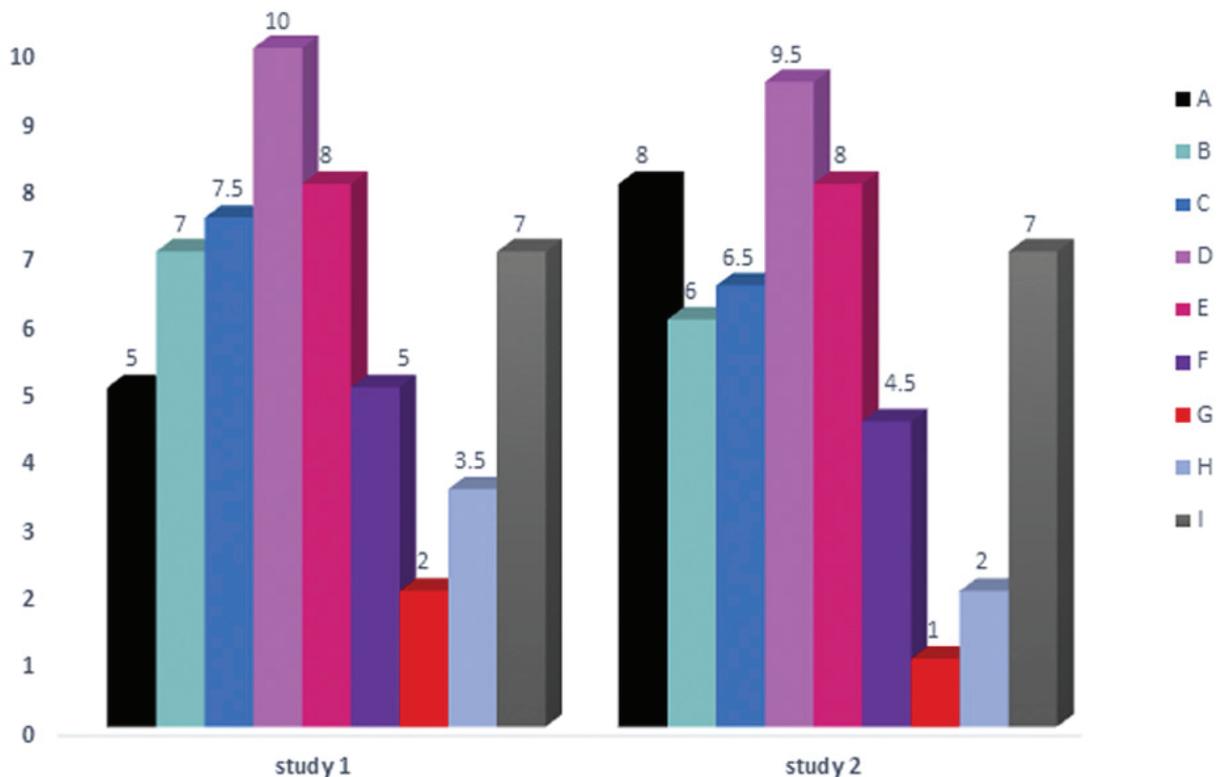


BURNOUT AMONG ANESTHESIOLOGISTS AND INTENSIVE CARE PHYSICIANS

DEDICATED TO TWO ANESTHESIOLOGISTS WHO SUDDENLY DECIDED TO PASS AWAY



Anesthesiologists and intensive care physicians in Study-1 and Study-2 (median value). Assessment of your own fatigue during the working week on average from 0 to 10 (where 10 is very tired) (A), Assessment of your own productivity 0 to 10 (where 0 is low) (B), Assessment of how much you love your job from 0 to 10 (C), Assessment of how much you would like to love your job from 0 to 10 (D), If I had the opportunity, I would not work (E) (yes I do not want - number of persons), How optimistic you feel about your future from 0 to 10 (F), How many positive feelings you feel today (G), How many positive feelings you felt yesterday (H), Rate your emotional state now on the scale from 0 to 10 (I)

Original article**BURNOUT AMONG NEURO ANESTHESIOLOGISTS AND INTENSIVE CARE PHYSICIANS A PROSPECTIVE ANONYMOUS BLIND OBSERVATIONAL STUDY***Elena Sinbukhova¹, Andrey Lubnin¹*

¹“N. N. Burdenko National Medical Research Center of Neurosurgery” of Ministry of Health of the Russia Federation, 16, 4th Tverskaya-Yamskaya St., Moscow, Russia, 125047

Dedicated to Two Anesthesiologists who suddenly decided to pass away.

Abstract

Background. Burnout is the phenomenon of depersonalization, emotional exhaustion, and low personal accomplishment. Burnout can lead to insomnia, sexual disorders, tachycardia, increased pressure, headache, digestive system disorders, destructive behavior, then to the final stage of burnout – a sense of meaningless existence. The aim of this study was to assess the dynamic of burnout among neuroanesthesiologists and intensive care physicians. **Methods.** Two identical sets of tests were used to determine: burnout, depression, anxiety in our study. To determine the dynamics of these three phenomenon, the tests were repeated after three months in the same group of physicians. Data collection included demographic factors, Maslach Burnout Inventory (MBI) for Medical Personnel, Purpose in life test (Crumbaugh & Maholick), Toronto Alexithymia Scale (TAS), State-adopted Trait Anxiety Inventory (STAI), assessment of depression –HADS, the questionnaire “Burn-out” Boyko VV. **Results:** Study included 20 neuroanesthesiologists and intensive care physicians who fully completed tests in both study phases. According study phase 1 (Study 1): MBI scale 20 % of participants had high scores in all three subscales of burnout. In study phase 2 (Study-2): according to the scale 40 % of participants had high scores in all three subscales of burnout. High rates in some of three sub-scales of burnout in Study-1: 70% of participants, had high rates in some of three sub-scales of burnout in Study-2: 95%. Depression was detected in Study-1 in 10% of doctors and in Study-2 in 30% of physicians. **Conclusion:** Data from our study indicate a significant prevalence of emotional exhaustion, depersonalization, reduction of professional achievements and a high degree of suicidal risks. These data suggest that individual work with neuroanesthesiologists and intensive care physicians, aimed to identify burnout is needed. Burnout prevention measures like psychological support in the form of psychocorrection sessions should be suggested to anesthesiologists and intensive care physicians. The assistance should be specific, targeted to help both the high risk group of physicians and the patient dependent on him.

Key words: Burnout: anesthesiologists and intensive care physicians, Depression, Anxiety.

Acknowledgement: The authors would like to thank neuro anesthesiologists and intensive care physicians for their active participation in this study.

Introduction:

Burnout is the phenomenon of personal deformation, the state of physical, emotional and mental exhaustion, which affects the person as a whole, destroying it and having a negative impact on the effectiveness of professional activity¹.

Prolonged exposure to stress can lead the doctor to various consequences, ranging from reducing

cognitive flexibility and speed of decision-making to wrong self-understanding, reduced self-regulation, lack of faithful self-motivation and commitment, reduced personal participation in work, cynical attitude to people, various psychosomatic problems. Wrong self-consciousness, “not correct” thoughts, no adaptability, closeness of self-perception of “I”, the presence of internal barriers, ignoring problems, presence of various mechanisms of psychological protection and “tunnel” consciousness

lead to decrease in the level of auto-sympathy and creates a contradiction in the development of the individual. However, stress is inevitable in the work of anesthesiologists and intensive care doctors, constantly working with complex patients, they should be ready for a second to make decisions and take responsibility for the patient's life. Sometimes unfriendly attitude of surgeons, as well as various social factors and family problems contribute to emotional overload. All these can lead to development of emotional burnout. Burnout affects the value meaning-sphere of profession and life.

According to the different stages of burnout from excessive involvement in work to loss of interest in work and sense of helplessness sometimes including insomnia, sexual disorders, tachycardia, increased pressure, headache, digestive system disorders, decreased immunity, destructive behavior then to the final stage of burnout – a sense of meaningless existence.

Among high stress risk groups there are different specializations of physicians, including anesthesiologists and intensive care doctors. Emotional burnout poses a threat to mental and physical health and life of anesthesiologists and intensive care specialists and may lead to memory loss, exhaustion, irritability and intolerance, emotional and/or physical disruptions, depression, suicidal tendencies, various somatic problems and, therefore, may be a factor of reducing the quality of medical care²⁻⁶. Burnout of medical staff leads to decrease in the quality of patient care, medical errors and increases the risk of patients' mortality.⁷

Materials and methods:

Ethical considerations Ethical approval for this study was provided by the Ethical Committee "N. N. Burdenko National Medical Research Center of Neurosurgery" of Ministry of Health of the Russia Federation, 16, 4th Tverskaya-Yamskaya St., Moscow, Russia (chairman Konovalov A.N.) on 31 of May 2018. All participants of the study signed a written informed consent to participate in this study. Two identical sets of tests were used to determine: burnout, depression and anxiety in our study. To determine the dynamics i.e. changes over time, the set of tests was repeated after three months in the same group of physicians. The study

was performed in two phases including the same participants, phase 1 (Study 1) and three months later phase 2 (Study2). Inclusion criteria were the position of neuroanesthesiologist of the anesthesiology-intensive care department and intensive care physicians, signed informed consent to participate in the study. Exclusion criteria included unsigned informed consent to participate in the study.

Data collection for the study purposes included demographic data (age, gender, marital status, children, professional experience etc.), Maslach Burnout Inventory (MBI) for Medical Personnel (in Russian) 8, Purpose in life test (Crumbaugh & Maholick) 9, Toronto Alexithymia Scale (TAS 26) 10, State-Trait Anxiety Inventory (STAI) 11 adapted by Y. L. Hanin, Assessment of depression –HADS 12, and "Burn-out" questionnaire V. V. Boyko. "Burn-out" V. V. Boyko (Russian-language questionnaire)¹³ consists of three phases and each phase includes four symptoms: phase – tension is a sum of symptoms: experience a traumatic circumstance, dissatisfaction with yourself, driven into a cage, anxiety and depression; phases – resistance is a sum of symptoms: inadequate selective emotional response, emotional disorientation, savings of emotions, reduction of professional achievements; phase – exhaustion is a sum of symptoms: emotional deficits, emotional detachment, personal detachment, psychosomatic and psychovegetative syndrome. The result of "Burn-out" questionnaire is the sum of all 12 symptoms.

REDCap (7.4.17 - Vanderbilt University) was applied for data collection. RStudio (Version 1.0.153) was applied for statistical analysis and Microsoft Excel 2016 for histograms. Data were presented as percentage and median (range). Data were analyzed with Wilcoxon paired test. $p < 0.05$ was considered as statistically significant.

Results

Study phase 1 started in June 2018 when 20 neuroanesthesiologists and intensive care physicians fully completed all tests. In this study, we present data on 20 completed test forms. The studied group consisted of 4 female and 16 male physicians, average age were 43,8 (26-79) years, time of practice from 1 to 50 years (average 18,6), weekly workload from 24 to 96 working hours (aver-

Table 1 Prevalence of the Maslach Burnout Inventory (MBI) dimensions.

Dimension (level)	n (20) %					
	Emotional Exhaustion		Depersonalization		Personal Accomplishment	
	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2
low	45%	15%	20%	5%	35%	10%
medium	15%	30%	30%	30%	15%	10%
high	40%	55%	50%	65%	50%	80%

age 45,8-46 hours), 15 participants were married, three single, one divorced, live together -1. A small number of participants didn't allow stratification of participants based on gender and age. The change of test results in three months period was assessed.

In Study 1 according to MBI scale 20% (4/20) of participants had high scores in all three subscales for burnout, while in Study 2 40 % had high scores in all three subscales of burnout. High rates in some of three sub-scales of burnout in Study 1: 70% of participants had high rates in some of three sub-scales of burnout in Study 2: 95% (P value: Study-1 vs. Study-2: emotional exhaustion p=0.16, depersonalization p=0.39, personal accomplishment=0.09). Assessment of burnout dynamics showed changes over time. Obtained results of burnout prevalence in the study indicated the need for preventive measures and correction.

According to Boyko test, high rates in some of three sub-scales of burnout were recorded in Study 1 in 50% of participants and in Study 2 60% of participants (P-value: Study-1 vs. Study-2: phases-tension p=0.07, phases-resistance p=0.4, phases-exhaustion p<0.0001. Both tests for burnout showed high prevalence of burnout.

High level of situational anxiety was detected in Study 1, 40 % of participants and 75% in Study

2: 75%. High level of personal anxiety was recorded in 50% of participants in Study 1, and 85% in Study 2. Depression was detected in Study 1 in 10% of participants and in 30% in Study 2. Between two phases significant difference was noticed in personal anxiety (p= 0.031) and depression (p = 0.03).

According to the Purpose in life test- a total value below 50 points may indicate the absence of life goals. In our Study 1 scored from median 78.5 points (51 to 99 points), and in Study 2 median 71 points (51 to 99 points). TAS - increased level of alexithymia may be a contraindication for professionals working in the field of communication. Alexithymic personality features - 74 and more points, not alexithymic - 62 or fewer points. In our studies the median TAS in Study 1: was 73 (64-102) points, in Study 2: median was 73 (range 64 -100) points. Between two phases of the study there was no difference in situational anxiety (p = 1), purpose in life test (p = 0.19) and TAS (p=1).

In addition to the questionnaires, respondents were also asked to answer a series of general questions, which are presented in the Figures below: 2, 3 and 4.

In Study1: in median, doctors estimated the optimism of their future by 5 points (2-10 points). Score equal or higher of 8 points were record-

Table 2 Prevalence of Burnout according to Boyko test dimensions.

Dimension (level)	n (20) %					
	Phases-Tension		Phases-Resistance		Phases-Exhaustion	
	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2
not formed	65%	35%	25%	5%	50%	50%
in the formation stage	25%	40%	25%	35%	25%	15%
formed	10%	25%	50%	60%	25%	35%

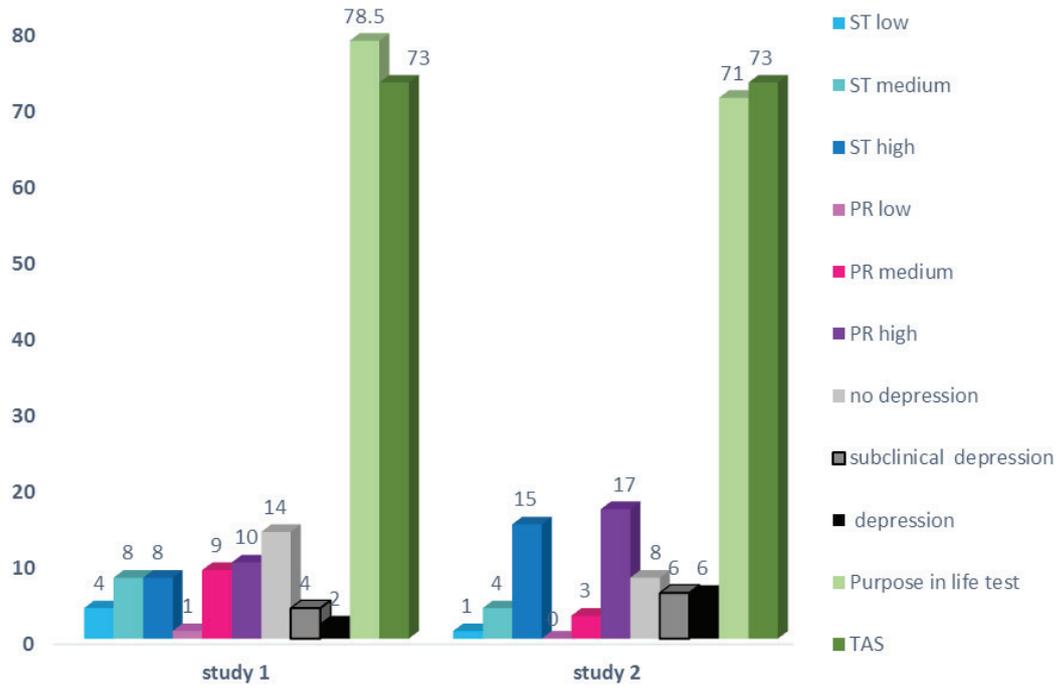


Fig. 1. Anesthesiologists and intensive care physicians in Study-1 and Study-2. Anxiety: situational (ST) and personal (PR), Depression (number of persons); Purpose in life test, Toronto Alexithymia Scale (TAS) (median value).

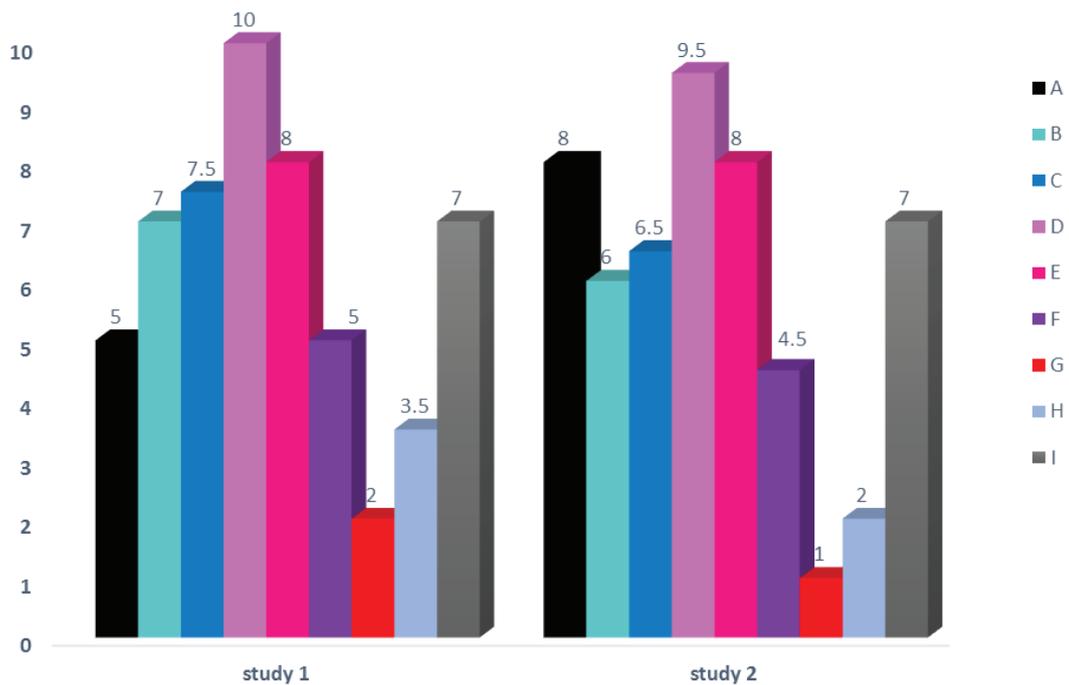


Fig. 2. Anesthesiologists and intensive care physicians in Study-1 and Study-2. Assessment of your own fatigue during the working week on average from 0 to 10 (where 10 is very tired) (A), Assessment of your own productivity 0 to 10 (where 0 is low) (B), Assessment of how much you love your job from 0 to 10 (C), Assessment of how much you would like to love your job from 0 to 10 (D), If I had the opportunity, I would not work (E) (yes I do not want - number of persons), How optimistic you feel about your future from 0 to 10 (F), How many positive feelings you feel today (G), How many positive feelings you felt yesterday (H), Rate your emotional state now on the scale from 0 to 10 (I). (median value).

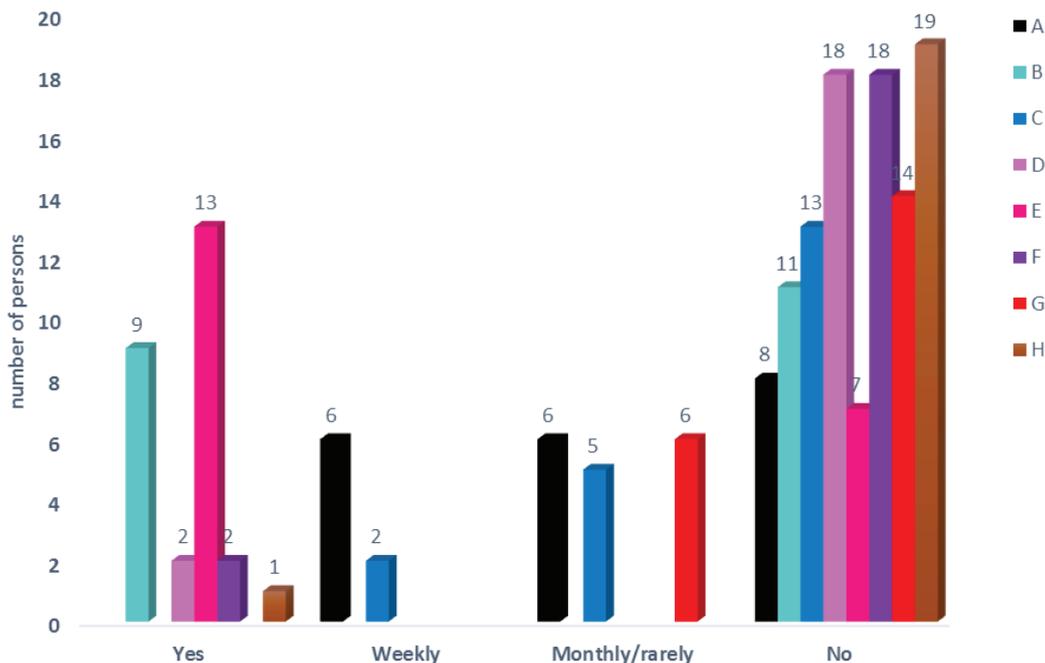


Fig. 3. Anesthesiologists and intensive care physicians in Study-1. Frequency of headache (A), use of analgesics (B), dizziness (C), complaints of heartbeat/pain/discomfort in the heart (D), complaints about the gastrointestinal tract (E), complaints about the respiratory system (F), feeling of lack of air (G), complaints about the genitourinary system (H). (number of persons).

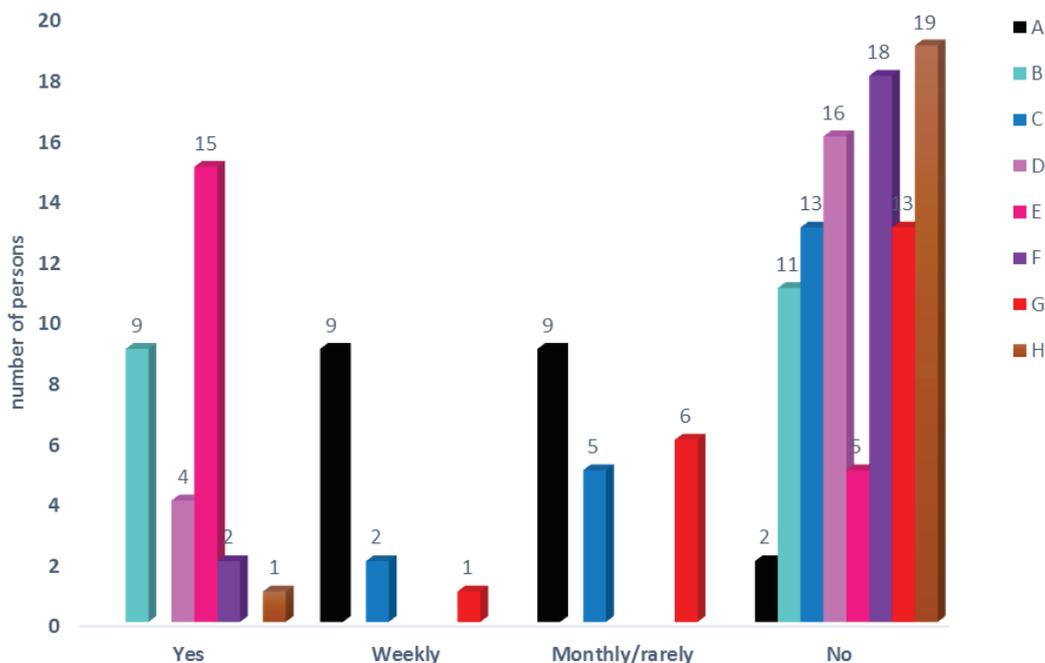


Fig. 4. Anesthesiologists and intensive care physicians in Study 2. Frequency of headache (A), use of analgesics (B), dizziness (C), complaints of heartbeat/pain/discomfort in the heart (D), complaints about the gastrointestinal tract (E), complaints about the respiratory system (F), feeling of lack of air (G), complaints about the genitourinary system (H). (number of persons).

ed in 30% of anesthesiologists and intensive care physicians. The lowest score below 4 points was recorded in 45% of participants. In Study 2, the optimism of their future was scored with 4.5 points (2-10 points). Score equal or higher of 8 points was recorded in 30% of participants, while the lowest score from 0 to 4 points was chosen by 50% of participants. Thus, almost every second physician was not optimistic about future of his/her future or him/her self in the future.

The most common somatic complaints based on literature data were investigated (Figures 3 and 4).

Suicidal ideas were also tested and the question "I thought about suicide": (where 1=yes I thought about it, 5- I never thought) according to the Study 1 was negatively answered by 11 people (55% of respondents), and 1 participant confidently replied that he/she thought about suicide, 4 people (20%) – answered that sometimes they think about suicide, 4 people (20%) – answered that they think about suicide rarely. According to the Study 2, about suicidal ideas, the answer was negative in 10 people (50% of respondents), 2 participants confidently replied that he/she thought about suicide, 5 people (25%) – answered that sometimes they think about suicide, 3 people (16%) – answered that they think about suicide rarely.

Discussion

So far published literature raises attention on large number of doctors and nurses having different stages of burnout. Recently published study presented high burnout level in 18.63% nurses, 12.06% anesthesiologists, and even more alarming critical level in 3.74% nurses and 5.90% anesthesiologists 14. Another study noticed that frequency of high-risk responses ranged from 26% to 59% of participants across three categories, however 15% had unfavorable scores in all 15. The study of Dutch anesthesiologists showed psychological distress in 39.4% and burnout prevalence in 18% of all respondents, and difference between the residents and consultant anesthesiologists: 11.3% vs. 19.8% 16. In Serbian hospitals based in Belgrade prevalence of total burnout among anesthesiologists was 6.34%, high emotional exhaustion, high depersonalization and low personal accomplishment was 52.7, 12.2 and 28.8%, respectively 5. The

study of anesthesiologists from Southern Brazil showed that 48.7% of participants were positive for burnout, 26.9% for emotional exhaustion, 41.3% for depersonalization and 32.7% for low personal accomplishment 17. Study performed among anesthesiologists practicing in US metropolitan area revealed high degrees of burnout in 61.4% emotional exhaustion, 31.6% depersonalization and 64.9% low personal achievement 18. Investigation including Lithuanian cardiac surgeons and cardiac anesthesiologists reported in 19.3% physicians emotional exhaustion, 25.9% had high depersonalization, and 42.3% demonstrated low personal accomplishment at work 19.

There is variability of burnout incidence among countries and studies. In our research, in Study 1, 70% of the examined anesthesiologists and intensive care physicians (MBI) had high rates in some of three sub-scales of burnout and it is close to other studies data. But, in Study 2, 95% of the examined anesthesiologists and intensive care physicians had high rates in some of three sub-scales, and this is 30% higher than in the study in US metropolitan area. High rates in all three sub-scales of burnout syndrome are present in our study, in Study 1, 20% of the examined anesthesiologists and intensive care physicians, in Study 2, 40%. It is obvious that high prevalence of burnout syndrome requires action and proposition of potential solutions for this problem.

In recent years, the suicide among physicians in different countries has led to the fact that the topic of doctors' health has become more noticeable in research. Suicide does not typically arise from burnout alone, but can be associated with other mental illnesses, such as depression. The risk of suicide and suicidal ideation increases from 4% during the pre-internship period to about 25% during the intern year, and increases approximately four-fold in the first three months of the internship year, but the actual highest rate of suicide in physicians is in late middle age 20.

Some of the studies show greater prevalence of depression in physicians and demonstrates the overlap of burnout and major depression 21. Depression is common in medical professionals, including anesthesiologists, and it is closely related to the suicide, so it may be a marker for the risk of suicide 22. Depression as a mood disorder (an emotional disorder) includes anguish, anxiety,

guilt, anhedonia, apathy, in addition there may be certain violations in the sphere of thinking, memory and attention loss. Various related symptoms such as sleep disorders, digestive system disorders, sexual disorders, fatigue, possible abuse of alcohol or other psychoactive substances that are used to improve mood. Thus, testing of medical professionals' burnout symptoms should include the study of depression level. For example, according to one study substance use disorder remains one of the commonest sources of impairment among anesthesiologists. One-third of anesthesiologists during their career can have different degrees of impairment, such as physical ailments, depression, burnout, age cognitive decline and others 23.

According to systematic review burnout prevalence among physicians in the United States exceeds 50%, that means it has reached epidemic proportions and is still rising 24. Also, systematic review published in 2017 showed increased percentage of physicians reporting at least one burnout symptom 25. So, it is an emerging problem of healthcare systems. And although prevalence of burnout greatly varied according to different studies (10%–41% high risk, up to 59% at least moderate risk), noted that prevalence among anesthesiologists is relatively high at all career stages. Burnout leads to poorer patient safety and quality of care, resulting in higher risk of errors. No relationship between doctors' burnout and hospital characteristics, gender, or marital status was not found. And a small number of studies reporting approach warrants further research in field of burnout among anesthesiologists 25.

The term alexithymia appeared in the scientific literature at the end 1960s. Alexithymia is literally translated as: "without words for feelings". It is characterized by poor differentiation and verbalization of emotions that lose their signal functions, lack of emotional sensitivity which leads to communication difficulties and distant and cold relationships with other people. Having alexithymia people mainly complain of somatic troubles. According to Boyko VV, alexithymia is a psychological characteristic of a person who has the following cognitive features: the difficulty in the definition (identification) and description of their own feelings; difficulty in distinguishing between feelings and body sensations; reduced ability to symbolize, as an evidenced of the poverty of imagination; focus more on external

events than on inner feelings. Alexithymia can be "primary" and "secondary". Primary alexithymia is usually irreversible, and it can not be eliminated in the process of psychotherapy. Secondary alexithymia can be overcome through psychotherapy, encouraging the patient to observe and express their emotions¹³. Increased level of alexithymia may be a contraindication for professionals working in the field of communication. According to the data of Bekhterev Psychoneurological Institute adaptation of TAS technique, average value of alexithymia in several groups were as follows, the control group of healthy people 59.3+1.3 points, the group with psychosomatic disorders 72.09+0.82, the group with neuroses 70.1+1.3. ¹³ In our studies the median TAS in Study 1 was 73 (64-102) points and in Study 2, 73 (64-100) points. We can hypothesize that the test high scores are dependent on burn out prevalence, and therefore psychological support can play significant role in physicians professional and personal life.

Burnout leads the doctor to a steady decrease in labor productivity, it leads to memory slowness 26 and deterioration, increase in consumption of various stimulation drinks 23,21 and destructive behavior. The emergence of a variety of psychosomatic disorders (insomnia, sexual disorders, tachycardia, increased pressure, headaches, disorders of the digestive system, decreased immunity), etc. At the final stage of burnout there is a sense of meaningless existence, despair, the appearance of suicidal thoughts and committed suicides.²⁷ Based on the importance of the problem and its disastrous consequences for the health and life of the anesthesiologists and intensive care doctors, as well as the life and health of their patients, it is necessary to conduct regular testing of doctors aimed at identifying the first symptoms of burnout.

Stress is inevitable in the work of anesthesiologists and intensive care doctors 28, and requires adaptive behavior. It becomes obvious that in certain periods of the professional career anesthesiologists and intensives should be routinely tested for burnout. Thus, the solution to the burnout problem includes two important points, the first is identification of employees with burnout, and the second regular preventive psychological work with employees aimed at preventing appearance of burnout symptoms. Psychological interventions should be aimed at developing skills of overcoming

problems, goal-setting, the ability to resolve conflicts, time management, the absence of conflict “I am ideal” and “I am real”, proper understanding of oneself, the development of communication skills in the family and the team 28. Based on this there is a question does every large hospital should have psychologist available for consultations in case physicians themselves requires help.

Conclusion

Prevention of burnout syndrome should begin with its diagnosis, also the diagnosis of presence of depression, situational and personal anxiety should be included in the study. The advantage of sharing different burnout scales for greater reliability of the results should be noted. Assessment of burnout, depression and other parameters in the dynamics showed that the levels are not constant and can change over time. Future: future research on a larger number of respondents will be able to provide a greater understanding of the results and the conclusions.

Since the results obtained by us indicate a significant prevalence of emotional exhaustion, depersonalization and reduction of professional achievements, and a high degree of risk of suicide, it is desirable to conduct not anonymous, but individual work with the staff of anesthesiology- intensive care physicians, aimed at identifying burnout, its prevention and psychological support - conducting psychocorrection sessions with anesthesiologists - intensive care physicians.

Thus, assistance should be specific, targeted to help both the doctor and the patient dependent on him.

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Conflicting interest. – The authors declared no potential conflicts of interests