight, 30.0–34.9 – obesity class I, 35.0–39.9 – obesity class II, ≥40.0 – obesity class III [11].

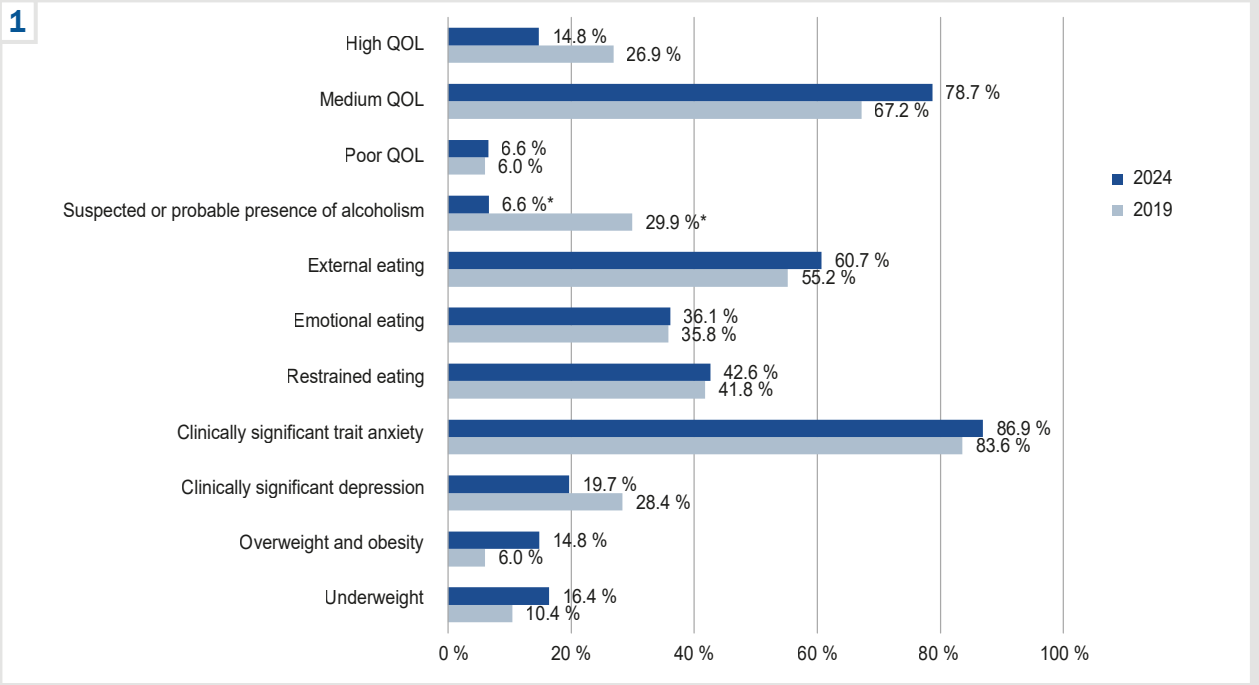

Fig. 1. The prevalence of key indicators and conditions in the sample. *: p < 0.05, the chi-square test.

The data were processed using Statistica 6.1 software (StatSoft Inc., serial number AGAR909E415822FA) and MedCalc Statistical Software, trial version 23.0.2 (MedCalc Software Ltd, Ostend, Belgium; https://www.medcalc.org; 2024). Variables with a normal distribution were presented using parametric statistical methods (arithmetic mean and standard deviation (M (SD)) and compared between groups via Student's t-test. Non-normally distributed indicators were presented using nonparametric statistical methods (median and 1–3 quartiles – Me [Q1; Q3]) and compared between groups by the Mann–Whitney test. Given the presence of quantitative data with a non-normal distribution, the correlation analysis of indicators was conducted using the non-parametric Spearman correlation coefficient. In this case, the value of the correlation coefficient showed: r = 0.0–0.3 – very weak correlation; r = 0.3–0.5 – weak correlation; r = 0.5–0.7 – moderate correlation; r = 0.7–0.9 – strong correlation; r = 0.9–1.0 – very strong correlation [12]. The group homogeneity in terms of qualitative characteristics was tested by the chi-square test [13]. A simple logistic regression analysis was done to determine the odds ratio (OR) with a 95 % confidence interval (CI). The effect size was calculated using Cohen's Q, and the difference between the two correlations was interpreted according to the following categories: <0.1 – no effect; from 0.1 to 0.3 – small effect; from 0.3 to 0.5 – medium effect; >0.5 – large effect [14]. Differences were considered significant if a p-value was <0.05.

Results

The study results, in the form of the main mean indicators from the questionnaires in the studied groups, are presented in *Table 1*.

A statistically significant age difference has been found between the two groups, but the actual age divergence was insignificant, the subjects were of the same age category, that did not affect the study results.

Table 1. General characteristics of the sample

Parameter	Year 2019, n = 67	Year 2024, n = 61	p
Males	17	15	0.92*
Females	50	46	0.92*
Age	22.0 [21.0; 22.0]	20.0 [20.0; 21.0]	<0.01**
BMI	20.7 [19.5; 22.2]	21.1 [19.1; 23.3]	0.52**
PHQ-9	7.0 [4.0; 10.0]	6.0 [4.0; 9.0]	0.71**
Restrained eating	2.2 [1.4; 3.1]	2.0 [1.2; 2.9]	0.47**
Emotional eating	1.6 [1.2; 2.4]	1.5 [1.2; 2.2]	0.72**
External eating	2.9 (0.7)	3.0 (0.8)	0.42***
Trait anxiety	44.1 (13.1)	43.8 (11.7)	0.89***
Alcohol screening	3.0 [2.0; 5.0]	0.0 [0.0; 2.0]	<0.01**
QOL	26.8 (4.9)	26.0 (3.8)	0.28***

*: chi-square test; **: Mann–Whitney test; ***: Student's t-test – p < 0.05, statistically significant indicator.

The data obtained have shown a statistically significant difference in the indicators of alcohol screening between the two groups of examinees. According to the questionnaire, students surveyed in 2024 reported consuming less alcohol.

In general, the findings obtained from both groups have indicated normal weight, restrained and emotional eating behavior (EB), absence of alcoholism, and a medium level of QOL. However, a low level of depression, a tendency towards externalizing EB, and a moderate level of trait anxiety have been revealed among the examinees. No statistically significant difference has been observed between the two groups for the listed indicators.

The estimated prevalence of key parameters and conditions in both samples is presented in *Fig. 1*.

As a result, a statistically significantly higher prevalence of suspected or probable alcohol dependence has been found in 2019.

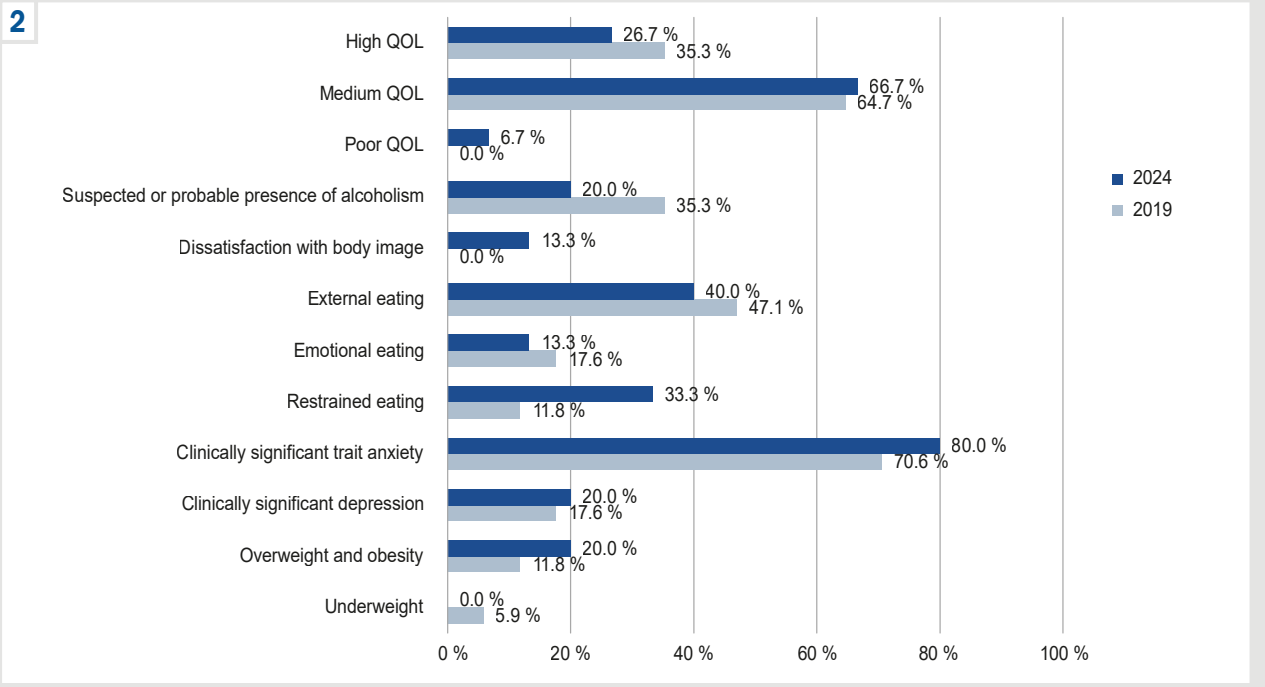

Fig. 2. The prevalence of key indicators and conditions among men. *: p < 0.05, the chi-square test.

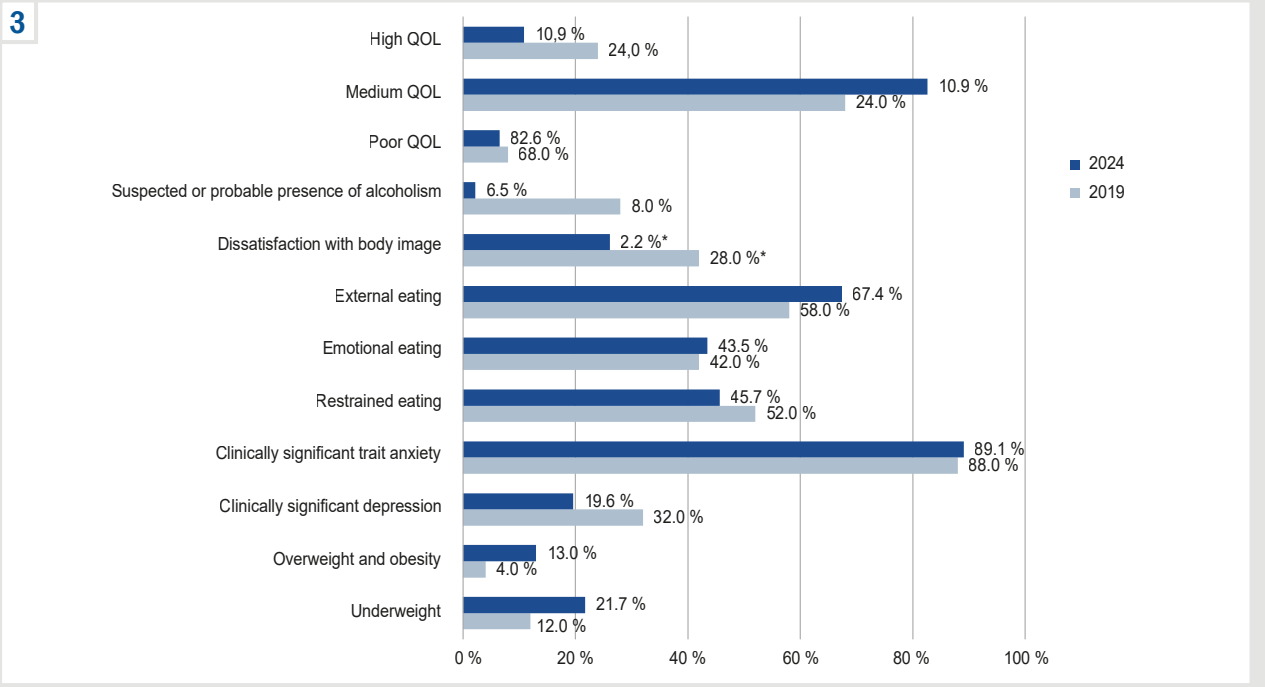

Fig. 3. The prevalence of key indicators and conditions among women. *: p < 0.05, the chi-square test.

Data of participants within each group and between the two groups have been analyzed and compared by gender. The results are presented in *Table 2*.

In the 2019 group, when comparing indicators by gender, a statistically significant difference has been found in the indicators of restrained eating and trait anxiety. Thus, women have demonstrated a tendency to restrained eating and a high level of trait anxiety, while men have shown a moderate level of trait anxiety.

When analyzing the data between the two groups, a statistically significant difference has been revealed in the level of depression among women. Thus, the value was equal to mild depression in both groups, but with a slightly lower level in women surveyed in 2024. A statistically significant difference has also been found in the level of trait anxiety in men and women between the two groups. Women examined in 2019 have shown a high level of trait anxiety, while those examined in 2024 have shown a

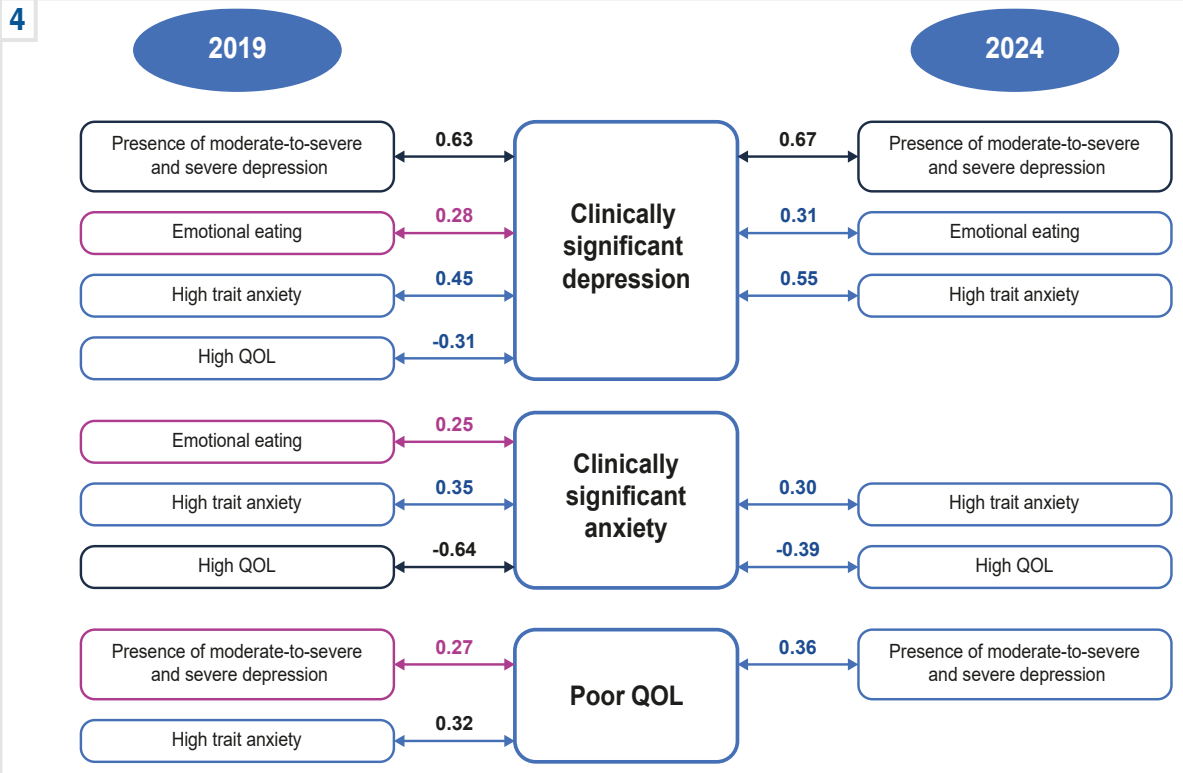

Fig. 4. Analysis of associations and correlations in both groups.

r = 0.0–0.3 – very weak correlation; r = 0.3–0.5 – weak correlation; r = 0.5–0.7– moderate correlation

Table 2. Comparison of indicators within and between groups by gender

Parameter	Year 2019			Year 2024		
	Men, n = 17	Women, n = 50	p	Men, n = 15	Women, n = 46	p
BMI	20.9 [20.2; 24.0]	20.7 [19.4; 21.9]	0.14	22.8 [20.7; 24.7]	20.6 [18.9; 22.1]	<0.05
PHQ-9	5.0 [3.0; 7.0]	7.0 [4.0; 10.0]*	0.09	5.0 [4.0; 9.0]	6.0 [4.0; 9.0]*	0.53
Restrained eating	1.1 [1.0; 1.5]	2.6 [2.1; 3.4]	<0.01	1.5 [1.2; 2.6]	2.2 [1.2; 3.1]	0.36
Emotional eating	1.5 [1.2; 1.8]	1.8 [1.2; 2.5]	0.07	1.3 [1.0; 1.6]	1.6 [1.3; 2.5]	<0.05
External eating	2.7 [2.3; 3.3]	2.9 [2.4; 3.3]	0.72	2.6 [2.3; 3.8]	3.2 [2.6; 3.6]	0.33
Trait anxiety	39.0 [29.0; 41.0]*	45.5 [36.0; 58.0]*	<0.01	41.0 [32.0; 51.0]*	42.5 [36.0; 52.0]*	0.31
Alcohol screening	3.0 [2.0; 6.0]	3.0 [2.0; 5.0]	0.45	1.0 [0.0; 3.0]	0.0 [0.0; 2.0]	0.98
QOL	27.6 [25.3; 31.0]	25.6 [22.7; 29.7]	0.06	26.1 [22.4; 30.3]	26.4 [24.0; 28.6]	<0.05

*: statistically significant difference in indicators between groups (Mann–Whitney test, $p < 0.05$).

moderate level of trait anxiety. Scores for males were not quite the same, as men in both groups have demonstrated a moderate level of trait anxiety, however, with a higher rate in 2024.

The prevalence of pathological conditions by gender in 2019 and 2024 is shown in *Fig. 2* and *3*.

As a result, a statistically significantly higher prevalence of poor QOL and restrictive eating has been detected in 2024 among men. A statistically significantly higher prevalence of suspected or probable alcohol dependence among women has therefore been found in 2019.

We have analyzed associations and correlations between clinically significant levels of depression and anxiety, poor QOL, and other parameters, and compared these values between the two groups. The results obtained are presented in *Fig. 4*.

Thus, we have noticed an increased strength of correlations, and, accordingly, the impact on the clinically significant depression levels, moderate-to-severe and severe depression, emotional EB, high trait anxiety, as well as the absence of statistically significant inverse correlations with high QOL in 2024.

When analyzing associations between the indicators and clinically significant levels of anxiety, very weak direct correlations between emotional eating in 2019 group and their absence in 2024 group have been identified. In both groups, weak direct correlations with high trait anxiety have been observed. A significant difference in the impact of high QOL levels was also noticeable, since a moderate inverse correlation has been shown in 2019, whereas a weak one in 2024.

When examining associations with poor QOL, very weak direct correlations with moderate-to-severe and

Table 3. Comparative analysis of relative risks and odds between the two groups

Factor	2019		2024	
	RR	CI	RR	CI
Relative risk of poor QOL				
Presence of moderate-to-severe and severe depression	6.44*	1.03–40.17	9.17*	1.56–53.79
Relative risk of clinically significant depression				
Emotional eating	2.46*	1.15–5.28	3.55*	1.20–10.45
High trait anxiety	4.42**	1.80–10.81	18.17**	2.51–131.71
Relative risk of clinically significant anxiety				
Poor QOL	1.21**	1.08–1.36	1.16**	1.05–1.29
Normal QOL	0.83**	0.74–0.92	0.86**	0.77–0.95
Presence of clinically significant depression	1.29**	1.11–1.51	1.19**	1.06–1.35
Presence of moderate-to-severe and severe depression	1.23**	1.09–1.39	1.17**	1.05–1.31
Relative odds of clinically significant depression				
Factor	OR	CI	OR	CI
Emotional eating	3.70*	1.22–11.25	5.00*	1.29–19.30
High trait anxiety	8.40**	2.49–28.23	33.92**	3.96–290.65
Relative odds of clinically significant anxiety				
High QOL	0.02**	0.00–0.14	0.10**	0.01–0.55

RR: relative risk; **OR:** odds ratio; **CI:** confidence interval; ***:** $p < 0.05$; ****:** $p < 0.01$.

severe depression and weak correlations with high trait anxiety have been found in 2019. In 2024 group, only weak direct correlations have been revealed with the presence of moderate-to-severe and severe depression.

At the same time, no statistically significant difference has been found between the correlation values.

Taking into account some of the intergroup differences between indicators based on the correlation analysis, the next step was to calculate the Cohen's effect size for the impact of long-term stressful events in 2020–2024, namely the most significant factors (according to the study authors), the COVID-19 pandemic and military operations in Ukraine.

The calculated results of students surveyed in 2024 have shown a weak effect of high trait anxiety (0.135) on the development of clinically significant depression and a medium-sized effect (0.352) of high QOL on the development of clinically significant anxiety.

We have analyzed the relative risks and odds of clinically significant depression and anxiety, as well as poor QOL. The results are presented in *Table 3*.

Subsequent to the result analysis of relative risks and odds, a significant increase in indicators of poor QOL and clinically significant depression has been found among individuals examined in 2024, with relative risks and odds increased severalfold for some indicators. These data coincide with those obtained from the calculation of correlations, where a difference in the strength of associations between the factors and poor QOL index and clinically significant depression was observed. At the same time, when calculating the relative risks and odds of clinically significant anxiety, no significant difference has been identified between the two groups, although examined in 2019 students have shown slightly higher results.

Discussion

Living during the COVID-19 pandemic and a war environment under constant threat to life are extremely stressful events that affect the entire population of Ukraine, including medical students. At the same time, studying at a medical school is in itself a strong stressor, which can cause increased levels of anxiety, stress, and depression, as has been seen in the group of students surveyed in 2019, prior to the influence of prolonged stressors such as the COVID-19 pandemic and the prolonged martial law.

Overall, the study has not revealed significant differences or worsened indicators among 2024 group respondents as compared to those surveyed in 2019. The students have demonstrated mild levels of depression, moderate levels of trait anxiety, average quality of life, no evidence of alcoholism, or a tendency towards external EB. Conversely, the increased strength of correlations between clinically significant depression and other factors, as well as the considerably higher relative risks and odds ratios for clinically significant depression development have been observed in 2024 group.

In a survey collected information from 350 Syrian 2nd–6th-year students, the prevalence of depression was 60.6 % and anxiety – 35.1 %, whereas our examinations of 2024 group have shown figures 19.7 % and 86.9 %, respectively. At the same time, a data analysis from the Syrian student survey has found no evidence of a significant association between the war impact and students' mental health [15]. Our study has demonstrated effects of prolonged stressful events from 2020 to 2024 (the COVID-19 pandemic and military actions in Ukraine), including a weak effect of high trait anxiety influence on the development of clinically significant depression and a medium effect of high QOL influence on the development of clinically significant anxiety. However, no statistically significant differences have been found between 2019 and 2024 samples regarding the quantitative indicators of depression and anxiety as well as their prevalence. In terms of quantitative indicators of anxiety, a statistically significant increase has been observed in men in 2024 compared to 2019 along with a statistically significant decrease in anxiety levels in women in 2024. Besides, statistically significantly higher anxiety levels have been seen amongst women as compared to men in 2019.

A systematic review in November 2022 on the impact of the COVID-19 pandemic and the war in Ukraine on stress and anxiety among students has reported a prevalence of anxiety ranging from 13.63 % to 88.9 % and the gender influence on these indicators, while our study in 2024 has shown the trait anxiety level of 86.9 %, but without statistically significant gender-based differences [16].

In a study on emotional eating among 575 Israeli college students with a mean age of 27.82 (8.87) years during the war, an average BMI was 24.4 (5.12) kg/m^2, 8 % were underweight, 36 % were overweight or obese, and 37 % demonstrated emotional EB [17]. The participants of our study were younger (20.0 [20.0; 21.0]) with a lower BMI (21.1 [19.1; 23.3] kg/m^2), more examinees (16.4 %) were underweight, with a lower prevalence of overweight and obesity (14.8 %) in 2024. Emotional EB has been detected in 36.1 %, which was somewhat more frequent than in 2019 – 35.8 %, but without statistically significant differences, being comparable to the Israeli study [17].

An online survey distributed to 2,280 medical students from 148 medical schools in Brazil, Chile, Colombia, Germany, Italy, Japan, Mexico, Spain, and Venezuela from June 22 to July 24, 2020, since the onset of the COVID-19 pandemic, has shown worsened students' mental and physical health,

but our study has not reported significant deteriorations in the mental state of medical students, given the severe war stress, although there has been some decrease in QOL, although without statistical significance [18].

A study on mental health of French students during the COVID-19 pandemic has reported depression rates of 43 % and anxiety rates of 39.19 %, but the study was conducted only for 4 days during the pandemic and the findings could indicate a high prevalence of these symptoms in this sample even without the pandemic stressor influence [19]. Similar results have been obtained from a survey of 947 students in China in February – March 2023, where the prevalence of anxiety and depression was 37.8 % and 39.3 %, respectively [20]. A meta-analysis of the prevalence of mental health problems among nurses during the pandemic and a study including students at Heidelberg University have also demonstrated analogous results [21,22]. In our study in 2024, the prevalence of clinically significant depression was 19.7 % and anxiety 86.9 %.

In general, the students surveyed in our study have not shown significant differences in mental health levels between 2019 and 2024, the time of the pandemic and the war stress, even improvements in some indicators (alcohol screening) have been seen. At the same time, greater statistical scrutiny has revealed the increased strength of positive correlations and relative risks and odds for the occurrence of clinically significant depression, as well as further calculation has revealed a weak effect of stressful events on the factors of clinically significant depression. That is, medical students have demonstrated a fairly high level of distress tolerance and the use of adaptive stress-coping strategies. For example, examinations of medical students' resilience conducted at the Department of Psychiatry, Narcology and Medical Psychology of DSMU have demonstrated that they used a multifaceted model of stress coping with a predominance of cognitive strategies, indicating a resource-oriented way of overcoming crisis situations and high resilience [23,24,25].

Conclusions

1. Our study has demonstrated an increased strength of associations between factors (emotional eating, high trait anxiety) that influenced the onset of clinically significant depression and an increase in the relative risks and odds ratios of its development among the students surveyed in 2024.

2. Effects of long-term stressful events from 2020 to 2024 (the COVID-19 pandemic and military actions in Ukraine) have been found, including a small effect of high trait anxiety on the development of clinically significant depression.

3. In such extreme conditions, medical students of DSMU have demonstrated a high level of stress resilience in the conditions of long-term exposure to extreme stressful events, which was confirmed by our study results revealing no significant deterioration in the mental health and quality of life in 2024 student sample compared to 2019 one.

Prospects for further research. The study on the impact of prolonged stressful events on medical students' mental health is crucial for the development and implementation of prevention programs aimed at enhancing the resilience of aspiring physicians.

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