



Factors Associated with Distress Among Medical Staff During the Initial Phase of the COVID-19 Pandemic in Peru

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Accepted: 8 March 2022

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Abstract

The current COVID-19 pandemic affects the mental health of medical staff. Our objective was to evaluate the factors that are associated with the distress of physicians in two general hospitals in Lima, Peru. A cross-sectional correlational survey study was carried out. Physicians completed The Impact of Event Scale-Revised-22 (IES-R), Patient Health Questionnaire-9 (PHQ-9), and Generalized Anxiety Disorder-7 (GAD-7). A total of 310 physicians completed the survey, 36.5% of whom reported distress symptoms. Higher levels of distress were reached by women, by those with a prior psychiatric diagnosis, by those who considered that the hospital does not provide adequate personal protective equipment, and by those who perceived stigma from family members. Multiple regression analysis showed that there is a correlation between distress symptoms and anxiety symptoms, ($B=0.509$), depressive symptoms ($B=0.305$), the total hours/week worked in the Emergency Department ($B=-0.142$), and the stigma perception ($B=0.096$). Early intervention programs must be developed to support medical staff members exposed to severe distress situations such as the current viral pandemic.

Keywords COVID-19 · Coronavirus · Mental health · Distress · Physicians · Peru

The outbreak of the novel coronavirus disease 2019 (COVID-19), whose original cases were first reported in Wuhan, Hubei, a province of the People's Republic of China, back in December 2019, has now spread to many countries. On January 30, 2020, the World Health Organization (WHO) declared the pandemic as a state of global health emergency, based on the growing number of cases in China and other countries and continents (Velavan & Meyer, 2020). Peru is one of the countries most affected worldwide by the COVID-19 pandemic. According to the official data given by the Peruvian Government, up to March 13, 2022, there have been 3,536,496 confirmed cases and 211,546 deaths, and the

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mortality rate was 5.98% (Gobierno del Perú, 2022). In order to ensure a decrease in the spread of the disease, measures have been taken to limit contact and exposure, including isolation and quarantine. On March 16, 2020, Peruvian authorities decreed a state of emergency with mandatory quarantine measures. The pressure on the Peruvian health system is not the only problem; the pandemic has also had an impact on the economy, and due to the pandemic, many people in Peru have lost their jobs, which could have negative effects on their mental health (del Carmen, 2020).

Based on experiences from past epidemics and pandemics, it is well known that serious concerns may arise in the general population, patients, and health-care workers: fear of death and pervasive feelings of anxiety, loneliness, sadness, and irritability (Chan & Huak, 2004; Chen et al., 2005; Jeong et al., 2016; Khalid et al., 2016).

In the fight against COVID-19, health-care workers faced enormous pressures due to a high risk of infection, inadequate personal protective equipment, self-isolation, increased time and work demands, subsequent frustration in dealing with patients who express high negative emotions themselves, lack of contact with their own family members, fatigue, and tiredness. These are typical risk factors for developing mental problems (Kang et al., 2020), which would then not only affect the well-being of physicians and other health professionals but also their ability to pay due attention and make adequate clinical decisions, both crucially important tools to fight against COVID-19 (Kang et al., 2020).

Health professionals must provide timely and sufficient attention to the mental health of the general population and health-care workers. To achieve this, it is necessary to have adequate instruments to assess mental health problems caused by COVID-19 (Ahorsu et al., 2020; Huarcaya-Victoria et al., 2020; Reznik et al., 2020). The immediate priority is the collection of data on mental health and the psychological effects of the COVID-19 pandemic across vulnerable groups (e.g., health-care workers) (Holmes et al., 2020). Due to the lack of information regarding the impact of COVID-19 on the mental health of Peruvian physicians, we decided to conduct a study to evaluate the influence of demographic and occupational factors on distress symptoms in a sample of physicians from two general hospitals in Lima during the initial phase of the pandemic in Peru.

Materials and Methods

Participants

This observational, cross-sectional, and correlational study was carried out in the Hospital Nacional Guillermo Almenara Irigoyen (HNGAI) and the Hospital Nacional Edgardo Rebagliati Martins (HNERM), which are tertiary care establishments that receive patients of high clinical complexity, such as COVID-19 victims, from all over Peru. The study population included physicians working in the hospitals' Emergency Departments. A convenience sample was used. Following the social distance recommendation, physicians were recruited from online advertisements, e-mail, and social media. Data collection took place from March 29 through April 11, 2020, 2 weeks after the state of emergency was declared and mandatory self-quarantine was ordered

in Peru. The criteria for inclusion were (i) acceptance to participate in the study, (ii) being a physician, and (iii) correct completion of forms.

Measurement Instruments

Impact of Event Scale-Revised (IES-R) is a self-reporting instrument which assesses distress (Weiss & Marmar, 1997). IES-R scores reflect four levels of distress severity: normal (0–8), mild (9–25), moderate (26–43), and severe (44–88). In the present study, an acceptable internal consistency was found (Cronbach's $\alpha=0.961$).

Patient Health Questionnaire-9 (PHQ-9) is a self-administered scale consisting of 9 items which assess depression. In studies carried out in Latin America, PHQ-9 has been proven to be a valid and reliable tool for detecting depressive symptoms in various types of populations (Cassiani-Miranda et al., 2017; Saldivia et al., 2019). The PHQ-9 was validated in Peru. Indications of validity include internal structure, invariance of measurement, and adequate values of internal consistency (Villarreal-Zegarra et al., 2019). In the present study, an acceptable internal consistency was found (Cronbach's $\alpha=0.856$).

Generalized Anxiety Disorder-7 (GAD-7) is a valid and efficient self-administered scale to assess the severity of anxiety disorders in clinical practice (Spitzer et al., 2006). In the present study, an acceptable internal consistency was found (Cronbach's $\alpha=0.885$).

In addition to the mentioned scales, sociodemographic and labor data were also collected.

Data Analysis

Descriptive statistical techniques were conducted on all variables. IES-R, PHQ-9, and GAD-7 were evaluated by means of their summary statistics and their distribution. The nonparametric Mann-Whitney *U* test and Kruskal-Wallis test were applied in order to compare the severity of distress between two or more groups. The correlation between the total results of IES-R with PHQ-9 and GAD-7 was conducted using Spearman's ρ .

A multiple linear regression analysis was conducted considering the total of the IES-R as the dependent variable; the remaining variables were considered independent by means of the "forward" method, and only those rated as significant were selected. For this analysis, we did not consider those participants who have a history of mental disorder. Residual analysis was also conducted to ensure there was no violation of the assumptions of multiple linear regression analysis: residual normality (through histogram), no autocorrelation (with the Durbin-Watson statistic; $d > 1.4$ not reject), homoscedasticity (residual graphs), linearity (partial regression graphs and residual graphs), and no multicollinearity (variance inflation factor, VIF). The alpha level was set at 0.05 before the analysis. All of the latter were conducted with the help of the IBM SPSS statistical program, version 23.

Ethical Aspects

The present study was authorized by the Research Ethics Committee for COVID-19. All participants gave their informed consent to participate after the aim of this study was explained. The Declaration of Helsinki guidelines were followed.

Results

Initially, 327 participants were recruited. Participants who did not meet the inclusion criteria included the following categories: not agreeing to participate in the study ($n = 2$), not being a physician ($n = 9$), and not filling out their form correctly ($n = 6$). Thus, a total of 310 physicians were included in the study. The mean age of the sample was 33.29 ± 6.56 , the minimum was 25, and the maximum was 62 years. The mean years of professional practice was 6.59 ± 5.39 , with the minimum as 1 and the maximum as 25. The mean of hours/week worked in the Emergency Department was 28.68 ± 29.51 . The detailed sociodemographic features can be found in Table 1.

The distress levels in physicians according to IES-R were 83 (26.8%) mild, 21 (6.8%) moderate, and 9 (2.9%) severe. With PHQ-9, 90 (29%) of the probands showed mild, 25 (8.1%) moderate, 6 (1.9%) moderately severe, and 2 (0.6%) severe depressive symptoms. The proportions of anxiety symptoms according to GAD-7 were 77 (24.8%) mild, 19 (6.1%) moderate, and 6 (1.9%) severe.

The comparative analysis according to the variables studied for the PHQ-9, GAD-7, and IES-R results are found in Table 1. Women experienced higher levels of depressive symptoms, anxiety, and distress. Physicians with previous diagnosis of mental health problems obtained higher levels of depressive symptoms, anxiety, and distress. Higher levels of distress were reported by those physicians who considered that the hospital did not provide them with adequate personal protective equipment. Fear of infecting family members with SARS-CoV-2 produced higher levels of anxiety symptoms. Those physicians who perceived stigma from their family members (e.g., “they move away from you for fear of being infected by COVID-19”) obtained higher levels of depressive symptoms, anxiety, and distress.

The IES-R total was positively correlated with the GAD-7 ($\rho = 0.693$; $p < 0.01$) and the PHQ-9 ($\rho = 0.621$; $p < 0.01$). No significant correlations were found between IES-R and age ($\rho = -0.082$; $p = 0.150$), years of professional practice ($\rho = -0.021$; $p = 0.310$), and total number of hours worked by the physicians in the Emergency Department ($\rho = 0.027$; $p = 0.637$).

As shown in Table 2, anxious symptoms ($B = 0.509$, 95% CI: 1.307–1.1981; $p = 0.000$), depressive symptoms ($B = 0.305$, 95% CI: 0.605–1.1214; $p = 0.000$), the total hours/week worked in the Emergency Department ($B = -0.142$, 95% CI: -0.081 to -0.023 ; $p = 0.000$), and the stigma perception ($B = 0.096$, 95% CI: 0.409–4.483; $p = 0.019$) were associated with distress scores.

The coefficient of determination was 0.578, and the mean square error was 53.18. Regarding the assumptions of the model when analyzing the residuals, we found that these were fulfilled. The Durbin-Watson statistic was 1.891, so the assumption of no autocorrelation was fulfilled. The residual graphs checked the assumptions of normality of the residuals, homoscedasticity, and linearity. The analysis of collinearity is found in Table 1, in which no multicollinearity is found.

Table 1 Bivariate analysis of demographic variables with the levels of distress, depression, and anxiety in the sample (*n*=310)

Variables	<i>n</i> (%)	Distress (IES-R)		Depression (PHQ-9)		Anxiety (GAD-7)		<i>p</i>
		<i>X</i> ± <i>σ</i>	<i>Me</i> (IQR)	<i>X</i> ± <i>σ</i>	<i>Me</i> (IQR)	<i>X</i> ± <i>σ</i>	<i>Me</i> (IQR)	
Gender								0.000
Male	161 (51.9)	7.34 ± 9.5	4 (9)	3.76 ± 3.40	3 (5)	3.35 ± 3.12	3 (4)	0.002
Female	149 (48.1)	12.56 ± 13.32	8 (16)	5.19 ± 4.29	4 (5)	4.53 ± 4.08	3 (4)	0.185
Marital status								0.103
Married	86 (27.7)	7.84 ± 9.63	4.5 (9)	3.66 ± 3-15	3 (4)	3.41 ± 2.87	3 (3)	0.788
Single	215 (69.4)	10.6 ± 12.42	5 (13)	4.70 ± 4.12	3 (5)	4.06 ± 3.8	3 (5)	0.171
Profess some religion								0.000
Yes	233 (75.2)	9.63 ± 11.33	5 (11)	4.39 ± 3.86	3 (4)	3.92 ± 3.71	3 (3)	0.000
No	77 (24.8)	10.49 ± 13.06	5 (10)	4.60 ± 4.09	3 (6)	3.90 ± 3.51	3 (5)	0.239
Live with								0.000
Alone	68 (21.9)	11.87 ± 13.32	5 (18)	4.71 ± 3.91	4 (6)	3.99 ± 3.91	3 (5)	0.000
Couple	111 (35.8)	8.94 ± 11.49	5 (9)	4.24 ± 3.97	3 (5)	4.15 ± 3.8	3 (3)	0.530
Fathers / other familiars	131 (42.3)	9.56 ± 11.09	5 (11)	4.48 ± 3.89	3 (4)	3.68 ± 3.4	3 (4)	0.000
History of mental disorder								0.000
Yes	29 (9.4)	19.97 ± 16.55	16 (25)	7.59 ± 5.48	6 (8)	7.14 ± 5.2	6 (8)	0.000
No	281 (90.6)	8.8 ± 10.66	5 (9)	4.12 ± 3.58	3 (5)	3.58 ± 3.3	2 (4)	0.000
Patient centered								0.000
Patient centered	229 (73.9)	9.71 ± 10.91	5 (10)	4.28 ± 3.61	3 (4)	3.85 ± 3.57	3 (4)	0.000
Technology centered	81 (26.1)	10.22 ± 13.99	5 (12)	4.93 ± 4.65	4 (4)	4.1 ± 3.92	3 (4)	0.000
Works with patients suspected with COVID-19								0.000
Yes	196 (63.2)	11.15 ± 12.66	6 (13)	4.95 ± 4.03	4 (5)	4.42 ± 3.73	3 (4)	0.000
No	114 (36.8)	7.6 ± 9.69	4 (9)	3.58 ± 3.57	3 (4)	3.05 ± 3.36	2 (3)	0.000
Works with patient with confirmed COVID-19								0.000
Yes	73 (23.5)	12.41 ± 12.23	8 (13)	5.29 ± 4.07	5 (5)	5 ± 3.64	4 (5)	0.000
No	237 (76.5)	9.05 ± 11.53	5 (10)	4.19 ± 3.84	3 (5)	3.58 ± 3.6	3 (4)	0.000

Table 1 (continued)

Variables	<i>n</i> (%)	Distress (IES-R)		Depression (PHQ-9)		Anxiety (GAD-7)		<i>p</i>
		$\bar{X} \pm \sigma$	Me (IQR)	$\bar{X} \pm \sigma$	Me (IQR)	$\bar{X} \pm \sigma$	Me (IQR)	
Does the hospital provides you with the right amount of personal protective equipment?								0.774
Yes	85 (27.4)	8.35 ± 11.06	4 (10)	4.18 ± 3.57	3 (4)	3.68 ± 3.29	3 (4)	
No	225 (72.6)	10.41 ± 12	6 (13)	4.55 ± 4.11	4 (4)	4 ± 3.79	3 (3)	
Does the hospital gives you adequate information about COVID-19?								0.022
Yes	58 (18.7)	7.21 ± 8.5	4 (9)	3.64 ± 3.8	3 (5)	3.6 ± 3.4	3 (4)	
No	252 (81.3)	10.45 ± 12.33	5 (12)	4.63 ± 3.92	4 (4)	3.99 ± 3.72	3 (3)	
Are you afraid of infecting your family with SARS-CoV-2?								0.766
Yes	287 (92.6)	10.16 ± 12.05	5 (11)	4.45 ± 3.94	3 (4)	4.07 ± 3.73	3 (3)	
No	23 (7.4)	5.96 ± 6.29	4 (5)	4.43 ± 3.59	4 (4)	2.04 ± 1.84	2 (2)	
Does your family stigmatize you for being health personnel?								0.006
Yes	71 (22.9)	14.28 ± 12.63	10 (16)	5.63 ± 4.59	5 (5)	5.48 ± 4.73	4 (5)	
No	239 (77.1)	8.53 ± 11.19	4 (9)	4.09 ± 3.63	3 (5)	3.45 ± 3.14	3 (4)	

Table 2 Multiple linear regression models

Model	Non-standardized coefficients		Standardized coefficients Beta	T	Sig.	95% Confidence interval for B		Collinearity	
	B	Standard error				Lower limit	Upper limit	Tolerance	VIF
1	(Constant)	0.523	0.658	0.794	0.428	-0.773	1.819		
	GAD-7	2.310	0.135	17.083	0.000	2.044	2.576	1.000	1.000
2	(Constant)	-0.838	0.672	-1.248	0.213	-2.160	0.484		
	GAD-7	1.676	0.172	9.761	0.000	1.338	2.014	0.560	1.786
	PHQ-9	0.881	0.158	5.566	0.000	0.570	1.193	0.560	1.786
3	(Constant)	0.252	0.743	0.339	0.735	-1.211	1.715		
	GAD-7	1.720	0.169	10.149	0.000	1.386	2.054	0.556	1.797
	PHQ-9	0.899	0.156	5.764	0.000	0.592	1.205	0.559	1.788
	Total hours/week worked in the Emergency Department	-0.046	0.014	-3.206	0.002	-0.075	-0.018	0.980	1.020
4	(Constant)	0.088	0.740	0.119	0.906	-1.369	1.545		
	GAD-7	1.644	0.171	9.605	0.000	1.307	1.981	0.537	1.864
	PHQ-9	0.910	0.155	5.882	0.000	0.605	1.214	0.559	1.790
	Total hours/week worked in the Emergency Department	-0.052	0.015	-3.573	0.000	-0.081	-0.023	0.954	1.048
	Stigma	2.446	1.035	2.364	0.019	0.409	4.483	0.916	1.091

Dependent variable: IES-R total

PHQ-9; Patient Health Questionnaire-9; GAD-7, Generalized Anxiety Disorder-7; IES-R, Impact of Event Scale-Revised-22; VIF, variance inflation factor

Selection of cases only for which diagnosis of mental disorder=No

Discussion

The main finding of this study was that 2 weeks after the declaration of the state of emergency and mandatory quarantine in Peru, distress symptoms were reported in 36.5% of the evaluated physicians. This figure is higher than that reported by Huang et al., who, using the Post-Traumatic Stress Disorder Self-rating Scale (PTSD-SS) in 230 health professionals, found a distress prevalence of 27.39% (Huang et al., 2020). In another study, by Lai et al., IES-R applied to 493 doctors detected distress symptoms in 66.9% of them (Lai et al., 2020). A possible explanation of the differences between these results could be that the data collection performed by Huang et al. took place 2 weeks later than Lai et al.'s, in addition to different measurement instruments as well as a different sample sizes.

The highest prevalence of distress in women during the current pandemic has been reported in other studies on health care workers (Huang et al., 2020; Lai et al., 2020) and general populations (Liu et al., 2020; Qiu et al., 2020; Wang et al., 2020). Women tend to experience more symptoms of hyperactivity and recurrent distressing memories, as well as cognitive problems and mood disorders (Liu et al., 2020). These results support the evidence published in other studies, indicating that women are more likely to experience symptoms of post-traumatic stress disorder (PTSD) (Bell & Folkerth, 2016).

It is not surprising that physicians with a history of mental disorder and those who perceive that sufficient personal protection elements are not provided display more distress symptoms. An adequate identification of psychiatric history should be made, and appropriate measures of emotional support must be provided to all health workers, as they are placed in a more vulnerable situation.

Through the multiple linear regression model, it was found that the variables that most influenced the total of the IES-R were depressive symptoms, anxiety symptoms, total hours/week worked in the Emergency Department, and the stigma perception. The total of the GAD-7 was the one that had more influence in the levels of distress, which means that greater levels of anxiety are related to higher levels of distress. The total hours/week worked in the Emergency Department is negatively related to distress, which means that the more hours the physicians work in the emergency, the lower the distress levels. This result is similar to that reported by Li et al., who found that the traumatization of non-front-line medical staff is more serious than that of front-line medical staff (Li et al., 2020). One of the possible explanations for this result could be that the front-line medical staff are more knowledgeable about the pandemic than the non-front-line workers (Li et al., 2020).

The stigma perception is a variable that passes the multiple linear regression model and hence is related to higher levels of distress. These three variables explain 64% of the IES-R variance. In the course of the COVID-19 pandemic, the stigma towards health professionals represents an interesting feature. It is striking that 22.9% of our sample perceives stigma coming from their family members for just being a health-care worker. Physicians who reported this also had higher levels of distress, depression, and anxiety. Without similar studies to compare ours with in the current context, past literature on research conducted during other epidemics and/or pandemics reported that between 20 and 49% of health professionals experienced social stigma in the form of declared fear from community and family members to be infected by them. In a study of 187 nurses during the MERS-CoV outbreak, it was found that stigma influences mental health, either directly or indirectly, with stress as a defining mediator (Park et al., 2018). There is a need to design an effective antistigma program that breaks the misperception in

COVID-19, increases general population knowledge in COVID-19, and spreads positive and supportive messages (Chung-Ying, 2020).

This study must be understood in the context of its methodological limitations. First, convenience sampling does not ensure adequate potency. Nonetheless, this study is heuristically significant as it provides data on factors associated with distress in doctors at some general hospitals in Peru. Secondly, being that this is a cross-sectional study, a causal relation and how distress evolves could not be assessed. Future studies in Peru and other countries should evaluate how distress levels change as the pandemic evolves. On the other hand, the results cannot be generalized as the sample proceeds from only two hospitals, but their consonance with those reported in other countries is worth noting. Finally, since the scales used are self-administered, they might generate a social desirability bias.

In summary, our results indicate that during the initial phase of the COVID-19 pandemic in Peru, more than one-third of the physicians in our sample have shown symptoms of distress. The associated factors that most influenced distress are depressive symptoms, anxiety, the total hours/week worked in the Emergency Department, and stigma perception. Special attention to promote mental well-being and adequate management measures to deal with emotional distress and its consequences among physicians during this pandemic and similar events are fundamental steps.

Declarations

Ethical Approval All procedures performed in this study involving human participants were in accordance with the ethical standards of the research team's organizational Ethics Board and with the 1975 Helsinki Declaration.

Informed Consent Informed consent was obtained from all participants.

Conflict of interest The authors declare no competing interests.

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