Prevalence of Anxiety, Depression and Insomnia Among Medical Workers of Emergency Medical Service in the Eastern Kazakhstan

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Abstract:

Studying the prevalence of anxiety, depression and insomnia among medical workers of Emergency medical service is a relevant task that will allow us to better understand the scope of the problem and develop effective strategies to support and prevent psychological problems among medical staff. Methods. A cross-sectional study was conducted with the participation of 592 medical workers employed at emergency medical service in the East Kazakhstan and the Abay regions of the Republic of Kazakhstan. The study included questions regarding socio-demographic data of the respondents, questions aimed at assessing the severity of insomnia using the Insomnia Severity Index (ISI) and questions from the HADS scale to assess the level of anxiety and depression among the participants. Results. Nearly half of healthcare workers reported symptoms of insomnia (28.2% subthreshold, 16.2% insomnia, 3.0% severe), anxiety (22.1% subclinical, 13.0% clinical), or depression (20.4% subclinical, 9.8% clinical). Feldshers (nursing staff) and those with higher education had elevated levels of these conditions. Insomnia severity strongly correlated with anxiety ($r=0.539$, $p<0.001$) and depression ($r=0.415$, $p<0.001$), emphasizing the need for targeted mental health interventions. Conclusion. The study revealed high rates of insomnia, anxiety, and depression among healthcare workers, with nursing staff and highly educated individuals most affected. Insomnia correlated strongly with anxiety and depression, highlighting the need for mental health support.

Keywords: anxiety; depression; insomnia; medical workers; emergency medical station; East Kazakhstan

1.Introduction:

While healthcare workers play a key role in providing patient care, they are also subject to high levels of stress and psychological strain that can lead to the development of anxiety, depression, and insomnia [1]. Depression is a serious psychological disorder characterized by a constant feeling of sadness, loss of interest in life, fatigue, sleep and appetite disturbances, and a negative impact on a person's daily life. Prolonged depression can lead to decreased immunity, poor physical health, and an increased risk of cardiovascular disease. Anxiety is a state of restlessness, tension and nervousness that can manifest itself in various forms, from mild anxiety to panic attacks. Anxiety can be accompanied by physiological symptoms such as rapid heartbeat, sweating, trembling, etc. Constant stress and anxious thoughts can lead to elevated levels of cortisol (stress hormone) in the body, which can negatively affect the cardiovascular system, digestion, and immune system. Insomnia is a sleep disorder in which a person experiences difficulty falling asleep, interrupted sleep, waking up early or not getting enough sleep. Insomnia can be caused by stress, anxiety, depression, or other factors, and it can seriously affect a person's overall physical and mental health. Insomnia, or sleep disturbance, can lead to impaired cognitive function, impaired concentration and memory. Lack of sleep also increases the risk of depression and anxiety [2]. The study of the prevalence of anxiety, depression and insomnia among medical workers of emergency medical service has high scientific relevance for several reasons. First, emergency medical service workers face high levels of stress and traumatic situations on a daily basis. They encounter emergency cases, unexpected deaths, and severe injuries. This can lead to the development of psychological problems such as anxiety, depression, and insomnia [2]. Second, psychological problems in health care providers can negatively affect their physical and mental health, as well as the quality of care they provide. Studies show that medical errors and treatment failures can be associated with psychological problems in health care workers. It is therefore important to study the prevalence of these problems among health workers and to develop effective strategies to prevent and treat them [3]. Third, studying psychological problems in health care workers can help develop supportive measures and improve working conditions for this category of professionals. Understanding the prevalence and causes of these problems can help to develop education programs and trainings aimed at strengthening the psychological resilience and emotional well-being of medical

personnel [4]. In 2017, Kazakhstan adopted new Regulations on Emergency Medical Services, which, among other provisions, introduced organizational changes to the emergency medical service system [5]. In the subsequent years, an increase in the proportion of feldshers (nursing staff) teams within the emergency medical service structure was observed. As of 2021, the ratio of physician-led teams to feldshers (nursing staff) teams was 18% to 82%, respectively. [6].Nowadays in Kazakhstan, emergency medical services are regulated by the law "On the Approval of Rules for the Provision of Emergency Medical Care, Including the Use of Medical Aviation." [7]. According to this rule the dispatcher of the Emergency Medical Service (EMS) receives calls from citizens reporting health disturbances via the "103" hotline. The processing time for a call, from the moment it is received by the EMS dispatcher, is five minutes, during which the call is triaged based on its urgency category. Calls received by the Emergency Medical Service (EMS) dispatcher are classified into four urgency categories:

Category 1 Urgency Call – A patient's condition that poses an immediate threat to life and requires urgent medical assistance.

Category 2 Urgency Call – A patient's condition that presents a potential threat to life if medical assistance is not provided.

Category 3 Urgency Call – A patient's condition that poses a potential threat to health if medical assistance is not provided.

Category 4 Urgency Call – A patient's condition caused by an acute illness or exacerbation of a chronic disease without sudden or significant dysfunction of organs and systems, and without an immediate or potential threat to the patient's life and health. Emergency Medical Service (EMS) serve Category 1-3 Urgency Call. To manage Category 4 Urgency Call, teams have been established at the level of primary healthcare services [7]. Emergency medical services (EMS) are provided by feldshers (nursing staff) teams and specialized (physician-led) teams. Physician-led teams constitute no less than 25% of the total number of EMS teams and include: specialized (physician-led) intensive care teams, including those serving pediatric populations; and specialized teams in specific fields (e.g., cardiology and pediatrics). The composition of a feldsher (nursing staff) team varies depending on the urgency category of the call and includes either one feldsher (nursing staff) and a paramedic (or) driver, or two feldshers (nursing staff) and a paramedic (or) driver. The composition of a specialized (physician-led) team includes a physician, a feldsher (nursing staff), and a paramedic (or) driver [7]. To further contextualize the importance of addressing psychological issues among healthcare workers, it is essential to consider the organizational structure and operational dynamics of emergency medical services (EMS) in Kazakhstan. The unique challenges faced by EMS workers,combined with the evolving regulatory and organizational framework of the healthcare system, highlight the necessity of examining their mental health and well-being. This context provides a critical foundation for understanding the prevalence of anxiety, depression, and insomnia among this professional group.

Thus, studying the prevalence of anxiety, depression and insomnia among medical workers of emergency medical service is a relevant task that will allow us to better understand the scope of the problem and develop effective strategies to support and prevent psychological problems among medical staff. This investigation aimed to study prevalence of anxiety, depression and insomnia among medical workers of emergency medical aid stations in the Eastern region of Kazakhstan.

2.Materials And Methods:

Design, participants and settings East Kazakhstan region occupies the easternmost part of Kazakhstan, as of 2020, the East Kazakhstan Region has a population of 1369597 [8]. Abai Region previously was known as Semipalatinsk region. Upon Kazakhstan's independence in 1991, the Semipalatinsk region continued to exist until 1997, when it was merged back into East Kazakhstan region. In 2022, the region was reconstituted as the Abai Region, with its administrative center locates in Semey (Semipalatinsk). Total population of the region is 638 300 [8]. This is a cross-sectional, questionnaire study that was carried out at the East Kazakhstan and Abay regions, between September and December 2022. The Emergency Medical Stations of the East Kazakhstan and the Abay regions are independent healthcare institutions providing emergency medical services to both adult and pediatric populations in life-threatening conditions, accidents, and severe acute illnesses. In the Emergency Medical Station of the East Kazakhstan region, 438 healthcare workers are employed, of whom 320 (73.0%) confirmed their participation in the research. The Emergency Medical Station of the Abay region employs 493 medical workers, of whom 272 (55.2%) agreed to participate in the study. The inclusion criteria encompassed medical workers who: were adult responders (aged ≥18 years), were healthcare professionals (physicians, nurses, paramedics), and were able to complete the study questionnaire. Participants were excluded if they refused to participate, staff of Emergency Medical Services others regions of Kazakhstan. Data were gathered through a self-administered paper questionnaire, which was distributed by the researchers at each station. Each participant gave a different answer to each of the questions, which was then scored with a certain number of points. By summing the scores, the results were analyzed and interpreted. All participants in the study gave written consent after receiving detailed information about the study's purpose and the confidentiality of their personal data. Each participant was assigned a unique code, and a file linking this code to their personal identification information was kept by the database custodian, who was the only one with access to it. Others had access only to the coded (secure) database. The study had prior approval from the local ethical committee. The questionnaires The study included questions regarding socio-demographic data of the respondents, questions aimed at assessing the severity of insomnia

using the Insomnia Severity Index (ISI) [9]. The ISI is a 7- item self-report questionnaire designed to evaluate the nature, severity, and impact of insomnia. Each item is rated on a 5-point Likert scale ranging from 0 (no problem) to 4 (very severe problem), resulting in a total score between 0 and 28. The score interpretation is as follows: 0–7 indicates no insomnia, 8–14 suggests sub-threshold insomnia, 15–21 reflects moderate insomnia, and 22–28 signifies severe insomnia. In addition, the study included questions from the HADS scale used to assess the level of anxiety and depression among the participants. The HADS comprises 14 items divided into two subscales: anxiety and depression. Each item is scored on a four-point scale, with a maximum possible score of 21 for both anxiety and depression. Scores of 11 or higher on either subscale indicate a significant"case" of psychological morbidity, while scores between 8 and 10 are considered "borderline," and scores from 0 to 7 are classified as "normal." [10].The "forward-backward" procedure was applied to translate the ISI and HADS questionnaires from English into Kazakh and Russian languages. Four general practitioners translated the questionnaires into Kazakh and Russian and these were backward translated into English by a health professional and a professional translator. Then, a provisional version of the Kazakh and Russian questionnaires were provided. All authors the final version was developed. Reliability was assessed by measuring the internal consistency of the questionnaires using Cronbach's alpha coefficient, with a value of 0.70 or higher deemed satisfactory. The final draft of both the Kazakh and Russian version was administered to a sample of study population.

Data Analysis

Descriptive analysis was conducted and summarized the continuous data as means and SDs, and the categorical data as frequencies and proportions. Groups were compared using an independent t-test, one-way analysis of variance (ANOVA). Bonferroni correction was applied to post hoc tests to adjust for multiple comparisons. Pearson's correlation analysis was used to examine the relationships between insomnia severity (ISI) and anxiety and depression scores (HADS). Correlation coefficients (r) and p-values were calculated, with significance set at $p < 0.05$. SPSS version 20.0 program (IBM Ireland Product Distribution Limited, Ireland) was used for statistical analysis.

3.Results

The study included 592 medical staff who worked in the Emergency medical stations of study regions. The mean age of the respondents was 37.0 (±12.5). The characteristics of the participants at baseline are shown in Table 1.

Table 1: Socio-demographic data of respondents.

Main Categories	Variable	Frequencies	Percent
Age group (years)	18-25	128	21.6
	26-35	197	33.3
	36-45	92	15.5
	46+	175	29.6
Gender	Male	417	70.4
	Female	175	29.6
Specialty	Physician	85	14.4
	Feldsher (nursing staff)	486	82.1
	Paramedic (driver)	21	3.5
Education	Higher	100	16.9
	Secondary	492	83.1
Region of residence	East Kazakhstan region	272	45.9
	Abay region	320	54.1

The group of respondents aged between 26 and 35 years was 33.3% (n=197), while the group older than 46 years was 29.6% (n=175). Majority of the respondents were male with 70.4 % (n=417). The survey was conducted among health workers living in two regions: East Kazakhstan – 45.9% (n=272) and Abay - 54.1% (n=320). The majority of respondents had secondary education - 83.1% (n=492) and worked as Feldsher (nursing staff) - 82.1% (n=486). (Table 1)

Table 2: presents the interpretation of the results of insomnia, anxiety and depression levels.

Interpretation	Frequencies	Percent

ISI		
No clinically significant insomnia	311	52.5
Subthreshold insomnia	167	28.2
Insomnia	96	16.2
Severe insomnia	18	3.0
HAD-A		
Absence of reliably expressed symptoms of anxiety	384	64.9
Subclinically expressed anxiety	131	22.1
Clinically expressed anxiety	77	13.0
HAD-D		
Absence of reliably expressed symptoms of depression	413	69.8
Subclinically expressed depression	121	20.4
Clinically expressed depression	58	9.8

Table 2: ISI and HADS scores: depression, anxiety, and sleep quality status among healthcare staff.

ISI - Insomnia Severity Index; HADS-A – Hospital Anxiety and Depression Scale-anxiety subscale; HADS-D -Hospital Anxiety and Depression Scale-depression subscale. The study found that 28.2% (n=167) of the respondents had subthreshold insomnia, 16.2% (n=96) had insomnia, and 3.0% (n=18) had severe insomnia. It was found that 22.1% (n=131) of health care workers had subclinically expressed anxiety, and 13.0% (n=77) showed clinically expressed anxiety. Subclinically expressed depression was revealed at 20.4% (n=121) health workers and the rest of them 9.8% (n=58) showed clinically expressed depression.

Table 3: summarizes the comparison of the participants' outcome measures based on their relating to age group, gender, specialty, educational level, region of residence

Main Categories	Variable	Frequency (%)	ISI		HAD-A		HAD-D	
			Mean (SD)	p value	Mean (SD)	p value	Mean (SD)	p value
Age group (years)	18-25	128 (21.6)	7.9 (6.7)	0.346	6.4 (3.7)	0.055	6.0 (3.5)	0.324
	26-35	197 (33.3)	8.5 (6.9)		6.4 (3.9)		6.0 (3.7)	
	36-45	92 (15.5)	8.4 (7.6)		5.6 (4.1)		5.0 (3.9)	
	46+	175 (29.6)	8,1 (6.6)		5.4 (3.9)		5.1 (3.5)	
Gender	Male	417 (70.4)	8.3 (6.7)	0.597	6.1 (3.9)	0.353	5.5 (3.7)	0.874
	Female	175 (29.6)	8.0 (7.1)		5.7 (4.0)		5.6 (3.5)	
Specialty	Physician	85 (14.4)	7.6 (6.5)	0.000	5.7 (3.8)	0.001	5.3 (3.5)	0.003

	Feldsher (nursing staff)	486 (82.1)	12.0 (7.5)		7.4 (4.4)		6.7 (4.2)	
	Paramedic (driver)	21 (3.5)	7.0 (6.5)		5.8 (3.3)		6.6 (3.6)	
Education	Higher	100 (16.9)	11.2 (7.3)	0.000	7.2 (4.3)	0.000	6.3 (4.1)	0.021
	Secondary	492 (83.1)	7.6 (6.6)		5.7 (3.8)		5.4 (3.6)	

Table 3: Differences in outcome measures based on participant characteristics (n=592).

ISI - Insomnia Severity Index; HADS-A – Hospital Anxiety and Depression Scale-anxiety subscale; HADS-D –Hospital Anxiety and Depression Scale-depression subscale; SD - standard deviation.

The comparison of the participants' outcome measures based on participant characteristics revealed significant difference between groups with accordance to specialty and level of education. Post hoc tests with Bonferroni correction confirm statistically significant pairwise differences (Table 4). Feldsher (nursing staff) had higher level of insomnia 12.0 (±7.5), this group also showed higher level of anxiety 7.4 (±4.4) and depression 6.7 (±4.2). However, participants with higher level of education predominantly showed elevated data of insomnia 11.2 (±7.3) with comparison of participants with second level of education 7.6 (±6.6). The same time the medical workers with higher level of education also had elevated data anxiety 7.2 (±4.3) and depression 6.3 (±4.1) compared to colleagues with secondary education.

Table 4: Bonferroni-Corrected Pairwise Comparisons.

	ISI		HAD-A		HAD-D	
	Mean Difference 95% CI	p-value (Bonferroni)	Mean Difference 95% CI	p-value (Bonferroni)	Mean Difference 95% CI	p-value (Bonferroni)
Physician vs Feldsher (nursing staff)	-4.42 (-6,30,-2,54)	0.000	-1.72 (-2.81, -0.62)	0.001	-1.34 (-0.41, -0.35)	0.004
Physician vs Paramedic (driver)	0.62 (-2.95, 4.18)	1.000	-0.07 (-2.15, 2,00)	1.000	-1.26 (-3.20, 0.69)	0.366
Feldsher (nursing staff) vs Physician	4.42 (2.54, 6.30)	0.000	1.71 (0.62, 2.81)	0.001	1.38 (0.35, 2.41)	0.004
Feldsher (nursing staff) vs Paramedic (driver)	5.03 (1.13, 8.94)	0.006	1.64 (-0.63, 3.91)	0.252	0.12 (-2.01, 2.25)	1.000
Paramedic (driver) vs Physician	-0.62 (-4.18, 2.95)	1.000	0.07 (-2.00, 2.15)	1.000	1.26 (-0.69, 3.20)	0.366

ISI - Insomnia Severity Index; HADS-A – Hospital Anxiety and Depression Scale-anxiety subscale; HADS-D –Hospital Anxiety and Depression Scale-depression subscale; CI – confidence interval.

Comparison between groups was conducted using post hoc tests with Bonferroni correction. Statistically significant within-group differences were identified (Table 4). This table presents post hoc comparisons of the Insomnia Severity ISI, HADS-A, and HADS-D between three groups: Physicians, Feldshers (nursing staff), and Paramedics (drivers). Statistically significant results ($p<0.05$) are highlighted below, considering Bonferroni correction. Physicians demonstrated significantly lower ISI scores compared to Feldshers (nursing staff), with a mean difference of -4.42 (95% CI: -6.30, -2.54; $p<0.001$). Feldshers (nursing staff) reported significantly higher ISI scores compared to Paramedics, with a mean difference of 5.03 (95% CI: 1.13, 8.94; $p=0.006$). Physicians reported significantly lower anxiety scores compared to Feldshers, with a mean difference of -1.72 (95% CI: -2.81, -0.62; $p=0.001$). Physicians demonstrated significantly lower depression scores compared to Feldshers, with a mean difference of -1.34 (95% CI: -2.41, -0.35; $p = 0.004$).Pearson's correlation was used to examine the relationship between the severity of insomnia and anxiety in the sample of 592 healthcare workers of EMS. A significant positive correlation was found between insomnia severity and anxiety ($r=0.539$, $p<0.001$). This suggests that higher levels of insomnia are strongly associated with increased anxiety levels.Table 5 shows the correlation matrix for the variables, with the Pearson correlation coefficients and corresponding p-values. The correlation is statistically significant at the 0.01 level (two-tailed).

Table 5: Correlation Matrix of Insomnia Severity and Anxiety Scores.

Variable	ISI	HAD-A
ISI	1	0.539*
HAD-A	0.539*	1
N	592	592
Significance (two-tailed)	p = 0.000	p = 0.000

*Correlation is significant at the 0.01 level (two-tailed).

Pearson's correlation analysis was conducted to explore the relationship between insomnia severity and depression in the study population. A significant positive correlation was observed between insomnia severity and depression ($r=0.415$, $p<0.001$), indicating that higher levels of insomnia are associated with higher levels of depression Table 6 presents the correlation matrix, with the Pearson correlation coefficients and the corresponding p-values. The correlation is statistically significant at the 0.01 level (two-tailed).

Table 6: Correlation Matrix of Insomnia Severity and Depression Scores.

Variable	ISI	HAD-D
ISI	1	0.415*
HAD-D	0.415*	1
N	592	592
Significance (two-tailed)	p = 0.000	p = 0.000

*Correlation is significant at the 0.01 level (two-tailed).

4.Discussion:

Insomnia is a common sleep problem that can affect healthcare workers as well. For healthcare workers, insomnia can be particularly problematic due to their irregular work schedules, stress, high levels of responsibility and the need to remain alert and focused during long shifts. Insomnia in healthcare workers can lead to poorer quality of work, fatigue, irritability, memory and attention problems, and an increased risk of errors and accidents. Therefore, it is important that healthcare workers pay proper attention to their sleep and take care of their physical and emotional well-being. To combat insomnia, healthcare professionals can employ various strategies such as maintaining a regular sleep schedule, creating a calm and comfortable sleep environment, avoiding caffeine and other stimulants before bedtime, engaging in relaxation practices such as yoga or meditation, and seeking professional help if insomnia becomes a chronic problem [11]. According to our findings, nearly half of the medical workers exhibited symptoms of insomnia. Specifically, 28.2% of participants had subthreshold insomnia, indicating mild symptoms that do not yet meet the criteria for a clinical diagnosis. Additionally, 16.2% of the participants experienced insomnia, characterized by clinically significant symptoms, while 3.0% were affected by severe insomnia, indicating a high level of disruption to their sleep and overall functioning. This indicating a notable prevalence of sleep disturbances among study population. Anxiety in health care workers is a common condition caused by stress, overwork, constant contact with patients and difficult cases, and the uncertainty and unknowns of the job. Health care professionals such as doctors, nurses, and other professionals may experience anxiety due to

high expectations, lack of resources, difficult decisions, and responsibility for patients' lives. Constant stress and anxiety can lead to fatigue, emotional burnout, decreased productivity, and even psychological problems. Therefore, it is important for healthcare professionals to pay attention to their mental health, seek support from colleagues, management or mental health professionals. It is also important to practice relaxation techniques, exercise, and maintain a work-life balance to reduce anxiety and improve overall well-being [12]. In our study, the majority of healthcare workers (64.9%) demonstrated no clinically significant symptoms of anxiety, indicating a relatively low level of anxiety among most participants. However, a substantial proportion of participants exhibited varying degrees of anxiety. Specifically, 22.1% showed subclinical anxiety, meaning they had mild symptoms that did not reach the threshold for clinical diagnosis but were still noticeable. Additionally, 13.0% of participants experienced clinically significant anxiety, indicating that their symptoms were severe enough to potentially affect their daily functioning and require clinical attention. Depression among health professionals is a serious problem that is often underestimated and under-discussed [13]. Health care workers such as doctors, nurses and other health care professionals face high levels of stress, emotional and physical strain, constant pressure and responsibility for the lives and health of patients. Because of the constant contact with patients, difficult cases, and often traumatic situations, healthcare workers are at risk for developing depression. They may experience symptoms such as fatigue, despair, feelings of helplessness, loss of interest in work and life, and social isolation. It is important to realize that depression in healthcare workers should not be ignored. Help should be sought from psychologists, psychiatrists, or other professionals to diagnose and treat depression. It is also important to create a supportive environment in healthcare facilities where workers can communicate about their feelings and receive support and help. Combating depression in health care workers requires a comprehensive approach, including psychological support, training in stress management strategies, regular mental health monitoring, and creating conditions for a healthy work-life balance [14]. In our study, the majority of healthcare workers (69.8%) showed no significant symptoms of depression, indicating that most participants were not experiencing major depressive symptoms. However, we also observed that 20.4% of the participants exhibited subclinical levels of depression, meaning they reported mild symptoms that did not reach the threshold for a formal diagnosis but were still noteworthy. In contrast, 9.8% of participants experienced clinically significant depression, suggesting a more serious impact on their well-being and daily life, potentially requiring treatment or intervention. Some of the socio-demographic factors associated with depression, anxiety and insomnia in health care workers include high workload, lack of peer and management support, exposure to traumatic events, work-life imbalance, and occupational burnout. These factors can have a negative impact on the mental health of health care workers and increase the risk of developing psychological problems [15]. Investigating the prevalence of anxiety, depression and insomnia among medical professionals in emergency stations is important for several reasons. Caring for the mental well-being of medical professionals is at the center of attention, as they face high levels of stress and emotional strain in their work on a daily basis. Studying the psychological aspects of their condition will help to better understand their needs and develop effective support strategies [16]. The mental health of medical professionals has a direct impact on their performance and ability to provide quality care [17]. Medical errors and deficiencies in the quality of care can result from mental health problems such as anxiety, depression and insomnia. Studying these problems helps to identify factors that may negatively affect health care providers and offer appropriate solutions and support measures [18]. Mental health problems in health workers can have economic consequences for the health care system. They can lead to decreased productivity, increased absenteeism from work, and increased treatment and rehabilitation costs. Studying the prevalence and factors associated with anxiety, depression, and insomnia provides an opportunity to assess the economic burden and develop interventions to reduce this burden [19]. Studying the prevalence of anxiety, depression and insomnia among emergency station health workers helps to develop and tailor effective support and intervention programs. This may include stress management training, psychological support, creating a caring environment for mental health and implementing measures to reduce the risk of developing mental health problems [20], [21]. While a study by Argentinian researchers showed a prevalence of anxiety at 44% and depression at 21.9% [22]. In a study conducted by researchers from Saudi Arabia, it was found that 32.3% of health care workers have high levels of anxiety and 36.1% have moderate levels of anxiety [23]. In a study conducted by Turkish researchers, it was found that 77.6% of health care workers had depression, 60.2% had anxiety, and 50.4% had insomnia [24]. Our findings highlight notable differences in the outcome measures based on participants' characteristics, specifically their specialty and education level. These differences suggest that both the nature of the healthcare role and the level of education may play a significant role in the severity of insomnia, anxiety, and depression among medical workers. First, feldshers (nursing staff) were found to experience significantly higher levels of insomnia (12.0±7.5), anxiety (7.4±4.4), and depression (6.7±4.2) compared to physicians and paramedics. These results could reflect the unique demands of the nursing staff role, which may involve more direct patient care and potentially higher emotional and physical stress. On the other hand, paramedics (drivers) exhibited comparatively lower levels of insomnia, anxiety, and depression, which might be related to the specific nature of their duties, such as driving and transport, which may carry different stressors than direct medical care. Additionally, our study revealed that healthcare workers with higher levels of education tended to report elevated scores for insomnia (11.2±7.3), anxiety (7.2±4.3), and depression (6.3±4.1) compared to those with secondary education. This could suggest that higher education, while providing medical knowledge and training, may also lead to increased awareness of the psychological

demands of healthcare work, or could potentially indicate greater self-reflection on mental health issues. It is also possible that higher education correlates with roles that carry greater responsibility, which could lead to higher stress levels and more significant psychological strain. These findings were further confirmed by post hoc tests with Bonferroni correction, which demonstrated significant differences in the severity of insomnia, anxiety, and depression between the groups. Physicians showed significantly lower levels of insomnia, anxiety, and depression compared to feldshers, while feldshers had higher scores compared to paramedics. These findings underscore the potential impact of the nature of medical specialties on mental health outcomes. Our results are consistent with previous research indicating that healthcare workers, particularly those in direct patient care roles like nursing staff, are at greater risk of experiencing psychological distress. The higher prevalence of insomnia, anxiety, and depression among nursing staff and those with higher education may reflect both the emotional and cognitive demands of their roles, suggesting a need for targeted mental health support and interventions for these groups. In this study, Pearson's correlation analysis was used to explore the relationship between insomnia severity and both anxiety and depression in a sample of 592 healthcare workers. The results revealed a significant positive correlation between insomnia severity and anxiety ($r=0.539$, $p<0.001$), suggesting that higher levels of insomnia are strongly associated with increased anxiety levels. This finding supports the idea that insomnia and anxiety are often linked, with one potentially exacerbating the other. The strong correlation emphasizes the importance of addressing both conditions simultaneously in healthcare settings, where both are prevalent among medical workers. Similarly, a significant positive correlation was observed between insomnia severity and depression ($r=0.415$, $p<0.001$). This indicates that higher levels of insomnia are associated with higher levels of depression. The relationship between insomnia and depression is well-established in previous research, as sleep disturbances can both result from and contribute to depressive symptoms. These findings suggest that addressing insomnia could be an effective strategy in mitigating depressive symptoms, particularly in populations experiencing high levels of psychological stress,such as healthcare workers. These results are consistent with previous studies indicating strong links between sleep disturbances and mental health issues like anxiety and depression. Given the significant associations found in this study, future research should investigate targeted interventions that focus on improving sleep quality as a means of reducing anxiety and depression in healthcare workers. The study of depression, anxiety, and insomnia is important to the health care system for several reasons. First, these psychological problems can significantly impair a person's physical health, leading to serious consequences such as increased risk of cardiovascular disease, a weakened immune system, and other physical problems. Second, depression, anxiety, and insomnia can significantly impair a person's quality of life, leading to social isolation, impaired occupational performance, and other negative consequences. Finally, these psychological problems can cause people to seek medical care, which increases the burden on the health care system. Therefore, the study and effective management of depression, anxiety and insomnia are important for maintaining public health and optimizing the health care system. A comprehensive approach is needed to solve the problem of anxiety, depression, and insomnia among health care providers. Incorporating support programs such as counseling and group support can provide confidential and professional help. Improving the work environment, such as reducing work hours and increasing staff numbers, can reduce stress levels and improve overall well-being. Encouraging healthy lifestyles including physical activity, healthy eating and regular sleep can help improve mental health. Increasing awareness of mental illnesses and their signs and symptoms can help health care providers recognize and treat these conditions early. Solving the problem of anxiety, depression and insomnia among healthcare workers will improve their mental health, increase productivity and provide better patient care. Our study had some limitations. Firstly, as this was a cross-sectional study, the causality between compared variables cannot be established. Secondly, the surveyed population in this study was relatively small. Also unknown and unmeasured confounders may exist, and the results should be interpreted with caution. Despite these limitations, it is the first study in Kazakhstan where we analyzed anxiety, depression and insomnia among medical workers of emergency medical aid stations using the valid instruments as ISI and HADS scale.

5.Conclusions:

Our study revealed a high prevalence of insomnia, anxiety, and depression among emergency medical service workers, with significant differences based on specialty and education level. Feldshers (nursing staff) showed higher levels of these symptoms compared to physicians and paramedics, likely due to the emotional and physical demands of their roles. Additionally, emergency medical service workers with higher education reported more severe symptoms, potentially linked to increased responsibilities or self-awareness of mental health. A significant positive correlation was found between insomnia severity and both anxiety and depression, suggesting that sleep disturbances may contribute to mental health issues. These findings highlight the need for targeted mental health interventions, particularly for nursing staff and those with higher education. Improving sleep quality may be an effective strategy for reducing anxiety and depression in healthcare workers.

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Helsinki and approved by the Ethics Committee of Semey Medical University (Protocol № 4, 20 December 2021). Informed Consent Statement: Informed consent was obtained from all subjects involved in the study
9.Data Availability Statement: The data presented in this study are available upon request from the corresponding author. The data are not publicly available due to privacy restrictions.
10.Conflicts of Interest: The authors declare no conflicts of interest.
11.References:

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