

ORIGINAL PAPER

Psychiatry

Evaluation of the mental health of health professionals in the COVID-19 era. What mental health conditions are our health care workers facing in the new wave of coronavirus?

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Abstract

Background: The aims of this study were to analyse the mental health and health-related quality of life (HRQoL) of a broad sample of healthcare workers (HCWs) in Spain and to identify potential factors that have a significant effect on their mental health and HRQoL.

Method: This prospective cohort study comprised 2089 HCWs who completed the Generalized Anxiety Disorder 7-item (GAD-7) Scale, the Patient Health Questionnaire-9 (PHQ-9), the Impact Event Scale-Revised (IES-R), the Insomnia Severity Index (ISI), and the health-related quality of life Questionnaire (EQ-5D). Sociodemographic and clinical data in relation to Covid-19 were also recorded. Descriptive statistics, univariable analysis and multivariable linear regression models were applied to identify factors associated with mental health and HRQoL.

Results: 80.87% of participants were female and 19.13% male; 82.38% were aged under 55 years; 39.13% were physicians and 50.17% were nurses or auxiliaries; 80.42% of the health workers have directly treated patients with Covid-19 and 12.28% have themselves tested positive for Covid-19. 38.58% of HCWs had clinical depression; over half (51.75%) had clinical anxiety; 60.4% had clinical stress; and 21.57% had clinical insomnia. Older professionals (>55 years) reported lower rates of anxiety, depression, insomnia, and stress. Having worked directly with Covid-19 patients appears to be an explanatory variable of suffering greater anxiety, depression, stress and insomnia, and of having a worse HRQoL amongst our HCWs. The group of HCWs suffering the worst mental state were nursing home workers.

Conclusions: Our study confirms that symptomatology of anxiety, depression, stress, insomnia, and HRQoL were affected amongst HCW during the Covid-19 pandemic.

1 | INTRODUCTION

In the recent months, a great deal of data has been published on the coronavirus disease (COVID-19) pandemic. Nonetheless, there are still many unknowns regarding the virus and its consequences. The effects of the pandemic have been felt around the world. A multi-national study across three continents results provides empirical evidence that COVID-19 affected mental health worldwide,¹

and a recent systematic review found that relatively high rates of symptoms of anxiety, depression, post-traumatic stress disorder, and stress were reported in the general population during the COVID-19 pandemic globally.² Another multi-national study across three continents results provides empirical evidence that COVID-19 affected mental health worldwide.³ However, one of the groups most affected have been those involved in providing health care to the community.⁴

During the months of the COVID-19 lockdown in Spain, a cross-cultural study on Spain and other country found that Spanish respondents reported more physical symptoms, contact history with COVID-19, higher perceived risk of contracting COVID-19, and frequent use of but less confidence in medical services. Also reported higher levels of stress and depression, while Chinese participants reported higher levels of psychological impact.⁵ Specifically, health-care workers (HCWs) faced very intense work stressors, such as long working hours, varying instructions and safety measures, and a lack of personal protective equipment, as well as having to carry out tasks for which many were not prepared.^{6,7} The efforts of the health system focused—almost exclusively—on saving the lives of COVID-19 patients and providing them with the greatest possible comfort. At this time, catering to the psychological needs of personnel involved in this work was not a priority. These professionals were highly exposed not only to the virus but also to situations with a strong emotional impact,⁸ leading to the possible appearance of symptoms of anxiety, depression or disorders resulting from post-traumatic stress.^{7,9} A number of studies have observed adverse psychological reactions among health workers in other emergency situations, such as SARS¹⁰⁻¹² and MERS.¹³

The causes of the increase in prevalence of mental-health-related symptoms in the context of COVID-19 is likely to be multifactorial, with reasons such as fear of contracting the infection and the social and economic consequences of the pandemic, which could play a role in this COVID-19 context.¹⁴ Globally, studies on HCWs mental health show that in China, health professionals displayed symptoms of anxiety (44.6%), depression (50.4%), and distress (71.5%).¹⁵ A multinational and multicentre study that describes a comprehensive range of physical symptoms experience by HCWs demonstrates a significant association between the prevalence of physical symptoms and psychological distress, which is probably bi-directional.¹⁶ Another study highlights that all HCWs were vulnerable to psychological adversity regardless of the volume of confirmed COVID-19 cases.¹⁷ In Spain, stress levels amongst HCWs were evaluated and the results showed that the perceived stress level was highest amongst workers who had been in direct contact with COVID-19 patients,¹⁸ and that nurses and trainee physicians are the most vulnerable groups.¹⁹ Another study²⁰ determined the degree of burn-out amongst health professionals, with high scores (38.9%) on the depersonalisation subscale. These Spanish studies also addressed the issue of mental health amongst Spanish HCWs,^{18,20} but contain certain limitations, due to the critical nature of the emergency.

Our study addresses these methodological limitations, studying anxiety, depression, stress, insomnia, and health-related quality of life among health professionals.

2 | METHODS

2.1 | Participants

This is a descriptive study, with a sample group comprising 2089 Spanish health workers, recruited by non-probabilistic sampling

What's known

The effects of the pandemic have been global, but one of the most affected groups has been healthcare professionals.

What's new

This study provides an analysis of the mental health and health-related quality of life (HRQoL) of a broad sample of healthcare workers in Spain and identifies potential factors that have a significant effect their mental health and HRQoL.

(snowball sampling and emails or WhatsApp/mobile app messages) among tertiary care centres, primary care centres, and nursing homes.

2.2 | Measures

Participants provided *socio-demographic data*, including age, gender, professional status/working status, years of experience. *COVID-19-related clinical data* included having been in quarantine, having tested positive, and psychological support received at this time in relation to the present situation. They also completed Spanish-language versions of five self-administered *perception-of-health* questionnaires:

2.2.1 | Generalized Anxiety Disorder 7-item scale

The Generalized Anxiety Disorder 7-item (GAD-7) scale is a 7-item self-related questionnaire that assessed general anxiety disorder.²¹ The items are scored on a four-point scale referring to the past two weeks. We took 10 points as the cut-off point in this study.^{4,22} The questionnaire has been translated into and validated in Spanish and shows good internal consistency and adequate test-retest reliability.²³

2.2.2 | Patient Health Questionnaire-9

The Patient Health Questionnaire-9 (PHQ-9) is a self-administered questionnaire designed to measure depression and depression severity.²⁴ The 9 items are scored on a four-point scale in the past two weeks. It has been validated in the Spanish population.²⁵ We took 10 points as the cut-off point in this study.^{15,26}

2.2.3 | Impact Event Scale-Revised

The Impact Event Scale-Revised (IES-R) is a self-administered scale designed to assess the perceived stress to the experienced traumatic

event.²⁷ The 22 items are scored on a five-point Likert scale referring to the last 7 days. The 24 points was taken as the cut-off point in this study. It has been validated in the Spanish population.²⁸ This scale was validated in different cultures during the pandemic (Iranian, Poles, Philippines, and Vietnamese).²⁹⁻³²

2.2.4 | The Insomnia Severity Index

The Insomnia Severity Index (ISI)^{33,34} is a brief self-report instrument measuring a patient's perception of the severity of his/her insomnia. The validated Spanish version of the ISI was used to assess the subjective severity of insomnia over a 1-week period.³⁵ Each item was rated on a five-point Likert scale. This questionnaire was validated during the pandemic.³⁶

2.2.5 | Health-related quality of life questionnaire

The self-report version of the *EuroQol generic health-related quality of life questionnaire (EQ-5D)*³⁷ consists of two parts: the EQ-5D-5L descriptive system and the EQ Visual Analogue scale. It has been validated in the Spanish population.³⁸

2.3 | Procedure

Data were collected by means of an online survey, between April and September 2020. A researcher from the Galdakao-Usansolo Hospital Research Unit directly emailed several Spanish hospitals, primary care centres and nursing homes, who facilitated contact with their staff and with medical personnel who had been working in these centres during the COVID-19 outbreak. Clinical and non-clinical healthcare workers were included (physicians, nurses, administrative personnel, ambulance drivers, cooking and cleaning staff, orderlies, religious service providers, etc). Frontline medical staff were identified as being those working in the Emergency, Respiratory, Intensive Medicine, Reanimation and Infectious Diseases services.

Before beginning the survey, all participants were asked to read the information on the study—including objectives, data confidentiality and an email address to contact in the event of any queries—and were required to give their electronically informed consent to complete the questionnaires.

Participants were asked to provide socio-demographic data and information related to COVID-19 and to complete the Spanish-language versions of five self-administered instruments (PHQ-9, GAD-7, IESR-22, EQ-5D, ISI-7). Eligible personnel included health workers who were in active employment at the time of the pandemic. Participants who did not give their informed consent were excluded. Participation in the study was anonymous and voluntary, and all information was kept confidential. The study was approved by the Ethics Committee of the hospital (Galdakao-Usansolo Hospital, Protocol 08/20).

2.4 | Statistical analysis

Descriptive statistics for the entire sample were calculated using frequencies and percentages for categorical data and by means and standard deviations for continuous variables. The scores of the five questionnaires analysed (EuroQol-5D, PHQ-9, GAD-7, IESR-22, and ISI-7) were treated as continuous variables, and dichotomous variables were created to indicate clinical values of anxiety, depression, stress and insomnia, based on the published cut-off points of the corresponding score.

Univariable analyses were first performed to identify, among sociodemographic and COVID-19-related variables, factors associated with (a) the quality-of-life score and (b) having clinical values of anxiety, depression, stress and insomnia, using Chi-square or Fisher's exact test for categorical data and Student *t* test or non-parametric Wilcoxon test for continuous variables. Variables that were significant at 0.20 level were considered as potential independent variables to fit (a) a multiple linear regression model to predict the outcome of the quality-of-life score and (b) multivariable logistic regression models to predict clinical values of anxiety, depression, stress, and insomnia. In all cases, the final predictive factors were those that were significant at .05 level.

The coefficient of determination R^2 was calculated to evaluate the percentage of the quality-of-life score variation explained by the model. Estimates and 95% confidence intervals were calculated. The predictive accuracy of each of the logistic regression models was determined by calculating the area under the receiver operating curve (AUC) and calibration of these models was assessed using the Hosmer and Lemeshow test. The odds ratio (OR) and 95% confidence intervals (%95 CI) were calculated.

All effects were considered statistically significant at $P < .05$. All statistical analyses were performed using SAS for Windows statistical software, version 9.4 (SAS Institute, Inc, Cary, NC) and R[®] software version 4.0.0.

3 | RESULTS

The study comprised 2089 participants, 1691 females (80.87%) and 398 males (19.13%). These data are consistent with the results of other studies.^{15,20,39-41} Table 1 shows socio-demographic and clinical data in relation to COVID-19 pandemic, and mental health characteristics of the healthcare workers. 82.38% of the participants were aged under 55; 39.13% were physicians and 50.17% were nurses or auxiliaries; 27.6% were frontline medical staff, and 37.44% had more than 10 years' work experience. 79.08% of the data were obtained during the months of restrictions on movement of people in Spain.

With regard to COVID-19 data, 80.42% of the health workers had directly treated patients with COVID-19, and 12.28% had themselves tested positive for COVID-19. Only 19.76% felt that they had been sufficiently protected in their job; 40.43% felt that they had not been sufficiently protected in their job, and 10.71% had received psychological attention in relation to COVID-19 in their workplace.

TABLE 1 Descriptive analysis of sociodemographic data and clinical data in relation to COVID-19 (n = 2089)

	N (%)	Missing (%)
<i>Sociodemographic data</i>		
Age		1 (0.05)
<40	831 (39.8)	
40-55	889 (42.58)	
>55	368 (17.62)	
Gender (male)	398 (19.13)	8 (0.38)
Professional profile		14 (0.67)
Medical doctor	812 (39.13)	
Nurses/nursing assistants	1041 (50.17)	
Other	222 (10.7)	
Years of experience		13 (0.62)
<5	305 (14.69)	
5-10	371 (17.87)	
>10	1400 (67.44)	
Services		35 (1.68)
Services with greatest contact with COVID-19-patients ^a	581 (28.29)	
Primary care	453 (22.05)	
Nursing homes/geriatric services	160 (7.79)	
Other medical/surgical services	568 (27.65)	
Central services	200 (9.74)	
Other	92 (4.48)	
Response date		0 (0)
During state of alarm (until 06/21/2020)	1652 (79.08)	
Subsequent to state of alarm	437 (20.92)	
Response month		0 (0)
April	4 (0.19)	
May	1104 (52.85)	
June	650 (31.12)	
July	125 (5.98)	
August	143 (6.85)	
September	63 (3.02)	
<i>Clinical data in relation to COVID-19</i>		
Have you been in quarantine? (Yes)	458 (21.98)	5 (0.24)
Positive PCR		4 (0.19)
Yes	256 (12.28)	
No	1742 (83.55)	
I have not been tested	87 (4.17)	
Have you worked directly with COVID-19 patients (Yes)	1663 (80.42)	21 (1.01)

(Continues)

TABLE 1 (Continued)

	N (%)	Missing (%)
Have you worked in any service other than your own (Yes)	813 (39.12)	11 (0.53)
Sufficient knowledge about how to do your job (Yes)	1325 (63.79)	12 (0.57)
Do you have you enough knowledge about protection measures (Yes)	1481 (71.48)	17 (0.81)
Do you feel that you have been sufficiently protected in your activity?		9 (0.43)
No	841 (40.43)	
Sometimes	828 (39.81)	
Yes	411 (19.76)	
Have you received psychological care/support in your workplace? (Yes)	223 (10.71)	7 (0.34)
Increased use of tranquilizers/sedatives in the last weeks (Yes)	394 (18.93)	8 (0.38)
Increased alcohol consumption in the last weeks (Yes)	311 (14.92)	5 (0.24)
Increased tobacco use in the last weeks (Yes)	285 (13.72)	11 (0.53)
Increased drugs consumption in the last weeks (Yes)	19 (0.91)	11 (0.53)

^aServices with more COVID-19 contact: Emergencies, Anesthesiology & Reanimation, ICU/CCU, Respiratory, Intensive Medicine, Internal Medicine and Infectious Diseases.

In relation to the consumption of toxic substances, the data show a 0.91%, 13.73%, 14.92%, and 18.93% increase respectively, in the consumption of drugs, tobacco, alcohol, and tranquilizers/sedatives.

As measured by the PHQ-9 score, 38.58% of HCWs had clinical depression (PHQ-9 score of ≥ 10); over half (51.75%) had clinical anxiety (GAD-7 score of ≥ 10); 60.4% had clinical stress (IESR-22 score of ≥ 24); and 21.57% had clinical insomnia (ISI-7 score of ≥ 15). The mean total PHQ-9 score for HCWs was 8.58 (SD 6.06); the mean total score on the GAD-7 was 9.92 (SD 5.39); the mean IESR-22 score was 33.45 (SD 22.89); and the mean ISI-7 score was 9.32 (SD 6.15) (Table 2).

Scores on the symptomatology of anxiety, depression, stress, insomnia, and quality of life according to a *univariable analysis* of the sociodemographic, relative to COVID-19 pandemic, and workers' mental health variables are shown in Table S1 (see online material).

We also have included the categorized scores (clinical vs non clinical) on the symptomatology of anxiety, depression, stress, and insomnia according to a *univariate analysis* of the socio-demographic, relative to COVID-19 pandemic, and workers' mental health variables (Table S2, see material online).

Results of *multivariable analysis* for the EuroQol-5D are presented in Table 3. In this linear regression model for health-related quality of life, scores for gender (<0.0001), age (<0.0001), service

TABLE 2 Descriptive analysis of mental health and health-related quality of life data (n = 2089)

	N (%)	Missing (%)
	2089	
<i>Health-related quality of life (EuroQol-5D)</i>		
From 0 to 100, rate your state of health TODAY (item 6) ^a	73.1 (17.93)	23 (1.1)
Score EuroQol-5 Da	0.82 (0.16)	20 (0.96)
<i>Depression symptoms (PHQ-9)</i>		
Score PHQ-9 ^a	8.58 (6.06)	18 (0.86)
Classification scores PHQ-9		18 (0.86)
Normal (0-4)	609 (29.41)	
Mild (5-9)	663 (32.01)	
Moderate (10-14)	446 (21.54)	
Moderately severe depression (15-19)	221 (10.67)	
Severe (20-27)	132 (6.37)	
Clinical depression - score ≥10 (Yes)	799 (38.58)	18 (0.86)
<i>Anxiety symptoms (GAD-7)</i>		
Score GAD-7 ^a	9.92 (5.39)	2 (0.1)
Classification scores GAD-7		2 (0.1)
Normal (0-4)	367 (17.59)	
Mild (5-9)	640 (30.67)	
Moderate (10-14)	679 (32.53)	
Severe (15-21)	401 (19.21)	
Clinical anxiety - score ≥10 (Yes)	1080 (51.75)	2 (0.1)
<i>Distress symptoms (IESR-22)</i>		
Score IESR-22 ^a	33.45 (22.89)	3 (0.14)
Classification scores IESR-22		3 (0.14)
Normal (0-8)	384 (18.41)	
Mild (9-25)	477 (22.87)	
Moderate (26-43)	512 (24.54)	
Severe (44-88)	713 (34.18)	
Clinical distress - score ≥24 (Yes)	1260 (60.4)	3 (0.14)
<i>Insomnia symptoms (ISI-7)</i>		
Score ISI-7 ^a	9.32 (6.15)	7 (0.34)
Classification scores ISI-7		7 (0.34)
Absence (0-7)	888 (42.65)	
Subthreshold (8-14)	745 (35.78)	
Moderate (15-21)	388 (18.64)	
Severe (22-28)	61 (2.93)	
Clinical insomnia - score ≥15 (Yes)	449 (21.57)	7 (0.34)

^aResults shows as mean (standard deviation). GAD-7: Total scores range from 0 to 21. A score of 0-4 indicates the absence of anxiety, a score of 5-9 indicates mild anxiety symptoms, a score of 10-14 indicates moderate anxiety symptoms and a score of 15-21 indicates the presence of severe symptoms of anxiety. PHQ-9: Total scores range from 0 to 27. A score of 0-4 indicates absence of depression, a score of 5-9 indicates mild depression symptoms, a score of 10-14 indicates moderate depression symptoms, a score of 15-19 indicates moderately severe depression, and a score of 20-27 indicates clinical depression. IES-R-22: Total scores range from 0 to 88. A score of 0-8 indicates normal distress, a score of 9-25 indicates mild distress, a score of 26-43 indicates moderate distress, and a score of 44-88 indicates severe distress. ISI-7: The total score is interpreted as follows: absence of insomnia (0-7); sub-threshold insomnia (8-14); moderate insomnia (15-21); and severe insomnia (22-28).

(<0.0001), having sufficient knowledge about how to do the job (0.0005), being sufficiently protected (<0.0001), increased use of tranquilizers (<0.0001), increased alcohol consumption (<0.0001), and increased tobacco use (<0.0001) showed a significant negative association with the EQ-5D total scores.

Results of *multivariable* analysis for depression, anxiety, stress, insomnia are presented in Table 4. In the multiple logistic regression model for depression, scores for gender (0.0004), service (<0.0001), caring directly for COVID-19 patients (0.002), having sufficient knowledge about how to do the job (<0.0001), being sufficiently protected (<0.0001), increased use of tranquilizers (<0.0001), and increased alcohol consumption (<0.0001) showed a significant positive association with the PHQ-9 total scores. In the multiple logistic regression model for anxiety, scores for gender (<0.0001), professional profile (<0.0001), working in another service (0.002), having sufficient knowledge about how to do the job (<0.0001), being sufficiently protected (<0.0001), increased use of tranquilizers (<0.0001), and increased alcohol consumption (<0.0001) showed a significant positive association with the GAD-7 total scores. In the multiple logistic regression model for stress, scores for gender (<0.0001), professional profile (0.0003), service (0.0003), working in another service (0.004), having sufficient knowledge about how to do the job (0.0002), being sufficiently protected (<0.0001), having psychological care in the workplace (0.005), increased use of tranquilizers (<0.0001), and increased alcohol consumption (<0.0001) showed a significant positive association with the IESR-22 total scores. In the multiple logistic regression model for insomnia, scores for professional profile (<0.0001), caring directly for COVID-19 patients (0.02), having sufficient knowledge about how to do the job (0.0004), being sufficiently protected (<0.0001), increased use of tranquilizers (<0.0001), increased alcohol consumption (0.0004), and increased tobacco use (0.03) showed a significant positive association with the ISI-7 total scores.

4 | DISCUSSION

This study evaluates the mental health of a broad sample of Spanish HCWs with respect to symptomatology of anxiety, depression, stress, insomnia, and HRQoL, as measured by various validated questionnaires. Our study confirms that all these variables were affected amongst health-professionals. These results are consistent with previous studies^{15,41-49} using the same questionnaires.

With respect to socio-demographic variables, 80.87% of participants in our study were *females* and 19.13% males. This higher percentage of female participation is also seen in other studies, with very similar percentages.^{20,39} Our study suggests that providing care to COVID-19 patients has a marked *emotional impact*, as 51.75% of the HCWs appeared to suffer from clinical anxiety and 38.58% from clinical depression. This is higher than the data recorded in other studies in Europe and China, which show values of between 5 and 10 for clinical anxiety and clinical depression respectively.^{15,46,48,49} Our HCWs also reported higher scores in stress and insomnia than

TABLE 3 Multiple linear regression model for health-related quality of life EuroQol-5D

	EuroQol-5D		
	Estimate	IC (95%)	P value
Gender (female)	-0.049	(-0.067, -0.032)	<.0001
Age			<.0001
<40 years	ref.	ref.	-
40-55 years	-0.028	(-0.044, -0.014)	.0001
>55 years	-0.037	(-0.057, -0.018)	.0002
Service			<.0001
Services with greatest contact with COVID-19-patients ^a			
Primary care	-0.012	(-0.031, 0.006)	.20
Nursing homes/geriatric services	-0.083	(-0.109, -0.056)	<.0001
Medical/surgical services	-0.024	(-0.070, -0.003)	.05
Other	-0.036	(-0.049, 0.0005)	.03
Central services	ref.	ref.	-
Sufficient knowledge about how to do your job (No)	-0.026	(-0.040, -0.011)	.0005
Do you feel that you have been sufficiently protected in your activity?			<.0001
Yes	ref.	ref.	-
Sometimes	-0.029	(-0.048, -0.011)	.001
No	-0.068	(-0.087, -0.049)	<.0001
Increased use of tranquilizers/sedatives (Yes)	-0.134	(-0.149, -0.115)	<.0001
Increased alcohol consumption (Yes)	-0.031	(-0.050, -0.012)	.0011
Female tobacco use (Yes)	-0.038	(-0.058, -0.019)	.0001
$R^2 = 0.2$			

^a Services with most COVID-19 contact: Emergencies, Anaesthesiology & Reanimation, ICU/CCU, Respiratory, Intensive Medicine, Internal Medicine and Infectious Diseases. Ref.: reference category. The coefficient of determination R^2 was calculated to evaluate the percentage of the quality of life score variation that the model explained. CI 95%: confidence interval of 95%. Bold represents the significance threshold was .05.

in other research.^{47,49,50} The overall EQ-5D-5L score for Spanish HCWs (0.82) in this study was lower than general population under COVID-19 (0.95)⁵¹ but higher than patients suffering from diabetes (0.8),⁵² human immunodeficiency virus (HIV) (0.8),⁵³ skin diseases (0.73),⁵⁴ respiratory diseases (0.66),⁵⁵ dengue fever (0.66),⁵⁶ frail elderly (0.58),⁵⁷ and elderly after fall injury (0.46)⁵⁸ and fracture injuries (0.23).⁵⁹

In our study, *senior professionals (>55 years)* reported lower rates of anxiety, depression, insomnia, and stress. This is consistent with other studies^{60,61} that indicate that the protective effect of "being senior" is due to the fact that expertise and confidence helps minimize the stress caused unforeseen situations.¹⁸ It should also be noted that the *rate of infected HCWs* (12.28%) is practically 3-4 times higher than elsewhere.⁶²

Likewise, the proportion of personnel coming into direct contact with COVID-19 patients is also very high (80.42%). Thus, amongst our HCWs, *having worked directly with COVID-19 patients* appears to be an explanatory variable of suffering greater anxiety, depression,

stress and insomnia, and having a worse health-related quality of life. We also think it is important to note that the group of HCWs with the worst mental state were *nursing home workers*. One possible explanation may be found in the data estimating that 6% of elderly people living in nursing homes died in the pandemic (out of a total of more than 330 000 places occupied), and it is estimated that between 47% and 51% of deaths (to 23 June) occurred in social services centres, as compared with 39% in Germany.⁶³

The effects of *stress on increased use of drugs/toxic substances* have been well-demonstrated,⁶⁴ particularly among HCWs, due to their easier access to psychotropic drugs (increased risk of use of opiates/benzodiazepines/hypnotics),⁶⁵ and a fear of professional stigma that can prevent them from seeking psychological treatment.⁶⁶ Similarly, in the SARS-CoV-1 epidemic, an increased risk of alcohol use disorder was reported among primary care workers.⁶⁷ Our multivariable analysis reflects a relationship between increased drug use and worse results in depression, anxiety, stress, insomnia and health-related quality of life. It should be taken into account that

TABLE 4 Multivariable logistic regression models for the depression, anxiety, stress, and insomnia measures

	PHQ9 (depression)			GAD7 (anxiety)			IESR22 (stress)			ISI7 (insomnia)		
	OR	IC 95%	P value	OR	IC 95%	P value	OR	IC 95%	P value	OR	IC 95%	P value
Gender (female)	1.64	(1.25-2.16)	.0004	2.07	(1.58-2.69)	<.0001	2.02	(1.56-2.62)	<.0001	2.02	(1.56-2.62)	<.0001
Professional profile	-	-	-	-	-	<.0001	-	-	-	-	-	<.0001
Doctor				0.84	(0.59-1.17)		0.82	(0.57-1.18)		0.67	(0.43-1.07)	
Nurses / nursing assistants				1.39	(1.01-1.94)		1.31	(0.93-1.84)		1.29	(0.83-1.99)	
Other				ref.	ref.		ref.	ref.		ref.	ref.	
Service				-	-	<.0001	-	-	.0003	-	-	-
Services with greatest contact with COVID-19-patients ^a	1.35	(1.02-1.78)					1.66	(1.27-2.17)				
Primary care	1.13	(0.84-1.51)					1.16	(0.88-1.54)				
Nursing homes / geriatric services	2.87	(1.92-4.31)					2.34	(1.53-3.59)				
Central services	1.79	(1.24-2.59)					1.26	(0.88-1.82)				
Other	1.82	(1.07-3.08)					1.29	(0.77-2.16)				
Medical/surgical services	ref.	ref.					ref.	ref.				
Have you worked in any service other than your own? (Yes)	-	-	-	1.35	(1.10-1.64)	.003	1.35	(1.10-1.67)	.004	-	-	-
Have you worked directly with COVID-19 patients? (Yes)	1.56	(1.17-2.15)	.002							1.5	(1.06-2.12)	.02
Sufficient knowledge about how to do your job (No)	1.92	(1.56-2.37)	<.0001	1.82	(1.48-2.23)	<.0001	1.51	(1.22-1.88)	.0002	1.54	(1.21-1.97)	.0004
Do you feel that you have been sufficiently protected in your activity?												
Yes	ref.	ref.		ref.	ref.		ref.	ref.		ref.	ref.	
Sometimes	1.59	(1.17-2.15)		1.39	(1.06-1.81)		1.73	(1.32-2.26)		1.51	(1.01-2.27)	
No	2.59	(1.91-3.5)		2.33	(1.77-3.06)		2.72	(2.06-3.6)		3.32	(2.24-4.93)	
Have you received psychological care/support in your workplace? (Yes)	-	-	-	-	-	-	1.62	(1.16-2.26)	.005	-	-	-
Increased use of tranquilizers/sedatives (Yes)	4.11	(3.18-5.3)	<.0001	4.99	(3.75-6.66)	<.0001	4.38	(3.19-6.02)	<.0001	5.94	(4.59-7.69)	<.0001
Increased alcohol consumption (Yes)	2.7	(2.04-3.58)	<.0001	2.45	(1.83-3.27)	<.0001	2.15	(1.58-2.92)	<.0001	1.76	(1.29-2.4)	.0004
Increased tobacco use (Yes)	-	-	-	-	-	-	-	-	-	1.42	(1.04-1.95)	.03
AUC (IC 95%)/H-L	0.75	(0.72-0.77)/0.6944		0.75	(0.72-0.77)/0.8967		0.74	(0.71-0.76)/0.6480		0.78	(0.76-0.81)/0.5130	

Abbreviations: AUC, area under the receiver operating curve; CI 95%: confidence interval of 95%; H-L, P value of Hosmer-Lemeshow test; OR, odds ratio; Ref., reference category.

^aServices with most COVID-19 contact: Emergencies, Anaesthesiology & Reanimation, ICU/CCU, Respiratory, Intensive Medicine, Internal Medicine and Infectious.

Bold represents the significance threshold was .05.

the lockdown measures imposed between March and June in other European countries were not as extreme as in Spain, where people were only allowed to leave their homes to go to work or to buy food and medicines, and borders were closed. This may have complicated the issue of increased drugs use, since without the possibility of drawing on the social support of the wider family environment and friends, or even of performing physical exercise (which would have been a good coping strategy), the use of drugs or toxics was resorted to instead.

The characteristics of this pandemic—uncertain knowledge, severity, deaths among HCWs—increased its potential psychological impact on those personnel.⁶⁸ Based on the results of other studies reviewed, it is surprising to see that our sample group was more mentally affected than other similar sample groups measured using the same instruments. This is the case amongst sample groups from countries that are socio-culturally different to our own, such as China, Hong Kong, and Vietnam, and in countries with cultures closer to our own, such as Italy. Are our HCWs “fragile heroes”?⁶⁹ The following are some possible explanations:

On the one hand, a meta-analysis and a Spanish study found that factors protecting against psychological distress included having sufficient medical resources and accurate health information,^{19,70} since clear and effective guidance is key to staff confidence and reassurance during a crisis.⁷¹ However, in our study only 19.76% of HCWs felt that they were sufficiently protected in their job; 40.43% had not felt protected, and 39.81% had only sometimes felt protected. There is also a relationship between this variable and anxiety, depression, stress, insomnia, and health-related quality of life. Are our HCWs somehow “softer”? It seems that we need to seek other explanations for this major difference in psychological distress. Some of the explanations that the HCWs themselves described with regard to the situation they experienced (through open questions) were as follows:

- Action protocols were updated based on the availability of personal protective equipment at the hospital, rather than on its real importance in treating COVID-19 patients and protecting staff. This created a high degree of fear and mistrust amongst staff.
- High level of improvisation; there were different rules each day. Tremendous healthcare burden in a short period of time, with a feeling of a shortage of hands and extreme exhaustion.
- Psychologically very hard to have to report to patients' next-of-kin over the phone, due to lockdown, trying to empathize with their situation.
- Feeling of impotence in the face of actions resulting from health policies that did not prioritize or invest in prevention and protection against this situation.
- We felt helpless in terms of the lack of security and knowledge of ICU (intensive care unit) patient care.

At the same time, on December 1, it was reported in the news that Spain will suffer the worst recession among G-20 countries, only behind Argentina, according to the OECD.⁷² Therefore, concern

over the socioeconomic situation must surely also be impacting the psychological stress amongst our HCWs. Taking all this into account, it is important to offer psychological interventions to help HCWs. The most evidence-based treatment is cognitive behaviour therapy (CBT),^{73,74} especially Internet CBT that can prevent the spread of infection during the pandemic.⁷⁵

Our study has several *strengths*. These include a large sample of HCWs; the use of validated instruments to determine their mental health; and personnel with different profiles and from different services. Some *limitations* of our study must also be noted. It is possible that participants in the study may have experienced a higher symptomatology than those HCWs who opted not to participate. Another limitation concerns the overrepresentation of women in our sample group. Despite, the women are overrepresented in depression even prior to the pandemic.⁷⁶ Another limitation is that the COVID-19 pandemic was found to cause hemodynamic changes in the brain.⁷⁷ This study mainly used self-reported questionnaires to measure psychiatric symptoms and did not make clinical diagnosis. The gold standard for establishing psychiatric diagnosis involved structured clinical interview and functional neuroimaging.⁷⁸⁻⁸⁰

An additional limitation is the fact that we performed the assessment at only one point in time, which prevented us from observing changes in the HCWs' mental health over time or draw any conclusions regarding causation. About this, one longitudinal study in China⁸¹ revealed a statistically but not clinically significant reduction in psychological impact during the initial phase and four weeks later during the COVID-19 epidemic. Thus, longitudinal data are needed to evaluate the psychological impact of the pandemic over time.

5 | CONCLUSIONS

At a global level, we tend to speak of a first wave during the first months of the pandemic and a second wave after the summer. However, what we experienced in Spain between March and April was not so much a first wave as an infernal tsunami (compared to other regions/countries), and in addition, health decisions in health policy have resulted in insufficient medical information and resources.

We therefore believe that care must be provided for our HCWs in the short- to medium-term future, bearing in mind that “new waves” of the pandemic are expected in the coming months.

It will be necessary to monitor HCWs—particularly those most at risk—and our data, together with other current studies, can help to establish screening, support and treatment strategies for improving their mental health. For future research, it would be useful to assess the views of Spanish HCWs on COVID-19 vaccine. Chews et al (2021) used a self-administrated survey and collected information on willingness to vaccinate, perception of COVID-19, vaccine concerns, COVID-19 risk profile, stigma, prosocialness scale, and trust in health authorities.⁸²

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ETHICAL STANDARDS

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008 and “that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional guides on the care and use of laboratory animals.”

DISCLOSURES

The authors declare that they have no competing interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author at email direction (jmartin@cop.es). The data are not publicly available due to privacy or ethical restrictions.

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SUPPORTING INFORMATION

Additional Supporting Information may be found online in the Supporting Information section.

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