Identification of Predictors of Burnout Among Employees of Socially Significant Professions

Igor Zavgorodnii[1], Olha Lalymenko[1], Iryna Perova[2(✉)], Polina Zhernova[2], and Anastasiia Kiriak[2]

[1] Kharkiv National Medical University, Kharkiv, Ukraine
zavnikua@gmail.com, yaloposta@gmail.com
[2] Kharkiv National University of Radio Electronics, Kharkiv, Ukraine
rikywenok@gmail.com, polina.zhernova@gmail.com, anastasiia.kiriak@nure.ua

Abstract. The article presents theoretical and practical aspects of study of professional burnout formation among representatives of socially significant professions. The issues of establishing the relationship between work-related behaviors using the Work-related Behavior and Experience Pattern (AVEM) and professional burnout predictors based on the Maslach Burnout Inventory questionnaire among medical workers, medical university teachers and bank employees are studied. It was established the most informative subscales of Maslach Burnout Inventory questionnaire that correspond to initial burnout level for each profession. It has been established that critically significant questions of the MBI questionnaire are the affirmations of the "cynicism" subscale for all three groups of respondents (medical workers of the emergency medical service, university teachers and bank employees); at the same time, significant results on the "personal achievement reduction" scale were obtained in the group of medical worker and university workers teachers.

Keywords: Professional burnout · Work-related behavior · Mental health · Regression model · Questionnaire

1 Introduction

The definition of "health" by the WHO encompasses the state of physical, mental and social well-being in absence of diseases as well as dysfunctions of organs and systems of the body [1]. According to the guidelines of the National Institute for Health and Care Excellence (NICE) (2017), health covers a person's physical and mental favourable condition and well-being. Well-being is a subjective health state, including happiness, comfort and satisfaction with the quality of life. At the same time, mental health is not only the absence of mental disorders, but also the positive state of psychological health of workers in general [3]. Mental well-being concerns the emotional and psychological state of a person, including self-esteem and the ability to communicate with colleagues and cope with difficulties

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as well as the ability to develop and broaden potential, work productively and creatively, build strong and positive relationships with other people, and make a contribution to the community [12,23]. One of necessary conditions for achieving a high degree of professionalism is the improvement of professional skills along with the psychological characteristics of the person, depending on the type of activity. But the specifics of a particular profession can lead to the emergence of various negative phenomena in the psychological structure of the personality, complicating the adaptive behavior of a specialist and effective implementation of their professional tasks. The path of formation and development of a professional requires exertion of energy, activation of physical and psychosocial resources of the individual. One of the results of such a destructive effect of professional activity on a person is the phenomenon of professional (emotional) burnout [16, 24].

A wide range of negative consequences of professional burnout has been identified. Thus, interpersonal consequences are manifested in social, family relationships, as well as in labor conflicts or destructive stress when communicating with colleagues, business partners, clients, etc. Workers who are excessively absorbed by work problems and cannot even get rid of them in the family circle or with friends are most susceptible to the development of psychological deformation due to so-called professional burnout. The consequences of professional burnout manifest in the development of negative attitudes towards clients, work, organization or yourself as well as in alienation from work and, as a result, in a significant decrease in loyalty and attractiveness of the work in this company. Behavioral consequences manifest both at the individual employee level and at the level of the whole company. Such workers resort to unconstructive or ineffective behaviors, exacerbating their own feelings of distress and increasing tension, which undoubtedly leads to the decrease in the quality of work and communications [7].

Scientific and practical interest of professional burnout syndrome is due to the fact that such a condition is a direct manifestation of ever-growing problems associated with the well-being of employees, their labor efficiency and the company's progression. The concern of employers and managers about the burnout of employees could be explained by the fact that it is unnoticed at the beginning; but its consequences manifest in the form of "economic losses" are known to be very expensive for companies [9,19].

Study of the characteristics of professional burnout, determination of its emotional and personal prerequisites as well as its effects within the framework of individual specializations will help better understand the specifics of the destructive influence of professional activity on the personality as well as develop directions for improving the conditions of professional activity and means to ensure professional longevity and health of specialists.

2 Review of the Literature

Professional burnout is known to be a syndrome that is characterized by emotional exhaustion, depersonalization and low personal self-esteem, leading to the

development of psychological deformation of the personality and subsequently the formation of psychosomatic pathology. The term "professional burnout" was firstly mentioned as a condition that arises among employees of "assisting professions". The authors of such a term were Bradley in 1969, Herbert Freudenberg in 1974 and Christina Maslach in 1976 [11,17]. On May 27, 2019, occupational burnout was recognized in the 11th revision of the International Classification of Diseases by the World Health Organization as an occupational phenomenon. It is described in the chapter: "Factors influencing health status or contact with health services" - which includes reasons for which people contact health services but that are not classed as illnesses or health conditions [27].

An estimated number of 30–50% of health workers worldwide experience symptoms of burnout. At the same time, the formation of professional burnout among medical workers can lead to deterioration of their attitude to patients, a decrease in professionalism, the development of depressive and suicidal thoughts, and professional errors, affecting patients . In addition, healthcare providers who experience burnout symptoms may develop sleep disturbances, alcoholism, musculoskeletal disorders, hypertension, and coronary heart disease [8,21]. The characteristic feature of the professional activity of teachers of higher educational institutions is known to be hard work associated with increased emotional tension, the complexity of interpersonal communication, great intellectual, sensory, emotional stress as well as unfavorable mode of work. Teachers of higher educational institutions, in addition to teaching and research, have significant voice and psycho-emotional stress and are exposed to constant background noise while performing administrative, organizational and methodological work [26]. According to studies conducted in a number of countries, it has been shown that about 30% of teachers at various departments of medical universities in Germany and Austria show pronounced signs of professional burnout syndrome, manifesting in a decrease in ability to constructively solve professional tasks, a tendency to refuse in situations of failure, and a feeling of dissatisfaction with the results of their activities [14].

At the same time, employees of financial institutions work in constant contact with a large number of people in a tight schedule and time limit in compliance with instructions and regulations; what is more, they work with financial documents, thus constant high concentration of attention is highly required. As a result, specialists form a specific behavior model aimed to maintain internal psychological comfort; long-term work under such conditions is accompanied by signs of internal accumulation of negative emotions and gradually leads to professional burnout [13].

A number of authors consider professional burnout as a consequence of the influence of individual and organizational factors when there is a mismatch between the individual and the working environment. Numerous recent studies have proved psychosocial production factors to be important in the violation of both mental and physical health. According to the International Labor Organization (1998), factors affecting the occurrence of professional burnout include such aspects of work and the working environment as the organizational cli-

mate or culture, work roles, interpersonal relationships at work, the structure and content of tasks, as well as the organizational environment (internal needs) and aspects of personality [4]. The organizational factor of emotional burnout is associated with hours of work that is not properly evaluated, requiring exceptional productivity and appropriate training. Professional experience and the time spent in a stressful environment play an important role as well [5].

In order to identify symptoms of professional burnout, a three-factor model of K. Maslach and S. Jackson is used, which includes emotional exhaustion, depersonalization and reduction of personal achievements, manifesting usually among employees of "assisting professions". Emotional exhaustion is considered as the main component of emotional burnout and manifests in a reduced emotional state, indifference, or emotional glut. The second component (depersonalization) manifests in the deformation of relations with other people. In some cases, this may lead to an increase in dependence on others. In other cases, there is an increase in negativity, cynicism of attitudes and feelings towards recipients: patients, clients, etc. The third component of emotional burnout - the reduction of personal achievements - can manifest either in a tendency to negative self-assessment, underestimation of one's professional achievements and successes, negative attitude to labor dignities and opportunities or to downplay their own dignity, limiting their capabilities, duties in relation to others [15].

According to K. Maslach and C. Jackson, burnout is considered in general as a stressful reaction and as structural formation, which is largely determined by individual and personal properties, which allows simultaneously considering this phenomenon in the aspect of the phenomenon of professional deformation. Questionnaire for the diagnosis of professional burnout by K. Maslach MBI-GS contains three subscales that evaluate emotional exhaustion (EE), depersonalization (DP) and a sense of low personal achievement (LPA) [20]. This is the most commonly used and proven tool for detecting burnout among healthcare professionals, and is therefore considered the gold standard, as shown in Fig. 1. The definition of burnout using MBI-GS is such that the higher the scores in the area of exhaustion and cynicism and the lower the score for professional performance, the higher the degree of burnout. The reliability of MBI-GS was confirmed in studies conducted in various European countries.

According to procedural models of burnout, burnout is considered as a dynamic process that develops over time and has certain phases or stages. Procedural models consider the dynamics of burnout development as a process of increasing in emotional exhaustion, which results in negative attitudes towards subjects of professional activity. A burned out specialist is trying to create an emotional distance with their colleagues as a way to overcome exhaustion. At the same time, a negative attitude is developing in relation to their own professional achievements (reduction of professional accomplishments) [10].

Stress experienced by workers can be caused by various factors, generally caused by external factors and internal factors of the individual themselves. Existing studies tend to focus on the influence of external factors on stress conditions experienced by workers, such as environment and work situation.

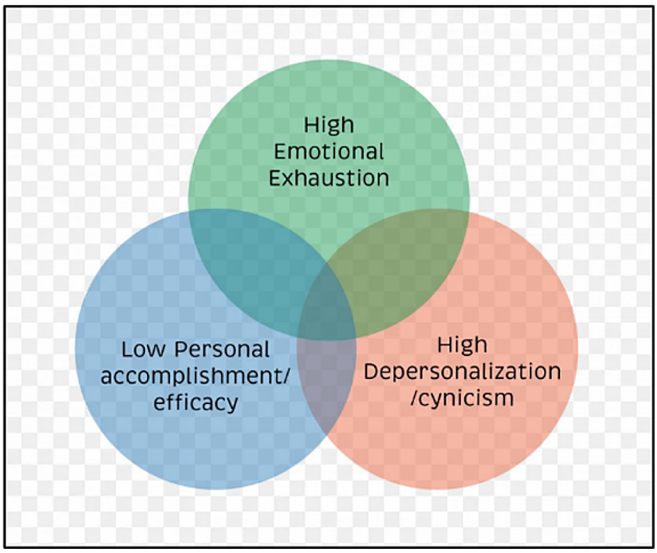

Fig. 1. Three subscales of Maslach Burnout Inventory

Meanwhile, studies focusing on internal factors as a cause of worker stress are still not widely practiced, particularly with regard to experience patterns and work-related behavior. Measurements used to measure experience patterns and work-related behavior are also newly adapted in some countries, using the AVEM test.

Questionnaire "Work-related behaviors and experiences" Arbeitsbezogenes Verhaltens- und Erlebensmuster (AVEM) was developed by W. Schaarschmidt and A. Fisher and reflects human reactions to the requirements of the professional environment and behaviors formed on the basis of these reactions, as well as the severity of manifestations of emotional burnout. The AVEM questionnaire is a 66-point diagnostic tool that allows determining the characteristics of the behavior and feelings of employees when their professional requirements are presented to them. The questionnaire includes 11 scales, each containing 6 questions, with answer options presented in the form of a five-point Likert scale ranging from 1 ("I completely disagree") to 5 ("I completely agree"). The questionnaire encompasses three areas of human behavior and experience that are associated with professional activities. The first one describes the readiness for energy costs, the degree of involvement into the work, the subjective significance of the activity and professional ambitions. The second area characterizes the psycho-emotional stability in situations of failure, as well as the willingness to overcome them. The third area reflects the emotional attitude to the activity, the possibility to obtain social support, as well as the experience of own professional success [25]. Based on the analysis of indicators of individual scales of

the questionnaire and their relationships, the authors of the technique identified four types of behavior and experiences in a professional environment:

Pattern G: "Health" - this model represents a healthy attitude towards work. People are ambitious at work, but are also able to maintain an emotional distance from work. They have high resistance to stress and can control their own energy costs in all aspects related to positive emotions; workers are mentioned to overcome situations of failure and defeat, which are considered not as a source of frustration and negative emotions, but as an incentive to search for active strategies for overcoming them.

Pattern S: "Unambitious" - this model is characterized by a rather unpretentious attitude to work, while the lowest ratings characterize the commitment to work and the highest ones - rates of detachment. This is an economical, thrifty pattern with an average level of motivation, energy costs and professional aspirations, a pronounced tendency to maintain distance in relation to professional activities, satisfaction with the results of their own work. Nevertheless, an economical behavior strategy is effective only in a limited time frame. In further perspective, professional dissatisfaction is likely to increase. The issue of this model constitutes in a larger extent in encouraging motivation and not to health as.

Risk pattern A: "Overexertion" - this model is characterized by excessive commitment to work and difficulties in emotional suspension from work, excessively high subjective importance of professional activity, a high degree of readiness for energy costs, and low resistance to frustration and stress. The high level of negative emotions resulting from mental overload, the pursuit of excellence and the resulting dissatisfaction with the effectiveness of one's activities and the violated mechanisms to overcome stress and negative emotions also characterize such debilitating pattern.

Risk pattern B: "Burnout" - People with such a model show low ratings for parameters related to professional commitment. They achieve high scores for retirement tendencies and, accordingly, low scores for emotional distance and active overcoming difficulties. Their emotional status is characterized by low scores in balance and mental stability, job satisfaction, life satisfaction and limited experience of social support. Low subjective value of activity, low stress resistance, limited ability to relax and constructive problem solving, a tendency to refuse in difficult situations, a constant sense of anxiety and pointless fear are widely developed. It should be noted that, there is a similarity between types B and S related to a low subjective value of activity, however, the difference between them is that type B is not capable of maintaining the necessary distance with respect to work. This leads to additional mental stress, constant dissatisfaction with oneself, a decrease in the overall mental stability of the body, apathy and unwillingness to perform professional tasks [22]. This model presents the main symptoms of burnout.

The study of the internal psychological characteristics of an individual contributing to the development of professional burnout allows considering the type of behavior in the work environment as a conscious strategy of employee behav-

ior, responsible for its implementation both in a successful situation and in failure [18].

The results of many studies of recent years allow concluding that the leading role in the emergence and development of factors of emotional burnout belongs to the personal factor, which is a combination of individual psychological characteristics. Individual psychological characteristics are understood as private psychological properties and qualities (such as rigidity - mobility, emotional reactivity, etc.), as well as holistic personality formations (interests, character, lifestyle, etc.). On the one hand, individual psychological characteristics undergo changes due to age, as a result of continuous training; on the other hand, a single lifestyle of the personality, subordinating all private qualities and characteristics to one direction, remains quite stable throughout life [6].

3 Problem Statement

It is obvious that the study of the formation of professional burnout among employees of socially significant professions, by identifying the relationship between the nature, degree of individual psychological characteristics of a person in relation to their professional activity and the level of burnout, is not well understood and is of great interest nowadays. Identification of the most significant relationships between the risk of professional burnout and the behavior and experiences associated with work, taking into account specific issues of MBI-GS and AVEM, combined with identification of the most significant statements, can significantly improve and speed up the procedure for diagnosing professional burnout in employees.

4 Experiment, Results and Discussion

The study was conducted by questioning 360 employees (emergency medical center employees - 120, teachers of university departments - 120, bank employees - 120). In order to identify symptoms of professional burnout, a survey was conducted using the standardized Maslach Burnout Inventory - General Survey (MBI-GS). The risk of developing professional burnout is determined on the basis of three subscales: “emotional exhaustion”, “cynicism” (depersonalization) and “reduction of personal achievements”.

For all employees standard calculation of burnout level was provided. After that we should identifier an employees in each of three professions with initial burnout level. It gives us possibilities defining the most significant statements that correspond to beginning of a burnout process. Using standard approach for calculation burnout level by MBI questionnaire (Fig. 2) we have summarized results of three scales: “emotional exhaustion” (cell “SumA” in Fig. 2), “cynicism” (cell “SumB” in Fig. 2) and “reduction of personal achievements” (cell “SumC” in Fig. 2). Further, we have converted these amounts to point (cells “RezA”, “RezB” and “RezC” in Fig. 2) and summarized them (cell “Result” in Fig. 2). As a group with the initial burnout level was taken a group with

ID	GENDER	AGE	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8	A_9	A_10	A_11	A_12	A_13	A_14	A_15	A_16	sumA	sumB	sumC	RezA	RezB	RezC	Result
418001	0	46	0	0	0	0	0	0	6	0	0	6	6	6	0	0	0	6	0	0	30	0	0	0	0
418002	0	65	1	3	1	1	6	3	6	0	0	5	6	5	5	1	0	5	9	6	33	0	1	0	1
418003	0	58	1	3	1	0	6	0	6	1	1	6	6	5	5	1	1	6	5	9	35	0	1	0	1
418004	0	68	0	0	0	0	6	0	6	0	0	6	6	6	6	0	0	6	0	6	36	0	1	0	1
418005	1	35	0	0	0	0	6	0	6	0	0	6	6	6	0	0	0	6	0	0	36	0	0	0	0
418006	1	35	6	6	6	6	5	5	5	1	2	6	6	6	3	0	0	6	29	6	34	2	1	0	3
418007	1	65	3	2	1	0	2	1	6	0	0	6	5	6	1	3	0	6	7	4	31	0	1	0	1
418008	1	45	0	0	0	6	6	0	6	0	0	6	6	6	0	0	0	6	6	0	36	0	0	0	0
418009	1	31	3	6	5	3	6	4	6	1	1	6	6	6	5	6	2	6	21	15	36	2	2	0	4
418010	1	43	6	6	6	0	6	6	2	0	5	6	6	6	6	2	6	4	24	19	30	2	2	0	4
418011	1	65	0	0	0	0	1	0	6	0	0	3	4	6	0	0	0	6	0	0	26	0	0	0	0
418012	0	78	2	0	3	6	6	0	6	0	0	6	6	1	6	0	0	6	11	6	31	0	1	0	1
418013	0	38	3	4	4	2	5	2	5	3	3	5	5	5	5	5	1	5	15	17	30	1	2	0	3
418014	1	37	0	0	1	0	6	1	5	0	0	6	6	5	0	1	0	6	2	1	34	0	0	0	0
418015	1	37	4	5	5	1	6	4	6	0	3	6	6	6	4	0	0	6	19	7	36	1	1	0	2
418016	0	73	0	0	0	0	6	1	6	0	0	6	6	6	1	0	0	4	1	1	34	0	0	0	0

Fig. 2. MBI questionnaire answers

value less than 3 in "Result" cell and values less than 2 in "RezA", "RezB" and "RezC" cells. So, from university department's teachers number of objects in the group with initial burnout level is equal to 29, emergency medical center employees - 22, bank employees - 31.

For best understanding of mutual position of clusters, which corresponds to different burnout levels, visualization using principal component analysis (PCA) method was provided. PCA data visualizations for different professions are presented on Figs. 3, 4 and Fig. 5. On each figure a group with the initial burnout level marked by yellow color, a group with the high burnout level - by red color, a group without burnout symptoms - by blue color. It is easy to see that group without burnout symptoms forms a compact cluster while a groups of initial and high burnout level form clusters with low density because professional burnout can be shown in three different subscales.

Defining the most significant statements that correspond to beginning of a burnout process cab be done using regression analysis and eli5 Python library. This library allows to visualize results of logistic regression model, it provides a way to explain black-box models results [2]. So, logistic regression model was trained on data of MBI questionnaire, accuracy is from 88% to 92% for different professions using cross-validation. Result of eli5's processing for three professions is presented on Fig. 6.

For each profession numbers of most informative questions from MBI questionnaire are different. For teachers and emergency medical center employees the most informative questions belong to subscales of "cynicism" and "reduction of personal achievements", for bank employees - to subscales of "cynicism".

Work-related characteristics and models of behavior using the AVEM questionnaire were studied. AVEM questionnaire and MBI questionnaire describe different parts of total professional burnout. For all three professions employees without burnout symptoms correspond to pattern G ("Health") of AVEM questionnaire by 84,7%. Using logistic regression and eli5 Python library the most informative questions from AVEM questionnaire were established. We have to note the need of additional studying for best understanding this approach.

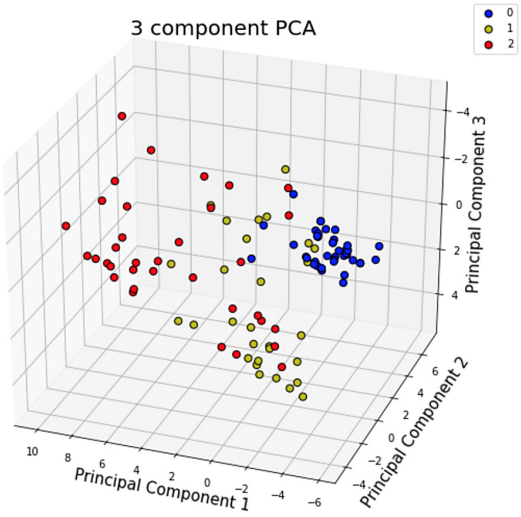

Fig. 3. Data visualization for teacher's group

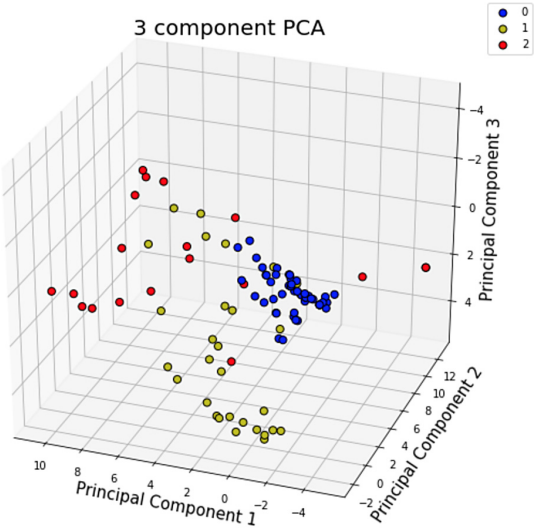

Fig. 4. Data visualization for bank employee's group

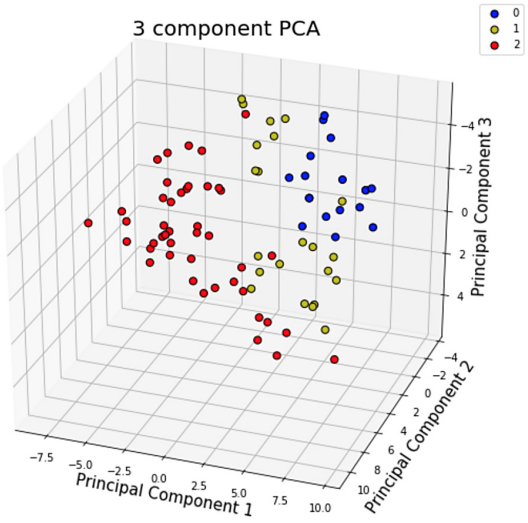

Fig. 5. Data visualization for group of emergency medical center employees

y=1.0 top features

Weight[?]	Feature
+2.089	A_13
+0.365	A_1
+0.241	A_2
+0.144	A_5
+0.085	A_10
-0.013	A_7
-0.019	<BIAS>
-0.027	A_11
-0.270	A_3
-0.309	A_6
-0.448	A_12
-0.640	A_15
-0.743	A_14
-0.929	A_4
-1.184	A_9
-1.186	A_16
-1.299	A_8

university teachers

y=1.0 top features

Weight[?]	Feature
+0.745	MBI_11_lf
+0.607	MBI_13_zy
+0.575	MBI_07_lf
+0.322	MBI_10_lf
+0.299	MBI_04_ee
-0.031	MBI_12_lf
-0.103	MBI_09_zy
-0.172	MBI_08_zy
-0.200	MBI_01_ee
-0.267	MBI_03_ee
-0.290	MBI_05_lf
-0.345	MBI_02_ee
-0.354	MBI_06_ee
-0.384	<BIAS>
-0.396	MBI_16_lf
-0.421	MBI_14_zy
-0.526	MBI_15_zy

emergency medical center employees

y=1.0 top features

Weight[?]	Feature
+1.841	MBI_13_zy
+0.581	MBI_15_zy
+0.434	MBI_02_ee
+0.192	MBI_16_ef
+0.183	MBI_14_zy
+0.160	MBI_07_ef
+0.157	MBI_05_ef
+0.103	MBI_10_ef
+0.051	MBI_01_ee
+0.013	MBI_12_ef
-0.017	MBI_09_zy
-0.041	MBI_03_ee
-0.055	MBI_11_ef
-0.122	MBI_04_ee
-0.344	MBI_08_zy
-0.492	MBI_06_ee
-0.801	<BIAS>

bank employees

Fig. 6. Eli5's visualizing of logistic regression model results

5 Conclusions

This paper is dedicated to the first in Ukraine study of professional burnout among employees of socially significant professions: emergency medical center employees, teachers of university departments, bank employees. For each professions the most informative questions of MBI and AVEM questionnaire were established. It was also revealed that a pronounced feature of bank employees

according to the AVEM questionnaire was the decrease in motivation for professional attachments, energy costs in relation to work, a decrease in the quality of performed work and ability to hold distance from professional activities, as well as a decrease in satisfaction with their professional achievements marked against the background of low mental stability of the respondents. In university teachers, the AVEM questionnaire revealed a decrease in the active strategy of solving problems, a decrease in the feeling of social well-being and a sense of success in the professional activity. At the same time, medical workers were distinguished by a high inability to maintain distance in relation to work and excessive dissatisfaction with life circumstances.

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