



# Wiadomości Lekarskie

Official journal of the Polish Medical Association



Memory of  
dr Władysław  
Biegański

VOLUME LXXV, ISSUE 11 PART 1, NOVEMBER 2022

Since 1928

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ALUNA Publishing House

Wiadomości Lekarskie is abstracted and indexed in: PUBMED/MEDLINE, SCOPUS, EMBASE, INDEX COPERNICUS,  
POLISH MINISTRY OF EDUCATION AND SCIENCE, POLISH MEDICAL BIBLIOGRAPHY

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**Publisher:**

ALUNA Publishing House  
ul. Przesmyckiego 29,  
05-510 Konstancin – Jeziorna  
www.wydawnictwo-aluna.pl  
www.wiadomoscilekarskie.pl  
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## ORIGINAL ARTICLE

# STUDY OF NEUROTICISM AND EXTRAVERSION AS PREDICTORS OF THE SYNDROME OF EMOTIONAL BURNOUT (EBS) IN STUDENTS

DOI: 10.36740/WLek202211113

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## ABSTRACT

**The aim:** To investigate internal factors – neuroticism and extroversion, which can be predictors of emotional burnout syndrome and their prevalence among student youth.

**Materials and methods:** Used a complex of methods: theoretical – theoretical analysis, synthesis, systematization; sociological method of questioning; empirical: observation, testing-Eysenck's methods for assessing the impact of neuroticism and externality; statistical. The object of the research is the process of influence of personal characteristics (individual factors) on the development and spread of EBS among students. Subject – personal characteristics (individual factors) of students – extraversion and neuroticism. The number of respondents was 610 students.

**Results:** A study of the personal characteristics of neuroticism and extraversion, which can be predictors in the genesis of EBS, was conducted. It has been established that several negative internal factors influence students. The significant prevalence of internal risk factors of EBS indicates the need for a comprehensive approach to its prevention and the need for the development and application of modern adequate methods, forms, and methods of prevention.

**Conclusions:** The presence and influence of internal factors on the development of EBS have been theoretically proven. It has been established that there is a significant propagation of personal characteristics that may have signs of negative internal factors. The need for preventive measures for the development of EBS among students has been revealed.

**KEY WORDS:** emotional burnout syndrome (EBS), internal factors, neuroticism, extraversion, introversion

Wiad Lek. 2022;75(11 p1):2624-2630

## INTRODUCTION

Burnout syndrome is a medical problem worldwide. It is based on mental and behavioral changes [1,2]. This problem is characterized by significant destructive consequences both for family and professional relationships and for society as a whole. EBS is widespread in the society of various countries. Thus, the syndrome is noted in up to 40% of patients working in the public sector of Canada and the USA. The percentage of diseases among doctors, nurses, and teachers varies between 51-57%.

Based on the multifactorial theory of the disease [3, 4], three components are inherent in EBS: emotional exhaustion, depersonalization, and reduction of personal achievements. With emotional exhaustion, patients experience emotional tension and overstrain, indicating a feeling of exhaustion of their resources, which is followed by a feeling of emptiness. As a result, all emotions are muted and lose their brightness. Depersonalization is characterized by a callous attitude towards acquaintances, relatives, partners,

clients, and patients. A person affected by EBS shows a lack of empathy and formal and impersonal communication [5, 6, 7]. The reduction of personal achievements is characterized by the devaluation of personal activity and dissatisfaction with one's activities and successes. As a result, patients complain of a sense of meaninglessness in life and apathy [8, 9].

It is known that EBS depends on the activity (education, work) of a person. At the same time, a feeling of disappointment appears, which can have a pronounced character up to despair [10]. Patients point to the difference, which acquires a sense of dissonance, between personal contribution and the received award [11].

## THE AIM

To investigate internal factors – neuroticism and extroversion, which can be predictors of emotional burnout syndrome and their prevalence among student youth.

## MATERIALS AND METHODS

Used a complex of methods – theoretical (theoretical analysis, synthesis, systematization) – for generalization theoretical approaches to determining the essence and characteristics of the impact of neuroticism and manifestations of externality on the personality; sociological method of questioning (in order to obtain information about the feelings and motives of a person's behavior); empirical (observation, testing-Eysenck's methods for assessing the impact of neuroticism and externality); statistical (method of mathematical statistics to determine the validity and reliability of the results obtained, comparison of experimental data with the initial ones). The object of the research is the process of influence of personal characteristics (individual factors) on the development and spread of EBS among students. Subject – personal characteristics (individual factors) of students – extraversion and neuroticism. The number of respondents was 610 students. At the same time, the results of the questionnaires of 54 respondents were not considered due to insincerity in the answers. Insincerity in answers was determined by the scale of lies according to the Eysenck method (EPI, option B). The research considered the results of a survey of 556 people, of which 228 people study at the Bogomolets National Medical University and 328 at the Borys Grinchenko Kyiv University, which is 41.01% and 58.99% respectively.

## RESULTS

EBS develops more often in people who communicate a lot in their profession. This category includes doctors, nurses, teachers, social workers, etc. Scientists note a high percentage of EBS, up to 50%, among doctors and students, in particular doctors [12, 13]. The existence of the problem of EBS, 45-52% among students, is confirmed by many domestic and foreign scientists [5-7, 12].

Many factors contribute to the development of EBS among students. They are classified as external or professional and individual. It is known that motivational factors are the leading factors for the successful adaptation of students to study and that high motivation to study is a safeguard against emotional burnout. Therefore, it can be argued that individual factors are leading. These include age, gender, education, marital status, work experience, and personal characteristics (endurance, locus of control, resistance style, self-esteem, anxiety, neuroticism, and extraversion). Many researchers prefer personal characteristics (low self-esteem, high neuroticism, anxiety, externality) in the development of EBS [14].

Neuroticism is a personality trait characterized by emotional instability, anxiety, fear, rapid mood swings, low self-esteem, and sometimes vegetative disorders. In a broad sense, neuroticism is defined as the inability to effectively regulate negative emotions [14, 15]. Neuroticism is one of the strong predictors of the development of mental disorders. Scientists Clark & Watson, Costa & McCare, Tellegen, Warr et al., Watson & Clark indicate a strong dependence on the presence of neuroticism and negative affect. Accord-

ing to Elliot and Thrash, neuroticism, negative emotionality and behavioral inhibition form a factor in a person, which the authors called "avoidance temperament". Scientists have found a strong positive relationship between neuroticism and stress during exams in students. It is believed that the components of neuroticism are excitement, insecurity, and emotionality. Neurotic individuals often have discomfort and a feeling of anxiety during social and communicative stress. Such people are focused on their emotional experiences, and a high level of neuroticism negatively affects personal everyday and professional life. A high level of neuroticism prevents the creation of a pleasant atmosphere of communication, which is unacceptable for professions where communication is a tool and has a negative impact during training.

Personal characteristics of a person in the theory of personality also include introversion and extroversion. Extroverts are a type of personality that focuses on the outside world and the people that surround this personality. Extroverts like to communicate with people and attract people's attention wherever they are – whether at public speeches or informal events. Inactivity and loneliness deprive them of a sense of the meaning of life. According to Leonhard, an extrovert is a person without free will, subject to external influence, and an introvert is a strong-willed person. Introverts are characterized by restraint, pedantry, punctuality, and few words. It must be remembered that Leonhard's typology is psychiatric, not psychological, it is used to determine pathology. In psychology, for characterizing the personality, but not for the definition of pathology, such psychological terms as the locus of control (internal and external), externalism, and internalism (Akoff and Emery), etc., are close to Leonhard's interpretation.

The terms "extraversion" and "introversion" are also used in the Myers-Briggs typology, in socionics, in psychosophy, and in other modern questionnaires and diagnostic methods, where their interpretation has its specificity.

Why do young people, who are students, lose interest in learning? Why does the motivation to learn a profession, which should become the basis of all life, the foundation of well-being, become less than some other circumstances? Explanations may be different. Psychologists, more often than not, explain this with the development of EBS and indicate that anyone can suffer from this ailment.

To study this phenomenon, its possible development and spread among students, we conducted a study of the personal characteristics of neuroticism and extraversion, which can be predictors in the genesis of EBS.

An anonymous questionnaire survey was conducted among students of the third and fourth years of medical faculties studying at the Bogomolets National Medical University and among students of the first, second, third, fourth, and fifth courses of faculties of the Borys Grinchenko Kyiv University. The data are presented in Table I.

Analyzing the received data, by processing the questionnaires, according to the Eysenck method regarding the indicators of extroversion/introversion among all respondents, the result was obtained, according to which the



**Table I.** Number of respondents

Nº	Respondents	Quantity	Percentage
1	O.O. Bogomolets National Medical University	228	41,01%
2	Borys Grinchenko Kyiv University	328	58,99%
3	The total amount	556	100,00%
4	Total amount of surveyed by the questionnaire method	610	
5	Answers not considered	54	

**Table II.** Indicators of extraversion and introversion

	Deep introvert		Introvert		Ambivert		Extravert		Bright extravert	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
O.O. Bogomolets National Medical University	---	---	28	12,28% ±2,17%	161	70,61% ±3,02%	34	14,91% ±2,36%	5	2,19% ±0,97%
Borys Grinchenko Kyiv University	8	2,44% ±0,85%	35	10,67% ±1,7%	183	55,79% ±2,74%	88	26,83% ±2,45%	14	4,27% ±1,12%
Total	8	1,44% ±0,5%	63	11,33% ±1,34%	344	61,87% ±2,06%	122	21,94% ±1,76%	19	3,42% ±0,77%

**Table III.** Indicators of neuroticism

	Very high level		High level		Average level		Low level	
	Amount	%	Amount	%	Amount	%	Amount	%
Bogomolets National Medical University	36	15,79% ±2,41%	92	40,35% ±3,25%	87	38,16% ±3,21%	13	5,7% ±1,54%
Borys Grinchenko Kyiv University	41	12,5% ±1,83%	104	31,71% ±2,57%	158	48,17% ±2,76%	25	7,62% ±1,46%
Total	77	13,85% ±1,46%	196	35,25% ±2,03%	245	44,06% ±2,11%	38	6,84% ±1,07%

**Table IV.** Intensive rate and extensive indicator

Students	Intensive rate (number of cases per 100 students)		Extensive indicator, %	
	Extraversion	Neuroticism	Extraversion	Neuroticism
NMU of O.O. Bogomolets	37.500	49.460	33.243	39.913
Borys Grinchenko Kyiv University	31.098	25.360	27.568	20.464
Total	44.207	49.101	39.189	39.623

largest number of surveyed students were ambiverts – 344 people, which is 61.87%. Introverts and deep introverts – 63 students (11.33%) and 8 (1.44%), respectively, which makes a total of 71 (12.77%). Extroverts and bright extroverts – 122 (21.94%) and 19 (3.42%), respectively, which together makes 141 (25.36%). So, the research established that there are 70 more people (12.59%) with extroversion, who have a higher risk of emotional burnout, than with introversion, who have a reduced risk of developing SEV (Table II, Fig. 1).

When comparing the extroversion/introversion index (Fig. 1) among students of two universities, it was found that there are fewer extroverts among medical students, the index is 14.91% versus 26.83% among Borys Grinchenko Kyiv University students. This also applies to bright extroverts. The indicator is 2.19% among medical students, against 4.27% among Borys Grinchenko Kyiv University students (Fig. 2).

Manifestations of the personal characteristic – extroversion are less among medical students by 14%. The number of people with introversion is almost the same, according to the study, medical students have less by only 0.83% (Fig. 3 and Fig. 4).

The results of the study of the level of neuroticism, high indicators of which in an individual are a prerequisite for the occurrence of emotional burnout, indicate a very high level – in 77 students (13.85%) and a high level in 196 students (35.25%) (Table III, Fig. 5).

Among the respondents, 245 (44.06%) had an average level of neuroticism and 38 (6.84%) had a low level of neuroticism. A very low level was not detected. So, in 273 people (49.1%), which is almost half of all respondents, an increased risk of emotional burnout associated with a high level of neuroticism was found.

Research has established that the prevalence rate of a high level of neuroticism among students at different universities is different. So, at Bogomolets National Medical University

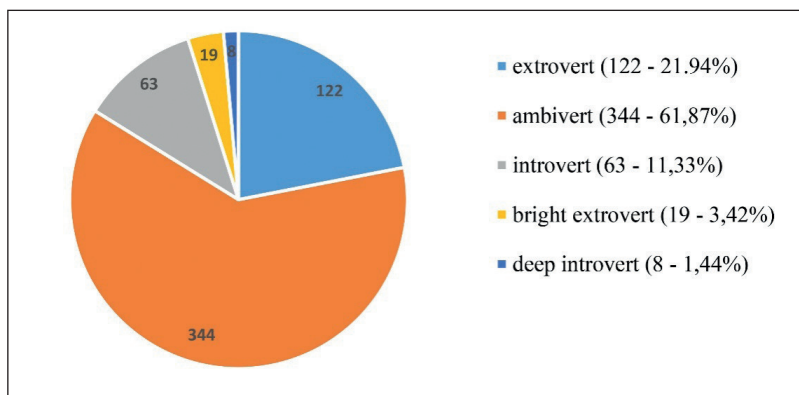


Fig. 1. Extraversion/introversion (quantity)

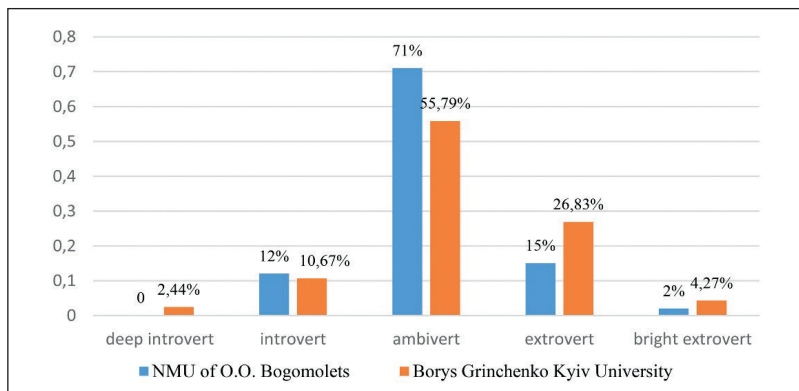


Fig. 2. Expression of extraversion/introversion (comparison)

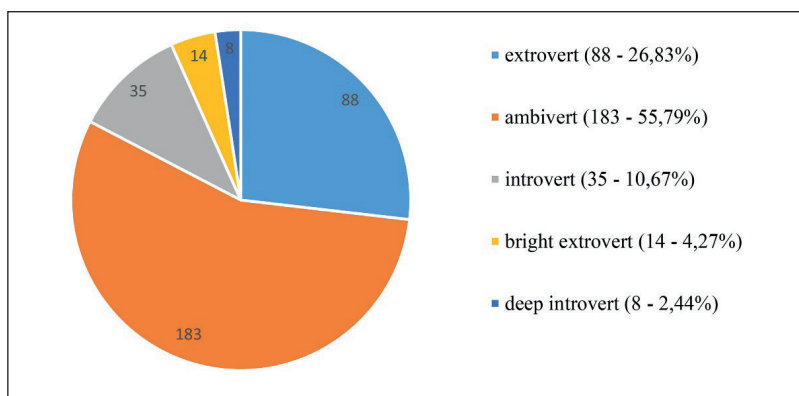


Fig. 3. Expression of extraversion and introversion among students of Borys Grinchenko Kyiv University

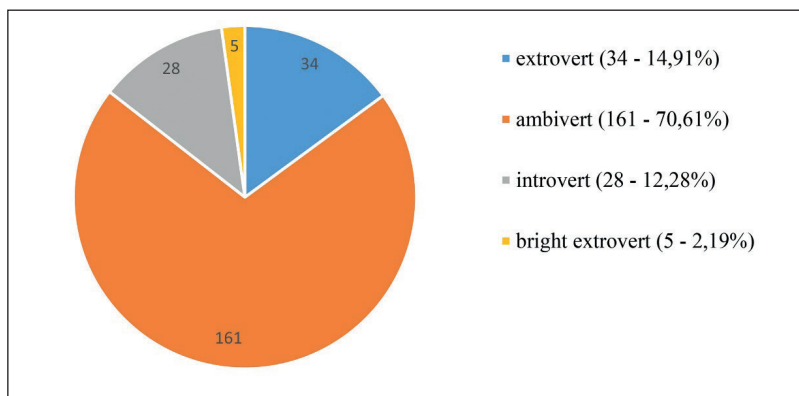


Fig. 4. Expression of extraversion and introversion among students of Bogomolets National Medical University

students with a high and very high level of neuroticism are 11.93% more than at Borys Grinchenko Kyiv University, and with a low level of neuroticism, it is 1.92% less (Fig. 6-8).

An intensive index was calculated to characterize the frequency, level, and distribution of negative internal factors (extraversion, neuroticism) among students.

An extensive indicator of personal characteristics was calculated to study the specific weight, structure, distribution, and composition of negative internal factors and analysis of the distribution into components (Table IV).

According to the calculation data, among the students of Bogomolets National Medical University, extraversion

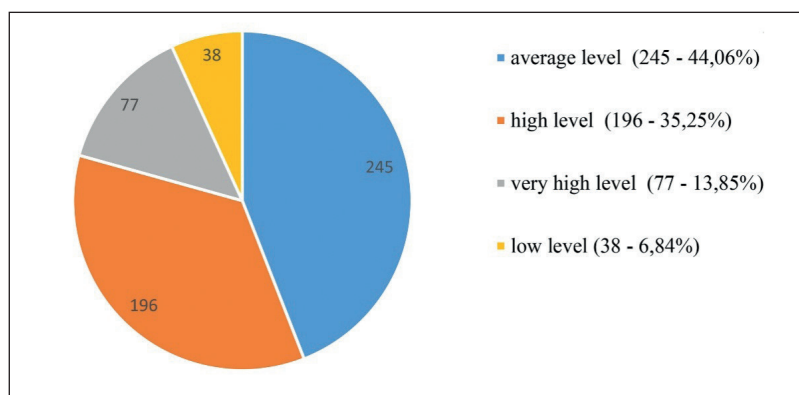


Fig. 5. Level of neuroticism

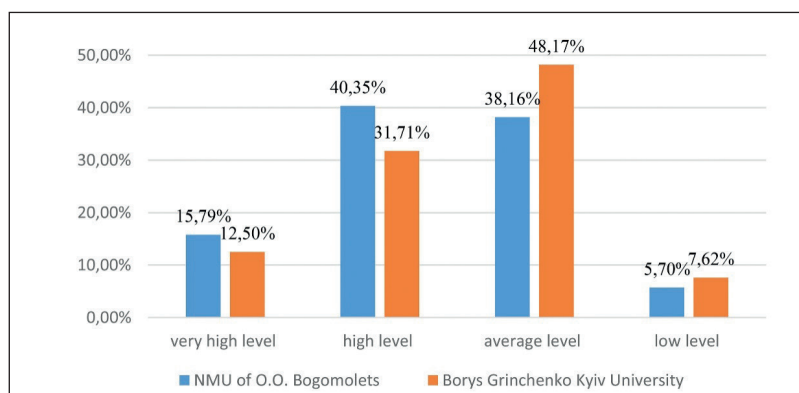


Fig. 6. Level of neuroticism (comparison)

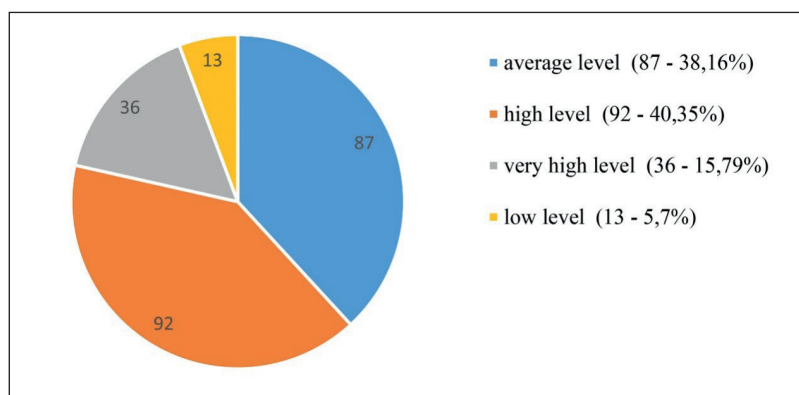


Fig. 7. The level of the neuroticism of students of Bogomolets National Medical University

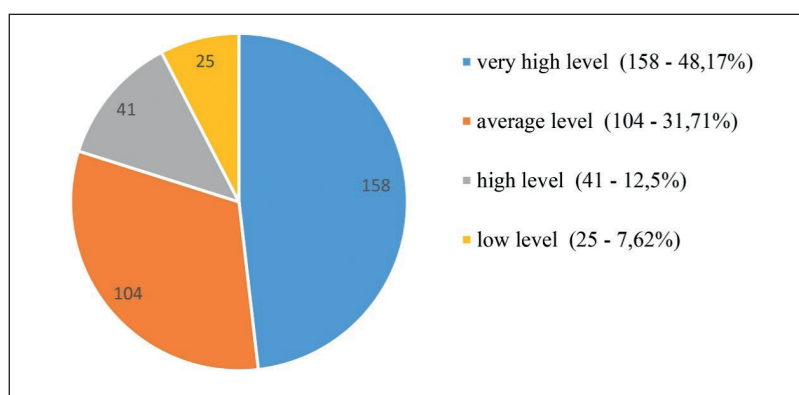


Fig. 8. The level of neuroticism among students of Borys Grinchenko Kyiv University

and neuroticism are more common than among students of Borys Grinchenko Kyiv University, respectively, by 17.105; 6,402 and 24.1 cases. The prevalence of negative internal factors is quite high among students. The specific gravity, structure, and distribution of internal factors in students

are correlated with the frequency, level, and distribution of internal factors.

When analyzing the received data of the empirical study, it was found that the number of high indicators of personal characteristics exceeds the number of surveyed students.

This indicates that the interviewed respondents are negatively affected by several internal factors, which require further research.

## DISCUSSION

The goal of the study was achieved, and internal factors were identified that can be predictors of EBS. It was established that the influence of internal factors on the student can be from one group or several.

When comparing indicators of the influence of negative internal factors on students of two universities, it was found that Borys Grinchenko Kyiv University has 12.71% more students who do not belong to risk groups than Bogomolets National Medical University. Also, Borys Grinchenko Kyiv University has 2.13% more students belonging to one of the groups. Students negatively affected by two risk groups are 17.28% more among medical students.

Manifestations of emotional burnout syndrome in students include decreased motivation to study, dissatisfaction with the learning process, conflicts with colleagues and teachers, chronic fatigue, exhaustion, nervousness, unreasonable excitement, boredom, longing, irritability, and distancing from colleagues and relatives. The specified symptoms in patients are not detected simultaneously and do not appear with the same force. There are always individual manifestations and variations because EBS is a reaction of an individual personality. EBS is a complex of experiences and responses to them in the form of behavior, which is caused by a decrease in work capacity and physical and mental well-being in interpersonal relationships [11].

## CONCLUSIONS

The paper analyzes theoretical approaches to studying the peculiarities of psychological factors of emotional burnout of students. The presence and influence of internal factors on the development of EBS have been theoretically proven. The methods used to study the internal psychological factors of students have been selected. The peculiarity of the influence of internal factors (personal characteristics) on the possibility of the development of EBS among students has been determined.

Empirical research has established a significant prevalence of personal characteristics, which may have signs of negative internal factors, among students. It was found that medical students studying at the Bogomolets National Medical University feel the influence of negative internal factors more than students studying at the Borys Grinchenko Kyiv University.

It has been established that several negative internal factors influence students. Features of the possible manifestation and prevalence of internal risk factors of EBS are the basis of unhealthy behavior among student youth and indicate the need for a comprehensive approach to its prevention and the need for the development and application of modern adequate methods, forms, and methods of prevention.

## REFERENCES

1. Palamar B. I., Gruzieva T. S., Palamar S. P. et al. Risk of emotional burnout syndrome in students in terms of public health. *Clinical and preventive medicine*. 2020; 3 (13). (In Ukrainian).
2. Tukaiev S., Palama, B., Vasheka T. et al. Sindrom emotsional'nogo vygoraniya. Psikhofiziologicheskiye aspekty [Burnout syndrome. Psychophysiological aspects] *Psychiatry, Psychotherapy and Clinical Psychology*. 2020; 11(4): 791-801. (In Ukrainian).
3. Tukaiev S., Vasheka T., Dolgova O. et al. Alexithymia formation as an adaptation to everyday stress is determined by the properties of the nervous system. *Wiadomości Lekarskie*. 2020; 73(11).
4. Maslach C., & Leiter M. P. Understanding the burnout experience: recent research and its implications for psychiatry. *World Psychiatry*. 2016; 15(2): 103-111. doi: 10.1002/wps.20311.
5. Dyrbye L. N., Thomas M. R., Huntington J. L. et al. Personal life events and medical student burnout: a multicenter study. *Academic Medicine*. 2006; 81(4): 374-384. doi: 10.1097/00001888-200604000-00010.
6. Karabiyik L., Eker M., Anbar A. Determining the Factors that affect burnout among academicians. *Ankara Üniversitesi SBF Dergisi*. 2008; 63(02): 091-115.
7. Toker B. Burnout Among University Academicians: an Empirical Study on the Universities of Turkey. *Doğuş Üniversitesi Dergisi*. 2011; 12(1): 114-127.
8. Portoghesi I., Leiter M. P., Maslach C. et al. Measuring Burnout among University Students: Factorial Validity, Invariance and Latent Profiles of the Italian Version of the Maslach Burnout Inventory Survey (MBI-SS). *Frontiers in Psychology*. 2018; 9: 2105. doi: 10.3389/fpsyg.2018.02105.
9. Vasheka T., Tukaiev S., Palamar B. et al. The alexithymia correlation between individual-typological properties, emotional sphere and mental states of personality. *Clinical and preventive medicine*. 2019; 3-4(9-10). doi: 10.31612/2616-4868.4(10).2019.04. (In Ukrainian).
10. Andrushko Ya. Genesis of the personality anxiety as a leading emotional component Open Menu. *Visnyk National Defence University of Ukraine*. 2020; 1(54). doi: 10.33099/2617-6858-2020-54-1-29-36. (In Ukrainian).
11. Golonka K., Mojsa-Kaja J., Popiel K. et al. Neurophysiological markers of emotion processing in burnout syndrome. *Frontiers in psychology*. 2017; 8: 2155. doi: 10.3389/fpsyg.2017.02155.
12. Golonka K., Gawłowska M., Mojsa-Kaja J. et al. Psychophysiological characteristics of burnout syndrome: Resting-state EEG analysis. *BioMed research international*. 2019. doi: 10.1155/2019/3764354.
13. Rotenstein L. S., Torre M., Ramos M. A. et al. Prevalence of burnout among physicians: a systematic review. *JAMA*. 2018;320(11):1131-1150. doi: 10.1001/jama.2018.12777.
14. Andrushko J.S. The genesis of personality anxiety as a leading emotional component. A question of psychology. *Bulletin of the National Defense University of Ukraine*. 2020; 1 (54). (In Ukrainian).
15. Jeronimus B.F., Kotov R., Riese H. et al. Neuroticism's prospective association with mental disorders halves after adjustment for baseline symptoms and psychiatric history, but the adjusted association hardly decays with time: a meta-analysis on 59 longitudinal/prospective studies with 443 313 participants. *Psychological Medicine*. 2016; 46, 2883–2906. doi: 10.1017/S0033291716001653.

*We thank all students of the Bogomolets National Medical University and Borys Grinchenko Kyiv University for participation in the psychophysiological study (0121U113726 «System of training of primary school teachers for professional activity in the context of the reform «New Ukrainian School»).*

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**Conflict of interest:**

*The Authors declare no conflict of interest.*

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**Received:** 08.06.2022

**Accepted:** 13.10.2022

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**A** - Work concept and design, **B** - Data collection and analysis, **C** - Responsibility for statistical analysis,

**D** - Writing the article, **E** - Critical review, **F** - Final approval of the article