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Anxiety in health care workers who treated COVID-19 patients in hospitals in Tlaxcala, Mexico

Ansiedad en trabajadores de la salud que atendieron pacientes con COVID-19 en hospitales de Tlaxcala, México

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Abstract

Objective: To evaluate the presence of state-trait anxiety in health care workers who attended patients with COVID-19 in public hospitals in Tlaxcala, Mexico.

Materials and methods: A cross-sectional study with a convenience sample population of 245 health care workers from 3 general hospitals and 4 hospitals with specific areas to treat SAR-CoV-2 infected patients. Quantitative and multivariate analysis of the data was performed using the Mann-Whitney U and Chi-square test. Logistic regression models were used to evaluate the risk of trait-state anxiety. The information was collected through the State-Trait Anxiety Inventory.

Results: The prevalence of trait-anxiety was 47.8% and state-anxiety was 85.7%. Temporary personnel were 1.9 times more likely to present moderate state anxiety and 2.15 times more likely to present severe state anxiety compared to the permanent staff. In terms of severe trait anxiety, participants in other work categories were 3.6 times more likely to present moderate anxiety and 11.4 times more likely to present severe anxiety status. No statistical differences were found between male and female personal.

Conclusions: There is a need to develop intervention and mental health promotion strategies for health professionals, especially during humanitarian and epidemiological risk emergencies. Long-term training and capacity-building should be performed frequently in all health institutions.

Keywords: Health Personnel; Anxiety; COVID-19; SARS-CoV-2; Mexico.

Resumen

Objetivo: Evaluar la presencia de ansiedad estado-rasgo en trabajadores de la salud que atendieron a pacientes con COVID-19 en hospitales públicos de Tlaxcala, México.

Materiales y métodos: Se realizó un estudio transversal en 245 trabajadores de la salud de 3 hospitales generales y 4 hospitales con áreas específicas para tratar pacientes con COVID-19. La información se recabó a través del Inventario de Ansiedad Estado-Rasgo, los datos se analizaron de forma cuantitativa y multivariada utilizando la U de Mann-Whitney y el examen de Chi cuadrada. Se realizaron modelos de regresión logística para evaluar el riesgo de ansiedad rasgo-estado.

Resultados: La prevalencia de ansiedad-rasgo fue de 47,8% y de ansiedad-estado 85,7%. El personal eventual mostró 1.9 veces más probabilidad de presentar ansiedad-estado moderada y 2.15 veces más de ansiedad-estado severa en comparación con el de base. En cuanto a ansiedad rasgo severa los participantes de otras categorías laborales mostraron 3.6 veces más probabilidad de presentar ansiedad moderada y 11.4 veces más de ansiedad-estado severa. No se encontraron diferencias estadísticas entre el personal masculino o femenino.

Conclusiones: Existe la necesidad de desarrollar estrategias de intervención y promoción de la salud mental en profesionales de la salud, especialmente durante emergencias humanitarias y epidemiológicas. Es recomendable que las instituciones de salud realicen capacitaciones de forma continua sobre los riesgos sanitarios a los que está expuesto su personal.

Palabras Claves: Personal de Salud; Ansiedad; COVID-19; SARS-CoV-2; México.

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Introduction

Mental health is a fundamental feature of the general definition of health; including emotional, psychological, and social well-being. This state of well-being manifests itself in a person's ability to develop their potential, cope with the normal stresses of life, work productively, and contributes to their family and community. It is related to personal well-being and quality of life, enabling individuals to develop their capacities, socialize with each other and with the environment in a positive way, cope with life situations and overcome adverse situations¹.

Crises produce disruption, and in the case of the COVID-19 pandemic, it profoundly affected people's lifestyles, with implications for all spheres of human experience, transcending the realm of health to become a social and economic problem whose consequences will persist for years to come². Compulsory isolation, social distancing, deaths in short periods of time, inability to work, virtual education, among others, were determinant in the struggle to maintain functionality amidst uncertainty, fear and ignorance about this new infectious agent³. In this context, health professionals formed the first line of defense in the fight against the virus; this position increased the risk of suffering physical and emotional problems in this population, traditionally considered vulnerable due to the type of professional activity carried out⁴.

Contact with illness, pain, death, and suffering are constants that increase psychosocial risk, added to adverse working conditions such as precariousness, lack of resources, exhausting working hours, patient overload, low staffing levels and absences due to medical rest due to COVID-19, magnified the problem; the lack of contact with their families and the need to deal with patients expressing negative emotions, situations that induce disabling conditions such as burnout syndrome, fatigue, frustration and trigger or aggravate mental disorders such as stress, anxiety, depressive symptoms, insomnia, denial, anger and fear². Globally, Mexico was among the countries with the highest number of confirmed cases in health care workers, approximately 15 %⁵.

Furthermore, health care workers more frequently present mental disorders, such as sleep disorders, somatization, psychosis, post-traumatic stress disorder, obsessive-compulsive symptoms, depression and anxiety, due to daily exposure in the care of patients ill with COVID-19⁶. Meta-analyses studies, including the anxiety variable, showed a range prevalence from 23 to 77.4% in healthy workers⁷. According to the level of anxiety studies mentioned that 26% had mild anxiety and 21% had from moderate to severe anxiety, while others reported a prevalence of 24.8% with mild, 12.9% moderate, 7.1% severe, and 2% extremely severe anxiety^{8,9}. On the other hand, 22 studies with nurses and doctors reported a prevalence of anxiety from 26.6% to 42% in female nurses and 37% on male of doctors^{7,10}. In most of the studies 43% of the health workers and staff in contact with COVID-19 patients had high anxiety levels¹⁰.

Therefore, health institutions have deemed necessary several studies to analyze and prevent stress factors, anxiety, depression and psychological disorders that would impede the well-being of staff in their different contexts of personal, work and professional interaction¹¹.

In different countries, there was an increase in negative emotions (such as anxiety, depression and indignation) and a decrease in positive emotions (such as happiness and satisfaction) during the pandemic of COVID-19¹² was observed among the population, generating erratic behavior among individuals and health professionals, due to lack of knowledge about how to become infected and the lack of available treatments¹³.

Staff exposure to COVID-19 generated physical and emotional demands, increasing levels of stress and anxiety. According to Cattell and Scheier (1961), anxiety is an unpleasant emotional state, characterized by feelings of tension, apprehension or worry and by the activation of the autonomic nervous system, and is differentiated into state-anxiety, which refers to a psychological state that responds to immediate emotions, which can be modifiable; and trait-anxiety refers to the tendency to present anxiety constantly¹⁴.

Anxiety disorder can manifest according to the type of situation and thought content and is modified by avoidance behavior and associated cognitive ideation. During the COVID-19 pandemic, the resulting emergency closures, such as curfews or quarantine, led to mental health disorders ranging from depression to suicidal ideation⁴.

Previous studies that have assessed the level of stress, anxiety and depression in this population group report very diverse results depending on the type of population, with medium and high stress being present in up to 29%, anxiety symptoms ranging from 4% to 75% and depressive symptoms ranging from 4.4% to 50%¹⁵. For this reason, this study was designed to assess the presence of trait-anxiety and state-anxiety in healthcare personnel caring for patients with COVID-19 in regular hospital services and in converted hospitals with specific areas for the care of patients with respiratory diseases in Tlaxcala, Mexico.

Materials and methods

A cross-sectional study was performed with a convenience sample population of 245 health personnel included: nurses, physicians, chemists, nutritionists, psychologists, radiologists, and support staff such as cleaning personnel, office assistants, administrative and ambulance drivers in the care of COVID-19 patients, all from 3 general hospitals and 4 modified hospitals from the Secretariat of Health of the State of Tlaxcala, Mexico, with specific areas to providing healthcare to patients with respiratory diseases, confirmed and/or suspected of SAR-CoV-2 infection. A questionnaire was sent in digital format to the personnel from the hospitals, who were invited to participate and share the survey with other coworkers between July and August 2020. The information was collected through the State-Trait Anxiety Inventory. The questionnaire was anonymous, and participants voluntarily



agreed to take part in the study through the electronic format. Quantitative and multivariate analysis of the data was performed using the Mann-Whitney U and Chi-square test. Logistic regression models were used to evaluate the risk of trait-state anxiety.

Assessment of Trait-anxiety and State Anxiety

The information was collected using the STAI (State Trait-Anxiety Inventory) scale, that was validated in Spanish, with Cronbach's alpha between 0.83 and 0.92 structured in two subscales: State Anxiety and Trait-Anxiety^{15,16,17}. Participants were instructed to "read each statement and fill in the circle regarding how you feel at this moment", the 20 statements they could respond were: "I feel calm", "I feel confident", "I am tense" among others; the four possible answers were: 1) Not at all, 2) A little, 3) Quite a lot, and 4) A lot. For anxiety-trait, participants were instructed to "Read each statement and fill in the circle of the number that indicates how you usually feel", the statements they could choose from were: "I feel good", "I get tired quickly", "I feel like crying", among others^{18,19}; the four possible answers were: 1) Almost never, 2) Sometimes, 3) Frequently, and 4) Almost always. The scores of both subscales ranged from a minimum of 20 points to a maximum of 80 points. Once the scores of the state and trait anxiety questionnaire were obtained, the subjects were classified into two categories according to the author's scale, those with a score ≥ 40 were considered to present high levels of anxiety^{20,21,22,23}. In order to compare participants with different levels of anxiety in relation to sociodemographic variables, they were divided into tertiles: mild, moderate and severe state-anxiety or trait-anxiety. The prevalence of clinically elevated clinical levels of anxiety was estimated in those participants scoring ≥ 40 on either of the two subscales of trait or state-anxiety. Subsequently, to evaluate the relationship of both types of anxiety with respect to the demographic and hiring type characteristics of the participants the tertiles of the trait-anxiety and state-anxiety were related to other variables such as age in years.

Statistical analysis

To assess the relationship between sociodemographic and labor characteristics with the trait or state-anxiety levels, Mann-Whitney U test was used for numerical variables that showed a non-normal distribution (such as age), and chi-squared test was applied for nominal variables such as sex, marital status, occupation, cohabit, economic dependents, type of contract and years of service. Then, to assess the risk of state-anxiety according to the type of contract as the main predictor variable, bivariate and multivariate logistic regression models were performed. Further, to evaluate whether health workers with higher levels of trait-anxiety are more predisposed to suffer greater intensity of current state anxiety, we have calculated the likelihood of moderate or severe level of state-anxiety within the three trait-anxiety categories, according to the type of contract. Thus, we performed bivariate and multivariate logistic regression models with their respective confidential intervals at 95%, and adjusted for age, sex, marital status, occupation, and type of hospital. Data analyses were performed using STATA software, version 17.0.

Results

The average age was 40.9 years old, 70.4% were women, 42.9% were married, 26.9% reported 6-10 years of service, 50.6% reported to be in a COVID-19 hospital, and regarding the type of workers, 45.7% were nurse, 23.3% physician, and 6.9% administrative. The prevalence of trait anxiety was 47.8% with a point score of 39.7 (range from 25 to 58 points), while the prevalence of state anxiety was 85.7% with a point score of 44.5 (range from 33 to 60 points). Regarding the relationship between trait-anxiety (mild, moderate and severe) with demographics and labor characteristics: participants who reported civil status of free union showed a higher percentage of severe trait-anxiety (20.8%) than moderate (7.4%) or mild (17.9%) ($p=.024$) (Table 1).

Tabla 1. Socio-demographic characteristics of the health personnel related to trait-anxiety

Socio-demographic and task Characteristics	TRAIT-ANXIETY (n=245)			p-value*
	Mild (n=78)	Moderate (n=95)	Severe (n=72)	
Age, years, ($\pm$SD)	41.6 ($\pm$ 9.7)	40.7 ($\pm$ 9.2)	40.4 ($\pm$ 9.0)	.705
Sex				
Men (%)	26.9	25.5	38.0	.187
Women (%)	73.1	74.5	61.9	.187
Civil status				
Single (%)	28.3	45.3	34.7	.062
Married (%)	47.4	42.1	38.9	.562
Widowed (%)	1.3	1.1	2.8	.677
Divorced (%)	5.1	4.2	2.8	.756
Free Union (%)	17.9	7.4	20.8	.024
Occupation[®]				
Health personnel (%)	70.5	71.6	63.9	.538
Support staff (%)	29.5	28.4	36.1	.538
Cohabit				
Parents (%)	20.5	25.3	20.8	.704
Siblings (%)	47.4	44.2	43.0	.852
Children and husband (%)	28.2	20.0	22.2	.438
Husband, no children (%)	3.8	10.5	13.9	.074

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Health worker with economic dependents[§]				
Yes (%)	5.1	10.5	5.5	.325
No (%)	94.9	89.5	94.4	.325
Type of hospital[⌘]				
COVID-19 hospital (%)	48.7	50.5	48.6	.960
Hospital with COVID-19 area (%)	51.3	49.5	51.4	.960
Type of contract[¥]				
Indefinite-period contract (%)	64.1	67.3	66.7	.897
Definite-period contract (%)	35.9	32.6	33.3	.897
Years of service				
1 to 5 years (%)	60.2	57.9	52.8	.641
Further de 5 years (%)	39.7	42.1	47.2	.641

Note: *p value was estimated by means of Mann-Whitney U test for unmatched numeric variables with non-parametric distribution, and chi square test for categorical variables, considering a value < 0.05, as statistically significant.

⌘ Occupation: Health personnel were defined as nurses, physicians, chemists, nutritionists, psychologists and radiologists. Support staff were defined as cleaning personnel, secretaries, administrative and ambulance drivers in the care of COVID-19 patients.

§ Health worker with economic dependents: Worker with a family member who lacks economic autonomy and is subject in his or her maintenance and expenses to the decisions of another person.

⌘ Type of hospital: COVID-19 hospital is a building completely restructured to provide healthcare to patients confirmed with COVID-19. Hospital with COVID-19 area, is a zone inside the building in which healthcare is provided to suspected or confirmed patients with COVID-19, and patients with other diseases.

¥ Type of contract: an indefinite-period contract consists of a deal that expires when both parties (workers and employers) agree. Definite-period contract consists of a deal that expires in a determinate period.

Concerning the relationship between state-anxiety with demographics and labor characteristics: participants who reported to be in a hospital with COVID-19 area showed higher percentage of severe (63%) than moderate (41.5%) or mild (50%) state-anxiety ($p=.021$), and those who have an indefinite-period contract presented higher percentage of severe state-anxiety (72.6%) than moderate (70.2%) or mild (50%) ($p=.045$) (Table 2).

Table 3 shows the likelihood of presenting moderate or severe state-anxiety comparing workers with definite-period contract with indefinite-period contract: in the multivariate analysis, participants with definite-period contract had 2.2 times more likelihood to present moderate ($p=0.032$), and 2.7 times more likelihood of severe state-anxiety ($p=.014$) than workers with indefinite-period contract.

Tabla 2. Socio-demographic characteristics of personnel related to state-anxiety

Socio-demographic characteristics	STATE-ANXIETY			
	(n=245)			p-value*
	Mild (n=78)	Moderate (n=94)	Severe (n=73)	
Age, years (±SD)	41.0 (±9.7)	41.7 (±9.6)	39.6 (±8.4)	.316
Sex				
Men (%)	36.4	25.5	27.7	.285
Women (%)	63.6	74.5	72.2	.285
Civil status				
Single (%)	34.6	43.6	30.1	.179
Married (%)	42.3	40.4	46.6	.723
Widowed (%)	1.3	2.1	1.3	.892
Divorced (%)	6.4	2.1	4.1	.362
Free Union (%)	15.4	11.7	17.8	.527
Occupation [®]				
Health personnel (%)	66.7	60.2	69.8	.866
Suport staff (%)	33.3	29.8	30.1	.866
Cohabit				
Parents (%)	20.5	21.2	26.0	.682
Siblings (%)	43.6	41.5	50.7	.477
Children and husband (%)	25.6	26.6	16.4	.238
Husband, no children (%)	10.2	10.6	6.8	.657
Health worker with economic dependents [§]				
Yes (%)	10.2	8.5	2.7	.135
No (%)	89.7	91.5	97.3	.135

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Type of hospital*				
COVID-19 hospital (%)	50.0	58.5	37	.021
Hospital with COVID-19 area (%)	50.0	41.5	63	0.021
Type of contract*				
Indefinite-period contract (%)	55.1	70.2	72.6	.045
Definite-period contract (%)	44.9	29.8	27.4	.045
Years of service				
1 to 5 years (%)	60.2	51.1	61.6	.312
Further de 5 years (%)	39.7	48.9	38.3	.312

Note: *p value was estimated by means of Mann-Whitney U test for unmatched numeric variables with non-parametric distribution, and chi square test for categorical variables, considering a value < 0.05, as statistically significant.

Œ Occupation: Health personnel were defined as nurses, physicians, chemists, nutritionists, psychologists and radiologists. Support staff were defined as cleaning personnel, secretaries, administrative and ambulance drivers in the care of COVID-19 patients.

§ Health worker with economic dependents: Worker with a family member who lacks economic autonomy and is subject in his or her maintenance and expenses to the decisions of another person.

ж Type of hospital: COVID-19 hospital is a building completely restructured to provide healthcare to patients confirmed with COVID-19. Hospital with COVID-19 area, is a zone inside the building in which healthcare is provided to suspected or confirmed patients with COVID-19, and patients with other diseases.

¥ Type of contract: an indefinite-period contract consists of a deal that expires when both parties (workers and employers) agree. Definite-period contract consists of a deal that expires in a determinate period.

Tabla 3. Probability of presenting emotional state-anxiety, according to the type of contract of the participants

Type of contract ¥	STATE-ANXIETY (n=245)		
	Mild	Moderate	Severe
Indefinite contract (reference category)	Bivariate analysis		
	1.0	1.0	1.0
	1.0	1.9 (1.0-3.6)	2.1 (1.9-4.3)
Definite contract		P= .042	P= .027
Indefinite contract (reference category)	Multivariate Models		
	1.0	1.0	1.0
	1.0	2.2 (1.1-4.4)	2.7 (1.2-5.8)
Definite contract		P= .032	P= .014

Note: Multivariate model was adjusted for: Age, sex (male), marital status (single), occupation (physician), and type of hospital (COVID-19 hospital).

¥ Type of contract: indefinite-period contract consists in a deal that expires when both parties (workers and employers) agree. Definite-period contract consists of a deal that expires on a determined date.

Table 4 shows the likelihood of presenting moderate or severe levels of current state anxiety, stratifying the analysis within the three trait-anxiety categories, and according to the type of contract. In the multivariate analysis and considering only those participants who were categorized in the severe trait-anxiety (n=73): participants who have a definite-period contract showed 3.6 times more probability of presenting moderate state-anxiety (95% CI 1.1-11.9; p= .039), and 11.4 times more probability of severe state-anxiety (95% CI 2.0-65.5; p=0.006) than workers with indefinite-period contract.

Tabla 4. Probability of presenting emotional state-anxiety, within each of the three categories of trait-anxiety in relation to the type of contract of the participants

	TRAIT-ANXIETY								
Type of contract [¥]	Mild (n=78)			Moderate (n=94)					
	RISK OF STATE-ANXIETY								
	Mild	Moderate	Severe	Mild	Moderate	Severe	Mild	Moderate	Severe
Indefinite- period contract ^a	Bivariate analysis								
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		1.0	0.9	1.0	1.3	1.2		3.7	11.5
Definite-peri- od contract	1.0	(0.2-0.4)	(0.2-3.9)		(0.5-3.5)	(0.4-3.8)	1.0	(1.2-11.1)	(2.3-58.3)
		<i>p</i> =.941	<i>p</i> = .948		<i>p</i> = .565	<i>p</i> = .729		<i>p</i> = .021	<i>p</i> = .003
Indefinite-pe- riod contract ^a	Multivariate analysis								
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		0.7	1.2	1.0	1.6	1.7		3.6	11.4
Definite-peri- od contract	1.0	(0.1-3.8)	(0.2-6.6)		(0.5-5.0)	(0.5-6.2)	1.0	(1.1-11.9)	(2.0-65.5)
		<i>p</i> = .675	<i>p</i> = .833		<i>p</i> = .377	<i>p</i> = .407		<i>p</i> = .039	<i>p</i> = .006

Note: Multivariate model adjusted for: Age, sex (male), marital status (single), occupation (physician), and current secondment (COVID-19 hospital).

¥ Type of contract: indefinite-period contract consists in a deal that expires when both parties (workers and employers) agree. Definite-period contract consists of a deal that expires on a determined date

^a reference category

Discussion

A systematic review of 12 articles from Europe and the United States of America, showed lower prevalence of anxiety using the STAI or other scales, such as Depression, Anxiety and Stress Scale (DASS), Generalized Anxiety Disorder Scale (GAD), and State-Trait Anxiety Inventory (STAI): in Italy, using the STAI scale, it was 20%; using the DASS-21 scale, in the Basque-Navarre was 37% whereas in Turkey it reached 52%; and the highest prevalence was 72% in Italy. Furthermore, the intensity of symptoms, using the GAD scale (interval 20-80), placed the total mean between 47.3 and 51.3, being 53 points in front-line workers and 50 points in the rest of the professionals (p< .05)¹⁵.



In a study on a representative sample of 1,044 workers in Finland, a short 6-question version of the STAI-6 instrument was used to evaluate the degree of anxiety and predictors of anxiety, showing that the workers had a mean of 18.91 points (on a scale between 6 to 42 points), and 50.86% reported symptoms of high anxiety²⁴. A study conducted in Spain¹⁹ showed that the prevalence of both types of anxiety was lower than in our study population: 39.29% presented moderate trait anxiety and 60.29% state anxiety. In addition, 46.36% showed a high level of stress, while 75.05% presented worse general health; showing that anxiety and stress were significant predictors of a worse state of health of the participants.

The global spread and threat by COVID-19 had a strong impact on the mental and physical health of the health personnel who have treated COVID-19 patients. This study highlights that almost half of the participants had trait-anxiety, while almost 9 out of 10 workers showed state-anxiety. Furthermore, it has shown that participants who were already characterized as having the most severe level of trait-anxiety also increased near to four times the risk of moderate state-anxiety and more than 11 times the risk of severe state-anxiety.

Comparing our data with other studies about anxiety, we found a general prevalence of state-anxiety of 85.7% in the subjects, 66.7% mild, 60.2% moderate and 69.8% severe; in trait-anxiety the general prevalence was in 47.8% of the subjects, mild 70.5%, moderate 71.6% and severe 63.9%. In a study in Mexico²⁵, it was reported that 100% of health professionals showed severe state anxiety; trait-anxiety. 51.6% moderate and 36.5% severe. In Peru²⁶, it was reported that 60% of health professionals presented mild anxiety, 51.6% moderate and 36.5% severe; in trait-anxiety 52% mild level. Because of the differences in data results, the influence in facing problems in each case must be considered according to the anxiety level²⁷.

Among the Argentinian population, state-trait anxiety was assessed using the STAI questionnaire during the first 10 days after the declaration of the COVID-19 pandemic: state-trait anxiety and state-anxiety were below the first quartile in men and women of all age groups. However, health professionals presented higher levels of state-anxiety, but state-trait anxiety was the inverse²⁸. In addition, among health professionals, those with the highest state-anxiety were found, contrary to the reported in our study, followed by mental health professionals, dentists and, finally, physicians; and for trait-anxiety: it was higher in mental health professionals. Other study assessed trait-state anxiety using the STAI, in addition to psychological impact, resilience and coping with the COVID-19 pandemic in physicians and nurses, showing lower trait-state anxiety scores than the Mexican study population (20.95 and 23.32, respectively), as well as lower prevalence of high trait-state anxiety (28% and 32%, respectively)²⁹.

Some studies have shown anxiety disorders in medical personnel, even after the COVID-19 pandemic. A literature review showed different assessments of anxiety using different scales: in a study of Spanish healthcare, 37%³⁰ of the personnel reported anxiety. In Mexico, a report in a third level

hospital showed that 83.1% of the personnel had some anxiety level, female nurses, singles, and residents were more affected than males. In the present study 61.9% of females had a mild level in trait-anxiety³¹.

In the present study type of contract was the main variable associated with trait-state anxiety, and definite-period healthcare workers were more likely to present trait-state anxiety, and those who were already categorized in the highest level of trait-anxiety increased even more the risk of current state-anxiety. The increase in anxiety in this study population may be attributable to occupational factors such as work overload, shortage of personal protective equipment, lack of specific medications for treatment, decision making under uncertainty of the patients state of severity; in addition to individual-family factors such as fear of direct contact with the patient due to the risk of contagion, rejection by society, social isolation, among others. Some limitations of this study are related to the online application of the survey and the low participation of health personnel in answering the questionnaire, could biases results.

It is recommended that further research with a qualitative approach be conducted related to the mental health of this population in a short or long period of time, mainly in those who were infected or lost either a member of the family or a friend.

The health personnel and staff that faced the COVID-19 pandemic were under physical and psychological pressures. Because of this, it is important to implement continuous and effective strategies for monitoring and attend the emotional behavior, including anxiety, depression, somatization and post-traumatic stress. The public health system has the liability to generate intervention mechanisms and capacitation to improve health care conditions of all the personnel involved in patient care during sanitary emergencies such as epidemics or pandemics. A simple way to do this task is by constant psychological evaluations by means of questionnaires and generate institutional policies and approaches to improve security, trust, self-confidence, protective equipment and fast response in emergencies to guarantee safe care of the population, a better quality of life before, during, and after any emergency situations.

Conclusions

The global spread and threat of COVID-19 have had a significant impact on the mental and physical health of healthcare workers treating these patients. This has led to changes in the mental health of workers, with an increase in both state anxiety and trait anxiety. This shows that the public health system and the population were not prepared to deal with a crisis of this kind. Therefore, public and private healthcare institutions must take into account that health emergencies such as COVID-19 have significant consequences for the mental health of workers, which affects the care they provide to patients. This study demonstrated the need for protocols to develop institutional strategies for



intervention and mental health promotion among professionals who care for the population during humanitarian and epidemiological risks caused by infections. Continuous long-term training on health risk management should be carried out continuously in all healthcare institutions to be aware of any circumstances and be prepared with trained personnel and the necessary material resources.

Conflict of interest

The authors declare no conflicts of interest.

Ethical considerations

This research was approved by the research and ethics committees of the Secretariat of Health of the state of Tlaxcala, number CEI04082020.

Use of artificial intelligence

The authors declare that they have not used any generative artificial intelligence applications, software, or websites in the writing of the manuscript, in the design of tables and figures, or in the analysis and interpretation of the data.

Authors' contribution

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