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RESEARCH ARTICLE

DEVELOPMENT OF THE QUESTIONNAIRE AND ESTIMATION OF THE PARTICULARITIES OF OWN EXHAUSTION IN MEDICAL WORKERS UNDER COVID-19 PANDEMIC CONDITIONS. PILOT STUDY

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Abstract

Burnout syndrome is defined in the ICD-11, stated in section "273 – Problems related to the difficulty of organizing their own way of life", is a real scourge of the XXI century, especially for people who work within a communication-related field. This problem has gained particular importance under the influence of the coronavirus pandemic. However, the issues on development and specific manifestations of occupational stress among doctors of different specialties have not been systematically studied yet. Specialty scientific papers on the indicators that reflect the stress and burnout were consulted for the elaboration of the working tool (IPSSHM questionnaire - for diagnosing the professional stress syndrome in the healthcare workers) and selecting the testing methodology. A pilot study was conducted to assess the burnout syndrome as a complex systemic state of the professional activity of various medical specialists in the Republic of Moldova, depending on their psychophysiological characteristics. A questionnaire, which includes two parts (general and special), was developed. The general part of the questionnaire (with ten items) allowed to collect personal social, professional, and married data about the respondent, regarding age, biological gender, family situation, living environment, activity environment, medical specialty, place/work institution, work experience, and information about a part-time job. The unique part of the questionnaire represents a set of 131 items, which characterize the respondent through the prism of six distinctive structural blocks: emotional-sentimental, behavioral block, cognitive block, communicative block, individual-semantic block, and neurophysiological block. 38.3% of the medical workers tested (n=73) did not suffer from burnout, while 61.6% of them presented various signs of burnout. The specific characteristics of the professional exhaustion among healthcare workers were revealed depending on their specialty and work experience, as well as on their psychophysiological peculiarities. The most susceptible to stress factors were the healthcare workers with <10 years of working experience (77.1%). The constituent mental health blocks showed changes among different medical specialties under the influence of occupational exhaustion. The obtained results demonstrate the validity of the questionnaire and the

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possibility of its application identifying healthcare workers' burnout. A relationship between physician burnout, their behavioral type and level of emotional stability has been demonstrated.

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Introduction:-

Burnout syndrome has been now officially recognized as a medical condition, being included in the International Classification of Diseases under ICD-10: 273 - Problems related to the difficulty of organizing one's own way of life. According to statistics, 25% of people experience burnout at least once in their lives (Winefield, H.R., et al, 1991; Yates, S.W., 2020). Burnout has reached incredible proportions among healthcare professionals around the world, with more than half of doctors and one-third of nurses showing symptoms. Burnout epidemic is detrimental to patient care and may exacerbate looming medical shortage (Kumar, S., 2016). The topical issue of emotional exhaustion is the biggest for specialists whose professional activity is indispensable related to communication with people. Occupational stress in medical workers is conditioned by their vulnerability, being people always obsessed with work, perfectionists, with tendencies to have absolute control. All these exaggerated requirements cause the inner imbalance, which degenerates into professional stress. As a result, the aforementioned burnout phenomenon appears, an alarm sign for those stressed before getting sick (frequently) from cerebrovascular, cardiovascular, dysmetabolic diseases, etc.

Currently, the problems of occupational health and personal well-being of doctors are attracting more and more attention from researchers (Cooper, C.L., et al, 1999; Leonova, A.B., 2000; Cooper, C.L., et al, 2001; Bolanowski, W., 2005; Leonova, A.B., 2007; Vodopyanova, N.E. and Starchenkova, E.S., 2008; Quick, J.C. and Henderson, D.F., 2016). The COVID-19 pandemic has made adjustments to the schedule, intensity and working conditions of medical workers, induced the fear of contracting a new, previously unheard of infection, which only exacerbated the stressful impact on the medical staff (Abdelhafiz, A.S. et al, 2020). Emotional burnout of health workers also occurs in everyday life, but with the arrival of the virus, the situation has become more difficult and unpredictable. Stress in connection with the coronavirus pandemic, first of all, manifests itself with depressive and anxiety disorders, such as fear, insomnia, and difficulty concentrating. The pandemic acts as a trigger for the burnout of health workers. Studies on the severity of stress among Russian health workers working with covid patients have shown that young women, under 40, are more susceptible to stress. According to the Ministry of Health of Russia, more than 2,000 Russian medical workers were examined and 74% of them were diagnosed with burnout syndrome against the background of the coronavirus pandemic, Health Minister Mikhail Murashko said at the summit on the impact of the pandemic on the mental health of the population and the system of service delivery in the European region of the World Health Organization (Garcia, G.P.A. and Marziale, M.H.P., 2018). In Egyptian clinics, burnout syndrome was diagnosed in 30% of doctors who worked with COVID-19 (Abdelhafiz, A.S. et al, 2020). In the United States, two independent studies reported an increased level of burnout among anesthetists working in the red zone of mono-inpatient clinics (Almeida, M. and De Cavalcante, G., 2021; Watkins, S., et al, 2021). A study published in the journal General Hospital Psychiatry found New York clinicians showed high levels of stress, anxiety, and depression, especially among those with the greatest amount of patient interaction. More than half had high levels of acute stress and experienced insomnia. Nearly half screened positive for depressive symptoms. And about a third had anxiety. The study also points to a concern that prolonged acute stress may lead to post-traumatic stress syndrome (Attman, P., et al, 2020). Over the past year, doctors have noted a complete depletion of physical and mental resources (Kumar, S., 2016). According to statistics, presented by the Ministry of Health, Labor and Social Protection, 87% of Moldovan doctors show a certain level of burnout. All this convinced us of the need for the research of burnout as a complex systemic health condition among healthcare professionals of various specialties in the Republic of Moldova, depending on their psychophysiological characteristics.

Material and Methods:-

The pilot study consisted of implementing the questionnaire on "Identification of professional stress syndrome among healthcare workers (IPSSHW questionnaire)", which was designed on a number of 109 healthcare specialists working within medical institutions in the Republic of Moldova during 2020-2021. The questionnaire was completed online and the respondents had the opportunity to accept or refuse taking the survey. The respondents were informed about the confidentiality conditions in accordance with the provisions of the law. As participation in the study was voluntary, the informed consent was confirmed in 107 cases and 2 respondents refused to participate

in the survey research. The participants were selected according to inclusion and exclusion criteria of the study, which provided the following: the research participation agreement, being a resident of the Republic of Moldova, being a healthcare worker, working within a medical institution in the Republic of Moldova, and the survey completion rate. The final sample included 73 medical specialists, which corresponded to the study purpose of establishing a possible link between the occupational exhaustion of doctors, their specialty, experience and workload, temperament and behavioral type. The questionnaire is divided in two parts: the general one, consisting of 10 items and the special part of 131 items (the emotional and sentimental, behavioral, cognitive, communicative, individual-semantic, and neurophysiological blocks), which made it possible to characterize the individual psychophysiological status and study of the burnout syndrome among healthcare workers. The first question was related to the relationship between the doctor's specialty and burnout. According to the generally accepted classification, there are two main groups of medical specialties: the therapeutic specialties, which include doctors specializing in the diagnosis and non-surgical treatment of somatic disorders and diseases; and the surgical specialties, involving physicians using the surgical approach for treating diseases and injuries. The interviewees were divided as follows: 1. Physicians of therapy specialists who deal directly with patients (therapy, cardiology, endocrinology, gastroenterology, pneumology, etc.); 2. General practitioners and pediatricians; 3. Surgical doctors; 4. Healthcare providers without a direct patient contact.

Results:-

Consequently, a questionnaire that includes two parts was obtained: the general part with ten items and the special part with 131 items. The general part of the questionnaire allows us to collect personal data (social, professional, and matrimonial) about the respondent, with reference to age, biological gender, family situation, living environment, activity environment, medical specialty, place/work institution, work experience, and information about a part-time job. The special part of the questionnaire characterizes the respondent in terms of six structurally distinctive blocks. Still, the items in the questionnaire are randomly represented: emotional-sentimental block, behavioral block, cognitive block, communicative block, individual-semantic block, and neurophysiological block. The respondent selects the pre-set answers: Yes, No, I didn't think/Differently. Each answer gets a score from 1 to 3, depending on the specifics of the question and block belonging.

Indicators of constitutive block dysanogenies were applied:

Emotional block: Subject's inherent emotionality unmotivated change; irrational concern increase; loneliness feeling prevalence; gloominess and pessimism; anxiety, irritability, emotional duress; unmotivated sadness.

Behavioral block:

Unmotivated change in the subject's behavior: alcohol, tobacco or gambling addiction, suicidal impulses, unmotivated aggression, antisocial behavior, cynical attitude towards patients.

Cognitive block:

Loss of interest in new theories and ideas in the workplace, alternative problem-solving approaches, preference for standard templates, routine, rather than creative approach, cynicism or indifference to innovation; little participation or refusal to participate in development experiments - training, education; formal execution of work; Memory impairment, speech errors, stiffness and patterned thinking.

Communicative block:

Unmotivated decrease in the inherent sociability of the subject. The feeling of isolation, the lack of understanding of others and from others. Feeling of lack of support from family, friends, colleagues. Speech errors, decreased literacy.

Individual-semantic block:

Decreased interest in work, hobbies, life in general; disappointment in one's own activities and increasing problems in one's personal life. Inadequate self-assessment. Impotence, vital "inability". Decreased interest in work, in life in general; The emergence of collisions between the ideal and the vision of the real world; Strong feelings of guilt, self-blame.

Neurophysiological block:

Sleep disorders, common ailments (headaches, poor general health; high blood pressure; ulcers and inflammatory skin diseases; diseases of the cardiovascular system), food indifference, excessive use of medicines, fatigability, unmotivated weight changes.

As the questionnaire was also intended to determine the type of respondent's behavior, appropriate questions were included. In addition, the questionnaire included questions designed to assess the respondent's sincerity. In order to verify the veracity of the answers in the elaborated questionnaire, two questionnaires were used in parallel: the Maslach test (diagnosis of burnout) and the Eysenck test (determination of temperament type). The data analysis showed that out of 73 medical workers surveyed, 28 people (38.3%) did not experience burnout syndrome, while 45 (61.6%) expressed some or other signs of burnout; in turn, 38 (52.1%) and 7 (9.6%) of them were classified as having a medium level and a high level of burnout, respectively. It should also be noted that the highest burnout rate was registered among GPs and pediatricians (15 out of 20) and, paradoxically, among specialists who have no direct contact with patients (8 out of 11); 16 out of 29 were doctors of therapeutic specialties and 6 out of 13 were surgical doctors (Table 1).

Table 1:- Burnout among various healthcare specialists.

Medical Specialty				Work experience			Number of Jobs		Behavioral Type		Emotional characteristics	
Therapeutic specialists, %	Surgical specialists, %	GPs and pediatricians, %	doctors with no direct contact with patients, %	<10 years, %	10-20 years %	>20 years, %	1 job %	2 jobs, %	extraversion, %	introversion, %	Emotional stability, %	Emotional instability, %
Medium level of burnout												
44.8	38.5	65.0	63.6	65.7	30.4	46.7	51.2	53.1	46.5	70.0	33.3	67.6
High level of burnout												
10.3	7.7	10.0	9.1	11.4	17.4	6.6	12.2	6.2	7.0	10.0	5.6	13.5
Sanogenic condition												
44.8	53.8	25.0	27.3	22.8	52.2	46.7	36.6	40.6	46.5	20.0	61.1	18.9

Moreover, there were reported changes in the constituent mental health blocks among doctors of different specialties under the influence of burnout. It was noted that therapeutic doctors with medium level of occupational exhaustion presented frequent changes of the emotional, individual-semantic and cognitive blocks, whereas general practitioners and pediatricians: of the emotional and cognitive blocks (Table 2).

Table 2:- Medium level of burnout.

	Emotional block (%)	Behavioral block (%)	Communicative block (%)	Individual-semantic block (%)	Neurophysiological block (%)	Cognitive block (%)
Medical specialty:						
<i>Therapeutic specialists</i>	42.8	100.0	25.0	55.5	50.0	37.5
<i>Surgical doctors</i>	9.5	-	25.0	11.1	-	18.7
<i>GPs and pediatricians</i>	42.8	-	25.0	22.2	-	37.5
<i>doctors with no direct contact with patients</i>	4.8	-	25.0	11.1	50.0	6.3
Work experience:						
<i><10 years</i>	61.9	100.0	50.0	55.5	100.0	68.8
<i>10-20 years</i>	19.0	-	25.0	22.2	-	18.7

>20 years	19.0	-	25.0	22.2	-	12.5
Number of Jobs:						
1 job	57.1	100.0	50.0	88.8	75.0	50.0
2 jobs	42.9	-	50.0	11.1	25.0	50.0
Behavioral type:						
extraversion	52.4	-	50.0	22.2	50.0	37.5
introversion	47.6	100.0	50.0	77.7	50.0	62.5
Emotional characteristics:						
Emotional stability	33.3	-	50.0	33.3	50.0	25.0
Emotional instability	66.6	100.0	50.0	77.7	50.0	75.0

Healthcare workers with a high level of burnout from these two groups displayed functional changes of the behavioral, communicative and neurophysiological block (Table 3). Occupational exhaustion in surgical doctors was characterized by frequent changes in cognitive and emotional blocks. This phenomenon, which was studied in doctors without a direct patient contact regardless of their burnout level was characterized by more uniform changes in all the constituent blocks.

Table 3:- High level of burnout.

	Emotional block (%)	Behavioral block (%)	Communicative block (%)	Individual-semantic block (%)	Neurophysiological block (%)	Cognitive block (%)
Medical specialty:						
Therapeutic specialists	42.8	50.0	66.7	50.0	50.0	50.0
Surgical doctors	-	-	-	-	-	-
GPs and pediatricians	28.6	-	-	16.7	25.0	50.0
Doctors with no direct contact with patients	28.6	50.0	33.3	33.3	25.0	-
Work experience:						
<10 years	57.1	50.0	33.3	50.0	50.0	100.0
10-20 years	42.9	50.0	66.7	50.0	50.0	-
>20 years	-	-	-	-	-	-
Number of Jobs:						
1 job	57.1	100.0	66.7	66.7	50.0	50.0
2 jobs	42.9	-	33.3	33.3	50.0	50.0
Behavioral type:						
extraversion	57.1	50.0	33.3	25.0	50.0	-
introversion	42.9	50.0	66.7	75.0	50.0	100.0
Emotional characteristics:						
Emotional stability	42.9	-	-	33.3	-	50.0
Emotional instability	57.1	100.0	100.0	66.7	100.0	50.0

More research was needed to further explore the relationship between work experience, work intensity and the burnout rate. The current study revealed that the incidence of occupational exhaustion was not related to the number of jobs of the respondents, however, their work experience was quite relevant. The most exposed to stressors health workers (77.1%) were those who had an experience of up to 10 years.

Furthermore, the relationship between the exhaustion of health workers, their behavioral type and their level of emotional stability was also of great interest. The research findings showed a direct connection between the healthcare worker burnout and both of these indicators. Thus, out of 34 physicians with an introverted behavior, 26 showed changes characteristic of emotional burnout (80%), and 53.5% - among extroverts. It should also be noted

that out of 36 emotionally stable employees, 61.1% referred to the group with a sanogenic state, while out of 37 interviewees only 18.9% were emotionally unstable.

As regarding the specificity of burnout characteristics among healthcare workers of different behavioral types and emotional stability levels, it should be noted that the number of introverts, characterized by changes in individual-semantic and cognitive blocks, exceeded the number of extroverts.

Discussion:-

The indicators that reflect stress and burnout, which persist for more than six weeks, assume the presence of professional stress (Kumar, S., 2016; Olson, K.D., 2017; Garcia, G.P.A. and Marziale, M.H.P., 2018). But concrete prevention measures can be applied only when the factors causing the problem, the conditions of manifestation, the amplitude of the effects are well known. One of the effective methods in confirming the presence of burnout and establishing the factors that cause it is the application of psychophysiological tests and hygienic-social questionnaires.

Depending on the purpose of the research and the expected purposes, standardized tests/ questionnaires can be used, but much more effective are the questionnaires developed specifically for the initiated research. Thus, the questionnaire "Identification of occupational stress syndrome in healthcare workers" (IPSSHM) was designed. Before the main study, it is recommended to initiate a pilot study, which helps the researcher by studying small groups so that the correction of the questionnaire can be made, which makes it valid (Etikan, I., 2017; Fontes, F.F. and Herbert, J., 2020).

The initiation of a questionnaire has two key stages. The first of these is to articulate the questions that the research is intended to address. The second step is to determine the hypotheses around which the questionnaire is to be designed. The questionnaire predestined for research on burnout syndrome must reflect changes in all constituent components of mental health (neurophysiological, emotional-sentimental, cognitive, communicative, behavioral, individual-semantic) (Furdui, T.I., et al, 2012). The developed questionnaire meets these requirements. Reviewed scientific sources aimed to elucidate the role of working conditions in the occurrence of burnout syndrome provide a similar clinical picture, indicating that the increased workload and overtime hours might contribute to its development. The employees with a 12-hour working day have been shown to have a higher rate of occupational exhaustion than those with an 8-hour day. The scientific literature showed evidence that the incidence of burnout is independent of a person's age. It is commonly mediated by the length of the work experience, which correlates with the stages of professional development of specialists (Bagriy, M.A., 2009; Kozin, V.A., 2017). Our research agrees with these statements and shows that the highest burnout rate (80.0%) belongs to the group of specialists with less than 10 years of experience.

The researchers who have studied occupational stress among healthcare workers claim that it is likely to occur due to job specificity in general, which is characterized by intensity of interpersonal communication, increased workload and strict labor regulation, personal high-involvement work practice and responsibility. The scientific literature show evidence that the highest level of exhaustion is reported among resuscitators and surgeons compared to therapists who commonly experience an average level of burnout, which may be due to high emotional stress and responsibility levels of the first two professions (Bagriy, M.A., 2009). The primary assumption of our research on the main factors contributing to the onset of burnout was the direct contact with patients. However, the research results show that although general practitioners and pediatricians are ranked first (75.0%) in terms of the burnout incidence among selected groups of specialists, healthcare workers without direct patient contact in their professional activity are placed on the second place (72.8%). This index is 46.2% among the group of anesthetists and surgeons and 55.7% in the group of therapists. In our opinion, this may be due to the professional specificity, which requires a broader range of activity for the first two specialties, while the narrower specializations are inherent for surgeons and therapists.

There have been reported that stress in surgeons might be associated with worsening of the overall health condition, followed by anxiety and aggression, as well as signs of exhaustion, while in therapists the main stress manifestations are the worsening of the overall condition, anxiety and depression (Bagriy, M.A., 2009). Our study showed that burnout syndrome among therapists, family physicians and pediatricians is manifested by a change in the emotional and cognitive areas, while therapists are more likely to develop symptoms related to the individual-semantic block. The occupational stress among specialists from the other two groups is characterized by a more uniform

involvement of all mental health components.

Studies aimed at determining the nature of the relationship between burnout syndrome and the type of temperament, are of particular interest since they highlight the significant link between melancholic and choleric temperaments and emotional exhaustion syndrome, in other words, the burnout syndrome occurs more frequently in healthcare workers with these types of temperaments (Ugryumova, N.V., 2014; Khudalova, M.Z., 2018). This can be explained by unstable nervous system of choleric and melancholic patients, their sensitivity to low level of stress resistance, the predominance of excitation over inhibition processes, which combined with high-level stressors, can lead to neuropsychiatric diseases and occupational burnout. The N-Kruskal-Wallis test shows that groups differ by their temperament types, having a statistically significant value of $p < 0.001$ in terms of emotional exhaustion and depersonalization, thus, melancholic and phlegmatic people show signs of emotional exhaustion to a greater extent, while melancholic and choleric express depersonalization (Khudalova, M.Z., 2018). There are data on the association between the emotional exhaustion and temperament, as well as anxiety and stress resistance, which exhibit a considerable impact of personality traits on this syndrome. Thus, for example, melancholic people commonly express exhaustion, while phlegmatic people might display emotional stress (Ugryumova, N.V., 2014).

The analysis of our study results has confirmed these data by providing evidence of the dependence of occupational burnout rate on the type of temperament and levels of emotional stability. Moreover, our research adds information to the database about the range of changes and the particularities of the building mental health blocks among healthcare workers of different behavioral types.

Conclusions:-

1. The problem of burnout among doctors has worsened due to the covid-19 pandemic and is one of the most important directions in the research of specialists in various fields.
2. The impressive scale of distribution and the insufficient knowledge of this problem indicate the need for additional research of a theoretical, applied and experimental nature.
3. The questionnaire "Identification of professional stress syndrome in health workers (IPSSHM)" is the first complex tool developed at the national level, which aims at a methodical and multilateral assessment of the emotional exhaustion syndrome of health workers.
4. The verification of the instrument with the reference questionnaires (Eysenck and Maslach) and the calculation of the internal consistency coefficient Cronbach alpha is an argument in favour of the stability reliability of the developed instrument.
5. Expertise, validation, and testing of the instrument provide sufficient consistency and credibility to be used in larger sample studies.
6. The present study highlighted the interdependent relationship between the changes in the functions of the constituent mental health blocks, various specialties and psychophysiological characteristics.
7. This research registered the interrelationship between doctors' burnout, their behavioral types and level of emotional stability.
8. The present study opens up perspectives for further theoretical, applied and experimental research.

Conflict of interests:-

The authors declare no conflicts of interest.

Ethical approval:-

The study was approved by the Ethics Committee of The Nicolae Testemitanu State University of Medicine and Pharmacy from the Republic of Moldova, dated on 24.11.2020, no. 1.

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