









Impact of the COVID-19-pandemic and perception of self-efficacy on the mental health of out-of-hospital emergency healthcare professionals by modality of care

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Abstract

Objective: To analyse the influence of the COVID-19 pandemic and the perception of self-efficacy on the health professionals of the Spanish out-of-hospital emergency services.

Design: Observational, cross-sectional and descriptive with a survey methodology of 1710 participants from Spain (1 February–30 April, 2021).

Methods: The mental health of healthcare workers was assessed in terms of stress, anxiety and depression, as well as their self-efficacy. Linear and logistic regression models were fitted to predict these variables. A moderation analysis was conducted to determine the effect of self-efficacy on mental health.

Results: The means of the sample for stress, anxiety, depression and self-efficacy were 20.60, 15.74, 13.07 and 70.87, respectively. In the regression models, being a woman was the most significant factor for severe mental health impairment. Female gender was also a relevant factor for self-efficacy. Self-efficacy had a direct effect on the mental health for working in patient care.

Conclusions: Healthcare workers showed moderate stress, severe anxiety, mild depression and good self-efficacy. Direct patient care was associated with more stress and severe anxiety. Age, female gender, job changes and job adjustment were associated with levels of stress, anxiety and depression. Self-efficacy is a determining factor of mental health in the direct care modality.

Implications: The mental health of healthcare workers has been of great importance in the aftermath of the pandemic, but out-of-hospital emergency workers have been neglected in research. The levels of stress, anxiety and depression during the pandemic

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justify the creation of prevention and early diagnosis programmes, as they are essential in a health disaster. Surprisingly, their high level of perceived self-efficacy directly impact on the mental health of patient healthcare workers, so improving it will reduce the psychological risk.

Reporting Method: We have followed the STROBE guidelines. It has been partially funded by the Asistencia Sanitaria Interprovincial de Seguros - ASISA Foundation (Spain).

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KEYWORDS

COVID-19, emergency medical services, hotlines, management service organizations, mental health, pandemics, patient care management, prehospital care, self-efficacy

1 | INTRODUCTION

The COVID-19 pandemic has had a major impact on all Spanish healthcare professionals (HPs). The first positive case of SARS-CoV-2 virus occurred on an island on 31 January 2020 and reached the peninsula on 24 February 2020. By 14 March 2020, the population was confined, but HPs continued to work away from home (Fernández Riquelme, 2020; The Lancet Public Health, 2020).

The Spanish Emergency Medical System (EMS) follows the French model, which is also known as European model. Advanced life support (ALS) units are composed of physicians, nurses and emergency medical technicians (EMTs) in ambulances and, a pilot in the case of helicopters, an additional. In basic life support (BLS) resources, care is provided by EMTs (Martín Reyes et al., 2014; Sánchez, 2018). This model does not include paramedics, as in North America (Adnet & Lapostolle, 2004). In addition, there are physicians, nurses and regulatory technicians in the emergency call centre (ECC) who are responsible to attending the demands and providing a care response. As in other services, there are management staff who are the final decision-makers, particularly in relation to EMS, and who coordinate the necessary adjustments to the system in the event of disasters. This structure determines three modes of working operation. The first group is the direct patient care modality in ALS and BLS sources, which is the most numerous. They work in the different care response devices, which act as resources for transporting patients to the hospital environment. The second one is made up of ECC workers who do not provide direct patient care. The ECC is the resource that regulates EMS operations. The staff at these centres receive calls for help and allocate the most appropriate resources to the emergency. This is one of basic pillar for the functioning of the integrated emergency system. The last group is made up of management staff who perform tasks such as the planning of human and material resources or the decision-making about their deployment and use. Managers make economic sense of decisions and see how they affect health outcomes; develop the ability to set work objectives and see how they are integrated into the budget; improve the coordination of the actions of key or middle managers; harmonize knowledge, skills, experience and teamwork and

improve HPs motivation (Al-Shaqsi, 2010; Barroeta Urquiza & Boada Bravo, 2011; Sánchez, 2018).

The impact of the pandemic on HCWs in general is well known, but studies rarely include EMS workers, according to the articles obtained in the literature search for this study. Literature reviews do not usually include these HPs (Labrague, 2021; Aymerich et al., 2022). Exclusive studies with these workers are almost non-existent. These professionals have worked on the frontline with a heavy workload, especially during the first and second waves in Spain (Danet Danet, 2021). According to official data, they have fought against a virus that has infected almost 5 million people in the country and killed more than 85,000 (Statistics National Institute, 2023).

Depression, anxiety and stress are very common responses in the general population worldwide and particularly among frontline HPs (El-Hage et al., 2020).

On the other hand, self-efficacy is based on an individual perception of the ability of the person to perform a task as desired and has a direct impact on job satisfaction, as has already been demonstrated in HPs in the Spanish EMS prior to the onset of the COVID-19 pandemic (Navalpotro Pascual et al., 2019).

2 | BACKGROUND

2.1 | Stress, anxiety and depression

People's mental health is closely linked to emotional health, which can be determined by levels of stress, anxiety and depression (Usul et al., 2021).

According to the DSM-V Manual, acute stress disorder occurs when people have been directly or indirectly exposed to a traumatic event. Although the typical symptomatology is expressed as fear and anxiety, it is common to develop anhedonia and dysthymia, externalized as anger and hostility or dissociative symptoms (American Psychiatric Association, 2021a).

Anxiety, as a pathology, occurs when it is not adaptive. Anxiety disorders include some variety pathologies with similar features, such as an excessive fear and worry and associated behavioural

disturbances. These mental health problems are differentiated by cognition associated with the scenario and by the type of objects or situations that elicit fear, anxiety or avoidance behaviours (American Psychiatric Association, 2021b).

Finally, the common characteristic of depressive disorders is the presence of a sad mood and feelings of emptiness or irritability, accompanied by somatic and cognitive disturbances that significantly affect the individual's functional capacity. What differentiates them is their duration, temporal presentation or presumed aetiology (American Psychiatric Association, 2021c).

Prolonged exposure to stressful situations in the workplace can induce anxiety. In turn, if these situations are not uninterrupted, it can lead to depressive symptoms (Usul et al., 2021). This may be the case for EMS workers in the SARS-CoV-2 pandemic.

2.2 | Self-efficacy

Self-evaluation of one's capabilities determines behaviour and thinking, as well as the emotional response generated when faced with situations that, in advance, are predetermined to be difficult (Bandura, 2010). Although EMS workers are often exposed to stressful situations that may even endanger their physical integrity, the consequences of a pandemic are not comparable to other experiences. Self-efficacy influences an individual's motivation, persistence and success at work to promote a more or less adapted attitude to the demands of the situation. In turn, knowledge of one's capabilities is influenced by states of stress, anxiety and depression (Lovibond & Lovibond, 1995; Nguyen et al., 2021).

2.3 | Impact of the COVID-19 pandemic on HPs in EMSs on the mental health and importance of self-efficacy

The exposure of HPs to the virus has undoubtedly had an impact on their mental health (Buitrago Ramírez et al., 2022). In a previous partial study involving some autonomous communities in central Spain, high figures for psychological risk and post-traumatic stress in health emergency personnel were observed (Martínez-Caballero et al., 2021). In addition, there are also studies in China (Cai et al., 2021), India (Suryavanshi et al., 2020), Singapore (Li et al., 2021), Iran (Salari et al., 2020), Italy (Di Tella et al., 2020), Belgium (Vanhaecht et al., 2021), or the United States (Nguyen et al., 2021) with similar results to those obtained in these Spanish regions for EMS personnel in terms of the impact on mental health. Most of these studies consider the occupational status of workers; however, the perspective of the mode of work during the pandemic, as far as is known from the literature search, has not been assessed in previous studies.

The self-efficacy of HPs during the pandemic has depended, to a large extent, on the coping strategies or ability to adapt to the adversities encountered (Labrague, 2021). The strategies most

commonly by EMS workers were faith understood as religious sentiment, health vocation associated with altruism at work, empathy with the person in need of help, avoiding consulting the media reporting on the evolution of the pandemic and trying to think that they were working in an emergency similar to other situations experienced in the workplace (Munawar & Choudhry, 2021; Nguyen et al., 2021).

2.4 | Work characteristics in EMSs during the COVID-19 pandemic

Long working hours due to a lack of staff, scarce material resources and uncertainty in the caregiving activities, which are not always well defined or protocolled, have led HPs to suffer fear of their contagion and the possibility of infecting their relatives, triggering emotional disorders in some cases. This group of problems includes stress, anxiety and depression (Preti et al., 2020; Wei et al., 2020).

The HPs of the Spanish EMSs have worked on the front line under stressful and traumatic situations. The workload they have had geared has been overwhelming. Sometimes they have been forced to isolate themselves socially and even from their own family to avoid the risk of contagion. In some cases, they have been stigmatized because of the nature of their work. Such studies are necessary to bring to light the need for support that these workers have in the face of such dramatic situations as the COVID-19 pandemic. Moreover, these needs do not finish after the end of the acute phase of the pandemic, but have long-term effects. Determining what kind of health problems these people have suffered from is essential to mitigate the impact on their mental health. Knowledge of the problem also makes it possible to implement the preventive measures to avoid the development of mental pathologies and their chronicity.

3 | THE STUDY

3.1 | Objectives

The overall objective of the study was to analyse the influence of the COVID-19 pandemic in terms of stress, anxiety and depression and the perception of self-efficacy in the HPs of Spanish out-of-hospital EMSs, according to the main work modality they performed during the first and second waves of the pandemic.

3.2 | Design

A cross-sectional descriptive and analytical quantitative study was used through a self-administered online survey lasting approximately 15 min, developed on the e-Encuesta® platform.

The sample was approached through the Prehospital Emergency Research Network (RINVEREM) of the Spanish Society of Emergency Medicine (SEMES), to which the researchers belong. This scientific

society contacted the EMS directors of the 17 Spanish Autonomous Communities and the cities of Ceuta and Melilla, who distributed the survey to their staff through their work e-mail platforms. Non-random and convenience sampling was used because the geographical dispersion and restrictions imposed by the pandemic did not allow personal access to the population, opting for an online survey through volunteers.

3.3 | Participants

The study population consisted of EMS personnel from any Autonomous Community in Spain.

The criteria for inclusion in the study were to be a professional assigned to an EMS during the period from 1 February to 30 April 2021 (after the second wave of the COVID-19 pandemic in Spain), to be actively working at that time and voluntarily wish to participate in the study. Participants who did not complete the entire survey were excluded from the study, of which there were 17 respondents.

The sample consisted of 1710 HP from the EMS in Spain. The power estimate indicated a sample size of at least 1066 subjects to achieve a precision of 3.0% and a confidence level of 95%, with an attrition rate of 15%.

3.4 | Measures and instruments used

The main study variables were depression, anxiety, stress and self-efficacy. The validated measurement instruments included in the study were the Depression Anxiety Stress Scale-Abbreviated Version (DASS-21) and the General Self-Efficacy Scale (AE'G).

The DASS-21 is a robust scale for assessing stress, anxiety and depression. The original version consisted of 42 items (Lovibond & Lovibond, 1995), although the measurement validity of the 21 items abridged version has shown to be adequate, as well as has been validated for the Spanish population by Baldos et al. (2005). These are the reasons why the latter version is used. It consists of 3 sub-scales, each of which is made up of 7 items. The subject rates the intensity or frequency with which he/she has experienced different negative emotional symptoms during the previous week, using a Likert scale from 0 (Never) to 3 (Always). The total score in each sub-scale ranges from 0 to 42 as the score is multiplied by 2.

This instrument classifies severity into five groups: normal, mild, moderate, severe and extremely severe (Table 1). The reliability of the questionnaire assessed through internal consistency with Cronbach's alpha ranges from 0.71 to 0.88 (Rodríguez-Fernández et al., 2021; Soto-Cámara et al., 2021) and ensures that it is a valid instrument.

Stress, anxiety and depression were studied in a categorized manner (normal, mild, moderate, severe and extremely severe) and grouped (Group 1: normal, mild and moderate; Group 2: severe and extremely severe).

The General Self-Efficacy Scale (G-SES) is a short questionnaire (10 items) adapted and validated for the Spanish population (Baessler & Schwarzer, 1996). The person evaluates his or her self-efficacy on a 10-point Likert-type scale, from 1 (Never) to 10 (Always). The scale ranges from 1 to 100 points, with higher scores indicating higher perceived self-efficacy. The instrument shows a relevant predictive ability, with a Cronbach's alpha between 0.79 and 0.93 (Sanjuán Suárez et al., 2000; Schwarzer & Baessler, 1996). It can be applied to studies on performance, health and various emotions, because of its relationship with these variables.

The secondary variables were collected through an ad hoc questionnaire, which asked about sociodemographic aspects (Autonomous Community, age, sex, professional experience, occupational category and type of work), work aspects (main work, changes in working conditions and work adaptation) and factors related to exposure to SARS-CoV-2 (COVID-19 diagnosis and hospitalization for the COVID-19 pandemic).

3.5 | Ethical considerations

The study was approved by the Ethics and Medicines Research Committee of the Valladolid East Health Area in Spain (Registration PI20-2052). The study complied with the postulates of the Organic Law 3/2018, of 5 December, on Personal Data Protection and Guarantee of Digital Rights (Government of Spain, 2018). The tenets of the Declaration of Helsinki and its subsequent revisions were also respected. Participants were informed of the purpose of the research and any doubts that arose before completing the questionnaire were resolved via an email address of the IMPSYCOVID19-RINVEMER group. In all cases, the anonymity and confidentiality of the data were maintained, and they were not passed on to third parties. Participants could withdraw from the study at any time.

TABLE 1 Categorization of the DASS 21 sub-scales based on the score obtained in them.

	Z-score	Percentile	Depression	Anxiety	Stress
Normal	<0.5	0–78	0–9	0–7	0–14
Mild	0.5–1.0	78–87	10–13	8–9	15–18
Moderate	1.0–2.0	87–95	14–20	10–14	19–25
Severe	2.0–3.0	95–98	21–27	15–19	26–33
Extremely severe	>3.0	98–100	28+	20+	34+

3.6 | Data analysis

Data analysis was performed using the statistical package SPSS® v26.0 (IBM-Inc). Qualitative data were measured as absolute values (n) and percentages (%) and continuous values were expressed as mean (m) and standard deviation (SD). The Kolmogorov–Smirnov test was used to examine the normality of quantitative variables. The homoscedasticity of the sample was tested using Levene's test. Bivariate analysis was carried out using the Mann–Whitney U -test, Pearson's Chi-square and Fisher test depending on the type of variables studied. Forward stepwise multiple logistic regressions were also performed for severe or extremely severe stress, anxiety or depression, adjusting the models for the work mode. In these cases, the ROC curve was calculated in each model to test the null hypothesis. For the total score of self-efficacy, a linear regression was performed, confirmed by a descriptive analysis, histogram with normality curve and the P–P plot with the standardized residuals. Finally, a modulation analysis was performed in which X is the level of self-efficacy, Y_1 is the total score of the stress sub-scale, Y_2 is the total score of the anxiety sub-scale and Y_3 is the total score of the depression sub-scale. This statistical inference analysis was performed based on bootstrapping, as it does not limit the study by assumptions of normality and allows resampling up to 10,000 times. The level of statistical significance used was $p \leq .05$ in all cases.

3.7 | Validity, reliability and rigour

The research followed the guidelines of the EQUATOR Initiative for quantitative descriptive observational studies, specifically those included in the STROBE Initiative (Strengthening the Reporting of Observational Studies in Epidemiology) (Vandenbroucke et al., 2009). Variables obtained mainly from validated instruments were analysed. The research was based on bibliographic support with scientific evidence. The reliability of the scales in this study measured by Cronbach's alpha in this study was 0.95 for the DASS-21 instrument and 0.94 for the G-SES scale.

4 | RESULTS

The sample consisted of 1710 HP from all SEMs over Spain, with a higher representation from the Autonomous Communities of Castilla y León (14.8%) and Catalonia (12.9%). The mean age of the participants was 43.5 (SD=9.9) years, with a homogeneous gender distribution (49.3% men vs. 50.4% women). The majority of the sample were EMT (43.2%). 86.2% provided frontline care. The mean time of working in an out-of-hospital EMS was 15.2 (SD=9.1) years. 23.3% of the HPs had to modify their usual place of work; 35.9% had to change their working time or working hours; and 22.3% had to work in different unit than their usual one. Changes in working conditions were observed in 53.8%, while a job adaptation by the Occupational Health Service during the SARS-CoV-2 pandemic occurred in 79.6%.

93.7% of the HPs underwent a screening test to detect a possible SARS-CoV-2 infection and 20.5% were diagnosed with COVID-19, requiring hospitalization in 1.9% of the positive cases. The distribution of variables in the sample based on the type of job position is shown in Table 2.

For the stress, anxiety, depression and self-efficacy, the mean scores for the whole sample were 20.6 (SD=11.0), 15.74 (SD=11.1), 13.07 (SD=11.7) and 70.87 (SD=5.7), respectively.

Stress, anxiety and depression were also analysed in five categories. Their frequencies and percentages are shown in Table 3.

The relationship between the mean scores for depression, anxiety, stress and self-efficacy, according to the job position held during the pandemic, was also examined. Statistically significant differences were observed for the level of stress and the direct assistance ($p=.026$), as well as the self-efficacy score and the direct assistance, too ($p=.032$).

Different logistic regression models were constructed for depression, anxiety and stress in the severe or extremely severe patient groups. Age, female sex, professional experience, direct patient care, variation in working hours and job suitability by the occupational health service were the variables included in the analysis. These variables were entered into the model because they reached a significance ≤ 0.05 or they were considered confounding factors. However, work experience did not reach sufficient significance to be included in the models for depression, anxiety and stress and the direct care assistance in the case of anxiety. In the first three models, the most influential variable was female sex as its odds ratio (OR) was the furthest from the value 1. The results are summarized in Table 4.

A multivariate linear regression model was fitted for self-efficacy, whose results are shown in Table 5. Variables with a significance ≤ 0.05 and confounding factors were included in the model. These variables were age, gender, work experience, type of work, the increase in the number of hours in the working day and the change in job position by the Occupational Health Service. In this case, being a woman and the absence of changes in working conditions could explain the self-efficacy score on the measurement scale. Women who work in out-of-hospital settings tend to score low on the survey, which is related to lower self-efficacy. Those who have not had to modify their working environment changed have higher scores on the scale and, therefore, higher self-efficacy.

Finally, moderation analyses were carried out in three models. In each case the moderating variable W is the modality of direct assistance, the X variable is always the level of self-efficacy, the Y_1 variable is the global score in the stress sub-scale, the Y_2 total result in the anxiety sub-scale and the Y_3 global score in the depression sub-scale (Figure 1).

The power in this analysis was higher than the previous regressions, establishing how self-efficacy could influence the mental health of the out-of-hospital EMS HPs who carried out care activities with patients (Table 6).

In all cases, direct assistance variables acted as a modulating factor between the self-efficacy and mental health. In the direct

TABLE 2 Description of the distribution of the sample according to the job position (care, call centre and management).

	Care modality (n = 1475)			Call centre modality (n = 232)			Management modality (n = 64)		
	NO	YES	p-value	NO	YES	p-value	NO	YES	p-value
Age ^a	44 ± 17	44 ± 17	.374	44 ± 13	43 ± 18	.776	44 ± 14	47.5 ± 15	.005*
Gender: Female ^b	768 (52.1)	705 (47.9)	<.001**	84 (36.5)	146 (63.5)	<.001**	37 (58.7)	26 (41.3)	.132
Professional experience ^a	13 ± 15	14 ± 15	.007**	15 ± 14	13 ± 16.8	.121	15 ± 15	20 ± 14.5	.004*
Category									
Physician ^b	1085 (73.6)	390 (26.4)	.906	34 (53.9)	98 (46.1)	<.001**	45 (70.3)	19 (29.7)	.555
Nurse ^b	1080 (73.2)	395 (26.8)	.030*	152 (65.5)	80 (34.5)	<.001**	50 (78.1)	14 (21.9)	.287
EMT ^b	790 (53.6)	685 (46.4)	<.001**	197 (84.9)	35 (15.1)	<.001	43 (68.2)	21 (31.8)	.087
ECC-manager ^c	1475 (100)	0 (0)	<.001**	217 (93.5)	15 (6.5)	<.001**	61 (95.3)	3 (4.7)	.027**
Job change: Place ^b	1153 (78.2)	322 (21.8)	<.001**	138 (59.5)	94 (40.5)	<.001**	36 (56.2)	28 (43.8)	<.001**
Job change: Day ^b	976 (66.2)	499 (33.8)	<.001**	95 (40.9)	137 (59.1)	.849	24 (37.5)	40 (62.5)	.019*
Job change: Type of resources ^b	1140 (77.3)	335 (22.7)	.375	179 (77.1)	53 (22.9)	.849	42 (65.6)	22 (34.4)	.019*
No job change ^b	714 (48.4)	761 (51.6)	<.001**	177 (76.3)	55 (23.7)	.001**	48 (75)	16 (25)	.001**
Job change due to occupational health ^b	1214 (82.3)	261 (17.7)	<.001**	142 (61.5)	89 (38.5)	<.001**	43 (67.2)	21 (32.8)	.011**

Note: Quantitative variables (the mean and standard deviation). Qualitative variables (the absolute frequency and percentage).

Abbreviations: EMT, Medical Emergency Technician; ECC, Emergency call center.

^aU de Mann–Whitney.

^bChi cuadrado de Pearson.

^cFisher's exact statistic.

* $p \leq .05$. ** $p \leq .001$.

assistance modality, the total score of stress, anxiety and depression depended on the level of self-efficacy.

5 | DISCUSSION

The analysed out-of-hospital EMS HPs have shown high levels of stress, anxiety and depression. However, the perception of their self-efficacy has not been low despite the pandemic. A degree of moderate stress, severe anxiety and mild depression have been determined in most cases. Similar studies conducted with HPs from EMSs or other health units have obtained results consistent with those observed in this study (Ilczak et al., 2021; Shechter et al., 2020; Vagni et al., 2020; Vatan et al., 2021).

Under the approach of the first specific objective and based on the results found in the study, there are factors associated with severe or extremely severe stress, anxiety and depression among the

workers of the Spanish out-of-hospital EMSs. In the case of stress and anxiety, the modality of direct patient care is one of these factors in the sample studied. Extremely severe anxiety is frankly worrying when all work modalities are considered together since more than a quarter of EMS workers suffer from it. Although extremely severe stress and depression show lower levels, they are also a cause for concern in HPs, as other authors have pointed out (Cao et al., 2020; Chigwedere et al., 2021; Firew et al., 2020).

As expected, the majority of the sample is made up of HPs from the Spanish out-of-hospital EMSs who have intervened in frontline care of patients infected with SARS-CoV-2. The total scores for stress and self-efficacy have reached a significant relationship with working directly with patients in care. Although this result is not found in the multivariate linear regression, the moderation analysis, which increases the sample by 10.000 times, is more reliable and allows this statement to be made (Anto & Su, 2023; Su et al., 2023). These scores indicate that mental health problems are more prevalent in the direct assistance modality. An et al., in a study carried out in EMS nursing in China, have found that the quality of life of HPs who work directly with patients affected by COVID-19 is significantly lower than those others who work in different care modalities, which supports the findings of this study (An et al., 2020). Another investigation carried out in 26 countries establishes that the levels of anxiety are higher among frontline direct assistance workers (Mascayano et al., 2022). The same result has been obtained in a study of physicians conducted by the American College of Emergency Physicians (ACEP) during the pandemic (Nguyen et al., 2021). Out-of-hospital nurses in New York (USA) report significant psychological distress

TABLE 3 Description of the distribution of the sample in categories of stress, anxiety and depression.

	Depression n (%)	Anxiety n (%)	Stress n (%)
Normal	569 (33.2)	657 (38.4)	554 (32.4)
Mild	194 (11.3)	119 (6.9)	202 (11.8)
Moderate	426 (24.9)	261 (15.2)	315 (18.4)
Severe	213 (12.4)	172 (10.0)	382 (22.3)
Extremely severe	308 (18.0)	501 (29.3)	257 (15.0)

TABLE 4 Logistic regression analysis of the depression, anxiety and stress variables in the severe and extremely severe group.

	Stress (severe and extremely severe)			Anxiety (severe and extremely severe)			Depression (severe and extremely severe)		
	OR	95%CI	p-value	OR	95%CI	p-value	OR	95%CI	p-value
Age	0.981	0.967–0.995	.010**	0.979	0.969–0.988	<.001**	0.981	0.967–0.995	.010**
Sex: Woman	1.580	1.286–1.941	<.001**	1.548	1.267–1.892	<.001**	1.580	1.286–1.941	<.001**
Professional experience	0.996	0.980–1.012	.608	0.892	0.977–1.007	.309	0.996	0.980–1.012	.608
Direct assistance with patients: Yes	0.739	0.549–0.994	.046*	1.208	0.894–1.633	.219	0.739	0.549–0.994	.046*
Work shift variation: Yes	1.267	1.027–1.562	.027*	1.232	1.001–1.517	.049*	1.267	1.027–1.562	.027*
Suitability of the job: Yes	1.311	1.023–1.682	.033*	1.397	1.092–1.787	.008**	1.311	1.023–1.682	.033*

Abbreviations: OR, Odds ratio; CI, Confidence interval.

** $p \leq .001$. * $p \leq .05$.

TABLE 5 Multivariate linear regression analysis of the self-efficacy variable.

	Self-efficacy			
	Coefficient	SE	95% CI	p-value
Sex: Woman	-1.976	0.765	(-3.475 to -0.476)	.010*
Direct assistance with patients: Yes	1.427	1.113	(-0.757 to 3.611)	.200
Modification of working conditions: No	1.517	0.762	0.022–3.012	.047*

Abbreviations: SE, standard error; CI, confidence interval.

* $p \leq .05$.

(Shechter et al., 2020). Depression is also significant in this group. A Spanish study by Trumello et al. have shown that one in seven HPs suffer from a disabling mental health disorder, including depression,

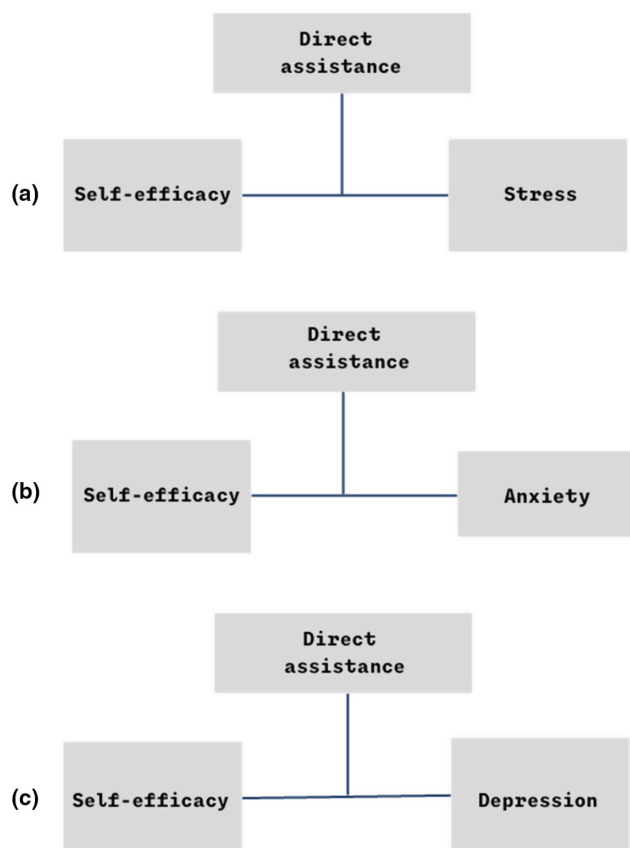


FIGURE 1 Moderation models (a, b and c) for the level of self-efficacy in total stress, anxiety and depression scores, according to the modality of direct assistance.

in the early stages of the pandemic. According to their findings, direct and frequent first-line assistance of COVID-19 patients leads to more mental health problems. This study conducted in Italy shows that direct assistance workers in services with a higher incidence of COVID-19, such as outpatient care, have higher rates of depression (Trumello et al., 2020).

The group of workers of the ECCs has not been studied as extensively as that of direct assistance, although some studies have lighted how these units have had to adapt to deal with the high volume of calls generated by the pandemic. In Canada, the number of calls was reduced (Vatan et al., 2021), but this is the exception to the rule of what has happened in the rest of the countries. In the capital of Denmark, Copenhagen, a specific telephone helpline was set up for the COVID-19 situation and an online triage system was created that was accessible to all citizens. In this way, it seems that the care pressure in these centres was less saturated of the Danish country (Jensen et al., 2020). No direct data were found to compare with those of this study in terms of stress, anxiety and depression in these workers, beyond the impact on mental health as a consequence of ECCs reorganization and the overload of telephone support (Simpson et al., 2022). These situations may be responsible for the worsening mental health of this group, but more researches are needed to prove it.

Regarding the management work, no studies have been found in the scientific literature with which to compare the results of this research. Significant changes have been performed in all EMSs during the pandemic, which are assumed to have been made by their managers, but there is no scientific evidence to confirm this. Cao et al. have documented a plan to restructure the healthcare system to adapt to the pandemic. These authors propose reducing the number of surgeries and training surgical staff in intensive care, recruiting medical residents to perform clinical tasks, integrating students in their final year of medicine studies into the Health System and proposing the

TABLE 6 Direct and indirect effects of self-efficacy of direct care workers on stress, anxiety and depression.

	β	SE	t	p-value	95%CI
(a) Self-efficacy level and total stress score					
DE: Self-efficacy level \rightarrow Total stress score	-0.221	0.017	-12.825	<.001**	(-0.254 to -0.187)
DE: Direct assistance \rightarrow Total stress score	4.751	3.499	1.357	.1748	(-2.113 to 11.615)
IE: Self-efficacy level \rightarrow Direct assistance \rightarrow Total stress score	-0.061	0.048	-1.253	.210	(-0.156 to 0.034)
(b) Self-efficacy level and the total anxiety score					
DE: Self-efficacy level \rightarrow Total anxiety score	-0.192	0.044	-4.399	<.001**	(-0.278 to -0.106)
DE: Direct assistance \rightarrow Total anxiety score	2.962	3.345	0.885	.376	(-3.598 to 9.523)
IE: Self-efficacy level \rightarrow Direct assistance \rightarrow Total anxiety score	-0.045	0.047	-0.968	.333	(-0.138 to 0.047)
(c) Self-efficacy level and the total score in depression					
DE: Self-efficacy Level \rightarrow Total depression score	-0.235	0.042	5.531	<.001**	(-0.319 to -0.152)
DE: Direct assistance \rightarrow Total depression score	2.125	3.259	0.652	.514	(-4.266 to 8.517)
IE: Self-efficacy level \rightarrow Direct assistance \rightarrow Total depresión score	-0.036	0.046	-0.778	.436	(-0.125 to 0.054)

Note: Sample size bootstrap for indirect effects.

Abbreviations: DE, direct effect; IE, indirect effect; SE, standard error; CI, confidence interval; β , non-standardized regression coefficient.

** $p < .001$.

active reintegration of recently retired staff (Cao et al., 2020). It is understandable that taking on the management of a pandemic must also be stressful and, therefore, have consequences for the HPs who work on this work modality. However, such a statement can only be made with the sample of this study since, as mentioned above, there is a lack of research on this modality.

The levels of severe or extremely severe stress among the HPs of the Spanish out-of-hospital EMS depend on some related factors. These are age, female gender, direct patient assistance modality, workplace changes and job adaptation. In the case of severe or extremely severe anxiety, aspects related to age, female sex, changes in the workplace and adaptation to the workplace are relevant. It is noteworthy that, in this case, direct assistance has not reached a statistical relationship, although extremely severe anxiety is the most suffered in the sample compared to stress and depression. For severe or extremely severe depression, there are relational factors such as age, female sex, modality of direct assistance to patients, changes in the workplace and the adaptation to the workplace. There are no known previous studies that estimate the levels of stress, anxiety and depression in EMS workers, taking into account the modality of work.

Among factors associated with lower scores on stress, anxiety and depression scales in the study sample, age is one of them. A systematic review of the literature has confirmed this aspect (Preti et al., 2020). The female sex has a greater tendency towards mental pathology in the sample. This result is supported by several authors (Firew et al., 2020; Ilczak et al., 2021; Usul et al., 2021). Instead, Elliott et al. find that the rates of mental health problems are invariant by sex (Elliott et al., 2021). Direct assistance to sick patients with COVID-19 has previously been discussed as a relevant factor for stress, anxiety and depression in EMS workers. Changes in working conditions to adapt to the increased demands during the pandemic have undoubtedly been a factor that generated higher stress, anxiety and depression. This result has also been found in a Polish study which identified the overworking of HPs as an indicator of stress (Ilczak et al., 2021). In this way, an American study has shown emotional exhaustion related to changes in the workday (Nguyen et al., 2021). In the United States, emotional exhaustion and psychological disturbances associated with an increase in working hours have been observed in HPs, which in turn is related to a greater risk of exposure to the virus and lower job satisfaction (Elliott et al., 2021). Requiring an adaptation of the job by the Occupational Health Service is also a generator of mental pathology among the participants of this study. Suffering from an illness makes HPs more susceptible to the severity of COVID-19, which is the reason why the job change, as pointed out by El Hage et al. (El-Hage et al., 2020). The time worked in EMSs is not a factor to consider in the sample. The study by Sanghera et al. shows different results from those found in this research, with those who worked the least time in EMSs being the most affected (Sanghera et al., 2020). The reason for this finding is unknown, but one possible explanation could be the need to obtain a Master's degree in Urgencies and Emergencies in Spain to be part of an EMS, which makes the HPs who work in them advanced

practice workers. This fact could reduce the likelihood of psychological pathology in those who have been in a Spanish EMS for less time. Further studies are needed to confirm this hypothesis.

To answer the second specific objective, it has sought to determine whether the self-efficacy of direct assistance HPs in Spanish EMSs has influenced the levels of stress, anxiety and depression. It has been found that self-efficacy acts as a modulating variable. The good perception of self-efficacy in all the care modalities in the sample is positively striking despite the high workload of trying to cope with SAR-CoV-2. Peñacoba et al. have found that HPs with better self-efficacy develop more resilience and enjoy a better quality of life (Peñacoba et al., 2021). This finding justifies the need to promote self-efficacy in EMSs as a protective factor against the deterioration of mental health in those who are at psychological risk, as pointed out by Llor Lozano et al. (2020). Within the training programmes for these workers, it would be appropriated to include the promotion of self-efficacy at work.

The findings obtained should be considered in light of their strengths and limitations. The main strength of this research lies in having studied a group of HPs who have not been included in previous studies as frequently as others, so their experience could be considered invisible until now. The validated surveys used, with good sensitivity and specificity, ensure the reliability of the results. The use of moderation analysis solves the problem that the sample does not follow a normal distribution, in addition to significantly improving the external validity of the study. As with any research, there are also some limitations. The most important of which is the low representation of EMS personnel from some Spanish Autonomous Communities. This fact has not excessively influenced the interpretation of the results because the global sample volume is adequate, although some geographical groups may be underrepresented. As the survey was conducted online, HPs who do not have access to work email may not have participated. Using a non-probabilistic sampling may have resulted in the participation of more HPs who are sensitized to the objective of the study. Finally, the scarce scientific literature about EMSs on HPs limits the comparability of the results with other studies. Similarly, broader analyses (moderation) can only be performed in the direct assistance modality because the sample in the other modalities is small.

Based on this research, future lines of work are suggested. It would be interesting to determine the mental health status of workers who have scored high on stress, anxiety and depression, as well as their self-efficacy after the pandemic. The in-deep knowledge of the experience of these people who work in the out-of-hospital environment can only be understood through a qualitative study. This line of research has already been developed and its results will be disseminated as soon as possible.

6 | CONCLUSIONS

The HPs of the Spanish out-of-hospital EMSs have shown a deterioration in their mental health, with moderate stress, severe anxiety

and mild depression after the second wave of the COVID-19 pandemic. Regarding self-efficacy, their perception was adequate.

The worst results in mental health were obtained in the work modality of direct assistance to patients, mainly in stress and self-efficacy.

The work modality of patient care was related to severe and extremely severe levels of stress and depression, along with other factors such as age, female sex, changes in the workplace to adapt to the needs of the pandemic and adaptation from the workplace by the Occupational Health Service.

The level of self-efficacy intervenes directly in the level of stress, anxiety and depression of the HPs of the out-of-patient Spanish EMSs, who have worked on the front line treating people infected by SARS-CoV-2 after the second wave of the pandemic.

Further studies are needed to determine whether the deterioration in the mental health of the HPs in the ECCs is due to the overload caused by the pandemic. Also, some contradictions with other authors can be clarified, such as the non-statistical significance of the time worked in the EMSs found in this study.

The need to pay attention to the mental health of HPs in the out-of-hospital EMSs is highlighted since disasters such as a pandemic may cause a deterioration of mental health, which can be prevented, detected early and avoided chronic fixations.

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The authors declare that there are no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

PEER REVIEW

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

OTHER STATEMENTS

The authors declare that the data used in the submitted manuscript have been legally acquired.

There is a statistician in the author team and state which author has been associated (Israel John Thuissard-Vasallo).

The authors affirm that the methods used in the data analyses are suitably applied to their data within their study design and context and the statistical findings have been implemented and interpreted correctly.

The authors agree to take responsibility for ensuring that the choice of statistical approach is appropriate and is conducted and interpreted correctly as a condition to submit to the Journal.

The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board of East Valladolid Health Area (PI-20-2052). Informed consent was obtained from all subjects involved in the study.

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