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PSYCHOPATHOLOGY IN SPANISH HEALTH PROFESSIONALS DURING THE COVID-19 PANDEMIC AND ASSOCIATED SOCIO-OCCUPATIONAL AND PSYCHOLOGICAL FACTORS

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Abstract

The objective of this study was to analyze the socio-occupational features, perceived stress, coping strategies and self-reported psychopathological symptoms of different groups of health professionals and the relationship among these variables during the Covid-19 pandemic. One hundred and thirty-five healthcare workers participated (medical staff, nursing staff and other health professionals), who obtained higher values than the normative data in the mean scores of perceived stress, phobic anxiety, and anxiety measures. The medical staff group showed a lower level of anxiety and somatization than the other group of healthcare professionals. Being a medical professional, having a lower level of perceived subjective stress, a greater proportion of active coping and lesser passive coping were significant predictors of fewer psychopathological symptoms. The description of a health professional profile with a lower risk of showing psychopathological symptoms can help identify healthcare groups with greater psychological vulnerability. The findings suggest specific psychological factors of interest to consider in interventions aimed at addressing the mental health needs of this population in the health context generated by Covid-19.
KEY WORDS*: Covid-19, health staff, mental health, psychopathology, stress.*

Resumen

El objetivo del estudio fue analizar las características sociolaborales, el estrés percibido, las estrategias de afrontamiento y la sintomatología psicopatológica de profesionales sanitarios y la relación entre ellas, durante la pandemia de Covid-19.

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Participaron 135 sanitarios (médicos, enfermeros y otros), quienes obtuvieron valores superiores a los datos normativos en las puntuaciones medias de las medidas de estrés percibido, ansiedad fóbica y ansiedad. El grupo de médicos mostró un nivel de ansiedad y somatización más bajo que el grupo formado por otros profesionales sanitarios. Ser profesional médico, tener un menor grado de estrés subjetivo percibido, más afrontamiento activo y menos afrontamiento pasivo eran predictores significativos de la presencia de menos síntomas psicopatológicos. La descripción del perfil del profesional sanitario español con un menor riesgo de mostrar sintomatología psicopatológica puede ser de utilidad para identificar a grupos de sanitarios con mayor vulnerabilidad psicológica. Los hallazgos sugieren factores psicológicos específicos de interés a considerar en las intervenciones destinadas al abordaje de las necesidades de salud mental de esta población en el contexto sanitario generado por la Covid-19.
PALABRAS CLAVE: *Covid-19, personal sanitario, salud mental, psicopatología, estrés.*

Introduction

The new coronavirus SARS-COV-2 (causing the Covid-19 disease) has posed a public health challenge at a global level for health professionals, which was unknown until now. Since the beginning of the pandemic in March 2020, this population has faced intense work stressors such as the increased risk of infection when directly intervening with Covid-19 patients, high workload and long working hours, lack of information and defined action protocols, shortage of personal protective equipment or reduction of social contact, among others (Brooks et al., 2020; Vieta et al., 2020; Wang et al., 2020; Xiang et al., 2020).

In addition to the features of healthcare workers, self-perceived stress (defined as the degree of uncontrollability and unpredictability that each person perceives about the situations and demands of their environment) can also be an important factor of work stress (Karlson et al., 2011; Takai et al., 2004). In general, workers with higher levels of self-perceived stress report more somatic complaints, higher levels of depression and anxiety, chronic stress and an imbalance between effort and reward, the latter as an indicator of work stress (Limm et al., 2010). In the context of healthcare staff working in intensive care units, an increase in disorders such as burnout was detected after the exposure to stressful traumatic situations (life or death decisions, communication with relatives). This was associated with a reduction in the ability to launch coping strategies or with an increase of negative attitudes towards work, which manifested like symptoms of exhaustion related to anxiety, depression or physical pathologies, for example, cardiovascular problems (Burghi et al., 2014).

Feelings of loneliness, fear and uncertainty, as well as stress, anxiety and depression, are the psychopathological symptoms that were most frequently referred in the general population within the context of the Covid-19 pandemic (Torales et al., 2020; Ventriglio y Bellomo, 2020), while in healthcare professionals higher levels of depression, anxiety, psychological stress and insomnia were observed (Krishnamoorthy et al., 2020; Lai et al., 2020). Studies conducted in Asia

showed mild, moderate, and severe levels of anxiety incidence in the healthcare population (Chew et al., 2020; Huang et al., 2020; Wang et al., 2020). These results were also reported at a European level among health professionals from different countries (Spain, Italy, Turkey and the United Kingdom), where between 37-78% suffered from stress, 25-65% from depression and 20-72% from anxiety (Cipolotti et al., 2021; Dosil-Santamaría et al., 2021; Elbay et al., 2020; Giusti et al., 2020; Rossi et al., 2020).

Certain working and direct-contacting with Covid-19 variables are related to the emotional impact that healthcare professionals have experienced in this context of the health crisis. Working directly with patients infected with Covid-19 increases the prevalence of symptoms of insomnia, depression, anxiety, and stress (Danet et al., 2021; Dosil-Santamaría et al., 2021; Lai et al., 2020; Pappa et al., 2020; Shaukat et al., 2020), although some authors found that there are no differences in the level of stress and psychological distress between healthcare workers in Covid units and professionals working in facilities that did not care for these patients (Man et al., 2020). Long working hours and having contact with suffering and death individuals also worsen the emotional health of professionals (Brooks et al., 2020; Liu et al., 2020; Lu et al., 2020). When analyzing the emotional symptomatology according to the professional profile, the studies showed the existence of a greater presence of symptoms of anxiety and depression in nursing assistants, nursing staff and radiology health technicians compared to the groups of doctors (Alonso et al., 2021; Erquicia et al., 2020; Huang et al., 2020; Lai et al., 2020; Luceño-Moreno et al., 2020).

Coping strategies used by healthcare professionals are another variable that can influence the psychopathological status. Depending on the situation, some of them may be more useful than others, promoting states of psychological well-being and health (McEwen, 1998). Thus, direct coping (focused on the problem) has beneficial effects, especially in stressful conditions where one perceives to be in control of the situation. In contrast, long-term avoidant coping strategies are ineffective when individuals try to manage major life events (Ben-Zur et al., 2012; Campos et al., 2004). During the Covid-19 pandemic, international research showed that active coping (such as the practice of physical activities or individual and group psychological support) and focusing on and positively interpreting the situation are the coping strategies mostly used by healthcare personnel to reduce stress and anxiety and depression symptomatology (Cipolotti et al., 2021; Man et al., 2020; Shechter et al., 2020).

In this health crisis, it is interesting to study the mental state of different categories of health professionals in Spain and to determine which factors may have a greater impact on their psychological discomfort. In this sense, the need to address the study of several psychopathological symptomatology in Spanish healthcare workers is evident, since the performed studies examine different groups of healthcare professionals and mainly analyze anxiety-depressive symptomatology and perceived psychological distress (Alonso et al., 2021; Erquicia et al., 2020; Luceño-Moreno et al., 2020; Martín et al., 2021; Rodríguez-Menéndez et al., 2021;

Sánchez-Sánchez et al., 2021). In addition, it is necessary to integrate into this analysis of the psychopathological state different psychological variables (such as the coping style and the stress perceived by health workers) to which less empirical attention was paid (Alonso et al., 2021; Erquicia et al., 2020; Luceño-Moreno et al., 2020; Martín et al., 2021; Rodríguez-Menéndez et al., 2021; Sánchez-Sánchez et al., 2021). Moreover, when these variables were analyzed together in different categories of healthcare professionals, studies did not fully explored the psychometric level, being evaluated through modified versions of validated instruments (selecting only some of their items) or using *ad hoc* questions (Cabedo et al., 2022; Romero et al., 2022).

The objectives of this study were: 1) to analyze the differences in socio-occupational characteristics, perceived stress, coping strategies and psychopathological symptomatology of the three groups of health professionals (medical staff, nurses and other health professionals) during the Covid-19 pandemic and 2) to examine the relationship between the type of healthcare professionals and self-reported psychopathological symptomatology during the Covid-19 pandemic, covarying by sociodemographic and socio-occupational factors, perceived stress, and types of coping strategies. We hypothesized that 1) the group of medical professionals would have significantly lower perceived stress, active coping strategies and less psychopathological symptomatology than the rest of the health professionals and 2) there would be a significant relationship between the type of healthcare professionals and the intensity of the reported psychopathological symptomatology.

Method

Participants

The initial number of individuals who agreed to participate in the study was 141, selected through a non-probabilistic incidental sampling. As an exclusive inclusion criterion, the participants to be health workers from any municipality in Spain when completing the evaluation instruments. Presenting incomplete data in any variable was considered the sole exclusion criterion. Six participants were dropped out from the study after having reported incomplete data in some of the measures, leaving a final sample with 135 participants, of whom 119 were women (88.1%) and 16 men (11.9%). Participant's mean age was 43.73 years (*SD*= 10.8; range 18-67 years). Mean years of working experience was 18.59 (*SD*= 11.00) in the whole sample. Regarding the professional category, 38.5% (*n*= 52) of the sample were healthcare professionals from the nursing group, 34.8% (*n*= 47) were medical professionals, and 26.7% (*n*= 36) were participants belonging to the group of other health professionals.

Instruments

a) *Ad hoc* survey related to sociodemographic variables. Through this survey, was collected information on different sociodemographic variables (gender and age), work activity and contact with the Covid-19 disease (type of health profession, years of work experience, number of health centers where participants worked at, availability of protection measures against Covid-19, Covid-19 infected family members, isolation due to Covid-19, presence of a deceased within their relatives due to Covid-19, showing concern about the infection of family members and being receiving psychological treatment).
b) *Coping Orientation to Problems Experienced* (COPE-28; Carver, 1997), Spanish version by Morán et al. (2010). The COPE-28 assessed coping strategies in stressful situations. This questionnaire consists of 28 items in which the different responses are included on a Likert-type scale with four alternatives (ranging from 0= "Not at all" to 3= "Very much"). It has 14 subscales, each one composed of two items that are integrated into two coping styles: active coping style (which encompasses the subscales of active coping, planning, instrumental support, use of emotional support, positive reinterpretation, acceptance, and humor) and passive coping style (which includes the self-distraction, venting, behavioral disengagement, denial, religion, substance use, and self-blame subscales). A higher score indicates greater use of the coping style. Regarding the instrument's reliability, the ranges of Cronbach's alpha values for the different subscales were between .50 - .90 (Morán et al., 2010).
c) *Symptom Assessment-45 Questionnaire* (SA-45; Davison et al., 1997), Spanish version by Sandín et al. (2008). The SA-45 was applied to examine general psychopathology. It is a self-administered questionnaire that includes a total of 45 items. It provides a general psychopathology score and nine symptom dimensions measures (obsession-compulsion, interpersonal sensitivity, hostility, anxiety, somatization, paranoid ideation, phobic anxiety, psychoticism and depression) ordered in groups of 5 items. Each of the items is scored on a Likert scale from 0 ("Not at all") to 4 ("Very much or extremely"). The total score varies from 0 to 180 points, while the scores of the dimensions ranges from 0-20 points. A higher score in the different subscales and the total score of the SA-45 reflect a higher level of psychopathological symptomatology. At the psychometric level, in the version used in this study, Cronbach's alpha values for the different dimensions ranged between .63 - .85, and it was .95 for the total measure (Sandín et al., 2008).
d) *Perceived Stress Scale* (PSS-14; Cohen et al., 1983), Spanish version by Remor y Carrobles (2001). This self-report estimates the degree to which, during the last month, people have felt that they control life circumstances or, on the contrary, are overwhelmed by them. It consists of 14 items with a Likert-type response format of five alternatives (0= "Never", 1= "Hardly Ever", 2= "Sometimes", 3= "Almost always", 4= "Always"). The scale scores range from 0-56, with higher

scores indicating greater perceived stress. In the version used in this study, the value of Cronbach's alpha was .67 (Remor y Carrobles, 2001).

Procedure

A simple retrospective *ex post facto* study was conducted on adult healthcare professionals. Data collection began on June 11th, 2020, and ended on July 31st, 2020. Participation was requested through an online form made with Google Forms. This form comprised the abovementioned instruments (*ad hoc* survey, COPE-28, SA-45 and PSS-14). We administered the form using social networks, email, cellphone messaging applications and through official professional associations webpages. In this form, the participants were informed of the purpose of the research and the voluntary nature of their participation, following the principles of the Declaration of Helsinki and subsequent amendments (Goodyear et al., 2007). This document also offered a reference contact so they could submit questions related to the study and to the assessment measures. Accepting the conditions reflected in the informed consent was a requirement to have access to the forms and be able to fill them out. The International University of La Rioja Research Ethics Committee approved the study(code PI-012/2020).

Data analysis

The mean and standard deviation were used to describe the quantitative variables and the frequency and percentages for the qualitative variables. The quantitative variables of psychopathology and perceived stress were assessed using Z scores, taking as a reference the normative data collected in the studies on the psychometric properties of the SA-45 and PSS-14 instruments in the Spanish population (Remor y Carrobles, 2001; Sandín et al., 2008). These Z-scores indicate the number of standard deviations away from a given score from the population mean.

Concerning the quantitative variables, their adjustment to the normal distribution was analyzed using the Kolmogorov-Smirnov statistic. In the first instance, comparisons between groups were determined using non-parametric tests (specifically, the Kruskal-Wallis test with post-hoc analysis using the Mann-Whitney U statistic, using the Eta squared value (η^2) to determine the effect size). However, after confirming that the Quade test (Conover, 1999) could not be applied to this sample as it needed to meet the requirement of homogeneity in the distribution of the covariates (in this case, it was not met for the covariate of sex), we decided to use normality test for performing the analysis of covariance (ANCOVA) and regression (linear regression model) given that the sample size is greater than 100 and both statistics are robust in situations including sample heterogeneity (Olejnik y Algina, 1984). The sample was divided into three groups based on the health profession of the participants: 1) medical professionals or group of doctors, 2) nursing professionals or group of nurses, and 3) other health professionals (including

in this group: physiotherapists, nursing assistants, psychologists, geriatricians, emergency technicians and occupational therapists). Qualitative variables were compared using the chi-squared test (χ^2).

Finally, using different multiple linear regression models, we examined the influence of sociodemographic, work and perceived stress variables and coping style on the level of self-reported psychopathology symptomatology by health professionals during the Covid-19 pandemic. The information was analyzed using the statistical package SPSS (version 22) for Windows.

Results

Sociodemographic, occupational and clinical characteristics of health professionals

Table 1 shows the results of the comparisons in the sociodemographic, work and contact with Covid-19 variables examined based on professional category. Significant differences were found between the professional groups in the variables of gender and availability of protective measures against Covid-19. About the distribution of gender in the different groups, we observed that men represented a small percentage in the nursing groups (5.8%) and in the other health professionals group (5.6%) compared to the frequency observed in the category of medical staff (23.4%). Nursing (34.6%) and other health professionals (27.8%) groups reported to a lesser extent absence of protection measures against Covid-19 compared to the medical staff (48.9%).

On the other hand, significant differences were obtained between the professional groups in terms of age and years of working experience. In the post-hoc comparisons, significant age differences were obtained between the group of medical staff and the groups of nursing (U= 560.50, $p \leq .001$, $\eta^2 = .16$) and other health professionals (U= 290, $p \leq .001$, $\eta^2 = .19$). Similarly, significant differences were also found in the years of working experience between the medical professionals and the groups of nursing (U= 741, $p = .001$, $\eta^2 = .08$) and between medical professionals and other health professionals (U= 334, $p \leq .001$, $\eta^2 = .16$). The medical professionals were significantly older and had more years of experience than the rest of the analyzed groups.

Figure 1 shows the Z scores of the perceived stress and psychopathological symptomatology variables in the total sample of health professionals. There was a greater deviation from the population mean (which ranged between 0.70 and 0.97 standard deviation units) in the scores of perceived stress, phobic anxiety and anxiety. There were differences of lesser magnitude in the rest of the psychopathological dimensions, ranging from -0.31 to 0.36 units of deviation from the mean of the normative group.

Table 1

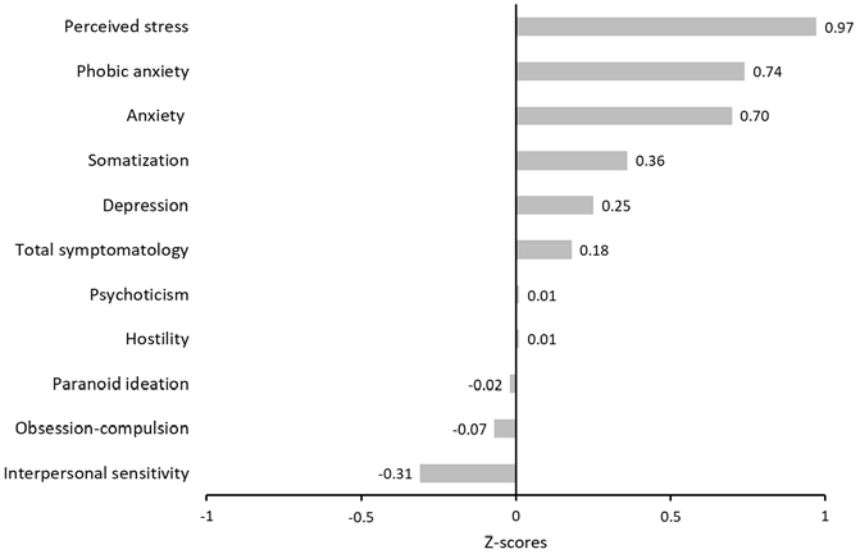
Analysis of the sociodemographic, work and disease-related variables according to the professional category

Variables		Medical professionals (*N*= 47)	Nursing professionals (*N*= 52)	Other health professionals (*N*= 36)	H/χ^2	*p*
		M (*SD*)	*M* (*SD*)	*M* (*SD*)		
Age		50.85 (8.29)	40.38 (11.15)	39.28 (8.79)	31.94	≤ .001**
Years of working experience		24.36 (9.38)	17.04 (11.50)	13.28 (8.80)	23.25	≤ .001**
		n (%)	*n* (%)	*n* (%)		
Gender	Woman	36 (76.6)	49 (94.2)	34 (94.4)	7.13	≤ .01*
	Men	11 (23.4)	3 (5.8)	2 (5.6)		
Working activity in more than one health center:	Yes	11 (23.4)	6 (11.5)	7 (19.4)	0.41	.52
	No	36 (76.6)	46 (88.5)	29 (80.6)		
Availability of protective measures against Covid-19	Yes	24 (51.1)	34 (65.4)	26 (72.2)	8.06	≤ .01*
	No	23 (48.9)	18 (34.6)	10 (27.8)		
Relatives infected with Covid-19	Yes	15 (31.9)	18 (34.6)	11 (30.6)	0.01	.93
	No	32 (68.9)	34 (65.4)	25 (69.4)		
Isolation or separation due to Covid-19	Yes	20 (42.6)	25 (48.1)	12 (33.3)	0.49	.48
	No	27 (57.4)	27 (51.9)	24 (66.7)		
Deaths in their environment by Covid-19	Yes	11 (23.4)	11 (21.2)	8 (22.2)	0.02	.87
	No	36 (76.6)	41 (78,8)	28 (77.8)		
Concern about infection in relatives	Yes	42 (89.4)	51 (98.1)	32 (88.9)	0.02	.88
	No	5 (10.6)	1 (1.9)	4 (11.1)		
Receive psychological treatment:	Yes	3 (6.4)	4 (7.7)	1 (2.8)	0.36	.54
	No	44 (93.6)	48 (92.3)	35 (97.2)		

Notes: H= Kruskal-Wallis test; *$p \leq .01$; **$p \leq .001$.

Figure 1

Z-score values for perceived stress and the different dimensions of psychopathological symptoms examined in the total sample of health professionals



As shown in Table 2, when comparing the scores on the different psychological measures according to the professional category, significant differences were obtained between health professionals in the dimensions of somatization and anxiety. However, only the differences in somatization remained after including the covariates age, gender, years of experience, and availability of protective measures against Covid-19.

The simple effect analysis only found differences in somatization and anxiety between the groups of medical staff and other professionals without including the covariates. Medical professionals had a significantly lower score in somatization (U= 580.50, p= .014, η^2= .04) and in anxiety (U= 564.50, p= .009, η^2= .05) than the group comprised of other health professionals. In the covariate model, the same direction of the differences was maintained, with the group of medical professionals obtaining significantly lower scores in somatization than the group of other health professionals (t= -1.01, p= .006) (Table 2). *Post-hoc* analyzes performed on these psychopathological measures between the categories of medical and nursing professionals and between the group of nurses and other professionals did not report significant results, regardless of the inclusion of covariates.

Table 2
Comparisons of clinical variables based on the professional category

Variables	Medical professionals (n= 47)	Nursing professionals (n= 52)	Other health professionals (n= 36)	Kruskal-Wallis		ANCOVA[1]		
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*H*	*p*	*F*	*p*	η^2
Perceived stress	0.97 (0.68)	0.92 (0.75)	1.05 (0.77)	0.13	.93	0.34	.71	.01
Active coping	24.34 (6.93)	23.80 (7.60)	25.25 (6.09)	0.88	.64	0.32	.72	.01
Passive coping	12.48 (6.93)	11.30 (6.33)	11.52 (5,41)	2.27	.32	1.86	.16	.03
Total symptomatology	-0.05 (1.00)	0.20 (1.30)	0.47 (1.16)	4.72	.09	1.49	.23	.02
Hostility	-0.01 (0.72)	-0.01 (0.08)	0.04 (1.10)	0.48	.78	0.44	.64	.01
Somatization	0,00 (1.12)	0.04 (1.33)	0.77 (1.46)	6.19	.04*	4.94	.01*	.07
Depression	0.07 (0.91)	0.26 (1.23)	0.45 (1.05)	2.91	.23	1.24	.29	.02
Obsession-compulsion	-0.24 (1.01)	-0.10 (1.30)	0.17 (1.02)	4.61	.10	1.10	.34	.02
Anxiety	0.43 (1.12)	0.67 (1.35)	1,08 (1.19)	6.59	.03*	2.46	.09	.04
Interpersonal sensitivity	-0.47 (0.77)	-0.36 (1.12)	-0.03 (1.11)	3.16	.20	1.67	.19	.02
Phobic anxiety	0.48 (1.55)	0.82 (1.55)	0.96 (1.96)	1.73	.42	0.36	.70	.01
Paranoid ideation	-0.15 (1.00)	-0.01 (1.21)	0.12 (1.22)	1.03	.59	0.40	.67	.01
Psychoticism	-0.22 (0.88)	0.21 (1.66)	0.01 (0.94)	2.31	.31	0.57	.56	.01

Notes: [1]The following covariates were included in the ANCOVA: age, gender, years of experience, and availability of protective measures against Covid-19. *$p \leq .05$.

Factors related to psychopathological symptoms

Table 3 shows the results of the multiple linear regression analyses and the variance percentages that can be explained in the psychopathological dimensions by the different socio-occupational and psychological variables analyzed.

Table 3

Multiple linear regression analyzing total score and the nine psychopathology dimensions of the SA-45 Scale according to the type of health professional, age, gender, years of experience, the existence of protective measures, active and passive coping, and perceived stress

Variables	*B*	*SE*	*t*	*p*	95% CI		R^2 (*F*)
					LL	UL	
Total symptomatology							
Healthcare professional type[1]	.38	.11	3.41	≤.001***	.16	.58	
Protection measures	.26	.16	1.60	.16	- .06	.58	
Perceived stress	.39	.12	3.08	.03*	.14	.63	
Active coping	-.04	.01	-3.49	≤.001***	-.07	-.02	49.2%
Passive coping	.12	.01	8.38	≤.001***	.10	.16	(15.26)***
Years of professional experience	.02	.01	1.05	.30	-.02	.53	
Age	-.01	.02	-.67	.55	-.04	.02	
Gender	-.07	.24	-.29	.77	-.55	.41	
Hostility							
Healthcare professional type	.02	.10	.21	.83	-.18	.22	
Protection measures	-.01	.15	-.05	.96	-.30	.28	
Perceived stress	.19	.11	1.71	.09	-.03	.42	
Active coping	-.26	.01	-2.30	0.02*	-.05	-.00	27.2%
Passive coping	.07	.01	5.40	≤.001***	.05	.10	(5.90)***
Years of professional experience	.01	.02	.56	.58	-.02	.04	
Age	-.02	.02	-1.14	.26	-.05	.01	
Gender	.18	.22	.81	.42	-.26	.62	
Somatization							
Healthcare professional type	.61	.14	4.37	≤.001***	.33	.89	
Protection measures	.07	.20	.35	.72	-.33	.47	
Perceived stress	.36	.16	2.32	.02*	.05	.67	
Active coping	-.03	.02	-2.10	.04*	-.06	-.00	38%
Passive coping	.10	.02	5.35	≤.001***	.06	.14	(9.65)***
Years of professional experience	.01	.02	.61	.54	-.03	.06	
Age	.02	.02	1.02	.31	-.02	.07	
Gender	-.46	.30	-1.50	.13	-1.06	.14	
Depression							
Healthcare professional type	.33	.12	2.73	.07	.09	.56	
Protection measures	.17	.17	1.02	.31	-.17	.52	
Perceived stress	.12	.13	.92	.36	-.14	.39	
Active coping	-.03	.01	-2.04	.04*	-.05	-.00	32%
Passive coping	.11	.02	6.52	≤.001***	.07	.14	(7.42)***
Years of professional experience	.02	.02	1.02	.31	-.02	.06	
Age	-.01	.02	-.47	.64	-.05	.03	
Gender	.04	.26	.16	.87	-.47	.56	
Obsession-compulsion							
Healthcare professional type	.30	.12	2.51	≤.01*	.06	.53	
Protection measures	.24	.17	1.43	.15	-.09	.58	
Perceived stress	.21	.13	1.60	.11	-.05	.48	
Active coping	-.03	.01	-2.40	.02*	-.06	-.01	39.3%
Passive coping	.12	.02	7.41	≤.001***	.09	.15	(10.20)***
Years of professional experience	.02	.02	1.00	.32	-.02	.05	
Age	-.02	.02	-.93	.36	-.05	.02	
Gender	.02	.26	.06	.95	-.50	.53	

Active coping	-.06	.01	-4.00	≤.001***	-.08	-.03	
Passive coping	.12	.02	6.88	≤.001***	.08	.15	
Years of professional experience	.03	.02	1.35	.18	-.01	.07	
Age	-.02	.02	-.96	.34	-.06	.02	
Gender	-.05	.28	-.17	.86	-.60	.50	
Interpersonal sensitivity							
Healthcare professional type	.31	.11	2.88	≤.01**	.09	.52	
Protection measures	.25	.15	1.67	.10	-.05	.56	
Perceived stress	.28	.12	2.37	.02*	.05	.52	
Active coping	-.04	.01	-3.13	≤.01**	-.06	-.01	40%
Passive coping	.10	.01	7.07	≤.001***	.07	.13	(10.49)***
Years of professional experience	.01	.02	.60	.55	-.02	.04	
Age	-.01	.02	-.50	.62	-.04	.02	
Gender	.03	.23	.12	.90	-.43	.49	
Phobic anxiety							
Healthcare professional type	.27	.20	1.37	.17	-.12	.67	
Protection measures	.27	.29	.95	.34	-.29	.84	
Perceived stress	.52	.22	2.31	.02*	.07	.96	
Active coping	-.05	.02	-2.27	.03*	-.09	-.01	20.6%
Passive coping	.09	.03	3.34	≤.001***	.04	.14	(4.08)***
Years of professional experience	.01	.03	.18	.85	-.06	.07	
Age	-.01	.03	-.09	.93	-.06	.06	
Gender	-.70	.43	-1.61	.11	-1.56	.16	
Paranoid ideation							
Healthcare professional type	.23	.12	1.87	.06	-.01	.48	
Protection measures	.28	.18	1.59	.11	-.07	.63	
Perceived stress	.38	.14	2.76	≤.01**	.11	.65	
Active coping	-.03	.01	-1.90	.06	-.05	.01	35%
Passive coping	.10	.02	6.05	≤.001***	.07	.13	(8.48)***
Years of professional experience	.02	.02	.90	.37	-.02	.06	
Age	-.02	.02	-.93	.36	-.06	.02	
Gender	.25	.27	.92	.36	-.28	.78	
Psychoticism							
Healthcare professional type	.15	.14	1.07	.29	-.12	.42	
Protection measures	.39	.20	1.97	.05*	-.01	.78	
Perceived stress	.48	.15	3.16	.02*	.18	.79	
Active coping	-.03	.01	-1.92	.06	-.06	.01	34%
Passive coping	.10	.02	5.36	≤.001***	.06	.14	(8.11)***
Years of professional experience	.01	.02	.30	.77	-.04	.05	
Age	-.02	.02	-.80	.42	-.06	.03	
Gender	-.03	.30	-.12	.91	-.63	.56	

Notes: [1]The reference group for the categorical variable type of health professional was the level "other health professionals". *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$.

As shown in Table 3, the professional category of the healthcare worker, the level of perceived stress, active coping and passive coping styles were the significant predictors of the total psychopathology score. The explanatory capacity of the model reached 49.2%. All these variables were positively associated with total symptomatology, except for active coping, whose relationship was inverse.

The previously described regression model is replicated in the psychopathological dimensions, with differences between the professional categories of medical staff and other health professionals, explaining 38% of the

variance in the somatization dimension and 42.2% in the anxiety level. Lastly, the variables professional category, perceived stress, active coping and passive coping were significant explanatory factors of other dimensions of general psychopathological manifestations examined in this study, as seen in Table 3.

Discussion

This study has sought to increase knowledge about the mental state of health professionals during the crisis generated by Covid-19, as well as to identify the factors that may be related to self-reported psychopathological symptoms by this population during the pandemic.

Based on the results found in the study, in this pandemic context, Spanish health professionals tend to present a higher degree of perceived subjective stress and a higher level of general symptoms of anxiety compared to the general reference population. Similarly, the scientific literature shows a higher prevalence of psychological problems (such as stress, insomnia, anxiety, depression and poor sleep quality) in health workers compared to the general population, both in the Covid-19 pandemic as well as in previous epidemics (Ji et al., 2017; Krishnamoorthy et al., 2020; Lee et al., 2018). Specifically and consistent with this study, a lower level of anxiety symptoms was observed in professionals with medical training compared to other health professionals (such as nursing assistants and radiology technicians) and nursing staff, which is consistent with previous data (Alonso et al., 2021; Erquicia et al., 2020; Huang et al., 2020; Lai et al., 2020; Luceño-Moreno et al., 2020; Pappa et al., 2020; Shaukat et al., 2020; Tay et al., 2020). The demanding and stressful working conditions that these professionals have been facing since the start of the pandemic (such as excessive workloads, lack of logistic support, concern about infection in family members derived from their work, etc.) together with compliance with the general health measures indicated for the population as a whole, such as quarantine, state of alarm with movement restrictions, etc. (Brooks et al., 2020; Ministerio de la Presidencia, Relaciones con las Cortes y Memoria Democrática, 2020; Nussbaumer-Streit et al., 2020; Vieta et al., 2020; Wang et al., 2020; Xiang et al., 2020) could explain the high levels of observed anxiety. However, the analyses showed that when the gender variable was included in the between-group comparisons, the differences in anxiety between health professionals were no longer significant. This suggests that we should interpret the differences in anxiety with caution since they seem to be mediated by the gender variable. A higher proportion of women could be one reason that could explain the observed results, given that anxious symptomatology is usually more prevalent in women than in men in the general population (Jalnapurkar et al., 2018; McLean et al., 2011).

On the other hand, the analyses of the different categories of Spanish health workers revealed statistically significant differences in the level of somatization symptoms depending on the professional group. Specifically, the group of medical professionals presented a lower symptomatic intensity in somatization than the participants that comprised the group of other health professionals (category

composed of physiotherapists, nursing assistants, psychologists, geriatricians, emergency technicians and occupational therapists). These results are consistent with a greater presence of somatic symptoms (such as headache, muscle pain, weakness, etc.) in health workers who, specifically, have a higher level of anxiety, depression and stress (Chew et al., 2020). Based on what was found in this research, these results could be explained by the greater experience of the group of medical staff in controlling procedures and stressful clinical situations. In this pandemic context, the lesser work experience of health workers was identified as a factor associated with higher levels of anxiety and depression in these professionals (Elbay et al., 2020; Luceño-Moreno et al., 2020).

Other study results showed that belonging to the professional category of physician, having a lower degree of perceived stress, more active coping, and less passive coping was related to fewer general psychopathological symptoms. This profile of health worker was also related to the presence of fewer symptoms of somatization and anxiety, which were the psychopathological measures in which the participants with medical training and the group of other health professionals differed significantly. These findings align with international studies which reported a significant relationship between higher levels of perceived stress and greater anxiety-depressive symptoms in the general population during the pandemic (Torales et al., 2020). They are also consistent with other research that reported the use of active coping by healthcare professionals (through strategies such as focus and positive interpretation and actions such as psychological support and physical activity) to reduce stress, anxiety and depression (Cipolotti et al., 2021; Man et al., 2020; Shechter et al., 2020). In addition, as the main strength of the work, these data provide new information that indicates the relevance of subjective stress and coping style in different groups of psychopathological symptoms of Spanish health workers during the coronavirus crisis. This study addresses comprehensively at psychometric level these psychological constructs that have received less empirical attention in previous research performed in different groups of Spanish health professionals during the pandemic (Alonso et al., 2021; Dosil-Santamaría et al., 2021; Erquicia et al., 2020; Luceño-Moreno et al., 2020; Martín et al., 2021; Rodríguez-Menéndez et al., 2021; Sánchez-Sánchez et al., 2021).

There are some limitations in this study that should be taken into consideration. The survey was carried out at the end of the first pandemic wave in Spain, so the continuous exposure to negative stimuli by health personnel, exhaustion, and the prospect of an imminent improvement may have had some impact on the results. At a methodological level, it should be considered, on the one hand, that the cross-sectional design of the research collects information only on the psychological state of health professionals at a specific moment in the development of the pandemic in Spain. On the other hand, it should be taken into account that the application of online instruments and a non-probabilistic sampling could determine a possible bias in the selection of participants, including only health professionals interested in the subject of the study or with adequate digital skills. Lastly, concerning the sample, the greater proportion of women in the different

groups could be considered a bias in the interpretation of the present results. However, the analyses were controlled by gender to address the differences in proportion between men and women. In most cases, we observed that differences were maintained after including all of the covariates (except for the case of the anxiety variable in the comparisons between groups). On the other hand, the heterogeneity of health professions included in the group of "other health professionals" and the limited sample size could condition the identification of other possible differences between professional categories or of other variables related to the psychopathological state.

In conclusion, the results of the present study suggest that medical professionals presented fewer psychopathological symptoms than the rest of the health professionals, specifically somatization and anxiety, during the Covid-19 pandemic. Besides, the professional category, the degree of perceived stress and the type of active coping are predictors of psychopathological symptoms in health staff. This study has relevant clinical implications related to identification of health professionals who are more vulnerable to presenting psychopathological disorders and who would benefit from the development and implementation of psychological intervention programs in health care centers, mainly aimed at preventing somatization and anxiety. In light of the study findings, it would be useful for these programs to include perceived stress management and the promotion of active coping styles against problems and crises, such as those arising from Covid-19.

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