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PHYSICAL ACTIVITY AND HEALTH

Specifics of the Mental Component of the Quality of Life of Almaty Doctors in the Context of the COVID-19 Pandemic

RESEARCH

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ABSTRACT

Introduction: Today, in the context of COVID-19 pandemic, as a result of their professional activities, Kazakhstani medical workers experience a significant burden, which can lead to a rapid depletion of their psychoemotional resources. The purpose of this paper was to study the characteristics of the psychological component of the quality of life of Almaty doctors of practical healthcare.

Methods: The assessment of the psychological component of the quality of life was carried out using the standardised questionnaire SF-36 (Mental Component Summary). Data collection was carried out in September 2020 in Almaty, Republic of Kazakhstan, using the Google-Forms. The study involved 108 medical workers (65 women and 43 men) providing inpatient and outpatient care. To measure the reliability of factors that determine psychological health, the authors used the Spearman rank correlation analysis.

Results: The Role-Emotional indicator correlates with the nationality of doctors ($p = 0.005$), and the presence of children in the family ($p = 0.044$). A statistically significant relationship between the Mental Health indicator and the living conditions of doctors was determined ($p = 0.014$). The relationship between Social Functioning and the nationality factor was revealed ($p = 0.027$). Vitality has a statistically significant relationship with the age of doctors ($p = 0.043$).

Conclusion: The indicators of the psychological component of the quality of life of Almaty doctors depend (statistically) on such personal factors as: age, nationality, the presence of children in the family, and housing conditions. In the future, it is planned to conduct further assessment of the dynamics of the level of psychological health of medical workers and the factors determining it.

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INTRODUCTION

Some people are at risk for negative mental health consequences during a pandemic or epidemic. Scientists attribute the following categories of citizens to a risk group: patients with a confirmed diagnosis of COVID-19, families of patients with a confirmed diagnosis, people with mental illness or chronic diseases, the elderly, adolescents, children, emigrants, homeless people, as well as medical workers. People working in the healthcare sector are at risk as they provide assistance to citizens who have been infected with COVID-19. Doctors and other medical workers may develop mental disorders, they need specialised help from psychologists and moral support from the community. It is also important to note that according to the results of the studies, a large number of medical workers were found to have certain signs of depression, anxiety and other types of mental disorders (Vindegaard and Benros, 2020).

Citizens who work in the medical sector are constantly exposed to stress, as a result of which there is a high risk of developing certain mental health problems. These risks are particularly high during pandemics and epidemics, so the outbreak of COVID-19 is also a threat to the mental health of medical workers (Shcherban et al., 2021). There are a number of factors that particularly affect the physical and mental health of doctors and other healthcare professionals. These factors include family separation, long working days, the risk of contracting the virus, fatigue, loneliness, and lack of personal protective equipment (Preti *et al*., 2020).

During the COVID-19 pandemic, a significant psychoemotional load among medical workers providing care to patients with coronavirus infection (including incurable patients) often leads to the rapid depletion of their mental and emotional resources, which can manifest itself in various forms of pathology (Giorgi *et al*., 2020). It should also be noted that constant work in conditions of risk contributes to the development of increased nervous tension and, in general, can lead to a decrease in the quality of life of medical workers (Suryavanshi *et al*., 2020). The stress, as well as negative emotions, experienced by healthcare providers treating patients with COVID-19 are called triggers and lead to errors and delays in the provision of medical care. Identifying these factors is a key element in the delivery of health services, as well as in the management of a health facility during infectious disease outbreaks. All this is directly related to the performance indicators of medical workers, i.e., determines the quality of medical care (Sarma *et al*., 2020). According to the literature, there is compelling evidence of an increasingly deteriorating mental state of doctors of various specialties, in a public health emergency due to the COVID-19 pandemic, and this trend is more characteristic of medical practitioners (Pervichko & Koniukhovskaia, 2020). It is obvious that the stress that medical workers experience due to contact with seriously ill patients contributes to negative psychological manifestations and, as a consequence, the development of professional burnout (Barello *et al*., 2020; Morgantini *et al*., 2020). According to some authors, negative psychoemotional disorders are especially acute among older professionals, and may also be gender specific (Di Tella *et al*., 2020).

The foregoing determines the relevance of timely diagnosis of deviations in the psychoemotional sphere of medical workers. The method of MOS-SF-36 questionnaire (Medical Outcomes Study-Short Form), proposed in the USA in 1993 by J. E. Ware, belongs to a reliable and simple method for assessing psychological health. In the Republic of Kazakhstan, the Russian-language version of the SF-36 questionnaire, developed by Russian researchers at the International Centre for the Study of the Quality of Life (Amirdzhanova *et al*., 2008), is used. It should be noted that the modern literature contains a sufficient number of studies (systematic reviews, meta-analyses, etc.) on the assessment of the psychological health of medical workers, indicating a negative trend of this phenomenon. At the same time, the issue of psychological health among Kazakhstani medical workers has not been sufficiently studied. There is a shortage of papers devoted to the study of the psychological component of the quality of life of Kazakhstani medical workers in the context of the COVID-19 pandemic (Sasaki *et al*., 2020; Buselli *et al*., 2020; Khanal *et al*., 2020).

The applied value of this study lies in the possibility of practical application of the results obtained to qualitatively investigate the mental health of doctors in the context of the COVID-19 pandemic.

The purpose of this paper was to study the characteristics of the psychological component of the quality of life of Almaty doctors of practical healthcare.

MATERIALS AND METHODS

To diagnose the psychological component of the quality of life, the SF-36 Health Status Survey was used. The SF-36 Health Status Survey can be classified as a non-specific questionnaire. It was developed to assess the quality of life (QOL) of the population. This questionnaire is distributed in the United States of America and in some European countries, it is used to obtain results when conducting research on the quality of life of the population. The SF-36 Health Status Survey has been standardised for the general population of the United States and a representative sample of populations in Australia, France, and Italy. Population studies have been conducted in the United States and some European countries. The results were obtained in accordance with the standards for a healthy population and for groups of patients with various chronic diseases, with a sample of groups according to gender and age. The SF-36 questionnaire makes it possible to assess various components of the patient's physical and psychoemotional state as a whole. This questionnaire does not require considerable costs, it is simple and affordable to use and calculate the data obtained.

The analysis was carried out on the following scales: Role-Emotional (RE), Mental Health (MH), Social Functioning (SF), and Vitality (VT). The 36 items on the questionnaire were grouped into eight scales: Physical Functioning, Role-Physical, Bodily pain, General health perceptions, Vitality, Social Functioning, Role-Emotional, and Mental Health. The scores on each scale range from 0 to 100, with 100 representing complete health, and all scales form two indicators: mental and physical well-being. For each respondent, a procedure was carried out to recalculate the answers to the questionnaire into points (transformation). The scale values were calculated according to the formula: (the real value of the indicator – the minimum possible value of the indicator)/(possible range of values) * 100. Thus, the value of each scale changed from 0 to 100 (Elbeddini *et al*., 2020). To create the possibility of a direct interpretation of psychological health indicators, the values of each scale was standardised. For all scales, the Z-score were calculated — the ratio of the difference between the transformed value of each scale and its mean in the population to the standard deviation (Carbone, 2020). To standardise the values of each scale, a 50% level of "ideal" health and the same standard deviation of 10 was chosen (Table 1).

Table 1 Standardisation of indicator values of psychological health.

Z-SCORE	STANDARDISATION
REz = (RE – 66.048)/40.5052	REst = 50 + (REz * 10)
MHz = (MH – 55.889)/22.6767	MHst = 50 + (MHz * 10)
SFz = (SF – 67.130)/23.0927	SFst = 50 + (SFz * 10)
VTz = (VT – 58.380)/19.5251	VTst = 50 + (VTz * 10)

Data collection was carried out in September 2020 in Almaty, Republic of Kazakhstan, using the Google-Forms. Participation in the survey was voluntary and anonymous. A total of 108 doctors (65 women and 43 men) who provide inpatient and outpatient care took part in the study. In order to study the relationship of the average indicators of psychological health scales with gender, age, education, living conditions, nationality, marital status, ethnic characteristics of the family, the presence of children in the family, attitude to religion, and the dominant priority value of medical workers, a Spearman rank correlation analysis was carried out. Spearman's rank correlation coefficient is a measure of the linear relationship between random variables. Spearman's correlation is an order, that is, not numerical values are used to assess the strength of a connection, but the corresponding degrees. The coefficient is constant with respect to any monotonic transformation of the measuring scale. The correlation coefficient of the Spearman rank can be used to identify and assess the closeness of the relationship between two series of comparable quantitative indicators. If the series of indicators, arranged according to the degree of increase or decrease, in most cases coincide (a larger value of one indicator corresponds to a larger value of another indicator, for example, when comparing the height and body weight of a patient), it can be concluded that there is a direct correlation. Microsoft Excel and IBM SPSS Statistics were used as a tool for statistical processing of the data obtained. The limitation of this study may lie in the fact that it focuses on the health care system specifically in the Republic of Kazakhstan.

RESULTS AND DISCUSSION

Table 2 presents the standardised values of the psychological health scales of Almaty top-level medical workers (arithmetic mean, median, standard deviation, minimum and maximum). It was found that the Role-Emotional indicator varied within 33.7–58.4 (median – 58.4), Mental Health – within 25.4–69.5 (median – 50.0), Social Functioning – within 20.9–64.2 (median – 48.0) and Vitality – within 25.2–71.3 (median – 50.8).

STANDARDISED VALUES FOR PSYCHOLOGICAL HEALTH SCALES, N = 108				
	RE	MH	SF	VT
Arithmetic mean	50.0	50.0	50.0	50.0
Median	58.4	50.0	48.0	50.8
Standard deviation	10.0	10.0	10.0	10.0
Minimum	33.7	25.4	20.9	25.2
Maximum	58.4	69.5	64.2	71.3

Table 2 Standardised values for psychological health scales.

Table 3 presents the standardised mean values of psychological health scales of Almaty doctors, taking into account the studied characteristics. It should be noted that due to the fact that the standard deviations for all scales were the same and equal to 10, the differences in the mean values had a direct interpretation: one point of change corresponded to one tenth of the standard deviation and was equal to 0.1 units. According to the results obtained, male doctors in comparison with female doctors have higher indicators of Vitality and Social Functioning (on average by 0.8 points), but lower than Role-Emotional and Mental Health (on average, 1.5 points). The level of psychological health in the age group of doctors "under 27 years old" is higher than in the age group "over 27 years old", according to all analysed scales (on average by 2.7 units).

		RE	MH	SF	VT
GENDER	Male	49.5	49.2	51.0	51.2
	Female	50.2	50.2	49.7	49.6
AGE GROUPS	under 27 years old	49.9	48.3	49.2	48.1
	over 27 years old	50.2	52.3	51.1	52.6
EDUCATION	Higher	51.9	51.3	51.3	51.2
	postgraduate (Residency	48.7	49.1	49.1	49.2
	Doctor of Medicine, MD–PhD)	48.7	49.1	49.1	49.2
LIVING CONDITIONS	no improvement in living conditions required	51.5	52.2	50.9	51.1
	improvement of living conditions is required	47.9	46.8	48.7	48.4
NATIONALITY	Kazakh	51.4	51.4	51.2	51.0
	other nationality	44.8	44.8	45.4	46.2
MARITAL STATUS	married	51.5	51.6	51.4	51.8
	single	48.5	48.3	48.5	48.2
ETHNIC CHARACTERISTICS OF THE FAMILY	monoethnic	49.3	49.5	49.3	49.1
	multiethnic	51.8	51.2	51.8	52.2
THE PRESENCE OF CHILDREN IN THE FAMILY	have children	51.8	51.9	51.8	51.8
	have no children	47.8	47.6	47.8	47.8
RELIGIOUS BELIEFS (FORM OF BELIEF)	believe	49.6	50.2	49.7	50.0
	do not believe	53.9	48.0	52.4	49.9
DOMINANT PRIORITY VALUE	health	52.1	48.4	50.1	49.1
	family, loved ones	49.6	50.7	49.8	50.1
	career	50.2	50.1	61.5	54.7
	spiritual values	46.9	49.4	46.9	49.8
	other	41.9	46.5	58.8	56.0

Table 3 Standardised mean values of psychological health scales, taking into account the studied characteristics, n = 108.

The average standardised values of all scales of psychological health among doctors with higher education are higher than among holders of post-doctoral degrees (on average by 2.4 units). For doctors who needed to improve their living conditions, the indicators of psychological health were below the average level, and for doctors who do not need to improve living conditions – above 50%. The differences according to the averaged data were 3.5 units. Native-born physicians are characterised by higher scores on psychological health in comparison with doctors of other nationalities. Vitality by nationality differed by 4.8 points, Social Functioning by 5.8 points, and Role-Emotional and Mental Health indicators differed by 6.6 points each.

The standardised mean values of psychological health for doctors who are married are higher than for unmarried doctors (by 3.2 units on average). Medical specialists with a monoethnic family had lower indicators of psychological health in comparison with doctors with a multiethnic family (on average by 2.5 units). Higher indicators of psychological health are characteristic for doctors with the presence of children in the family, in comparison with doctors without children (by an average of 4.1 units). Doctors who marked the form of religious beliefs as "believe" in comparison with those who marked the form of beliefs as "do not believe" had a higher level of indicators of Mental Health (by 2.2 points) and Vitality (by 0.1 points), but a lower level of indicators Role-Emotional (4.3 units) and Social Functioning (2.7 units).

The average values of indicators of psychological health were also studied, taking into account the dominant priority value of doctors (Alsayedahmed, 2020; De Angelis *et al*., 2020). The highest level of the Role-Emotional indicator is typical for doctors with the dominant priority value – "health", and the lowest – with an unspecified priority value classified as "other" (differences in 10.2 units). The average values of Mental Health are higher for doctors with the dominant priority value "family, loved ones", and lower – with an "other" unspecified priority value (differences of 4.2 units). The highest and lowest average Social Functioning values are characteristic of doctors with the dominant priority values "career" and "spiritual values", respectively (the difference is 14.6 units). Vitality was higher for doctors with an unspecified priority value ("other"), and lower for doctors with a "health" value (differences of 6.9 units).

Along with the assessment of the levels of mean values of indicators of psychological health in different strata, the analysis of the correlation dependence of scales of psychological health with the personal data of doctors was carried out. It was found that the Role-Emotional indicator correlates with the nationality of doctors ($r = 0.269$, $n = 108$, $p = 0.005$), and is also due to the presence of children in the family ($r = 0.194$, $n = 108$, $p = 0.044$). A statistically significant relationship between the Mental Health indicator and the living conditions of doctors was determined ($r = 0.235$, $n = 108$, $p = 0.014$). The relationship between Social Functioning and the national factor was revealed ($r = 0.212$, $n = 108$, $p = 0.027$). The Vitality indicator has a statistically significant relationship with the age of doctors ($r = 0.195$, $n = 108$, $p = 0.043$). There is no correlation between indicators of Role-Emotional, Mental Health, Social Functioning, and Vitality with such personality traits as gender, education, marital status, ethnic family characteristics, religious beliefs, and the dominant priority value of medical workers (Robertson *et al*., 2020).

In modern conditions, the healthcare system of the Republic of Kazakhstan is under a certain load due to the spread of the COVID-19 coronavirus infection. Practitioners are the most vulnerable, since the specifics of their professional activities provide for close and, in some cases, long-term contact with critically ill patients. In turn, contact with patients is a stress factor leading to the development of psychoemotional disorders and, as a result of professional burnout (Restauri and Sheridan, 2020; Podder *et al*., 2020). The main question of this study was the following: what are the features of the psychological components of the quality of life in Almaty doctors of practical healthcare. The authors studied the levels of standardised mean values of indicators of psychological health, such as Role-Emotional, Mental Health, Social Functioning and Vitality, as well as the relationship of these scales of psychological health with the personal data of the doctor.

CONCLUSIONS

The study found that the indicators of psychological health (Role-Emotional, Mental Health, Social Functioning and Vitality) were below the average level among respondents in the age group "under 27 years old"; resident physicians, doctors of medicine, and holders of post-

doctoral degree; among doctors with a need to improve living conditions; among non-native born doctors; single doctors (unmarried); among doctors with a monoethnic family; among doctors with no children in the family. It was also found that male doctors had lower Role-Emotional and Mental Health scales, while female doctors had lower Social Functioning and Vitality scales.

It was revealed that doctors with a dominant value orientation towards health had higher rates of Role-Emotional and Social Functioning; doctors with a dominant family orientation had higher rates of Mental Health and Vitality; doctors with a career orientation had all indicators of psychological health higher than average; doctors with dominant spiritual values had all indicators of psychological health below average.

The main conclusion that can be made is that the level of quality of life due to psychological health among Almaty medical workers is not high enough and differs depending on the individual characteristics of a person. It can be concluded that the indicators of the psychological component of the quality of life of Almaty doctors are (statistically) dependent on such personal factors as: age, nationality, the presence of children in the family, and living conditions. When assessing the correlation dependence of the scales of psychological health with the personal data of doctors, some regularities were revealed. In particular, it was found that the indicators of the psychological health of Almaty medical workers correlate with such personal aspects as nationality (Role-Emotional and Social Functioning), the presence of children in the family (Role-Emotional), living conditions (Mental Health) and age (Vitality).

COMPETING INTERESTS

The authors have no competing interests to declare.

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