Research

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Psychological impact of the COVID-19 pandemic on primary care workers:

a cross-sectional study

Abstract

Background
The COVID-19 pandemic has had a major impact on the mental health of healthcare workers, yet studies in primary care workers are scarce.

Aim
To investigate the prevalence of and associated factors for psychological distress in primary care workers during the first COVID-19 outbreak.

Design and setting
This was a multicentre, cross-sectional, web-based survey conducted in primary healthcare workers in Spain, between May and September 2020.

Method
Healthcare workers were invited to complete a survey to evaluate sociodemographic and work-related characteristics, COVID-19 infection status, exposure to patients with COVID-19, and resilience (using the Connor–Davidson Resilience Scale), in addition to being screened for common mental disorders (depression, anxiety disorders, post-traumatic stress disorder, panic attacks, and substance use disorder). Positive screening for any of these disorders was analysed globally using the term 'any current mental disorder'.

Results
A total of 2928 primary care professionals participated in the survey. Of them, 43.7% (95% confidence interval [CI] = 41.9 to 45.4) tested positive for a current mental disorder. Female sex (odds ratio [OR] 1.61, 95% CI = 1.25 to 2.06), having previous mental disorders (OR 2.58, 95% CI = 2.15 to 3.10), greater occupational exposure to patients with COVID-19 (OR 2.63, 95% CI = 1.98 to 3.51), having children or dependents (OR 1.35, 95% CI = 1.04 to 1.76 and OR 1.59, 95% CI = 1.20 to 2.11, respectively), or having an administrative job (OR 2.24, 95% CI = 1.66 to 3.03) were associated with a higher risk of any current mental disorder. Personal resilience was shown to be a protective factor.

Conclusion
Almost half of primary care workers showed significant psychological distress. Strategies to support the mental health of primary care workers are necessary, including designing psychological support and resilience-building interventions based on risk factors identified.

Keywords
COVID-19 pandemic; cross-sectional study; health personnel; mental health; primary health care; psychological resilience.

INTRODUCTION

The outbreak of the COVID-19 pandemic in March 2020 saturated the capacity of the Spanish healthcare system and forced organisational changes at all levels of care to adapt to the changing conditions.[1] There was an important and abrupt change in the working conditions of primary care staff to meet new requirements, with staff having to tolerate uncertainties, organisational shortcomings, and a shortage of protective equipment.[2] In Spain, primary care was responsible for the screening and diagnosis of patients with COVID-19, non-hospital treatment of most of the patients with COVID-19, and, in the initial moments of the collapse of the healthcare system, even complex home care for patients with COVID-19. Many primary care professionals took on occupational relocations and new tasks, such as working in nursing homes, COVID-19-specific field hospitals, and also relocations to hospital services.[3,4]

Overload and changes in working conditions, facing new and unfamiliar situations, lack of resources, fear of contagion, or fear of infecting family members generated significant stress in healthcare professionals. An increase in the prevalence of depression, anxiety, post-traumatic stress, drugs use, burnout, and increased risk of suicide have been described.[5–7] Importantly, the psychological distress affecting healthcare workers not only has an impact on their wellbeing, but also their professional performance, quality of care, and patient safety.[8] On the other hand, a sense of professional and civic responsibility has emerged in healthcare professionals,[9,10]

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How this fits in

In the context of the COVID-19 pandemic, a psychological impact on healthcare workers has been described, although studies in non-hospital settings are scarce. This study found that a high proportion of primary care workers (43.7%) had a current mental disorder. Female sex, having a history of previous mental disorders, greater work exposure to patients with COVID-19, having children or dependents, and certain professional positions were associated with greater risk. Personal resilience was shown to be a protective factor. Preventive and support interventions for the mental health of primary care workers are required.

and staff have shown resilience in the face of insecurity and difficulties.

Despite the abundant literature on this subject, few studies have specifically analysed the situation in primary care,[11–15] notwithstanding the repercussions for those working in these settings and the different characteristics and conditions compared with those reported in hospital settings. In addition, females constitute the largest group within healthcare professions and yet most studies on the psychological impact of the pandemic on healthcare workers rarely mention sex as a variable affecting the results and they have not provided disaggregated data.[16] This study therefore analysed the psychological distress experienced by primary care workers in the context of the COVID-19 pandemic, including a sex-disaggregated analysis.

The aim was to investigate psychological distress in Spanish primary care workers during the first COVID-19 outbreak period. Specifically, this study aimed to:

- estimate the prevalence of psychological distress by sex;
- evaluate the associations between psychological distress and sociodemographic, occupational, and health characteristics by sex; and
- explore the role of resilience as a protective factor.

METHOD
Design, population, and sampling
A multicentre, cross-sectional, web-based self-reported survey was conducted of Spanish healthcare workers between May and September of 2020 as part of the MINDCOVID-19 project.[17] All workers in each healthcare institution included were invited to participate using administrative email distribution lists (that is, census sampling) that generated invitations to participate in the study containing an anonymous link to access the survey. A detailed description of the methods and procedures can be found in a previous article.[6] The present study analysed the data obtained from professionals in the primary care settings of five autonomous communities in Spain (the Basque Country, Catalonia, Madrid, Castile and León, and Valencian Community). The staff in Spanish primary care centres comprise family doctors, paediatricians, dentists, nurses, auxiliary nurses, midwives, social workers, administrative staff, and other personnel.[18]

Measurements
Sociodemographic and occupational characteristics. The survey included personal characteristics such as sex, age, marital status, having dependent children, caring for an older person or someone with disabilities, and profession.

Mental disorders. The survey screened for the following mental disorders: major depressive disorder, evaluated with the eight-item Patient Health Questionnaire;[19,20] generalised anxiety disorder, evaluated with the seven-item Generalized Anxiety Disorder scale;[21,22] panic attacks, evaluated via an item from the World Mental Health-International College Student;[23,24] post-traumatic stress disorder (PTSD), evaluated with the PTSD Checklist for DSM-5;[25] and substance use disorder, evaluated via the CAGE-AID questionnaire.[26,27]

The main variable, the presence of psychological distress, was considered present when there was a current positive screening for any of the above-mentioned mental disorders.

Mental disorders before the onset of the COVID-19 outbreak were recorded using a self-reported checklist based on the Composite International Diagnostic Interview, including lifetime depressive disorder, bipolar disorder, anxiety disorder, panic attacks, alcohol and drug use disorders, and other mental disorders.[28,29]

COVID-19 exposure and infection status. Participants were questioned about having been infected with SARS-CoV-2 and whether or not admission to hospital was necessary. Additionally, the responders were asked if their close ones (partner, children, parents, other relatives, or close friends) had contracted COVID-19. Occupational exposure to patients with

COVID-19 was assessed using a five-level Likert scale (ranging from none of the time to all of the time).

Resilience. The 10-item Connor–Davidson Resilience Scale (CD-RISC-10)[30,31] is a self-administered questionnaire with items rated on a five-point Likert scale (from 0, completely disagree to 4, completely agree) so that higher total scores indicate greater resilience.

Ethical considerations
Before accessing the survey content, participants were informed about the objectives and procedures of the study, and their explicit consent for participation was obtained. The study was registered at ClinicalTrials.gov (reference: NCT04556565). As psychological distress could be revealed in the survey, participants were offered a list of local resources for mental health care.

Statistical analysis
Participants who completed all the mental health items were included in the analysis. Sociodemographic, occupational, and health characteristics were compared between responders with and without psychological distress (that is, participants with and without a positive screening for any current mental disorder). To explore resilience, these variables were compared between participants with a resilience score above and below the 25th percentile. Categorical variables were analysed using the χ^2-test, and the Mann–Whitney *U*-test was used for continuous variables.

A multivariable logistic regression model was estimated to assess potential factors associated with any current mental disorder. As the psychological impact of the pandemic can vary over time, the analyses were adjusted by the month of the response to the survey. A sex-stratified analysis was also conducted.

Statistical analyses were conducted using Stata (version 14). Statistical significance was set at *P*<0.05.

RESULTS
Response
A total of 3089 primary care professionals participated in the survey. Of these, 155 were excluded because of missing data in the questionnaires regarding mental health and six because of a lack of information on sex. Finally, 2928 participants were included in the statistical analysis.

The survey response rate was 12.5% in the main study when including all healthcare settings. The value for the primary care setting alone could not be calculated because the censuses of some of the participating centres include both primary care and hospital professionals.

Participant characteristics
Table 1 shows participant characteristics, COVID-19 exposure, and infection status, as well as lifetime mental disorders. Of the participating sample, 82.7% were female and the median age was 50 years (interquartile range 42–57). Most responders were physicians (47.9%), followed by nurses and auxiliary nurses (29.8%), and administrative staff (11.1%). Of all participants, 41.6% reported any lifetime mental disorder before the COVID-19 outbreak.

Prevalence of any current mental disorder
The global prevalence of a positive screening for any current mental disorder was 43.7% (95% confidence interval [CI] = 41.9 to 45.4). The prevalence was significantly lower for males (33.8%, 95% CI = 29.7 to 37.9) than for females (45.7%, 95% CI = 43.7 to 47.7) (data not shown).

Factors associated with any current mental disorder
Table 2 shows the associations between the characteristics of participants and a positive screening for any current mental disorder, stratified by sex. Statistically significant differences in age and profession were found. Caring for people was associated with a higher prevalence of a current mental disorder in females, but these differences were not significant among males. The presence of a lifetime mental health disorder was associated with a positive screening for any current mental disorder.

Resilience
Resilience was associated with sex, profession, and lifetime mental health disorders (Table 3). Lower resilience was observed in females, administrative staff, responders with former mental health disorders, and those who declared being treated for such disorders.

Models
Table 4 shows the multivariate analyses of the associations between any current mental disorder and the characteristics of the responders. Being aged 30–49 years, having children aged >12 years, caring for an older person or someone with disablities, being a nurse or auxiliary nurse, or administrative staff, and being exposed to patients with COVID-19 were associated

Table 1. Sociodemographic and occupational characteristics, COVID-19 exposure, infection status, and lifetime mental disorders in primary healthcare workers

Characteristic	Total ($n = 2928$),[a] n (%)	Male ($n = 506$),[a] n (%)	Female ($n = 2422$),[a] n (%)	P-value[b]
Age, years	2928	506	2422	<0.001
18–29	207 (7.1)	27 (5.3)	180 (7.4)	—
30–49	1185 (40.5)	166 (32.8)	1019 (42.1)	—
≥50	1536 (52.5)	313 (61.9)	1223 (50.5)	—
Marital status[c]	2923	505	2418	0.025
Single, divorced/separated, or widowed	1166 (39.9)	179 (35.4)	987 (40.8)	—
Married	1757 (60.1)	326 (64.6)	1431 (59.2)	—
Children in care[c]	2840	493	2347	0.068
Aged ≤12 years	752 (26.5)	110 (22.3)	642 (27.4)	—
Aged >12 years	516 (18.2)	93 (18.9)	423 (18.0)	—
None	1572 (55.4)	290 (58.8)	1282 (54.6)	—
Caring for older person or person with disabilities	2464	420	2044	0.003
Yes	336 (13.6)	38 (9.0)	298 (14.6)	—
No	2128 (86.4)	382 (91.0)	1746 (85.4)	—
Profession	2892	500	2392	<0.001
Physician	1384 (47.9)	298 (59.6)	1086 (45.4)	—
Nurse or auxiliary nurse	863 (29.8)	85 (17.0)	778 (32.5)	—
Administrative staff	322 (11.1)	54 (10.8)	268 (11.2)	—
Other staff involved in patient care	228 (7.9)	34 (6.8)	194 (8.1)	—
Other staff not involved in patient care	95 (3.3)	29 (5.8)	66 (2.8)	—
Frequency of direct exposure to patients with COVID-19	2846	496	2350	0.015
All/most of the time	1357 (47.7)	238 (48.0)	1119 (47.6)	—
Some of the time	1041 (36.6)	161 (32.5)	880 (37.4)	—
A little/none of the time	448 (15.7)	97 (19.6)	351 (14.9)	—
Close one infected with COVID-19	2926	506	2420	0.502
No	542 (18.5)	103 (20.4)	439 (18.1)	—
Close one infected, not family member	1721 (58.8)	292 (57.7)	1429 (59.0)	—
Family member infected	663 (22.7)	111 (21.9)	552 (22.8)	—
COVID-19 infection status	2923	505	2418	0.053
Admission to hospital	39 (1.3)	12 (2.4)	27 (1.1)	—
Test positive/diagnosed	548 (18.7)	101 (20.0)	447 (18.5)	—
None	2336 (79.9)	392 (77.6)	1944 (80.4)	—
Resilience score, CD-RISC-10, median (IQR)[c]	29.0 (25.0–33.0)	30.0 (26.0–35.0)	29.0 (24.0–33.0)	<0.001
Lifetime mental disorders before COVID-19 outbreak	2895	501	2394	0.070
Yes	1203 (41.6)	190 (37.9)	1013 (42.3)	
No	1692 (58.4)	311 (62.1)	1381 (57.7)	

[a]Unless stated otherwise. [b]Mann–Whitney U-test for continuous variables and χ^2-test for categorical variables. [c]Total, n = 2744; males, n = 485; and females, n = 2259.

CD-RISC-10 = 10-item Connor–Davidson Resilience Scale. Close one = partner, children, parents, other relatives, or close friends. IQR = interquartile range.

with a higher risk of mental disorder, both for the complete sample and in females alone. However, these associations were not present in males. Having a history of any lifetime mental disorder was associated with a higher risk of a current mental disorder. Resilience was shown to be a protective factor for any current mental disorder.

DISCUSSION
Summary
The outcomes of the present study show that a high proportion (43.7%) of primary care workers screened positive for any current mental disorder; the proportion being significantly higher in females than in males. Female sex, having a previous history of mental disorders, greater occupational exposure to patients with COVID-19, caring for children or dependents, or certain occupations were factors that were independently associated with an increased risk of having a mental disorder, whereas resilience was shown to be a protective factor.

Strengths and limitations
This study is particularly relevant because it evaluated the impact of the pandemic on

Table 2. Prevalence of positive screening for any current mental disorder according to the characteristics of primary care workers, disaggregated by sex

Characteristic	Total (n = 1278) n (%)[a]	P-value for χ^2	Male (n = 171) n (%)[a]	P-value for χ^2	Female (n = 1107) n (%)[a]	P-value for χ^2
Age, years		<0.001		0.003		<0.001
18–29	99 (47.8)	—	7 (25.9)	—	92 (51.1)	—
30–49	586 (49.5)	—	73 (44.0)	—	513 (50.3)	—
≥50	593 (38.6)	—	91 (29.1)	—	502 (41.0)	—
Marital status		0.04		0.085		0.18
Single, divorced/separated, or widow/er	537 (46.1)	—	69 (38.5)	—	468 (47.4)	—
Married	740 (42.1)	—	101 (31.0)	—	639 (44.7)	—
Children in care		0.02		0.628		0.03
Aged ≤12 years	362 (48.1)	—	40 (36.4)	—	322 (50.2)	—
Aged >12 years	222 (43.0)	—	28 (30.1)	—	194 (45.9)	—
None	659 (41.9)	—	100 (34.5)	—	559 (43.6)	—
Caring for older person or person with disabilities		0.003		0.62		0.009
Yes	170 (50.6)	—	13 (34.2)	—	157 (52.7)	—
No	894 (42.0)	—	116 (30.4)	—	778 (44.6)	—
Profession		<0.001		0.005		<0.001
Physician	544 (39.3)	—	84 (28.2)	—	460 (42.4)	—
Nurse or auxiliary nurse	403 (46.7)	—	34 (40.0)	—	369 (47.4)	—
Administrative staff	179 (55.6)	—	27 (50.0)	—	152 (56.7)	—
Other staff involved in patient care	90 (39.5)	—	11 (32.4)	—	79 (40.7)	—
Other staff NOT involving patient care	47 (49.5)	—	14 (48.3)	—	33 (50.0)	—
Frequency of direct exposure to patients with COVID-19		<0.001		0.33		<0.001
All/most of the time	665 (49.0)	—	88 (37.0)	—	577 (51.6)	—
Some of the time	436 (41.9)	—	48 (29.8)	—	388 (44.1)	—
A little/none of the time	145 (32.4)	—	33 (34.0)	—	112 (31.9)	—
Close one infected with COVID-19		0.35		0.47		0.12
No	241 (44.5)	—	30 (29.1)	—	211 (48.1)	—
Close one infected, not family member	763 (44.3)	—	100 (34.2)	—	663 (46.4)	—
Family member infected	273 (41.2)	—	41 (36.9)	—	232 (42.0)	—
COVID-19 infection status		0.06		0.18		0.14
Admission to hospital	24 (61.5)	—	7 (58.3)	—	17 (63.0)	—
Positive test/diagnosis	246 (44.9)	—	35 (34.7)	—	211 (47.2)	—
None	1007 (43.1)	—	129 (32.9)	—	878 (45.2)	—
Lifetime mental disorders before COVID-19 outbreak		<0.001		<0.001		<0.001
Yes	712 (59.2)	—	93 (48.9)	—	619 (61.1)	—
No	558 (33.0)	—	77 (24.8)	—	481 (34.8)	—

[a]Percentages calculated from responders for each cell in Table 1. Close one = partner, children, parents, other relatives, or close friends.

primary care professionals, whose work characteristics and pandemic-related experiences differ greatly from those of hospital workers, the latter being more widely studied in the scientific literature.[32] A strength of this study is that other professional profiles aside from doctors or nurses were included; previous studies have rarely included this data. This allowed confirmation of the significant psychological repercussions of the pandemic on administrative personnel.

When interpreting these results, it should be kept in mind that females represent 83% of the participants, which, far from constituting a bias, is a reflection of the reality of the healthcare work setting, where females are the vast majority in all professional categories in European health systems and, in particular, in the Spanish health system.[33,34] One of the strengths of the present analysis lies in the reporting of sex-disaggregated data.

This study has several limitations. First, participation was voluntary, which may have introduced a difficult-to-predict bias because of self-selection of participants in the survey.[35] This is especially important when the non-response rate is high, although this limitation is inherent to the methodology employed and is similar to other studies based on telematic surveys.[36] Second, in a cross-sectional study, causality cannot be inferred from the factors associated

Table 3. Associations of sociodemographic and job characteristics, and lifetime mental health disorders with resilience in primary healthcare workers

Characteristic	Resilience score, CD-RISC-10		
	Under 25th percentile (*n* = 660), *n* (%)	Over 25th percentile (*n* = 2084), *n* (%)	*P*-value[a]
Sex			0.003
Male	91 (18.8)	394 (81.2)	—
Female	569 (25.2)	1690 (74.8)	—
Age, years			0.23
18–29	49 (25.8)	141 (74.2)	—
30–49	285 (25.5)	834 (74.5)	—
≥50	326 (22.7)	1109 (77.3)	—
Marital status			0.99
Single, divorced/separated or widowed	262 (24.1)	826 (75.9)	—
Married	398 (24.1)	1254 (75.9)	—
Children in care			0.298
Aged ≤12 years	167 (22.9)	563 (77.1)	—
Aged >12 years	111 (22.3)	387 (77.7)	—
None	382 (25.2)	1134 (74.8)	—
Caring for older person or person with disabilities			0.57
Yes	74 (22.9)	249 (77.1)	—
No	502 (24.4)	1559 (75.6)	—
Profession			0.008
Physician	313 (23.7)	1008 (76.3)	—
Nurse or auxiliary nurse	206 (25.4)	604 (74.6)	—
Administrative staff	87 (29.0)	213 (71.0)	—
Other profession involved in patient care	36 (16.4)	183 (83.6)	—
Other staff NOT involved in patient care	16 (18.0)	73 (82.0)	—
Frequency of direct exposure to patients with COVID-19			
All/most of the time	298 (22.8)	1007 (77.2)	0.34
Some of the time	253 (25.4)	743 (74.6)	—
A little/none of the time	109 (24.8)	331 (75.2)	—
Close one infected with COVID-19			0.05
No	142 (28.0)	366 (72.0)	—
Close one infected, not family member	365 (22.6)	1249 (77.4)	—
Family member infected	153 (24.7)	467 (75.3)	—
COVID-19 infection status			0.10
Admission to hospital	11 (31.4)	24 (68.6)	—
Test positive/diagnosed	138 (27.1)	371 (72.9)	—
None	509 (23.2)	1686 (76.8)	—
Lifetime mental disorders before COVID-19 outbreak			<0.001
Yes	370 (32.6)	764 (67.4)	—
No	285 (18.0)	1296 (82.0)	—

[a]*Mann–Whitney* U-*test for continuous variables and* χ^2-*test for categorical variables. CD-RISC-10 = 10-item Connor–Davidson Resilience Scale. Close one = partner, children, parents, other relatives, or close friends. IQR = interquartile range.*

presence of probable mental disorders has been assessed by a battery of screening instruments. Establishing genuine clinical diagnoses was not possible, but positive screenings can be a valid indicator of the presence of significant psychological distress.[37,38] Finally, when interpreting the data from this cross-sectional study, the time at which they were obtained, between the end of the first wave and the beginning of the second wave in the pandemic epidemiological curve in Spain, must be considered.[39]

Comparison with existing literature

Differences in the prevalence of psychological distress by sex are to be expected, as a higher prevalence of mental disorders in females is a consistent finding in epidemiological studies.[40,41] Greater vulnerability in females has also been reported among healthcare workers during the pandemic.[42–44] Various explanations for these differences have been proposed, including response bias (males would have greater difficulty recognising and communicating psychological distress), as well as biological, social, and demographic factors.[45,46] This study found that having children aged >12 years or caring for an older person or person with disabilities are important risk factors for psychological distress in females, whereas this association was not observed in males. This suggests that different family roles may be a key factor in sex-related differences in emotional distress.[16,47] In addition, differences in informal caregiving between sexes may have increased following the shutdown of or limited access to resources such as childcare centres, schools, daycare nursing centres, or residences for older people.[48] A qualitative study involving healthcare workers in England shows caring responsibilities as a factor that affects males and females differently in terms of their emotional state during the pandemic.[16]

As expected, the greater the occupational exposure to patients with COVID-19, the greater the risk of psychological distress for the overall sample; an association that is stronger and more consistent in females than in males.[49,50] However, similar to findings from other research,[51–53] this study found the paradox that administrative personnel were at greater risk than professional groups with direct patient contact. Again, these associations are strong and statistically significant in females, but not in males. As a result of the pandemic, primary care administrative staff have been exposed to changes, uncertainty, and a heavy workload, perhaps without sufficient support to handle this type of situation and

with the assessed outcomes. Observing the evolution over time of psychological distress as a function of experience with the pandemic will be necessary to establish causal relationships. Indeed, this is precisely the objective of a prospective follow-up of this cohort currently underway.[6] Third, the

Table 4. Multivariate associations between primary care workers' characteristics and lifetime mental disorders, stratified by sex[a]

Characteristic	Total (*n* = 2355), OR (95% CI)	*P*-value	Male (*n* = 408), OR (95% CI)	*P*-value	Female (*n* = 1947), OR (95% CI)	*P*-value
Sex						
Male	Reference	—	NA	—	NA	—
Female	1.61 (1.25 to 2.06)	<0.001	NA	—	NA	—
Age, years						
18–29	1.12 (0.75 to 1.66)	0.588	0.34 (0.09 to 1.35)	0.124	1.34 (0.87 to 2.05)	0.180
30–49	1.50 (1.19 to 1.88)	0.001	1.30 (0.72 to 2.33)	0.387	1.53 (1.19 to 1.97)	0.001
≥50	Reference	—	Reference	—	Reference	—
Children in care						
None	Reference	—	Reference	—	Reference	—
Aged ≤12 years	1.18 (0.91 to 1.51)	0.209	1.19 (0.63 to 2.23)	0.597	1.21 (0.92 to 1.60)	0.176
Aged >12 years	1.31 (1.03 to 1.67)	0.026	1.11 (0.60 to 2.03)	0.746	1.35 (1.04 to 1.76)	0.025
Caring for older person or person with disabilities	1.54 (1.18 to 2.00)	0.001	1.38 (0.62 to 3.06)	0.428	1.59 (1.20 to 2.11)	0.001
Profession						
Physician	Reference	—	Reference	—	Reference	—
Nurse or auxiliary nurse	1.34 (1.09 to 1.65)	0.006	1.49 (0.81 to 2.75)	0.204	1.33 (1.06 to 1.66)	0.012
Administrative staff	2.24 (1.66 to 3.03)	<0.001	1.69 (0.82 to 3.49)	0.157	2.39 (1.70 to 3.35)	<0.001
Other staff involved in patient care	1.08 (0.76 to 1.54)	0.660	1.18 (0.47 to 3.01)	0.723	1.09 (0.74 to 1.59)	0.668
Other staff not involved in patient care	2.22 (1.30 to 3.81)	0.004	2.24 (0.76 to 6.58)	0.142	2.09 (1.12 to 3.88)	0.020
Frequency of direct exposure to patients with COVID-19						
A little/none of the time	Reference	—	Reference	—	Reference	—
Some of the time	1.88 (1.40 to 2.52)	<0.001	1.15 (0.56 to 2.37)	0.712	2.06 (1.49 to 2.84)	<0.001
All/most of the time	2.63 (1.98 to 3.51)	<0.001	1.61 (0.80 to 3.22)	0.183	2.90 (2.11 to 3.99)	<0.001
Resilience score, CD-RISC-10	0.93 (0.92 to 0.95)	<0.001	0.91 (0.88 to 0.95)	<0.001	0.94 (0.92 to 0.95)	<0.001
Any lifetime mental disorder	2.58 (2.15 to 3.10)	<0.001	2.57 (1.60 to 4.12)	<0.001	2.59 (2.12 to 3.16)	<0.001

[a]Exponentiated coefficients, adjusted by month of survey. Total model: pseudo-R^2 0.1174; AIC 2874.2; BIC 2966.4; and AUC 0.72. Male model: pseudo-R^2 0.1304; AIC 467.2; BIC 527.4; and AUC 0.74. Female model: pseudo-R^2 0.1090; AIC 2422.4; BIC 2506.0; and AUC 0.71. AIC = Akaike Information Criterion. AUC = area under the curve. BIC = Bayesian Information Criterion. CD-RISC-10 = 10-item Connor–Davidson Resilience Scale. NA = Not applicable. OR = odds ratio.

with less control over their job conditions than other professional categories.[54] In contrast, female doctors experienced less psychological distress than those in other occupations, possibly because of skills and experience in managing and coping with situations of complexity and uncertainty inherent to medical practice.[55]

The association between the existence of previous mental disorders and the current presence of any mental disorder was particularly strong, being comparable in both sexes. This was to be expected given the tendency for recurrence and the often chronic nature of mental disorders,[56] and is consistent with other studies in healthcare workers in the pandemic setting.[44,57] The relevance of this risk factor is accentuated by the fact that 42% of the individuals in the present sample reported a history of previous mental disorders.

Resilience is an individual's ability to cope with and adapt to adverse situations while maintaining effective personal and professional functioning.[58] Concurring with a study on healthcare workers in Italy,[59] this

work identified resilience as a protective factor against the psychological distress caused by the pandemic in healthcare professionals, both in males and females, although the level of resilience was higher among males.[60] This ability to cope with stress was shown to be significantly impaired in those individuals with a previous history of mental disorders.

Implications for research and practice

This study found that a high proportion of primary healthcare workers experienced psychological distress in the context of the COVID-19 pandemic and some particularly vulnerable profiles were identified. Given this situation, establishing strategies and interventions for psychological support and resilience building of healthcare workers is highly relevant, taking into account the risk factors identified and tailoring the interventions accordingly. Proactive systems should be established to assess and monitor the psychological wellbeing of different professional groups in primary care and facilitate their access to psychological

help.[61] Additionally, interventions should be conducted to promote resilience, as it is a modifiable factor,[62,63] implementing strategies focused on self-care and changes in the organisation and work environment.[64,65]

Longitudinal studies are necessary to assess the evolution of the psychological impact of the pandemic over time and to identify the factors that determine or can predict this evolution. Evaluating the usefulness, feasibility, and effectiveness of any preventive or therapeutic interventions under real conditions will also be important, as well as determining the best way to implement them.[66]

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