

Emotional Burnout Syndrome as a Central Nervous System Condition Indicator in University Students

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Abstract:

Background: Purpose of the study is the evaluation of the relationship between EBS levels and the state of the university student's CNS condition using V. Boiko's methodology

Methods: During our examination, V. Boiko's informative, economical and simple express methodology for emotional burnout syndrome assessment was used. Central nervous system condition, psychological and physical health of 75 students of Perm State Agro-Technological University was investigated.

Results: The fully formed tension phase was determined in 26 students (34.4%), the resistance phase in 43 (57.1%), the exhaustion phase- in 31 students (41.3%). The relationship between the levels of the burnout syndrome phases and the number of students' complaints about central nervous system condition has been proved: the smallest number of complaints are presented by probationers with unformed burnout phases, and vice versa, in individuals with forming stages of phases and fully formed phases, the number of complaints growing up.

Conclusion: The results of our research indicate an important role of emotional burnout syndrome in mechanisms of various diseases development. Given methodology allows us to provide students health status assessment, conduct the person selection for specialist's examination: by a psychologist, psychiatrist or therapist. Comprehensive psychological, medical and pedagogical rehabilitation aimed at the central nervous system condition and mental well-being improving university students in common.

Keywords: emotional burnout syndrome according to V. Boiko, central nervous system, university students.

I. Introduction

Current condition of burnout syndrome

It is generally accepted that during the educational process in higher educational institutions, health deterioration in the majority of students is observed: only 1.8% of students have a high health level, 7.7% have an average level, 21.5% have a low level, and 69.9% have a very low health level (8). A similar high youth incidence rate was identified by other researchers (11). The basic reason for health aggravation is the combination of numerous harmful factors that influence the health of

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students: mental overload, study and rest schedule violation, hypodynamia, poor nutrition, smoking, alcohol consumption, etc.

After continuous influence of different harmful factors mixture, emotional burnout syndrome (EBS) is forming in university students (1, 3-6, 9, 10, 12, 17-19). The EBS causes, mechanisms, phases (stages) and clinics began to be actively studied in the 70s of the XX century. The American psychiatrist Herbert Freudenberger (22) first proposed the "burnout" term. Subsequently, Christina Maslach (26) defined "burnout" term: "Emotional burnout is a summation of emotional exhaustion, depersonalization and a decrease in personal achievement, happening among specialists engaged in "human-helping" professions" (26). Many scientists have a similar opinion on emotional burnout (10, 13, 15, 24). At the same time, researchers are trying to develop and implement new methods of the EBS diagnostic, prevention and treatment.

Burnout assessment

In practice, the most often used methodology of EBS assessment is based on the MBI questionnaire (Maslach Burnout Inventory) (26). The questionnaire has three scales: "Emotional exhaustion" (9 statements), "depersonalization" (5 statements) and "personal accomplishment" (8 statements). The respondent's answers are evaluated on a scale from 0 to 6 points, where 0 - "never" occurrence, 6 points - "every day". The higher the sum of points on each scale separately, the more different aspects of "burnout" are expressed in the respondent. The severity of burnout can be judged by the summary points of all scales (10, 26).

In our country, Boiko's "burnout" assessment methodology is working. (7, 20). The author has developed a classification of EBS by phases (stages), guided by studies of H. Selye's general adaptation syndrome. At the same time, Boiko divides EBS into three phases: 1st- tension phase, 2nd-resistance phase, and 3rd- phase of exhaustion, characterized overall energy tone reduction, the nervous system weakening, symptoms of emotional deficiency and detachment, psychosomatic and autonomic manifestations (1, 6, 7, 20). Among advantages of given technique: easy performance, high accuracy, economy and great informativeness (16, 17, 18, 19).

EBS outcomes

The main reasons for ESB development among working specialists are studied. Great importance presents a scientific work demonstrating the causes of EBS prevalence among medical workers of various countries (10). It was found that many specialists work with a significant overload: an average working day among anesthesiologists is 15 hours, regular night shifts – 79%, frequent weekend shifts – 72%, dissatisfaction with low wages – 73%, satisfaction with the profession - 46%; surgeons have an average working day of 10 hours, regular work night work at 79%, frequent duty on weekends at 72%, dissatisfaction with low wages at 73%, satisfaction with the profession at 58%; therapists have an average working day of 8 hours, the minimal amount of extra work, dissatisfaction with low wages – at 65%, satisfaction with the profession – 53% (3). Widespread burnout syndrome among medical workers was also revealed by other researchers (5, 10, 21, 24, 27,28, 30).

European scientists have found that the level of burnout depends on such factors as place of residence, job satisfaction, age and gender, alcohol, tobacco, and psychotropic drug consumption (27, 30).

The relationship between the frequency of medical errors and the EBS levels is proved through numerous studies (10, 23, 25).

US researchers have proven that stress, fatigue, excessive confidence, inadequate communication with colleagues significantly increase the surgeon's error probability (29). Studies conducted by interns and residents of South Korea and Japan revealed the main causes of doctors' errors: EBS, fatigue, and depersonalization (25, 29). Scientists also note a direct correlation between the level of EBS, depersonalization and the number of mistakes. Often, such syndrome becomes a motivational factor for an alteration of the profession (14).

Various EBS research methods have been successfully implemented and applied (1, 3, 6, 7). Due to this fact, it is reasonable to use V. Boiko's EBS assessment methodology for the central nervous system condition evaluation.

II. Material & Methods

The clinical study was conducted by the ethical principles of the Declaration of Helsinki. An informed agreement was obtained from all patients before the study.

75 second-year students took part in the research (10 men and 65 women aged 19–22 years old). There was no perceptible difference between men and women EBS levels during our study.

Boiko's emotional burnout assessment methodology

Given methodology contains 84 statements and is based on a student survey. The maximum score - 10 points receive the most indicative burnout symptom. Main rules of points calculation: the total score is determined separately for each of the 12 symptoms; the total for each burnout phase indicator is calculated; the final indicator of the emotional burnout syndrome is finding out — the sum of all 12 symptoms indicators. The proposed technique gives a detailed EBS picture. Separate individual symptoms are taking special attention. The severity of each symptom ranges from 0 to 30 points: 9 or fewer points — an uncomplicated symptom, 10-15 points, — an emerging symptom, 16 or more — prevailing. Symptoms with 20 or more points are dominant in the EBS syndrome phases (7, 20).

By presenting the results of the survey, indicators of the three EBS phases are evaluated: intension, resistance, and exhaustion. The total rating of these phases ranges from 0 to 120 points. Quantitative indicators allow only to judge how much each phase has formed and which phase has formed to a greater or lesser extent: 36 or fewer points - the phase has not formed, 37–60 points - the phase in the formation stage, 61 or more - the formed phase (7, 20).

The authors note, different EBS formation phases quantitative indicators computation, gives a sufficiently sizable personality profile, and more importantly, to outline individual preventive and corrective measures (3, 7).

The scientific case from the literature based on 82 students' examination showed the EBS is formed in the intension phase in 14 (17.1%), the resistance phase in 48 (58.5%) and the exhaustion phase in 15 (18.3%) students. There is proved fact, EBS plays an important role in the development of various pathologies in university students (16, 17, 18, 19), including pathology of the cardiovascular system (CVS): 82 students with an unformed EBS intension phase have the lowest complaints number of CVS condition (95 ± 0.07), while students with a stage of formation intension phase and the fully formed intension phase have a higher number of complaints, respectively- 125 ± 0.09 and 125 ± 0.16 , therefore given increase is statistically

significant ($P < 0.05$) (3, 7). Physical education and sports, the study and rest regimen adherence significantly improve health and increase the academic performance of the students (18, 19).

Questionnaire for the student's health assessment

In educational and medical institutions for the children and adolescent's health status evaluation, screening tests are used. Usually, such tests are presented by simple questions created based on the complaint of people with different organs and systems deviations (2). And as the authors rightly note, the targeted selection of such children during school mass observations have significant importance, since often different pathologies are not fully identified in non-stressed conditions, which leads to late recognition of the deviation and reducing of its treatment effectiveness. The universality of the test is predetermined by the fact, complaints do not differ in children, adolescents, boys and girls with somatic diseases. However, these tests are not widely used for university student's health status evaluation. Anamnesis collection and complaints processing allow putting a diagnosis for the absolute majority of patients. To provide higher accuracy of diagnosis, specialists use objective, laboratory, radiological and other studies.

During statistical processing of the research data, the mean (M), mean error ($\pm m$), Student's confidence coefficient (P) and rank correlation coefficient (r) were calculated.

III. Results and Discussion

Interdependence between EBS levels and the university student's CNS condition complaints number are shown in the table 1.

75 students are divided into three groups according to the phase sizing. The first group included 21 students. The average value of indicators reflecting this group is 26.0 ± 1.7 points. These individuals have unformed intension phase, individual indicators range from 0 to 35 points.

The second group included 28 examined with individual indicators from 37 to 57 points. Students of this group had the tension phase in the formation stage.

Table 1. The relation between the EBS phase levels and the CNS condition

Group	Number of students according to the first EBS phase	Number of observed students	Emotional burnout syndrome phases (M±m):			Frequency of CNS condition complaints:	
			1. Intension	2. Resistance	3. Exhaustion	Absolute number (M±m)	% Medium rank

I	21	26.0	57.9	34.4	305±	82.9
		±1.7	±4.4	±4.1	0.35	
II	28	45.4	63.6	43.4	318±	86.4
		±1.0*	±3.6	±2.6	0.28*	
III	26	78.3	78.3	63.8	473±	128.5
		±2.5*	±2.9	±2.9*	0.30*	
I-III	75	51.3	67.2	50.0	368±	100.0
		±2.7	±2.3	±2.3	0.08	

Note: * P <0.05 in comparison of first group student indicators.

The average phase value is 45.4 ± 1.0 points. The difference between the first and second groups phase levels is statistically significant (P <0.05).

The third group includes 26 (34.7%) students with individual indicators range from 62 to 112 points-which indicates already formed intension phase for these persons. The average value of the intension phase is 78.3 ± 2.5 points, which is significantly higher in comparison with the first group examined indices (P <0.05).

In the first group of students, the average value of the resistance phase is 57.9 ± 4.4 points, individual indicators range from 14 to 90 points. In 6 from 21 (28.6%) individuals, a fully formed phase of resistance is determined. Simultaneously, studies were conducted in students with the second and third EBS phases: resistance and exhaustion. In 28 students from the second group, the average value of this phase is 63.6 ± 3.6 points, indicators range from 37 to 87 points. At the same time, 16 students (57.1%) had a fully formed phase of resistance. In the third group, individual indicators of the resistance phase range from 43 to 83 points, the average value is 78.3 ± 2.9 points. Moreover, in 21 persons of this group (80.8%), a fully formed phase of resistance is determined. The difference between the indicators of the resistance phases between the first and third groups of students is statistically significant (P <0.05).

In the first group of students, the average value of the indicators of the exhaustion phase is 34.4 ± 4.1 points, individual indicators of this phase are from 16 to 77 points. Only 1 of 21 students (4.8%) have a fully formed phase of exhaustion. In the second group of students, individual indicators of this phase range from 14 to 90 points, the average value is 43.4 ± 2.6 points. In 16 of 28 individuals (57.1%) formed exhaustion phase was determined. In the third group (26 persons), the average value of the exhaustion phase is 63.8 ± 3.9 points, individual phase indicators are from 18 to 110 points. Moreover, in 14 (53.8%) persons from this group, a fully formed phase of exhaustion was determined. A statistically significant difference between the indicators of the exhaustion phase of the first and third student groups (P <0.05) was established.

Thus, out of 75 students in three groups, the fully formed tension phase is determined in 26 (34.4%), the resistance phase in 43 (57.1%) and the exhaustion phase in 31 (41.3%) students.

A direct correlation between the tension and resistance phases, tension and exhaustion phases, resistance and exhaustion phases of EBS in students is proved: the rank correlation coefficient is $+ 1.00 \pm 0.00$, $P < 0.05$.

The relationship between the EBS phase levels and the CNS condition has been studied. For students of the first group, the number of complaints is 305 ± 0.35 (82.9% of the average number of complaints of 75 students), for the second and third groups, respectively, the amount of complaints is 318 ± 0.28 (86.4%) and 473 ± 0.30 (128.5%). The results of these studies indicate a direct correlation between the EBS phases values and the number of CNS condition complaints ($r = + 1.00 \pm 0.00$, $P < 0.05$).

Thus, out of 75 students, the fully formed EBS tension phase is determined in 21 (28.0%), the resistance phase in 43 (57.1%) and the exhaustion phase in 31 (41.3%). Such Individuals, examined by a psychologist (psychiatrist) and therapist require comprehensive psychological, medical and pedagogical rehabilitation aimed at improving the health status.

IV. Conclusion

Boiko's simple, informative and economical express methodology for EBS assessment allows exploring the central nervous system condition, psychological and physical health of university students and select people for psychological, medical and pedagogical rehabilitation in a university, to monitor and predict the effectiveness of this rehabilitation.

Thus, out of 75 students, the fully formed EBS tension phase is determined in 21 (28.0%), the resistance phase in 43 (57.1%) and the exhaustion phase in 31 (41.3%). Such Individuals, examined by a psychologist (psychiatrist) and therapist require comprehensive psychological, medical and pedagogical rehabilitation aimed at improving the health status.

The relationship between the levels of the EBS phases and the amounts of students' complaints about the central nervous system condition: the smallest number of complaints are presented by subjects with unformed EBS phases, and vice versa, in individuals with phases in the formation stage and fully formed phases, the number of complaints increases.

Conflict of interest

The authors declare to have no conflict of interest

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