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Prevalence and associated factors of depression, anxiety, and stress among academic medicine faculty in Kazakhstan: a Cross-sectional Study

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Keywords

Psychological Distress • Depression • Anxiety • Stress • Medical Faculty

Summary

Introduction. *Psychological distress refers to a set of painful mental and physical symptoms of anxiety and depression, which often coexist and coincide with common somatic complaints and chronic conditions. In Kazakhstan, mental disorders are the second leading cause of years lived with disability. Currently, medical education in Kazakhstan is undergoing comprehensive reform, which creates an additional burden on faculty, fostering mental health concerns.*
Methods. *A quantitative observational cross-sectional study was conducted in 6 large medical universities in Kazakhstan. Data were obtained from 715 faculty academics by using an online self-reported DASS-21. Statistical analysis was performed using the SPSS version 20.0. Bivariate and multivariate logistic regression analyses were applied to evaluate the relationship between predictor and outcome variables.*

Results. *The total prevalence of depression, anxiety, and stress was 40.6%, 41.3%, and 53.0%, respectively. Younger age (p = 0.002), female gender (p = 0.001), being single (p = 0.044) or in a relationship (p = 0.001), having chronic diseases (p < 0.001), holding Master (p = 0.036) or PhD degree (p = 0.040), employment status (p = 0.034), and being involved in additional activities (p = 0.049) were significantly associated with different dimensions of distress.*
Conclusions. *Nearly half of the study population reported symptoms of depression, anxiety, and stress. Due to the higher prevalence of psychological distress amongst academic medicine faculty, determined risk factors must be taken into consideration in developing policies for mental issues prevention.*

Introduction

Healthcare system in Kazakhstan has undergone substantial changes over the past years. Since gaining independence in 1991, the government has attempted to undertake multiple reforms in the healthcare model inherited from the Soviet Union. The health sector confronted plenty of challenges, struggling with insufficient funding, outdated equipment, limited flexibility of services, and poor quality of medical aid in the cornerstone [1,2]. To ensure the success of transformations made to date, medical education ought to align with specific health system demands [3].

The rapid growth of medical education facilities intensified intense competition between higher education institutions, which consistently predetermines the serious responsibility of academic staff for teaching and research work. Educators are pressurized with regular obligations that are constantly expanding to meet the requirements of the new time [4]. It is commonly believed that health professionals, acceding to teaching positions, already have the necessary skills, since their core mission comprises sharing knowledge in a specific area. In this respect, a huge proportion of employees enter the academic environment insufficiently prepared for the role of a teacher [5, 6].

Currently, medical education in Kazakhstan is undergoing comprehensive reform in shifting from a traditional seven-year program (five-year bachelors with further two-year internship) to a six-year model. The new model implies the continuing education program integrated with internship and masters studies and demands full-scale efforts to revise the learning outcomes. Therefore, developing and enhancing curricula apart from educational or clinical activities creates an additional burden on faculty, which may foster mental health concerns. From this perspective, the investigation of factors associated with the psychological distress of faculty is becoming an evolving area of research around the world.

Psychological distress (PD) refers to a set of painful mental and physical symptoms of anxiety and depression, which often coexist and coincide with common somatic complaints and chronic conditions [7, 8]. The Global Burden of Disease 2019 study has denoted that depressive and anxiety disorders were the

leading causes of burden worldwide and ranked among the top 25 disability causes, remaining high across the entire lifespan. What is more devastating, an in-depth analysis demonstrated that the estimated cases of mental disorders had grown by 48.1% between 1990 and 2019 [9], and have the tendency to rise due to global disruption brought up by the COVID-19 pandemic [10]. According to the COVID-19 Mental Disorders Collaborators report, the pandemic triggered an increase in depressive and anxiety disorders by about 25% [11].

In Kazakhstan, mental disorders (in particular, depressive disorders) are the second leading cause of years lived with disability (YLD) [12], but as in many countries of Central Asia are not given due consideration. Cultural patterns and traditional beliefs, along with the Soviet system legacy developed certain attitudes towards mental health, including social stigmatization and neglect [13, 14]. The systematic review overviewing stigma towards psychiatric illnesses in six Asian societies has established that people with such health conditions were considered dangerous and aggressive and therefore discriminated against [15]. In most eastern cultures, mental disorders are perceived as a personal weakness and occasionally even as a family flaw. Fear of public labeling, prejudice, social abandonment, and withdrawal from civil life is found to be a strong barrier to seeking professional help [16, 17]. Globally, more than 70% of people with mental disorders do not receive appropriate treatment [18]. Nevertheless, 3.72% of the Kazakhstani population suffers from clinical depression and 2.26% from anxiety, which brings the country to rank second among countries in Central Asia on disability-adjusted life years (DALYs) after Uzbekistan and to rank 20th in global suicide rates [12, 19].

We have not identified studies pertaining to the prevalence and predictors of psychological distress amongst health sciences faculty in Kazakhstan or other countries of the post-Soviet region. Therefore, little to nothing is known about measures for addressing mental health issues in the era of curricular reforms. To the best of our knowledge, there was not any equivalent study conducted in Kazakhstan to investigate the borderline mental disorders among academic medicine faculty teachers. Hence, the aim of our study was to explore the current prevalence and associated factors of psychological distress amongst medical universities academic staff in Kazakhstan. Given the significance of mental health problem among representatives of medical education sector and limited number of studies dedicated to this issue, our study attempted to shed light on the current mental status of educators and factors that contribute to it. Moreover, early diagnostics of borderline mental disorders and timely response could be attained by using the appropriate instruments, including the DASS-21. Nevertheless, mental well-being among academic medicine faculty ought to be scrutinized more precisely. In light of the fact that this matter has not been given due attention, our study may contribute to further investigations.

Methods

STUDY DESIGN

This quantitative observational cross-sectional study was conducted over 3 months from October to December 2021 in Kazakhstan. Selecting this period was justified by the duration of the fall semester in Kazakh medical universities (from September to January). Therefore, the workload in the first and last months of the semester is particularly escalated, which could become an additional matter for psychological distress and distort real results. The manuscript was prepared following the STROBE guidelines for cross-sectional studies.

STUDY SAMPLE

The total study population was represented by 715 educators from six large medical universities from different regions (Fig. 1). The sample size was calculated by EpiInfo version 7.0 software, with an expected frequency of 30% and a confidence interval (CI) of 95%. The calculated sample size was 596, which was inflated by 20% with regard to data loss. We used a convenience sampling strategy in our study. Eligibility criteria comprised 1) willingness to participate in a survey, 2) present position of a medical university teacher, and 3) absence of clinical manifestations of mental disorders. Educators who 1) refused to participate, 2) had an annual principal vacation, and 3) were on a decree or sick leave were excluded from the study.

STUDY INSTRUMENT

The Depression Anxiety Stress Scale (DASS-21) was used to estimate psychological distress. DASS-21 is a valid three-dimensional self-reporting instrument for the evaluation of depression, anxiety, and stress level. The psychometric properties of the questionnaire have been proven in numerous studies. The reliability and internal consistency of DASS-21 demonstrated its practicability in both clinical and non-clinical settings [20-25].

DASS was developed by Lovibond S.H. and Lovibond P.F. in 1995 and previously consisted of 42 items [26]. Eventually, it was shortened to a 21-item form with 7 items on each subscale. In contrast to other questionnaires aimed at the evaluation of borderline mental disorders, DASS-21 is designed to assess the combined effect of depression, anxiety, and stress, since these disorders predominantly have a similar origin and are strongly correlated with each other.

The depression subscale assesses feelings of melancholy, hopelessness, lack of motivation and interest in life, anhedonia, and inertia. The anxiety subscale includes measuring situational anxiety, fear, and excitement. The stress subscale evaluates agitation, irritability, overreaction, and nervousness.

DATA COLLECTION

An online self-reported questionnaire was administered to collect data. The link with a survey was distributed among university teachers via WhatsApp messenger.

Fig. 1. Geographical spread of large medical universities in Kazakhstan
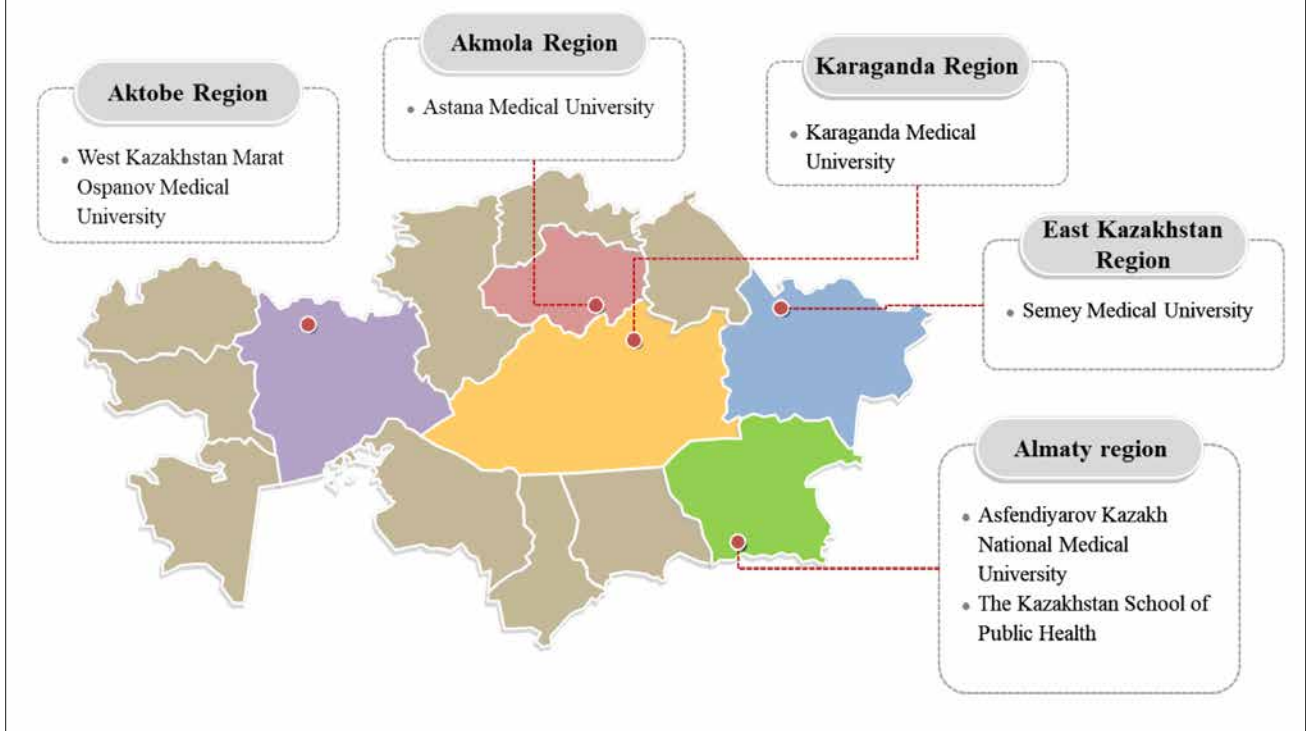
The first section of the form involved socio-demographic characteristics (such as age, sex, marital status, having children, having a spouse or partner with the same occupation, health status, current position, work experience, department focus, employment status, academic degree or rank, and additional activity).

The second section included statements of the DASS-21 form. The study participants were asked to read each statement and rate the applicability to their emotional state in the past week. Responses were rated on a 4-point Likert scale from 0 (does not apply to me at all) to 3 (most of the time applies to me). The scoring 0-4 for depression scale was evaluated as a normal condition, 5-6 mild, 7-10 moderate, 11-13 severe, and > 14 extremely severe depression. The anxiety scale was scored as follows: 0-3 normal condition, 4-5 mild, 6-7 moderate, 8-9 severe, and > 10 extremely severe anxiety. The stress scale scoring was the following: 0-7 normal condition, 8-9 mild, 10-12 moderate, 13-16 severe, and > 17 extremely severe stress. Therefore, the scores of 5, 4, and 8 were applied as cut-off points for depression, anxiety, and stress dimensions, respectively.

STATISTICAL ANALYSIS

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) version 20.0. In the course of the study, quantitative and qualitative data were obtained. The normality of distribution was analyzed using the Kolmogorov-Smirnov test. Data analysis included descriptive and inferential statistics. Pearson's correlation test was performed to analyze the correlation between three subscales of the DASS-21.

At the initial stage, we applied descriptive statistics and bivariate analysis to examine the association between outcome variables and socio-demographic data. A Chi-square test was conducted for bivariate analysis of categorical variables. The means and standard deviations (SD) were calculated for continuous variables, as well as categorical variables were presented in frequencies and percentages, along with p-values, odds ratios (OR), and 95% confidence intervals (CI).

Next, multinomial logistic regression via the forced entry procedure was run to evaluate the relationship between predictor and outcome variables. Variables with a p-value of less than 0.25 at the initial stage were included in the final regression model, as recommended by Bursac et al. [27]. The test for multicollinearity among all variables was conducted prior to data analysis. The cutoff value for variance inflation factor (VIF) of < 5 was accepted, as recommended by Vatcheva et al. [28]. A p-value of 0.05 was considered statistically significant for the final model.

Ethics statement

The study was conducted in compliance with the Declaration of Helsinki. Ethical approval was obtained from the Local Ethics Committee of Semey Medical University (No. 2-28-10-2020). Official letters with requests for permission to survey the faculty were sent to each medical university. Participation was voluntary and anonymous to ensure the honesty and integrity of the research. The informed consent outlined the essence of the study, the purpose, objectives, the role of the participants, and their right to withdraw from the study at any moment. Moreover, study participants

were informed that the data collected would be kept confidential and stored in a computer file in coded form. Likewise, any information published would be presented in integers and percentages.

Results

PSYCHOMETRIC PROPERTIES OF THE DASS-21

Reliability analysis illustrated a high internal consistency of scales used. Integral Cronbach's alpha for the DASS-21 was 0.949 (0.899 for depression subscale, 0.820 for anxiety subscale, and 0.907 stress subscale). A strong correlation has been revealed between all subscales: depression and anxiety ($p = 0.762$; $p < 0.001$), depression and stress ($p = 0.806$; $p < 0.001$), and anxiety and stress ($p = 0.752$; $p < 0.001$).

DESCRIPTIVE STATISTICS

Overall, 715 faculty members completed the online survey. Participants mean age ± SD was 41.12 ± 11.18, ranging from 23 to 78 years. The majority of responders were females (67.3%). The most common marital status was being married (61.4%). Furthermore, 28.3% of educators reported having a spouse or partner occupying the same position (medicine or teaching). Nearly three-quarters (73.8%) reported having children. Slightly over half of all responders (54.3%) instructed in theoretical and basic disciplines. Full-time staff represented the vast majority (77.9%) of the study sample. The most popular additional activity was research work, which was selected by nearly a quarter of teachers (22.4%).

The mean score ± SD in the depression subscale was 4.36 ± 4.21, in the anxiety subscale was 3.49 ± 3.08, and in the stress subscale was 7.87 ± 4.57. Descriptive analysis revealed various levels of psychological distress amongst the study population. Altogether, the prevalence of depression, anxiety, and stress was 40.6%, 41.3%, and 53.0%, respectively.

INFERENTIAL STATISTICS

We investigated the association between the socio-demographic characteristics of responders and the DASS-21 subscales (Tab. I). Ten variables were found to be significantly associated with depression and anxiety: age ($p < 0.001$), sex ($p < 0.001$), marital status ($p < 0.001$), having children ($p < 0.001$), having chronic diseases ($p = 0.029$ for DASS-D; $p < 0.001$ for DASS-A), position ($p < 0.001$ for DASS-D; $p = 0.004$ for DASS-A), work experience ($p < 0.001$), employment status ($p < 0.001$), academic rank ($p < 0.001$), and being involved in additional activities ($p = 0.013$ for DASS-D; $p = 0.040$ for DASS-A). Eight variables were significantly associated with stress: age ($p < 0.001$), marital status ($p < 0.001$), having children ($p < 0.001$), position ($p = 0.020$), work experience ($p < 0.001$), employment status ($p < 0.001$), academic rank ($p < .001$), and being involved in additional activities ($p < 0.001$).

REGRESSION MODELS FOR FACTORS ASSOCIATED WITH PSYCHOLOGICAL DISTRESS

Factors that were significant in the previous binary analysis were included in the final models as independent variables. Table II details the regression models for the DASS-21 subscales. In depression multivariate logistic regression model, age under 40 (AOR = 2.74; 95% CI 1.44-5.23), being single (AOR = 3.91; 95% CI 1.04-14.74) or in a relationship (AOR = 12.22; 95% CI 2.93-51.01), holding Master (AOR = 2.08; 95% CI 1.05-4.12) or PhD degree (AOR = 2.22; 95% CI 1.04-4.76), and being involved in various additional activities (AOR = 10.89; 95% CI 1.01-117.52) was associated with the risk of depression. Also, the male gender (AOR = 0.48; 95% CI 0.32-0.74) and the absence of chronic diseases (AOR = 0.37; 95% CI 0.25-0.55) were associated with a lower risk of depression.

In anxiety model, the male gender (AOR = 0.51; 95% CI 0.34-0.76), the absence of chronic diseases (AOR = 0.27; 95% CI 0.19-0.40), and working full-time (AOR = 0.61; 95% CI 0.38-0.96) were associated with lower odds to report anxiety. However, as in the depression model, holding Master (AOR = 2.33; 95% CI 1.25-4.34) and PhD degrees (AOR = 3.71; 95% CI 1.83-7.52) was associated with the higher risk of anxiety (Tab. III).

Results of the regression model for stress are demonstrated in Table IV. It was established that being in a relationship (AOR = 13.96; 95% CI 2.90-67.08), married (AOR = 4.45; 95% CI 1.23-16.05), or divorced (AOR = 9.99; 95% CI 2.50-39.82) were significantly associated with stress, along with holding PhD degree (AOR = 2.77; 95% CI 1.39-5.52) and combining the teaching with other activities (AOR = 5.52; 95% CI 1.01-30.13).

Discussion

Our study was principally aimed at the evaluation of the prevalence and associated factors of psychological distress in Kazakhstan medical faculty academics sample. Since both the education and healthcare sectors are vulnerable to distress, academic medicine faculty are at higher risk of mental health issues [29]. Our results illustrated the total prevalence of depression, anxiety, and stress of 40.6%, 41.3%, and 53.0%, respectively. These findings are corresponding to prior studies that explored the prevalence of psychological distress amongst educators [30-32]. Silva et al. [33] in their systematic review stated that the prevalence of anxiety ranged from 10% to 49.4%, depression from 15.9% to 28.9%, and stress from 12.6% to 50.6% around the world. The higher levels of distress in Kazakhstan may be due to the lack of attention given to mental health and psychological support.

Another possible reason for the higher rates of psychological distress may be the global disruption due to COVID-19 pandemic. Since epidemiological situation in Kazakhstan remained unstable for the period of data collection, we suppose that drastic

Tab. I. The association between socio-demographic characteristics of responders and the DASS-21 subscales.

Variable	n (%)	Depression		Anxiety		Stress	
		M ± SD	p-value[a]	M ± SD	p-value[a]	M ± SD	p-value[a]
Age			< 0.001*		< 0.001*		< 0.001*
< 40	379 (53)	6.2 ± 4.4		4.1 ± 3.3		9.4 ± 4.6	
> 40	336 (47)	2.9 ± 3.2		2.8 ± 2.6		6.2 ± 3.9	
Sex			< 0.001*		< 0.001*		0.527
Male	234 (32.7)	3.4 ± 3.4		2.8 ± 2.6		7.7 ± 3.7	
Female	481 (67.3)	5.3 ± 4.4		3.8 ± 3.2		8.0 ± 4.9	
Marital status			< 0.001*		<0.001*		< 0.001*
Single	111 (15.5)	5.9 ± 4.9		3.9 ± 3.5		8.3 ± 5.4	
In a relationship	74 (10.3)	8.9 ±4.5		5.3 ± 3.3		11.7 ± 3.9	
Married	439 (61.4)	3.8 ± 3.6		3.1 ± 2.8		7.3 ± 4.2	
Divorced	66 (9.2)	4.4 ± 3.8		3.7 ± 3.3		8.0 ±4.3	
Widowed	25 (3.5)	2.4 ± 2.1		2.4 ± 1.6		4.8 ± 2.9	
Spouse or partner occupying the same position			0.650		0.253		0.258
No	493 (71.7)	4.5 ± 4.2		3.5 ± 3.1		7.6 ± 4.6	
Yes	195 (27.3)	4.7 ± 4.2		3.4 ± 3.0		8.4 ± 4.2	
Children			< 0.001*		< 0.001*		< 0.001*
No	187 (26.2)	6.9 ± 4.9		4.5 ± 3.3		9.8 ± 5.0	
1	195 (27.3)	4.8 ± 3.9		3.4 ± 3.1		8.1 ± 4.4	
2	209 (29.2)	3.5 ± 3.3		3.0 ± 2.8		7.0 ± 3.9	
3 or more	124 (17.3)	2.9 ± 3.5		2.8 ± 2.8		6.1 ± 3.9	
Chronic diseases			0.029*		<0.001*		0.359
No	417 (58.3)	4.2±3.9		2.9 ± 2.8		7.5 ± 4.4	
Yes	298 (41.7)	5.2 ± 4.6		4.3 ± 3.3		8.3 ± 4.7	
Position			<0.001*		0.004*		0.020*
Assistant teacher	474 (66.3)	5.2 ± 4.6		3.9 ± 3.4		8.1 ± 5.0	
Head teacher	154 (21.6)	4.3 ± 3.4		2.9 ± 2.3		7.9 ± 3.7	
Head of the department	87 (12.2)	2.4 ± 2.3		2.6 ± 1.8		6.7 ± 3.0	
Work experience			< 0.001*		< 0.001*		< 0.001*
Less than 1 year	24 (3.4)	7.3 ± 5.4		5.3 ± 4.1		9.3 ± 6.4	
1-5 years	162 (22.7)	7.0 ± 4.8		4.4 ± 3.4		10.0 ± 4.9	
5-10 years	171 (23.9)	5.6 ± 4.1		3.8 ± 3.2		9.0 ± 4.4	
More than 10 years	358 (50.1)	2.9 ± 3.0		2.8 ± 2.6		6.3 ± 3.7	
Department focus			0.479		0.770		0.802
Theoretical/basic	388 (54.3)	4.9 ± 4.4		3.5 ± 3.1		7.8 ± 4.8	
Clinical	327 (45.7)	4.3 ± 4.0		3.5 ± 3.0		7.9 ± 4.3	
Employment status			< 0.001*		< 0.001*		< 0.001*
Full-time	557 (77.9)	4.2 ± 3.9		3.2 ± 3.0		7.3 ± 4.4	
Part-time	158 (22.1)	6.2 ± 4.8		4.4 ± 3.2		9.9 ± 4.6	
Academic rank			< 0.001*		< 0.001*		< 0.001*
No	174 (24.3)	4.3 ± 4.0		3.4 ± 3.1		7.5 ± 4.7	
Master	260 (36.4)	6.2 ± 4.5		4.1 ± 3.2		8.9 ± 5.0	
PhD	93 (13.0)	4.9 ± 3.5		3.9 ± 3.1		9.2 ± 3.4	
Professor/Candidate	188 (26.3)	2. 6± 3.2		2.6 ± 2.5		6.1 ± 3.7	
Additional activities			0.013*		0.040*		< 0.001*
No	113 (15.8)	3.4 ± 4.3		2.8 ± 3.5		5.0 ± 4.8	
Clinical activities	205 (28.7)	4.5 ± 4.0		3.5 ± 3.1		7.9 ± 4.1	
Research work	160 (22.4)	5.1 ± 4.7		3.8 ± 3.1		8.7 ± 4.8	
Methodological work	142 (19.9)	5.2 ± 3.8		3.4 ± 2.8		8.7 ± 3.9	
Educative activities	44 (6.2)	5.4 ± 5.0		3.8 ± 3.2		7.7 ± 5.2	
Mixed activities	43 (6.0)	4.3 ± 2.8		3.8 ± 2.1		9.8 ± 2.8	
Other	8 (1.1)	3.0 ± 2.2		3.9 ± 2.4		8.1 ± 5.1	

n: number of responders, M: mean, SD: standard deviation; [a] Using Pearson Chi-square test; * p-value is significant.

Tab. II. Multinomial logistic regression of the depression subscale with demographic data and work factors.

Variable	COR (95% CI)	p-value	AOR (95% CI)	p-value
Age				
< 40	5.74 (4.10-8.04)	< 0.001*	2.74 (1.44-5.23)	0.002*
> 40	1 (reference)		1 (reference)	
Sex				
Male	0.55 (0.40-0.77)	<0.001*	0.48 (0.32-0.74)	0.001*
Female	1 (reference)		1 (reference)	
Marital status				
Single	6.18 (1.99-19.17)	0.002*	3.91 (1.04-14.74)	0.044*
In a relationship	24.64 (7.23-83.90)	< 0.001*	12.22 (2.93-51.01)	0.001*
Married	2.48 (0.84-7.37)	0.101	1.90 (0.60-6.02)	0.279
Divorced	3.00 (0.92-9.77)	0.068	1.96 (0.56-6.88)	0.296
Widowed	1 (reference)		1 (reference)	
Children				
No	5.73 (3.4209.59)	< 0.001*	0.74 (0.30-1.81)	0.504
1	2.88 (1.74-4.78)	< 0.001*	1.17 (0.64-2.15)	0.610
2	1.26 (0.75-2.11)	0.393	0.76 (0.42-1.39)	0.376
3 or more	1 (reference)		1 (reference)	
Chronic diseases				
No	0.71 (0.53-0.97)	0.029*	0.37 (0.25-0.55)	<0.001*
Yes	1 (reference)		1 (reference)	
Position				
Assistant teacher	5.37 (2.84-10.14)	< 0.001*	1.79 (0.80-4.02)	0.159
Head teacher	3.88 (1.95-7.75)	< 0.001*	1.21 (0.51-2.86)	0.663
Head of the department	1 (reference)		1 (reference)	
Work experience				
Less than 1 year	8.86 (3.55-22.14)	< 0.001*	2.24 (0.68-7.33)	0.184
1-5 years	6.37 (4.24-9.58)	< 0.001*	1.66 (0.82-3.39)	0.162
5-10 years	4.35 (2.94-6.44)	< 0.001*	1.58 (0.85-2.94)	0.151
More than 10 years	1 (reference)		1 (reference)	
Employment status				
Full-time	0.49 (0.34-0.69)	< 0.001*	0.93 (0.57-1.52)	0.781
Part-time	1 (reference)		1 (reference)	
Academic rank				
No	3.38 (2.06-5.54)	< 0.001*	1.15 (0.57-2.34)	0.699
Master	7.07 (4.46-11.21)	< 0.001*	2.08 (1.05-4.12)	0.036*
Ph.D.	4.53 (2.58-7.96)	< 0.001*	2.22 (1.04-4.76)	0.040*
Professor/ Candidate	1 (reference)		1 (reference)	
Additional activities				
No	2.53 (0.30-21.43)	0.394	3.08 (0.30-31.65)	0.343
Clinical activities	4.86 (0.59-40.23)	0.143	6.43 (0.64-64.77)	0.114
Research work	5.04 (0.61-41.96)	0.134	4.75 (0.47-48.05)	0.187
Methodological work	6.08 (0.73-50.70)	0.095	6.23 (0.62-62.67)	0.121
Educative activities	6.39 (0.73-56.38)	0.095	5.30 (0.49-57.63)	0.171
Mixed activities	6.68 (0.76-59.05)	0.088	10.89 (1.01-117.52)	0.049*
Other	1 (reference)		1 (reference)	

COR: crude odds ratio; AOR: adjusted odds ratio; CI: confidence intervals; * p-value is significant.

changes in people's daily life may have challenged their mental health. Medical faculty members were particularly hit by the pandemic: most of the physicians overworked in the frontline, struggled with shifting to the distant learning, creating digital content for new training format, along with poor technical facilities and deficient internet connection. A systematic review and meta-analysis by Zeng et al. [34] investigating long term sequalae of COVID-19 pandemic highlighted escalation of depression, anxiety, post-traumatic stress disorder, and cognitive impairments within up to 12 months after infection. The COVID-19 Mental Disorders Collaborators report [10] showed more than 30% increase in the prevalence depressive and anxiety disorders in Kazakhstan during the outbreak.

A wide range of factors associated with depression, anxiety, and stress has been revealed in literature,

Tab. III. Multinomial logistic regression of the anxiety subscale with demographic data and work factors.

Variable	COR (95% CI)	p-value	AOR (95% CI)	p-value
Age				
< 40	2.16 (1.59-2.93)	< 0.001*	1.40 (0.74-2.65)	0.298
> 40	1 (reference)		1 (reference)	
Sex				
Male	0.51 (0.37-0.72)	< 0.001*	0.51 (0.34-0.76)	0.001*
Female	1 (reference)		1 (reference)	
Marital status				
Single	2.53 (0.98-6.52)	0.056	1.66 (0.52-5.29)	0.395
In a relationship	5.04 (1.86-13.66)	0.001*	2.95 (0.88-9.89)	0.080
Married	1.39 (0.57-3.40)	0.471	1.51 (0.57-4.00)	0.407
Divorced	2.14 (0.79-5.82)	0.135	1.66 (0.56-4.86)	0.360
Widowed	1 (reference)		1 (reference)	
Children				
No	3.69 (2.25-6.04)	< 0.001*	1.94 (0.83-4.53)	0.125
1	1.84 (1.13-3.00)	0.015*	1.26 (0.71-2.26)	0.439
2	1.61 (0.99-2.62)	0.056	1.53 (0.89-2.63)	0.126
3 or more	1 (reference)		1 (reference)	
Chronic diseases				
No	0.41 (0.30-0.56)	< 0.001*	0.27 (0.19-0.40)	< 0.001*
Yes	1 (reference)		1 (reference)	
Position				
Assistant teacher	2.06 (1.25-3.39)	0.005*	1.15 (0.58-2.27)	0.692
Head teacher	1.38 (0.78-2.43)	0.270	0.71 (0.34-1.49)	0.365
Head of the department	1 (reference)		1 (reference)	
Work experience				
Less than 1 year	4.28 (1.78-10.29)	0.001*	1.93 (0.61-6.05)	0.262
1-5 years	2.55 (1.74-3.73)	< 0.001*	1.02 (0.50-2.09)	0.954
5-10 years	1.75 (1.21-2.55)	0.003*	0.92 (0.49-1.71)	0.780
More than 10 years	1 (reference)		1 (reference)	
Employment status				
Full-time	0.47 (0.33-0.67)	< 0.001*	0.61 (0.38-0.96)	0.034*
Part-time	1 (reference)		1 (reference)	
Academic rank				
No	1.65 (1.05-2.57)	0.029*	1.52 (0.80-2.87)	0.202
Master	2.94 (1.96-4.40)	< 0.001*	2.33 (1.25-4.34)	0.008*
Ph.D.	2.70 (1.61-4.54)	< 0.001*	3.71 (1.83-7.52)	< 0.001*
Professor/candidate	1 (reference)		1 (reference)	
Additional activities				
No	0.26 (0.06-1.14)	0.074	0.30 (0.06-1.54)	0.148
Clinical activities	0.42 (0.10-1.79)	0.239	0.52 (0.10-2.61)	0.426
Research work	0.47 (0.11-2.02)	0.308	0.375 (0.08-1.88)	0.233
Methodological work	0.40 (0.09-1.75)	0.225	0.43 (0.09-2.15)	0.302
Educative activities	0.50 (0.11-2.36)	0.381	0.43 (0.08-2.40)	0.333
Mixed activities	0.83 (0.18-3.94)	0.818	1.04 (0.19-5.67)	0.961
Other	1 (reference)		1 (reference)	

COR: crude odds ratio; AOR: adjusted odds ratio; CI: confidence intervals; * p-value is significant

comprising both socio-demographic and work-related aspects. Our study identified that the women were at nearly 2 times higher risk of developing depression (AOR = 0.48; 95% CI 0.32-0.74) and anxiety (AOR = 0.51; 95% CI 0.34-0.76). Likewise, previous investigations enlightened that females have a tendency to report higher distress levels. This may be reasoned by the "double shift" phenomenon, when occupational risk factors overlap with home stressors, such as housework, childcare and upbringing, care for elderly family members, and many others [35-37].

Another socio-demographic determinant of poor mental health was younger age. Even though prior studies reported diverse findings regarding age and distress association [38], the majority of results indicated that younger faculty members have higher odds of reporting distress symptoms [39-42]. In our study, the faculty under the age of 40 were significantly associated with

Tab. IV. Multinomial logistic regression of the stress subscale with demographic data and work factors

Variable	COR (95% CI)	p-value	AOR (95% CI)	p-value
Age				
< 40	3.79 (2.78-5.17)	< 0.001*	1.76 (0.95-3.24)	0.071
> 40	1 (reference)		1 (reference)	
Marital status				
Single	10.36 (2.93-36.68)	< 0.001*	3.18 (0.73-13.79)	0.123
In a relationship	65.50 (14.74-248.28)	< 0.001*	13.96 (2.90-67.08)	0.001*
Married	6.37 (1.88-21.58)	0.003*	4.45 (1.23-16.05)	0.023*
Divorced	12.03 (3.26-44.34)	< 0.001*	9.99 (2.50-39.82)	0.001*
Widowed	1 (reference)		1 (reference)	
Children				
No	4.98 (3.05-8.13)	< 0.001*	2.18 (0.90-5.29)	0.085
1	2.12 (1.34-3.37)	0.001*	1.03 (0.59-1.80)	0.921
2	1.46 (0.92-2.30)	0.107	1.10 (0.66-1.84)	0.701
3 or more	1 (reference)		1 (reference)	
Position				
Assistant teacher	1.88 (1.18-3.00)	0.008*	0.93 (0.49-1.77)	0.816
Head teacher	1.97 (1.15-3.37)	0.013*	0.95 (0.47-1.91)	0.877
Head of the department	1 (reference)		1 (reference)	
Work experience				
Less than 1 year	3.96 (1.60-9.81)	0.003*	1.80 (0.55-5.90)	0.329
1-5 years	4.24 (2.83-6.36)	< 0.001*	1.29 (0.63-2.63)	0.484
5-10 years	2.87 (1.97-4.19)	< 0.001*	1.07 (0.58-2.00)	0.824
More than 10 years	1 (reference)		1 (reference)	
Employment status				
Full-time	0.34 (0.23-0.50)	< 0.001*	0.56 (0.34-0.90)	0.018*
Part-time	1 (reference)		1 (reference)	
Academic rank				
No	2.24 (1.46-3.43)	< 0.001*	1.23 (0.66-2.29)	0.522
Master	3.86 (2.59-5.75)	< 0.001*	1.70 (0.93-3.11)	0.087
PhD	5.35 (3.10-9.20)	< 0.001*	2.77 (1.39-5.52)	0.004*
Professor/Candidate	1 (reference)		1 (reference)	
Additional activities				
No	0.30 (0.07-1.28)	0.103	0.35 (0.07-1.65)	0.182
Clinical activities	1.14 (0.28-4.66)	0.860	1.13 (0.25-5.19)	0.874
Research work	1.50 (0.36-6.22)	0.576	1.25 (0.27-5.76)	0.771
Methodological work	1.54 (0.37-6.39)	0.555	1.46 (0.32-6.73)	0.625
Educative activities	1.10 (0.24-4.94)	0.906	0.94 (0.18-4.79)	0.937
Mixed activities	4.38 (0.90-21.34)	0.068	5.52 (1.01-30.13)	0.049*
Other	1 (reference)		1 (reference)	

COR: crude odds ratio; AOR: adjusted odds ratio; CI: confidence intervals; * p-value is significant.

depression symptoms (AOR = 2.74; 95% CI 1.44-5.23). This may be explained by the possible greater resilience and emotional stability of older people to the impact of stress. Besides, older faculty more often tend to be associate or full professors. Ahmady et al. [43] assume that professors are more experienced and do not have role stagnation compared to other ranks.

Our findings in multinomial logistic regression showed that depression was higher in educators who were single (AOR = 3.91; 95% CI 1.04-14.74) or in a relationship (AOR = 12.22; 95% CI 2.93-51.01). Despite the limited research exploring the association between mental health and marital status, some authors imply that being married may be buffering negative effects of occupational hazards [44-46]. Interestingly, these findings were established in eastern cultures (Turkey, Iran, United Arab Emirates), where the institution of marriage and family is of great importance. Therefore, we suppose that having a partner and being involved in household routine, but not registering formal marriage may serve as a risk factor for depressive symptoms in the cultural context of Kazakhstan.

According to our findings, educators suffering from chronic illnesses accumulated higher scores of depression and anxiety (p < 0.001). This was fairly anticipated, since suffering from chronic diseases for a long time may lead to distress symptoms. Our results are concordant with the latest studies of Santamaría et al. [47] and Silva et al. [33], devoted to scrutinizing the predictors of distress in teachers.

Moreover, our research has attempted to ascertain work-related determinants of psychological distress. In our sample of faculty academics, employment status was associated with stress (p = 0.018). Part-time educators were at nearly 2 times higher risk of stress in comparison with their full-time counterparts. This is consistent with the findings of Reevy and Deason [48], claiming that lower wages, failure to apply for a full-time faculty position, and low organizational commitment were potential risk factors for adverse outcomes.

We obtained interesting results regarding the association of psychological distress with academic rank. Our study identified that faculty with a Master and PhD degree were at higher risk of being depressed and anxious. Along with this, PhD educators were 2.77 times more prone to be stressed (p < 0.004). This may be possibly explained by the higher responsibility of PhD holders in advancing research at the departments, particularly in clinical departments, and attracting students and postgraduates for scientific work. According to Bell et al. [49], PhD faculty received half of all scholarly funding (50.2%), compared to 15.2% of MD faculty. Hurley et al. [50] noted that PhD faculty had 1.3 times more publications than MD (p = 0.0061), which made them the frontline supporters of the academic mission of the departments. University administration demands may put tremendous pressure on academics, who are forced to publish and generate clinical revenue along with teaching.

Our findings showed that combining various activities such as clinical, scientific, methodological, or educative obligations was significantly and positively associated with depression (AOR = 10.89; 95% CI 1.01-117.52) and stress (AOR = 5.52; 95% CI 1.01-30.13). This was somewhat expected due to the higher workload on faculty who mix teaching with extracurricular work. Besides, this category of faculty is more prone to hold academic degrees, which makes them responsible for departmental research projects, clinical volunteer work, curricula development, and tutoring.

To the best of our knowledge, this is the first study aimed at evaluating the prevalence of depression, anxiety, and stress amongst medical faculty staff in Kazakhstan. Additionally, none of the existing studies explored the occupational predictors of distress in equivalent samples. Our findings have provided constructive information about the prevalence of depression, anxiety, and stress, and their association with socio-demographic and job-related factors. Furthermore, the results shed light on the current mental health concerns of medical educators in Kazakhstan.

The study has several limitations. Firstly, data were obtained using a self-reported online questionnaire. Although the DASS-21 is a valid research instrument, the reliability of results might have been affected due to responders' inaccuracy in completing the survey. Besides, we have not confirmed our results with psychiatrists, and therefore the actual prevalence and severity of depression, anxiety, and stress may be lower or higher than in self-reported surveys. Secondly, income was not included in the study, although could

affect distress level. Thirdly, the study design was cross-sectional, hence there was no possibility to identify cause and effect relationships between variables. There is a need for longitudinal studies to address causal issues more congruously.

Conclusions

Mental health problems have become an increasingly important research topic in recent years. In our investigation, nearly half of the study population reported symptoms of depression, anxiety, and stress. Similar to previous studies, women suffered more from depression and anxiety rather than men. Holding academic degrees was significantly associated with all dimensions of distress. Due to the higher prevalence of psychological distress amongst academic medicine faculty, determined risk factors must be taken into consideration in developing policies for mental issues prevention. Moreover, it is recommended to conduct further investigations to reveal other paramount predictors of distress in larger samples.

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Conflict of interest statement

The authors declare no conflict of interest.

Authors' contributions

AU, AM: conceptualization. SM: data curation. AU, AB: formal analysis. AM, AB: methodology. AU, LM: visualization. AM, AB: supervision. AU: writing – original draft; AU, AM, SM, LM, LP, AB: writing – review & editing. SM: project administration.

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