

достовірним зменшенням систолічної функції ЛШ та погіршенням релаксаційної здатності міокарда з переважанням ригідного типу трансмітрального кровотоку. У пацієнтів із ГХ II стадії та частотою ШЕ порівняно з хворими на ГХ II стадії та СВЕ визначені більш суттєві зменшення систолічної функції ЛШ на фоні більш виразних порушень діастолічної функції серця, в той час як у хворих з СВЕ спостерігався дещо більший ступінь гіпертрофії ЛШ.

Ключові слова: артеріальна гіпертензія, гіпертонічна хвороба, суправентрикулярна екстрасистоля, шлуночкова екстрасистоля, ехокардіографія, холтеровське моніторування ЕКГ.

Стаття надійшла 30.06.2019 р.

достовірним зниженням систолічної функції ЛЖ і ухудшенням релаксаційної здатності міокарда з переважанням ригідного типу трансмітрального кровотоку. У пацієнтів с ГХ II стадії та частотою ЖЭ по сравнению с больными ГХ II стадии и СВЭ определено более существенное снижение систоліческой функции ЛЖ на фоне более выраженных нарушений диастоліческой функции сердца, в то время как у больных с СВЭ наблюдалась несколько большая степень гипертрофии ЛЖ.

Ключевые слова: артериальная гипертензия, гипертоническая болезнь, суправентрикулярная экстрасистолия, желудочковая экстрасистолия, эхокардиография, холтеровское мониторирование ЭКГ.

Рецензент Катеренчук І.П.

DOI 10.26724/2079-8334-2020-2-72-85-89

UDC 159.98:616-051:616.0-009.17

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SIMULATION AND PSYCHOLOGICAL TRAININGS AS METHODS OF PREVENTING EMOTIONAL BURNOUT IN DOCTORS

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The article analyzed the problem of emotional burnout in doctors, as well as the features of using and implementing medical simulation tools in the training process of medical specialists. The results of an empirical study of the simulation and psychological training effects on the psychological correction and the burnout syndrome prevention in doctors were presented. It was found that after these trainings doctors have reduced rates of emotional exhaustion, depersonalization, and improved well-being and mood. It was recommended to perform diverse psychological trainings and other psychological support and consulting procedures in the simulation training system.

Key words: medical simulation tools, simulation training, psychological training, burnout syndrome, psychological correction and prevention.

The work is a fragment of the research project "To develop a scientifically sound system for assessing the safety of hospitals in Ukraine", state registration No. 0118U003654.

Achieving true professional competence and skill of a doctor is preceded by a long and painstaking process of training and practical activities, associated with significant psychological stress and potential risks of emotional burnout. Words of the founder of modern medical ethics, Hippocrates: "Aliis inserviando consumor — Giving light to others, I burn myself" not only determined the purpose of a true healer, but also reflected the psychological energy-consuming nature of the doctor's activity. This explains why the medical profession occupies one of the first places in terms of the risk of burnout syndrome [2, 12, 14].

Burnout syndrome is characterized by a pronounced combination of disturbance symptoms in the mental, somatic and social spheres of life. It is generally accepted that this is a pathological condition associated with defatigation, a state of exhaustion of vitality.

Numerous empirical studies confirm the emotional exhaustion typicality in doctors, leading to disturbances in communication and self-regulation, which can lead to negative personality changes. Thus, I.P. Nazarenko found that altruistic, practical and aesthetic types of emotional orientation are characterized by a low level of formation of burnout symptoms. At the same time, the hedonistic type of emotional orientation (associated with satisfying the need for physical and mental comfort) increases the risk of burnout, especially in people who work in psychiatry [9].

D. R. Mikov, A.M. Kulesh, S.V. Muraviov and other researchers empirically substantiated that the burnout syndrome of doctors is in a state of dynamic development and manifests itself in emotional disorders, affective states, anxiety, depression and the symptom of "driven into the corner" [8]. T.A. Vezhnovets and V.D. Pariy substantiated that the burnout syndrome prevention in medical workers should be carried out taking into account the characteristics of psycho-traumatic factors, depending on the type of work motivation [2].

The problem of preventing burnout in doctors is especially relevant today, in the context of the pandemic of the coronavirus COVID-19 pandemic. To minimize the emotional (professional) burnout syndrome of doctors, various methods of psychological correction and therapy are offered today, in

addition to creating adequate working and resting conditions for doctors, increasing their social status. At the same time, the possibilities of preventing and correcting the burnout in doctors through a complex of educational simulation and psychological trainings have not been sufficiently studied.

The modern system of training doctors introduces simulation methods that provide not only a high practical level of clinical training for future and current doctors, but, what is equally important, also the launch-updating of the psychological mechanisms for the formation of their necessary professional and personal competencies.

Among the special tools of medical simulation in the doctors training, there are: mannequins, phantoms, models, trainers, simulators, etc. Today, simulation methods in medicine are widespread throughout the world [13, 15].

Over the past decades, Ukraine has been actively introducing new simulation technologies in medical education. A systematic repetition of identical simulated situations with further debriefing allows you to consolidate the resulting communicative experience as a conscious skill [1].

Today, medical simulation methods are usually implemented in the form of simulation training. We focus specifically on group trainings, which means educational and training procedures organized in a special way. Training is a kind of informational and subject medium filled with training events, various simulation scenarios, games, debriefings, etc. for targeted professional psychological training of a specialist [7]. Without an educational training context, simulation tools are just expensive toys. It should be noted that individual simulation programs are also successfully used in medical simulations, but group ones are always more effective, both from an economic point of view and from the training quality.

The purpose of the study was to study the possibilities of simulation and psychological training methods in psychological correction and prevention of the burnout syndrome in doctors based on empirical psychological research.

Materials and methods. To achieve this, we organized an empirical study on the basis of the educational and innovative center for practical training of doctors at the Odessa National Medical University. The study involved three groups of family physicians and pediatricians, a total of 44 people, undergoing skill development in the form of simulation training lasting from 5 to 10 days. The study was performed in the period of 2015-2016 and included three experimental stages. At the first phase, a stating experiment was performed with the examined doctors: an “input” questionnaire and psychodiagnostic testing.

At the second phase, a formative experiment was performed by participating in the simulation training programs and in the specially designed psychological training “Candle”. In the process of simulation trainings, various clinical situations were simulated, including using the Standardized Patient method. For this, we used robotic mannequin-simulators of medium and high level of realism. The implementation of video feedback was obligatory, which allowed debriefings and psychological consultations for a detailed analysis and error analysis. The “Candle” training included a set of exercises and psychological techniques to consolidate the results of simulation training, psychological correction and prevention of emotional burnout. Among the training methods, a special place was occupied by exercises aimed at developing the emotional and value-semantic sphere of the physician’s personality, analysis of the experiences of his functional states, as well as reflection on the meaning of life in the past, present and future.

At the third study phase, an “output” questioning of the subjects was carried out immediately after the end of training, as well as repeated psycho diagnostic testing two months after simulation and psychological trainings.

“The diagnosis of professional burnout” methodology was used (K. Maslach, S. Jackson, adapted by N.E. Vodopyanova) as a method of psychodiagnostics, which allows one to identify both a general indicator of professional emotional burnout and makes it possible to analyze the results of the three burnout components: emotional exhaustion; depersonalization; reduction of personal achievements. We used the test version for medical professionals (doctors) [3]. To assess the severity of a particular psychoemotional state of the subjects, the “WAM Questionnaire: Well-being, Activity, and Mood” was used (V.A. Doskin, N.A. Lavrentieva, V.B. Sharay, M.P. Miroshnikov) [10].

To identify reliable relationships and differences between the compared indices, methods of mathematical statistics were used (Pearson correlation coefficient and Student's T-test), which increased the validity of the conclusions of the study. Processing of the obtained data was carried out using the statistical software package for SPSS 14.0 for Windows and the Microsoft Office for Windows XP Professional software package.

Results of the study and their discussion. As a result of our “input” and “output” questionnaires of participants in simulation and psychological trainings, it was found that the contents of the simulation training program largely corresponded to their professional needs and personal goals. 81.8% (36/44) of the

surveyed respondents rated the level of relevance and information content of the simulation trainings as high as possible, 90.9% (40/44) of the respondents noted a high level of practicality regarding their medical activities. An emotional assessment is also indicative, especially of the psychological part of the training. Thus, 95.5% (42/44) of doctors noted a comfortable environment and psychological support during the trainings, which contributed to the successful training and acquisition of both professional skills and the skills of emotional regulation, stress resistance and better adaptability.

The results of professional burnout diagnosis in doctors before simulation training and 2 months after it are presented in table 1. As we see from the doctors during the stating experiment (before the training), increased indices of professional burnout on the scales of "Emotional exhaustion" and "Depersonalization" were revealed. Moreover, a direct correlation was established between these scales and the scales of the WAM questionnaire methodology "well-being" ($r = 0.452$; $p = 0.003$) and "mood" ($r = 0.305$; $p = 0.046$). This indicated that the doctors have revealed states of emotional emptiness, manifestations of depression and apathy, as well as satiety from work, which began to harden them more. Many doctors have indifference, callousness and a decrease in emotional warmth in relations with colleagues and subordinates, which indicates the presence of signs of professional deformation. All this happened against the background of a depressed state and well-being (weakness, fatigue, lethargy, dullness, pessimism, frustration, dissatisfaction, etc. were noted).

Table 1

Comparative results of testing doctors according to the method of "Diagnosis of professional burnout"

Scales/Mean group values	Emotional exhaustion (maximum 54 scores)	Depersonalization (maximum 30 scores)	Reduction of personal achievements (maximum 48 scores)	Total score of professional emotional burnout
Before trainings	39.7	22.9	28.4	91
2 months after training	34.2	19.5	27.5	81.2
Student's <i>T</i> -test	-3.229	-2.44	-1.049	-2.16
Significance point <i>p</i>	0.003	0.021	0.301	0.043

Repeated psychodiagnostic testing two months after simulation and psychological training revealed a decrease in the level of professional burnout in doctors on almost all scales. A comparative statistical analysis by Student's *T*-test showed that significant decreases in burnout syndrome were recorded on the scales of "Emotional exhaustion" ($t = -3.229$; $p = 0.003$) and "Depersonalization" ($t = -2.44$; $p = 0.021$). In addition, two months after the training, "Total score of professional emotional burnout" significantly decreased in doctors ($t = -2.16$; $p = 0.043$) (table 1).

The results of the study on the "WAM Questionnaire: Well-being, Activity and Mood", presented in table 2, indicated that before the trainings, the emotional state level of doctors was "below average" on the scales "Mood" and "Well-being". Moreover, the ratio of all indices on the WAM questionnaire also showed the presence of fatigue and exhaustion in doctors, since in a rested person, without symptoms of emotional burnout, assessments of activity, mood and well-being are approximately equal.

Table 2

Comparative results of testing of doctors on the "WAM Questionnaire: Well-being, Activity, and Mood"

Scales/Mean group values	Well-being	Activity	Mood
Before trainings	3.75	4.80	4.15
2 months after training	4.55	4.92	4.9
Student's <i>T</i> -test	2.101	0.915	2.198
Significance point <i>p</i>	0.047	0.409	0.04

Diagnostics after the training revealed that doctors had a tendency to reduce adverse conditions, in some cases there was a significant increase in favorable conditions and approximately the same ratio of all indicators. So, a significant increase was recorded on the scales "Well-being" ($t = 2.101$; $p = 0.047$) and "Mood" ($t = 2.198$; $p = 0.04$), which indicated a significant improvement in well-being, increased satisfaction, optimism and cheerfulness of doctors as a result of participation in simulation and psychological trainings. Given the established correlation of the data of the WAM methodology scales with the scales "Emotional exhaustion" and "Depersonalization" of the "Diagnosis of professional burnout" methodology, it can be argued that psychological correction and prevention of symptoms of emotional burnout occurred as a result of the participation of doctors in the trainings. They become less susceptible to emotional emptiness, fatigue, apathy, are more open and caring, they show interest in colleagues and people around them, they improve their overall emotional background, well-being and mood.

Our results are comparable with the data of recent studies and publications. Thus, T.A. Vezhnovets and V.D. Pariy were studied the dominant symptoms of emotional burnout among medical professionals

(stress, resistance, and exhaustion) [2]; D.R. Mikov, A.M. Kulesh, S.V. Muraviov, V.G. Cherkasova, P.N. Chainikov, N.V. Solomatina had empirically found that about half of medical workers experience symptoms of emotional burnout, while more than a third of them had an emotional burnout in the stage of actual development [8]. D.A. Shkurupii, V.B. Lukzen, I.V. Bukharov substantiate the dependence of the emotional burnout in doctors of a surgical profile on their professional deformation [11]. These patterns are also reflected in our study. In addition, our experimental testing of the training effectiveness in the prevention of burnout in doctors confirmed the similar research results of N.V. Gafarova [4].

I. Koval substantiated the necessity of introducing a program of psychological training on therapeutic interaction [5]. The study results of I.P. Nazarenko showed that medical workers with a more developed value-sensory sphere, who have higher general indicators of life-meaning orientations, are less amenable to burnout [9]. This was confirmed by the results of our study: the proposed and carried out training "Candle" helped to correct the signs of professional deformation and the development of the value-semantic sphere, which in turn reduced the level of burnout among doctors.

Conclusions

Thus, the training of doctors by simulation medicine methods, which takes place in conjunction with psychological trainings, contributes not only to the professional development of doctors, but also to the prevention of burnout syndrome. Therefore, in the system of simulation training, it is recommended to perform various psychological trainings and other psychological support and consulting procedures aimed both at correcting maladaptive forms of behavior, and at developing doctors' skills of stress resistance, self-regulation, communicative skills, clinical and creative thinking, self-development motivation and other professionally significant psychological qualities.

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Реферати

СИМУЛЯЦІЙНІ ТА ПСИХОЛОГІЧНІ ТРЕНІНГИ ЯК МЕТОДИ ПРОФІЛАКТИКИ ЕМОЦІЙНОГО ВИГОРАННЯ ЛІКАРІВ

Лєфтеров, В.О., Тімченко, О.В., Цільмак О.М., Ігнатєва, І. І.

У статті здійснюється аналіз проблеми емоційного вигорання лікарів, а також особливостей використання і впровадження засобів медичної симуляції в процес

СИМУЛЯЦИОННЫЕ И ПСИХОЛОГИЧЕСКИЕ ТРЕНИНГИ КАК МЕТОДЫ ПРОФИЛАКТИКИ ЭМОЦИОНАЛЬНОГО ВЫГОРАНИЯ ВРАЧЕЙ

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В статье проводится анализ проблемы эмоционального выгорания врачей, а также особенностей использования и внедрения средств медицинской симуляции в процесс

підготовки медичних фахівців. Наводяться результати емпіричного дослідження впливу симуляційних та психологічних тренінгів на психокорекцію і профілактику синдрому емоційного вигорання лікарів. Встановлено, що після зазначених тренінгів у лікарів значимо знижуються показники емоційного виснаження, деперсоналізації, поліпшується самопочуття і настрої. Рекомендовано проведення в системі симуляційного навчання різнопланових психологічних тренінгів та інших процедур психологічного супроводу та консалтингу.

Ключові слова: засоби медичної симуляції, симуляційний тренінг, психологічний тренінг, синдром емоційного вигорання, психокорекція та профілактика.

Стаття надійшла 23.06.2019 р.

підготовки медичних спеціалістів. Приводяться результати емпіричного дослідження впливу симуляційних та психологічних тренінгів на психокорекцію і профілактику синдрому емоційного вигорання лікарів. Встановлено, що після зазначених тренінгів у лікарів значимо знижуються показники емоційного виснаження, деперсоналізації, поліпшується самопочуття і настрої. Рекомендовано проведення в системі симуляційного навчання різнопланових психологічних тренінгів та інших процедур психологічного супроводу та консалтингу.

Ключевые слова: средства медицинской симуляции, симуляционный тренинг, психологический тренинг, синдром эмоционального выгорания, психокоррекция и профилактика.

Рецензент Скрипников А.М.

DOI 10.26724/2079-8334-2020-2-72-89-93

UDC 616-056+612.172.2]-072.-/073.7

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BIOELECTRICAL IMPEDANCE DETERMINING BODY COMPOSITION AND HARDWARE-SOFTWARE RECORDING OF HEART RATE VARIABILITY DURING AN OBJECTIVE STRUCTURED CLINICAL EXAMINATION AS A DIAGNOSTIC TOOL

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Practical issues of studying the role of electromagnetic phenomena of cardiac activity and impedance of body tissues in the diagnosis of the functional state of the human body are presented in the article. The purpose of the publication is to determine the clinical diagnostic potential and the appropriateness of applying the computerized methodology for a short record of heart rate variability and the body impedance measurement technique as an instrumental Objective Structured Clinical Examination. The article presents the results of a survey of functionally healthy people of different levels of fitness.

Key words: Non-communicable diseases, Objective Structured Clinical Examination.

The work is a fragment of the research project "Development of algorithms and technology for introducing a healthy lifestyle in patients with non-communicable diseases based on the study of psycho-emotional status", state registration No. 0116U007798.

Today, the concept of 4P-Medicine is one of the most promising models for modern Healthcare. Prediction, Prevention, Personalization, Participation - these are four basic principles of examination and treatment of patients according to modern approaches. Requirements for medical diagnostic procedures should increase. First of all, this applies directly to the communication between the doctor and the patient and the implementation of the Objective Structured Clinical Examination (OSCE) of the patient [6, 10, 14].

Therefore, the development of objective methods for diagnosing the functional state of the patient is extremely relevant. The current era of information technology and the computerization of the doctor's workplace has created technical capabilities for introducing fundamentally new computerized techniques for physical examination of patients during the initial examination of the patient and in the dynamics of treatment. The methodology of an OSCE of patients will comply with the principles of 4P-Medicine then to a greater extent [6,10,14]. Therefore, the issues of improving the diagnosis and management of patients with non-communicable diseases (NCDs) through the use of computerized methods of therapeutic examination and fundamentally new approaches to the study of electromagnetic phenomena in patients with NCDs are of interest for the further development of medicine and the practical part of healthcare.

We came to a preliminary conclusion in the course of a search study that it is electromagnetic oscillatory (wave) processes in the vascular system that are a synchronized indicator of the interaction between the central, autonomic nervous systems, humoral regulation and all organs, body tissues. It is necessary to consider cardiac activity as an integral electromagnetic wave cyclical phenomenon now. Thus, cardiac activity has a significantly greater diagnostic value in assessing the functional state of the body, and it is a source of complex parameters of the psychophysical potential, evaluating the prognostic value of the occurrence of adverse cardiovascular events. The method of assessing heart rate variability (HRV)