MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SUMY STATE UNIVERSITY
ACADEMIC AND RESEARCH MEDICAL INSTITUTE

Eastern Ukrainian Medical Journal

116, Kharkivska st., Sumy 40007, Ukraine eumj.med.sumdu.edu.ua
e-mail: eumj@med.sumdu.edu.ua ISSN: 2663-5909 (print)/2664-4231 (online)

How to cite / Як цитувати статтю: Regush A, Markova M, Pliekhov V, Yavorska T. Variability of clinical-psychopathological semiotics of professional maladjustment in medical workers of a neurosurgery center. *East Ukr Med J*. 2025;13(1):257-266

DOI: https://doi.org/10.21272/eumj.2025;13(1):257-266

ABSTRACT

Andriy Regush
https://orcid.org/0009-0000-6679-6767
Center of X-ray Endovascular Neurosurgery of the Kyiv City Clinical Hospital № 1, Kyiv, Ukraine

Marianna Markova
https://orcid.org/0000-0003-0726-4925
Department of Sexology, Psychotherapy and Medical Psychology, Kharkiv National Medical University of the Ministry of Health of Ukraine, Kharkiv, Ukraine

Vladyslav Pliekhov
https://orcid.org/0000-0001-6884-0151
Department of Sexology, Psychotherapy and Medical Psychology, Kharkiv National Medical University of the Ministry of Health of Ukraine, Kharkiv, Ukraine

Tetiana Yavorska
https://orcid.org/0009-0000-1411-0161
Department of Radiation Diagnostics FPGE at Danylo Halytsky Lviv National Medical University, Lviv, Ukraine

VARIABILITY OF CLINICAL-PSYCHOPATHOLOGICAL SEMIOTICS OF PROFESSIONAL MALADJUSTMENT IN MEDICAL WORKERS OF A NEUROSURGERY CENTER

Introduction. In modern scientific discourse, there is a lack of data on predisposing anamnestic factors for the occurrence of professional maladjustment in employees of neurosurgical medical institutions. This itself indicates the relevance of the study.

Materials and Methods. A prospective study was conducted involving a contingent of medical personnel of the Center for X-ray Endovascular Neurosurgery of the Municipal Non-Profit Enterprise "Kyiv Municipal Clinical Hospital No. 1". The study population was represented by a group of 50 medical professionals who were involved in the treatment of patients with acute ischemic stroke. The average age of the patient sample was 32.2 ± 5.8 years. During the study, clinical-psychopathological, psychodiagnostic, and clinical-statistical methods were used. The psychodiagnostic method was implemented using the questionnaire "Assessment of Professional Maladjustment" (N. O. Rodina, 1995; adapted by M. A. Dmitrieva, 1997).

Results. To analyze the prevalence of the studied phenomenon, we used the questionnaire "Assessment of Professional Maladjustment." No medical worker from the studied cohort was found to show a low or high level of professional maladjustment; a moderate level of professional maladjustment was observed in 22 (44.0%) people, while expressed level – in 28 (56.0%) people. Three clinical variants of professional maladjustment were identified in the selected cohort: somatoform, anxious-dysphoric, and asthenic-depressive. Risk factors for professional maladjustment in medical workers included older age (41–50 years), longer total length of work experience (≥ 16 years), number of working hours per month (≥ 201 hours), and working as a neurosurgeon.

Conclusions. The professional maladjustment profile of the cohort of neurosurgery center medical staff was characterized by a state of

conditional compensation since, despite the general severity of the professional maladjustment, the examined individuals maintained a sufficient level of motivation to continue their work, did not avoid it, and the social component (positive relationships with colleagues) was a source of resistance for mental state decompensation.

Keywords: professional maladjustment, burnout, anxiety, depression, medical workers.

Corresponding author: *Vladyslav Pliekhov, Department of Sexology, Psychotherapy and Medical Psychology, Kharkiv National Medical University of the Ministry of Health of Ukraine. Kharkiv, Ukraine*
e-mail: va.pliekhov@knmu.edu.ua

РЕЗЮМЕ

Андрій Регуш
https://orcid.org/0009-0000-6679-6767
Центр рентгенендоваскулярної нейрохірургії КНП «Київська міська клінічна лікарня №1», м. Київ, Україна

Маріанна Маркова
https://orcid.org/0000-0003-0726-4925
Кафедра сексології, психотерапії та медичної психології, Харківський національний медичний університет, м. Харків, Україна

Владислав Плєхов
https://orcid.org/0000-0001-6884-0151
Кафедра сексології, психотерапії та медичної психології, Харківський національний медичний університет, м. Харків, Україна

Тетяна Яворська
https://orcid.org/0009-0000-1411-0161
Кафедра променевої діагностики ФПДО, Львівський національний медичний університет імені Данила Галицького, м. Львів, Україна

ВАРІАТИВНІСТЬ КЛІНІКО-ПСИХОПАТОЛОГІЧНОЇ СЕМІОТИКИ СТАНІВ ПРОФЕСІЙНОЇ ДЕЗАДАПТАЦІЇ У МЕДИЧНИХ ПРАЦІВНИКІВ ЦЕНТРУ НЕЙРОХІРУРГІЇ

Вступ. У сучасному науковому дискурсі відзначається брак даних щодо предиспозиційних анамнестичних факторів виникнення професійної дезадаптації у працівників медичних закладів нейрохірургічного профілю. Саме це визначає актуальність проведеного дослідження.

Матеріали та методи. Проведено проспективне дослідження контингенту медичних працівників Центру рентгенендоваскулярної нейрохірургії КНП «Київська міська клінічна лікарня №1». Контингент дослідження було сформовано загалом 50 медичних працівників, які були залученні до терапії хворих на гострий ішемічний інсульт. Середній вік вибірки обстежуваних склав 32,2 ± 5,8 років. У ході дослідження було використано клініко-психопатологічній, психодіагностичний та клініко-статистичний методи. Психодіагностичний метод був реалізований шляхом використання Опитувальника «Оцінка професійної дезадаптації» (Н. О. Родіна, 1995; адаптація М. А. Дмитрієвої, 1997).

Результати. За результатами аналізу поширеності досліджуваного явища було встановлено, що жодний медичний працівник із сформованого контингенту дослідження не виявляв низький та високий рівень професійної дезадаптації; помірний рівень вираженості досліджуваного явища був визначено у 22 (44,0%) осіб, виражений рівень – у 28 (56,0%) осіб. Визначено три клінічні варіанти професійної дезадаптації у обраного контингенту медичних працівників: соматоформний, тривожно-дисфоричний та астено-депресивний. До факторів ризику формування стану дезадаптації у медичних працівників було віднесено старший вік (41-50 років), більша тривалість загального стажу роботи (≥ 16 років) та кількість робочих годин на місяць (≥ 201 годин), робота на посаді лікаря-нейрохірурга.

Висновки. Визначений профіль професійної дезадаптації обраного контингенту медичних працівників центру нейрохірургії характеризується станом умовної компенсації, оскільки незважаючи на загальну вираженість досліджуваного явища, обстежувані особи зберігали достатній рівень мотивації для продовження трудової діяльності, не уникали її, а соціальний компонент (екологічні відносини із колегами) був джерелом стійкості до декомпенсації їх психічного стану.

Ключові слова: професійна дезадаптація, емоційне вигорання, тривога, депресія, медичні працівники.

Автор, відповідальний за листування: *Владислав Плєхов, кафедра сексології, психотерапії та медичної психології, Харківський національний медичний університет, м. Харків, Україна*
e-mail: va.pliekhov@knmu.edu.ua

LIST OF CONVENTIONAL ABBREVIATIONS

PM – Professional Maladjustment
SG1 – Study Group 1
SG2 – Study Group 2

INTRODUCTION / ВСТУП

Violation of professional adaptation occurs as a result of decompensation of the balance between the personality and the external environment when the adaptive potential of the individual is exhausted under the influence of adverse workplace factors. Awareness of one's own unsuitability to environmental conditions leads to intrapsychic conflict and a state of professional maladjustment (PM) – a complex syndrome characterized by loss of professional motivation, professional activity avoidance, general mental exhaustion, impaired regulation of emotions, impaired concentration and memory, difficulties communicating with others (colleagues and family), etc. [1–4].

Different professions are marked by different maladjustment levels. In the scientific literature devoted to this topic, the professional environment of medical professionals is characterized as one of the most unfavorable in the context of maladaptive states. Significant physical exertion, night shifts, witnessing human suffering, a high level of responsibility, a significant intensity and unpredictability of the work process, a feeling of frustration due to one's helplessness when it comes to seriously ill patients – all these act against the adaptive resources of medical workers. The medical workers who provide emergency (urgent) medical care are the most representative cohort of this profession since they encounter the entire spectrum of the most unfavorable maladaptive factors in their activities [5–8].

In modern scientific discourse, there is a lack of data on predisposing anamnestic factors for the occurrence of PM in employees of neurosurgical medical institutions. This itself indicates the relevance of the study.

MATERIALS AND METHODS

A prospective study was conducted involving a contingent of medical personnel of the Center for X-ray Endovascular Neurosurgery of the Municipal Non-Profit Enterprise “Kyiv Municipal Clinical Hospital No. 1”. The study cohort consisted of 20 (40.0%) representatives of the nursing staff, 12 (24.0%) neurologists, 6 (12.0%) intensive care physicians, 6 (12.0%) neurosurgeons, 4 (8.0%) radiologists, and 2 (4.0%) physical rehabilitation specialists (a total of 50 people) who were involved in the treatment of patients with acute ischemic stroke. The average age of the patient sample was 32.2 ± 5.8 years. During the study, clinical-psychopathological, psychodiagnostic, and clinical-statistical methods were used. The psychodiagnostic method was implemented using the questionnaire “Assessment of Professional Maladjustment” (N. O. Rodina, 1995; adapted by M. A. Dmitrieva, 1997). Statistical processing of the obtained data was carried out using the chi-square test (χ^2). The strength of the correlation between quantitative indicators (r) was determined by means of Spearman's rank correlation method, with subsequent interpretation using the Chaddock scale. Differences were considered significant if the value of the corresponding criterion did not exceed the critical value at a significance level of $p<0.05$. Statistical processing and data evaluation were carried out using standard Microsoft Office Excel 2016 packages.

RESULTS

To analyze the prevalence of the studied phenomenon, we used the questionnaire "Assessment of Professional Maladjustment.” No medical worker from the studied cohort was found to show a low (less than 32 points) or high (96 points and more) level of PM; a moderate level of professional maladjustment (32 to 64 points) was observed in 22 (44.0%) people, while expressed level (65 to 95 points) – in 28 (56.0%) people. The absence of high or low PM levels in the cohort, on the one hand, indicated a significant maladaptive influence of the professional environment of the neurosurgery center and, on the other hand, confirmed the preservation of the adaptive potential in the subjects.

For a more accurate assessment of the influence of qualitative features on PM manifestations, the study cohort was divided into two groups according to the

intensity of the studied phenomenon: study group 1 (SG1) included 22 (44.0%) individuals who showed a moderate level of PM, and study group 2 (SG2) included 28 (56.0%) individuals with an expressed level of PM.

Based on a clinical and psychopathological study, we determined the general PM profile of the cohort of medical personnel who were working at the neurosurgery center. The profile was characterized by relatively high indicators of the components "Emotional disorders," "Activity impairment," "Circadian rhythm disorders," moderate indicators of the components "Fatigue," "Somatoform autonomic dysfunctions," and relatively low indicators of the components "Peculiarities of individual mental processes," "Peculiarities of social interaction" and "Decreased motivation of activity." At the clinical level, the determined PM profile in the selected cohort of medical workers was manifested by a persistently low mood with "negative" thoughts related to work, elements of emotional lability in the form of frequent episodes of irritation, which alternated with apathy and lack of initiative, a feeling of internal tension when performing usual work tasks, circadian rhythm disturbances, difficulties with falling asleep at night, a drowsiness during the day, fatigue even after a long sleep, a low assessment of one's own well-being, lack of desire to engage in leisure activities outside of working hours, somaform autonomic dysfunctions, the clinical manifestations of which varied depending on the age group: for younger people, a decreased visual acuity, dizziness, headache, unpleasant sensations in the back were more typical, while for older people – a shortness of breath, palpitations and swelling in the legs were more common (it should also be noted that among the middle-aged subjects, somaform autonomic dysfunctions were less pronounced). The social function component of the specified PM profile was characterized by a decreased ability to cope with conflict situations and a higher risk of stirring up controversy with outsiders, patients and their relatives. This finding was combined with a feeling of satisfaction from being a part of the neurosurgery center team and motivation to continue professional activities. The PM profile of the cohort of neurosurgery center medical staff was characterized by a state of conditional compensation since, despite the general severity of the phenomenon under study, the examined individuals maintained a sufficient level of motivation to continue their work, did not avoid it, and the social component (positive relationships with colleagues) was a source of resistance for mental state decompensation.

According to the dominant spectrum of psychopathological symptoms, three clinical variants of PM were identified in the selected cohort: somatoform, anxious-dysphoric, and asthenic-depressive.

The somatoform variant of PM was characterized by the prevalence of autonomic dysfunction manifestations in the clinical picture. These manifestations were represented by palpitations, shortness of breath, cutaneous flushing, dizziness, nausea, and sweaty palms at moments of special emotional tension (during or immediately after surgery, during communication with patients' relatives, waiting for a patient's admission, forced awakening in the early morning hours during a night shift, etc.) or, in some cases, without a clear connection with them. Also, the specified variant of PM was manifested by a feeling of decreased visual acuity, eye floaters, ringing in the ears, algic manifestations of various localization, a feeling of leg swelling, and other somatoform manifestations, the intensity of which increased while the subjects were at work. The mentioned disorders were accompanied by a general anxious-depressive emotional background represented by pessimistic thoughts regarding one's professional and personal future, the futility of further continuation of medical activity, the desire to change it, and a feeling of frustration due to the impossibility of doing so, an increase in background anxiety, which was manifested by a rapid flow of thoughts, anxious-pessimistic perceptions of current events, contrasting thoughts in the form of unpleasant work-related intrusive associations, increased timidity and tremor of the limbs. These disorders were accompanied by dyssomnia manifestations, such as circadian rhythm disturbances (due to frequent night shifts and the inability to fall asleep at the most physiological hours) and difficulties with falling asleep at night due to the inability to stop the flow of thoughts. The entire spectrum of mental manifestations that were presented within the corresponding clinical variant of PM should be regarded as somatized equivalents of anxious affect. In these cases, the psychological substrate was represented by the pattern of avoiding stressful events that arose during professional activities.

The mechanism of the specified PM variant formation is as follows: stressful event(s) → fear of its(their) recurrence → development of somatoform disorders → avoidance of potentially stressful events due to exacerbation of "somatic" diseases → awareness of one's own inferiority and futility of further activity.

This PM variant was detected in 11 (50.0%) individuals in SG1 and 8 (28.6%) individuals in SG2.

The anxious-dysphoric variant of PM was characterized by the predominance of impaired social functioning manifestations, which spread only to the non-professional environment of the surveyed medical workers: they reported a decrease in the threshold of

response to external stimuli, a feeling of internal tension, and cases of impulsive aggressive reactions during interactions with random strangers, patients and their relatives, and their close environment; these disorders were accompanied by a tendency to social isolation and avoidance of extra interactions, which were perceived as useless, unpleasant, and exhausting, and by a decreased desire for active activities outside of working hours (meetings with friends, relatives, group events, hobbies, etc.). Somatoform autonomic dysfunctions that were presented within the specified PM variant were limited to sweaty palms, palpitations with compressing head pain, and were manifested only at the peak of dysphoric reactions. The surveyed medical workers paradoxically maintained a high level of social functioning within the professional environment: irritability and a tendency to affective outbursts that occurred during communication with strangers were replaced by physiological conformity and a willingness to provide support during communication with colleagues. This pattern was explained by the different levels of anxiety manifestations that arose depending on the social environment: during interaction with strangers, patients, their relatives, etc., medical workers with the specified PM variant showed a relatively higher level of anxiety, which was eliminated due to the described dysphoric reactions, while communication with colleagues, on the contrary, reduced their anxiety and did not provoke the specified response patterns. The anxiety component itself in the subjects with this variant of PM was not always realized by them since it was deeper, encrusted with depressive inclusions and represented by thoughts about one's own unsuitability for the position held, possible negative consequences of dysphoric reactions that had occurred recently, the futility of further activity, and a feeling of frustration due to the impossibility of changing it.

The mechanism of formation of the specified PM variant is as follows: stressful event → fear of its recurrence → formation of associations between the stressful event and a certain social group → avoidance of social interactions → dysphoric reactions when it is impossible to avoid social interactions → anxiety due to the consequences of dysphoric reactions → thoughts about one's own unsuitability for the position with a feeling of frustration.

This PM variant was detected in 8 (36.4%) individuals in SG1 and 10 (35.7%) individuals in SG2.

The asthenic-depressive clinical variant of PM was represented by manifestations of mental exhaustion, a persistent feeling of weakness, a decrease in the speed of thinking, thoughts about the futility of continuing professional activity, and the devaluation of one's own professional qualities, an indifferent attitude to the results of patient treatment, a decrease in the initiative at work, apathy, a decrease in the desire for extraneous activities outside of working hours, avoidance of "unnecessary" social interactions due to "no stamina left," decreased concentration, and a slight decrease in memory for current events. In the vast majority of the subjects, the intensity of these symptoms varied throughout the day: some reported symptoms worsening in the morning hours, others – in the evening. The described manifestations were accompanied by sleep disturbances: difficulty falling asleep, periodic night awakenings, daytime sleepiness, and fatigue even after a long sleep. Impaired social functioning, which also occurred in medical workers with this variant of PM, manifested in the form of passive negativism and a tendency to avoid communication outside the professional environment: due to a lack of energy, such individuals avoided conflict situations, did not defend their own opinion, but also did not agree with the opinion of their opponent. It should be noted that despite the relatively significant severity of psychopathological manifestations, individuals with this variant of PM maintained motivation to continue their professional activities, clearly adhered to their work schedule, and did not try to change their place of work.

The mechanism of formation of the specified PM variant is as follows: prolonged exposure to stressful events → mental exhaustion → limitation of social functioning and/or indifferent attitude to the results of treatment → avoidance of conflict situations and/or avoidance of interaction with patients → awareness of one's own inability to interact correctly during conflicts and/or inability to perform professional duties → thoughts about one's own inferiority and unsuitability for the position held.

This PM variant was detected in 3 (13.6%) individuals in SG1 and 10 (35.7%) individuals in SG2.

A comparison of the formed groups by gender, specialization (profession), total work experience, work experience in the neurosurgery center, and number of working hours per month is presented in Table 1.

Thus, it was established that there was no statistically significant difference (p=0.78) between the formed groups by gender: SG1 consisted of 18 (81.8%) men and 4 (18.2%) women, SG2 consisted of 22 (78.6%) men and 6 (21.4%) women. The gender matching of the study groups indicated the absence of a significant influence of the gender factor on PM risk.

A significant difference was identified in age between the study groups. Thus, it was established that SG1 did not include subjects in the age category “41–50 years", while SG2 had 7 (25.0%) subjects of this age – this difference was statistically significant (p=0.01). In the age categories “21–30 years" and “31–40 years", no statistically significant difference was found between the groups.

Table 1 – Comparison of SG1 vs. SG2 by demographic and professional parameters

Criterion, number of subjects (n=50) / Study group		SG1 (n=22)	SG2 (n=28)	χ^2 (p)
Sex	Male (n=40)	18 (81.8%)	22 (78.6%)	0.08 (0.78)
	Women (n=10)	4 (18.2%)	6 (21.4%)	
Age	21–30 years (n=26)	12 (54.6%)	14 (50.0%)	0.1 (0.75)
	31–40 years (n=17)	10 (45.5%)	7 (25.0%)	2.3 (0.13)
	41–50 years (n=7)	-	7 (25.0%)	6.4 (0.01)*
Profession	Neurology (n=12)	7 (31.8%)	5 (18.9%)	1.32 (0.25)
	Neurosurgery (n=6)	-	6 (21.4%)	5.36 (0.02)*
	Anesthesiology (n=6)	2 (9.1%)	4 (14.29%)	0.31 (0.57)
	Radiology (n=4)	4 (18.2%)	-	5.53 (0.02)*
	Physiotherapy (n=2)	2 (9.1%)	-	2.65 (0.1)
	Nursing staff (n=20)	7 (31.8%)	13 (46.4%)	1.1 (0.3)
Total work experience	≤ 5 years (n=31)	15 (68.2%)	16 (57.1%)	0.64 (0.42)
	6–10 years (n=6)	5 (22.7%)	1 (3.6%)	4.28 (0.04)*
	11–15 years (n=8)	2 (9.1%)	6 (21.4%)	1.4 (0.24)
	≥ 16 years (n=5)	-	5 (17.9%)	4.37 (0.04)*
Work experience in the neurosurgery center	≤ 5 years (n=38)	21 (95.4%)	17 (60.7%)	8.12 (0.004)*
	6–10 years (n=5)	1 (4.6%)	4 (14.3%)	1.3 (0.25)
	11–15 years (n=5)	-	4 (14.3%)	3.42 (0.06)
	≥ 16 years (n=2)	-	2 (7.1%)	1.67 (0.2)
Number of working hours per month	≤ 160 hours (n=34)	19 (83.4%)	15 (53.6%)	6.09 (0.01)*
	161–200 hours (n=8)	3 (13.6%)	5 (17.9%)	0.61 (0.43)
	201–240 hours (n=6)	-	6 (21.4%)	5.36 (0.02)*
	≥ 240 hours (n=2)	-	2 (7.1%)	1.64 (0.2)

*Note. * – statistically significant differences (p < 0.05) according to Pearson's chi-square test*

The professional structure of the groups also differed. Thus, the number of neurologists was bigger in SG1 – 7 (31.8%) people versus 5 (18.9%) people in SG2, but this difference was not statistically significant. All neurosurgeons were included in SG2: 6 (21.4%) people; the indicated difference vs. SG1 reached a statistically significant level (p=0.02). The distribution of anesthesiologists between SG1 and SG2 did not differ significantly (p=0.57): 2 (9.1%) vs. 4 (14.3%) individuals, respectively. All radiologists were included in SG1: 4 (18.2%) people; the indicated difference was statistically significant vs. SG2 (p=0.02). Physiotherapy specialists also were all included in SG1: 2 (9.1%) people; however, the indicated difference was not statistically significant vs. SG2 (p=0.1). The distribution of nursing staff between SG1 and SG2 did not differ significantly (p=0.3): 7 (31.8%) vs. 13 (46.4%) individuals, respectively.

A number of differences were identified between SG1 and SG2 based on the criterion of general medical experience. Thus, the number of subjects with less than 5 years' work experience was bigger in SG1 – 15 (68.2%) people versus 16 (57.1%) people in SG2, but this difference was not statistically significant. A significant (p=0.04) predominance of subjects with 6 to 10 years' work experience was reported in SG1 – 5 (22.7%) persons versus 1 (3.6%) person in SG2. The distribution of medical workers with 11 to 15 years of work experience between SG1 and SG2 did not differ significantly (p=0.24): 2 (9.1%) vs. 6 (21.4%)

individuals, respectively. All medical workers with more than 16 years of work experience were included in SG2: their number was 5 (17.9%) people; the indicated difference vs. SG1 reached a statistically significant level (p=0.04).

Differences were also established between the studied groups according to the criterion of work experience in the neurosurgery center. Thus, the number of subjects with ≤ 5 years' work experience in the neurosurgery center was bigger (p=0.004) in SG1 – 21 (95.4%) people versus 17 (60.7%) people in SG2. The distribution of medical professionals with 6 to 10 years of experience working in a neurosurgery center did not differ significantly (p=0.25) between SG1 and SG2: 1 (4.6%) vs. 4 (14.3%) individuals, respectively. SG1 did not include any medical worker who had more than 11 years of experience working in the neurosurgery center, but despite the fact that SG2 included 4 (14.3%) individuals with 11 to 15 years of work experience and 2 (7.1%) individuals with more than 16 years of work experience in the neurosurgery center, this difference between the studied groups was not statistically significant (p>0.05).

A significant difference between the studied study groups was determined by the criterion of the number of working hours per month. Thus, the number of subjects with ≤ 160 working hours per month was significantly bigger (p=0.01) in SG1: 19 (83.4%) people versus 15 (53.6%) people in SG2. The distribution of medical workers who worked 161 to 200 hours per month did not differ significantly between SG1 and SG2 (p=0.43): 3 (13.6%) vs. 5 (17.9%) individuals, respectively. All medical workers who worked 201 to 204 working hours were included in SG2; their number was 6 (21.4%) people, and the indicated difference with SG1 reached a statistically significant level (p=0.02). All medical workers who worked more than 240 hours were included in SG2, and their number was 2 (7.1%) people, but this difference was not statistically significant compared to SG2 (p=0.2).

Thus, it was established that gender was not a significant risk factor for PM conditions in the selected contingent of medical workers; despite the fact that the age structure of SG2 had a tendency towards older age groups compared to SG1, however, older age itself could not be considered an isolated risk factor for PM conditions, since it was indirectly related to the duration of total work experience and work experience in the neurosurgery center; the determined distribution of medical workers in the study groups according to the above criteria had a similar trend – a shift in the distribution towards longer work experience in SG2 compared to SG1; a greater number of working hours per month (more than 200 hours) was a statistically significant PM risk factor in this cohort; the most unfavorable medical specialty from the point of view of PM formation was neurosurgeon, and the least unfavorable – radiologist. The determined pattern was explained not only by the specifics of the job duties of these specialists (the need to communicate with the patient's relatives, taking responsibility for the patient's life and treatment results, organization and supervision of the work of other medical personnel by a neurosurgeon and the absence of these elements in the work of a radiologist), but also by the characteristics of the study group: neurosurgeons had the greatest work experience and, naturally, work experience in a neurosurgery center.

Further, a study was conducted on the level of correlation between the severity of various components of professional maladjustment and quantitative indicators of the cohort (Table 2).

Thus, it was determined that there was a direct strong correlation between the severity of the PM component "Emotional disorders" and age (r=+0.71; p < 0.05). There was also a significant direct moderate correlation between the specified component and total work experience (r=+0.65; p < 0.05), work experience in the neurosurgery center (r=+0.69; p < 0.05), and the number of working hours per month (r=+0.56; p < 0.05). At the clinical level, this component was manifested by a persistently low mood with diurnal-specific mood swings, negative thoughts related to work (thoughts about one's work futility, lack of further prospects, devaluation of one's own professional qualities), elements of emotional lability.

A weak direct and statistically insignificant correlation (p > 0.05) was determined between the severity of psychopathological manifestations by the component "Peculiarities of individual mental processes" and age, total work experience, work experience in the neurosurgery center, and the number of working hours per month: r=+0.25, r=+0.21, r=+0.24, and r=+0.27, respectively. The clinical feature of this PM component was represented by functional cognitive impairment, i.e., poor concentration and impaired short-term memory.

A direct moderate correlation was also established between the severity of the "Activity impairment" component and age (r=+0.4; p < 0.05), total work experience (r=+0.36; p < 0.05), work experience in the neurosurgery center (r=+0.38; p < 0.05), and the number of working hours per month (r=+0.39; p < 0.05). The clinical features of this PM component were represented by general mental exhaustion with apathy, lack of initiative, and a feeling of internal tension when performing usual work tasks.

Table 2 – Correlation analysis between the intensity of professional maladjustment components and total work experience, work experience in the neurosurgery center, and the number of working hours per month in a cohort of medical workers

Maladjustment components \ Criterion		Age, r	Total work experience, r	Work experience in the neurosurgery center, r	Number of working hours per month, r
Feeling unwell	Emotional disorders	+0.71*	+0.65*	+0.69*	+0.56*
	Peculiarities of individual mental processes	+0.25	+0.21	+0.24	+0.27
	Activity impairment	+0.4*	+0.36*	+0.38*	+0.39*
	Fatigue	+0.42*	+0.48*	+0.65*	+0.5*
Somatoform autonomic dysfunctions		-0.34*	-0.3*	-0.19	-0.51*
Circadian rhythm disorders		+0.3*	+0.36*	+0.53*	+0.2
Peculiarities of social interaction		-0.14	-0.06	-0.07	-0.11
Decreased motivation for activity		+0.0001	+0.06	+0.04	+0.08
Total points		+0.09	+0.25	+0.33*	+0.43*

*Note. * – $p < 0.05$*

In addition, a statistically significant moderate correlation was observed between the severity of the “Fatigue” component and age (r=+0.42; p < 0.05), total work experience (r=+0.48; p < 0.05), and the number of working hours per month (r=+0.5; p < 0.05). The correlation between this component and work experience in the neurosurgery center was moderate and statistically significant (r=+0.65; p < 0.05). The clinical features of this PM component were represented by persistent fatigue, which reached its peak after the end of the work shift and did not completely disappear even after a long period of rest, accompanied by avoidance of intense activities outside of working hours, poor health, and malaise.

The severity of psychopathological manifestations by the "Somatoform autonomic dysfunctions" significantly inversely correlated with age (r=-0.34; p < 0.05), total work experience (r=-0.3; p < 0.05), and the number of working hours per month (r=-0.5; p < 0.05). The correlation between this component and work experience in the neurosurgery center was weak and statistically insignificant (r=-0.19; p < 0.05). The clinical features of this PM component were represented by a wide range of manifestations: decreased visual acuity; dizziness; headache; unpleasant, often painful sensations in the back and head; shortness of breath, palpitations, and swelling in the legs.

A direct moderate correlation was also established between the severity of the “Circadian rhythm disorders” component and age (r=+0.3; p < 0.05), total work experience (r=+0.36; p < 0.05). The correlation between this component and work experience in the neurosurgery center was moderate and statistically significant (r=+0.51; p < 0.05), while no significant correlation was established between the specified component and the number of working hours (r=+0.2; p > 0.05). The clinical features of this PM component were represented by circadian rhythm disturbances (due to frequent night shifts with the inability to fall asleep at the most physiological hours), difficulties with falling asleep at night (mainly due to the inability to stop the flow of thoughts), periodic night awakenings, increased sleepiness during the day (some subjects reported episodes of falling asleep during the day), and persistent fatigue that did not resolve even after a long sleep.

A weak reverse and statistically insignificant correlation (p > 0.05) were observed between the severity of psychopathological manifestations by the component “Peculiarities of social interaction” and age, total work experience, work experience in the neurosurgery center, and the number of working hours per month: r=-0.14, r=-0.06, r=-0.07, and r=-0.11, respectively. The clinical features of this PM component were represented by impaired social functioning with a tendency to affective outbursts, impulsive reactions, avoidance of social interactions, and anxious manifestations during social interactions outside the professional environment.

Also, no significant ($p > 0.05$) correlation was found between the severity of the component "Decreased motivation of activity" and age, total work experience, work experience in the neurosurgery center, and the number of working hours per month: r=+0.0001, r=+0.06, r=+0.04, and r=+0.08, respectively. The clinical features of this PM component were represented by decreased motivation to continue professional activity, which paradoxically was combined with the satisfaction from being in the professional environment and the absence of a tendency to avoid work duties.

The impact of these criteria on the sum of points for all PM components was separately assessed. Thus, a direct moderate correlation was established between PM severity and work experience in the neurosurgery center ($r=+0.33$; $p < 0.05$) and the number of working hours per month ($r=+0.43$; $p < 0.05$). The correlation of this indicator with age and total work experience was weak and statistically insignificant ($p > 0.05$): r=+0.09 and r=+0.25, respectively. The established patterns indicated that the general manifestations of PM in the selected cohort worsened with increasing length of work experience in the neurosurgery center and increasing working hours per month.

DISCUSSION

We obtained data indicating that increased duration and intensity of work in the neurosurgery center were significantly associated with an increased risk of emotional burnout and professional maladjustment. These results were expected and are confirmed by numerous studies by other authors. Thus, a group of researchers guided by J. Fernández-Villa de Rey-Salgado (2024) devoted their work to studying the prevalence, mechanisms of occurrence, and risk factors of burnout and professional maladjustment in neurosurgeons. They concluded that approximately a quarter of the subjects showed signs of exhaustion and professional maladjustment of a clinically significant level, two-thirds of the subjects demonstrated the indicated psychopathological manifestations of a subclinical level; most often, mental disorders associated with work stress were reported by specialists who worked longer in departments with a higher frequency of surgical operations per month, had frequent night shifts, and showed a tendency to avoid social contacts with friends and other activities outside of working hours [9].

J. Yu et al. (2020) conducted a study of burnout prevalence and identified risk factors for burnout with signs of professional maladjustment among neurosurgeons and orthopedic surgeons. In total, more than 1,300 specialists who were completing their scholarships in the indicated specialties participated in the study. After conducting a comprehensive study of the formed cohort, the authors identified that younger age, higher duty position in the department, more working hours per month, lower annual income, reduced sleep duration to less than 6 hours per day, and suffering from aggressive and violent actions in the workplace were the risk factors for mental disorders associated with professional stress and maladjustment. It should be noted that the above results are almost completely consistent with the conclusions of our study; the difference in the conclusions regarding age, as one of the mentioned factors, is due to the difference in the age structure of the cohorts being compared [10].

CONCLUSIONS

1. A significant prevalence of PM phenomena was found among the surveyed cohort of medical workers working in the neurosurgery center. A moderate level of professional maladjustment was observed in 22 (44.0%) people, while expressed level – in 28 (56.0%) people. Despite the significant maladaptive impact of the working environment of the neurosurgery center, medical workers involved in the treatment of patients with acute ischemic stroke retain adaptive potential, which creates prospects for increasing their level of resilience.

2. The psychopathological semiotics of three clinical PM variants in the cohort of medical workers working in the neurosurgery center were determined and clinically characterized: somatoform (with a predominance of somatoform dysfunction manifestations of organs and systems), anxious-dysphoric (characterized by the elimination of anxiety manifestations due to impaired social functioning) and asthenic-depressive (with a predominance of mental exhaustion manifestations with depressive response).

3. Risk factors for professional maladjustment in medical workers included older age (41–50 years), longer total length of work experience (≥ 16 years), number of working hours per month (≥ 201 hours), and working as a neurosurgeon. Factors that reduce the risk of PM in the selected cohort included total work experience of 6 to 10 years, shorter work experience in a neurosurgery center (up to 5 years), less than 160 working hours per month, and working as a radiologist.

PROSPECTS FOR FUTURE RESEARCH / ПЕРСПЕКТИВИ ПОДАЛЬШИХ ДОСЛІДЖЕНЬ

The prospect of further research is the further development of measures for psychotherapeutic correction of professional maladjustment in a selected cohort of medical workers.

AUTHOR CONTRIBUTIONS / ВКЛАД АВТОРІВ

All authors substantively contributed to the drafting of the initial and revised versions of this paper. They take full responsibility for the integrity of all aspects of the work.

FUNDING / ДЖЕРЕЛА ФІНАНСУВАННЯ

None.

CONFLICT OF INTEREST / КОНФЛІКТ ІНТЕРЕСІВ

The authors declare no conflict of interest.

REFERENCES/СПИСОК ЛІТЕРАТУРИ

1. Terenda NO, Pavliv TB, Terenda OA. [Occupational burning is one of the unsolved problems of the healthcare system]. *Bulletin of Social Hygiene and Health Protection Organization of Ukraine*. 2021;2:29-33. https://doi.org/10.11603/1681-2786.2021.2.12377
2. Bridgeman PJ, Bridgeman MB, Barone J. Burnout syndrome among healthcare professionals. *The Bulletin of the American Society of Hospital Pharmacists*. 2018;75(3):147-152. https://doi.org/10.2146/ajhp170460
3. Baigent M, Baigent R. Burnout in the medical profession: not a rite of passage. *Med J Aust.* 2018;208(11):471-472. https://doi.org/10.5694/mja17.00891
4. Shakir HJ, Cappuzzo JM, Shallwani H, Kwasnicki A, Bullis C, Wang J, Hess RM, Levy EI. Relationship of Grit and Resilience to Burnout Among U.S. Neurosurgery Residents. *World neurosurgery*. 2020;134:224-236. https://doi.org/10.1016/j.wneu.2019.10.043
5. Chorna VV, Makhniuk VM, Pshuk NG, Gumeniuk NI, Shevchuk Y, Khliestova SS.. Burnout in mental health professionals and the measures to prevent it. *Georgian Medical News*. 2021;1:113-118. https://dspace.vnmu.edu.ua/bitstream/123456789/5744/Article.pdf?sequence=1
6. Babatope VO, Okoye J, Adekunle IA, Fejoh J. Work burnout and organisational commitment of medical professionals. *Future Business Journal*. 2023;9(1):44. https://doi.org/10.1186/s43093-023-00219-y
7. Zaed I, Jaaiddane Y, Chibbaro S, Tinterri B. Burnout Among Neurosurgeons and Residents in Neurosurgery: A Systematic Review and Meta-Analysis of the Literature. *World neurosurgery*. 2020;143:529-534. https://doi.org/10.1016/j.wneu.2020.08.005
8. Klimo P Jr, DeCuypere M, Ragel BT, McCartney S, Couldwell WT, Boop FA. Career satisfaction and burnout among U.S. neurosurgeons: a feasibility and pilot study. *World neurosurgery*. 2013;80(5):59-68. https://doi.org/10.1016/j.wneu.2012.09.009
9. Yu J, Zou F, Sun Y. Job satisfaction, engagement, and burnout in the population of orthopedic surgeon and neurosurgeon trainees in mainland China. *Neurosurgical focus*. 2020;48(3):E3. https://doi.org/10.3171/2019.12.FOCUS19830
10. Fernández-Villa de Rey-Salgado J, Curiel-Montes A, Abarca-Olivas J, González-López P, Borrás-Rocher F, González-Sánchez L, Nieto-Navarro JA. Burnout in Neurosurgery. *World neurosurgery*.2024;184:586-592. https://doi.org/10.1016/j.wneu.2024.01.173

Received 04.08.2024
Accepted 15.11.2024

Одержано 04.08.2024
Затверджено до друку 15.11.2024

INFORMATION ABOUT THE AUTHORS / ВІДОМОСТІ ПРО АВТОРІВ

Regush Andriy – MD, PhD, Head of the Center of X-ray Endovascular Neurosurgery of the Kyiv City Clinical Hospital № 1; Kharkiv highway, building 121, Kyiv, Ukraine, 02091; e-mail: aregusch@gmail.com;

Markova Marianna – Doctor of Medical Sciences, Professor, Head of the Department of Sexology, Psychotherapy and Medical Psychology, Kharkiv National Medical University of the Ministry of Health of Ukraine; 4 Nauky Ave., Kharkiv, Ukraine, 61022; e-mail: markova.md.professor@gmail.com;

Pliekhov Vladyslav – PhD, Assistant of the Department of Sexology, Psychotherapy and Medical Psychology, Kharkiv National Medical University of the Ministry of Health of Ukraine; 4 Nauky Ave., Kharkiv, Ukraine, 61022; e-mail: va.pliekhov@knmu.edu.ua.; https://orcid.org/0000-0001-6884-0151; tel.: +38 (098) 493-84-92

Yavorska Tetiana, Doctor of Medical Sciences, Docent, Professor of the Department of Radiation Diagnostics FPGE at Danylo Halytsky Lviv National Medical University; 69 Pekarska St., 79010 Lviv, Ukraine, 79010; e-mail: tetanaavorskaa@gmail.com