

**ARTÍCULO ORIGINAL**

**ORIGINAL ARTICLE**

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## **FACTORS ASSOCIATED TO PERCEIVED STRESS IN HOSPITAL WORKERS IN A PSYCHIATRIC HOSPITAL IN SPAIN DURING COVID-19**

### **FACTORES ASOCIADOS A ESTRÉS PERCIBIDO EN TRABAJADORES DE UN HOSPITAL PSIQUIÁTRICO EN ESPAÑA DURANTE LA COVID-19**

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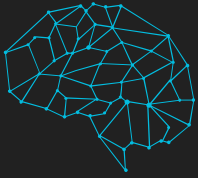
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## ABSTRACT

**Background:** Health workers enduring the COVID-19 pandemic could be at risk of psychological stress. This study aimed to 1) measure the levels of perceived stress by workers at a psychiatric hospital in Barcelona, Spain, 2) to identify demographic or occupational factors related to a higher risk of perceiving greater stress, and 3) to examine the use of the psychological support service offered to hospital employees as well as to identify potential barriers and preferences regarding access to this service.

**Methods:** All hospital workers were invited to participate in a cross-sectional, observational study. An anonymous online survey was employed to administer the 14-item Perceived Stress Scale (PSS) as a measurement of perceived stress. A multiple-choice questionnaire gathering participants' sociodemographic and occupational data was also included. The relationship between sociodemographic/occupational variables and the PSS score was analyzed by using t test or one-factor ANOVAs. In addition, all sociodemographic/occupational variables were included in a single linear additive model with the total PSS score as the dependent variable.

**Results:** Two hundred and forty-nine workers participated in the survey. The median PSS score was 24 IQR: (10.25). Associations between higher levels of perceived stress and *difficulties in work-family balance, having faced discrimination, and female gender* were found. A protective association between *perceiving current role as important* and lower perceived stress was also detected. Although 34% of participants recognized a personal need for psychological support, only 2% had contacted the in-house psychological support service. Issues regarding lack of time or scheduling difficulties were one of the main reported barriers reducing access to psychological support.

**Conclusion:** Health workers are at risk of facing stress during the COVID-19 pandemic. Risk factors for higher stress include female gender and also the potentially modifiable sociodemographic variables mentioned above.

**Keywords:** Stress; Psychological; COVID-19; Mental health; Health personnel; Cross-sectional.

## RESUMEN

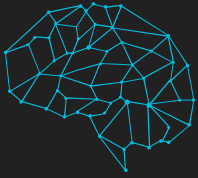
**Introducción:** los trabajadores sanitarios podrían estar sometidos a altos niveles de estrés durante la asistencia a la pandemia COVID-19. Los objetivos de este estudio son: 1) medir los niveles de estrés percibido por los trabajadores del Hospital Sagrat Cor 2) identificar los factores sociodemográficos/ocupacionales relacionados con un riesgo incrementado de percibir estrés, 3) examinar la prevalencia de uso del servicio de apoyo psicológico ofrecido a los trabajadores, así como identificar posibles barreras en el acceso.

**Métodos:** los empleados del hospital fueron invitados a participar en un estudio observacional de corte transversal mediante una encuesta anónima online que incluía la Escala de Estrés Percibido (PSS) y un cuestionario de información sociodemográfica y ocupacional. Se analizó la relación entre estas variables y la puntuación PSS mediante pruebas de t de Student o ANOVAs unifactoriales. Adicionalmente, todas las variables sociodemográficas/ocupacionales se incluyeron en modelo único lineal aditivo donde la puntuación PSS fue la variable dependiente.

**Resultados:** participaron 249 trabajadores. La mediana de la PSS fue: 24 IQR (10.25). Se encontró una asociación entre mayor puntaje en PSS y dificultades en conciliación familiar, haber experimentado discriminación por ser trabajador sanitario, y género femenino. Por otro lado, se documentó una asociación protectora con la percepción importancia del rol. A pesar de que el 34% de los participantes reconocieron la necesidad de apoyo psicológico, solo el 2% contactaron dicho servicio.

**Conclusiones:** los trabajadores sanitarios están en riesgo de sufrir estrés durante la pandemia. Los factores de riesgo para mayores niveles de estrés incluyen género femenino y también las variables sociales y ocupacionales potencialmente modificables mencionadas arriba.

**Palabras clave:** Estrés; Psicológico; COVID-19; Salud mental; Personal sanitario; transversal.



## INTRODUCTION

Since its appearance at the end of the year 2019, the COVID-19 virus has become a grave public health problem, provoking significant economic and social consequences, particularly amongst the most vulnerable population groups, and causing over 98.2 million reported cases of infection and over 2.1 million deaths (*Coronavirus Disease (COVID-19) Situation Reports, n.d.; Everyone Included: Social Impact of COVID-19 | DISD, n.d.*). Health workers shouldering the burden of the COVID-19 pandemic could be at risk of undergoing severe psychological stress.

Spain is one of the European countries that has been most affected by the advance of COVID-19 (Pollán et al., 2020). The Spanish Government declared a national state of alarm from the 14th of March 2020 and until the 21st of June 2020, in order to control the spread of COVID-19 including different phases of confinement of the population with the exception of essential personnel such as healthcare workers. In May of 2020, healthcare workers made up around 24% of all diagnosed COVID-19 infections in Spain (*Análisis de Los Casos de COVID-19 Notificados a La RENAVE Hasta El 10 de Mayo En España Contenido, n.d.*).

For health workers, the strain on the health system, increased workload, lack of human and material resources, precarious availability of protective equipment, a high risk of infection (particularly in frontline workers) (Nguyen et al., 2020), discrimination and frustration, in addition to different phases of confinement of the population, could all be important stressors enforcing a negative influence on their mental health (Kang, Li, et al., 2020).

In one study, Chinese healthcare workers, presented significantly higher prevalences of insomnia, anxiety, depression, somatization and obsessive-compulsive symptoms than non-medical health workers (Zhang et al., 2020). In another Chinese survey, 50.4% of participating health workers had symptoms of depression, 44.6% of anxiety and 34% of insomnia (Lai et al., 2020) while in an Italian sample, over 60% of health workers faced manifestations of burnout (Giusti et al., 2020). A Spanish study reported greater impact of COVID-19 on the mental health of health care workers compared to non-health care workers (García-Fernández et al., 2020). It is probable that there is a psychological toll on healthcare workers facing the pandemic in other countries as well.

However, at this time, the literature on the topic is scarce and there is a gap regarding the psychological well-being of

healthcare workers in Spain and even more so, in healthcare providers of psychiatric services. Research data such as identifying risk factors related to greater stress in health workers are needed in order to reduce psychological impact in this group through the formulation and implementation of evidence-based approaches (Wang et al., 2020).

Therefore, the main aim of this study was to measure the levels of perceived stress by workers at the Hospital Sagrat Cor – Martorell (Barcelona), amid the acute COVID-19 pandemic in Spain during the month of April, 2020. Secondary objectives were: 1) to identify demographic or occupational factors related to a higher risk of perceiving greater stress; and 2) to examine the prevalence of use of the psychological support service offered to hospital employees (amongst the participants), as well as to identify potential barriers and preferences regarding access to this service.

## METHODS

### STUDY DESIGN AND SETTING

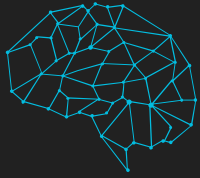
The Sagrat Cor Hospital is a psychiatric facility that is responsible for delivering mental health care for a population of 400000 inhabitants. The hospital has 430 beds, and has wards for acute, sub-acute and longer-term psychiatric in-patients. It also houses sociosanitary wards. In addition to the in-patient services, the hospital also coordinates out-patient care at specialized community mental health centres. During this pandemic, the hospital has also been assigned the in-patient care of psychiatric and non-psychiatric COVID-19 patients.

A cross-sectional observational study using a non-probability survey was carried out by using an online self-reported questionnaire that was open for voluntary participation of all hospital employees for 12 days from the 27th of April to the 8th of May 2020. Employees were informed of the study on the hospital's employee intranet site (to which they all have access from the moment they become hospital employees) where they were also provided with a web link and a QR code leading to an independent survey site.

### SURVEY CHARACTERISTICS

An anonymous survey was carried out by using the online survey tool SurveyMonkey, pre-specifying a condition of blocking of IP addresses to ensure the anonymity of participants.

The survey included 34 self-reported items: 1) a multiple selection format questionnaire on demographic, occupational



**Table 1. Characteristics of Study Participants**

Characteristic	n (%)
Total participants	249 (100)
Age (years):	
18-29	31 (12.45)
30-39	50 (20.08)
40-49	91 (36.55)
50-59	55 (22.09)
≥60	20 (8.03)
Gender:	
Male	61 (24.50)
Female	184 (73.90)
Non-binary/other	1 (<0.01)
Lives with partner**	179 (71.89)
Educational level:**	
Postgraduate or superior	60 (24.10)
University graduate	116 (46.59)
Other	71 (28.51)
Occupation:**	
Medicine	42 (16.87)
Nursing	58 (23.29)
Nursing assistants	59 (23.69)
Psychology	29 (11.65)
Other patient-care occupations*	34 (13.65)
Administrative tasks	21 (8.43)
Others	4 (1.61)
Currently working in:	
Hospital	176 (70.68)
Community services	69 (27.71)
Works in a COVID-19 ward**	100 (40.16)
Change of workplace due to COVID-19	89 (35.74)
Current tasks correspond with training/experience	212 (85.14)
Works night shifts	36 (14.46)
Perceives current role as important	229 (91.97)
Fear of contracting COVID-19	141 (56.63)
Fear of infecting a loved one	225 (90.36)
Worried about co-workers' health status	222 (89.16)
Reports having faced discrimination due to working in healthcare	35 (14.06)
Worried about supply of protective equipment	230 (92.37)
Difficulties in work-family balance	98 (39.36)
Has contacted in-house psychological support service	5 (2.01)

\*Includes: Social workers, occupational and physical therapists, social educators. \*\*Significant difference between gender groups in relation to these variables.

**Supplementary Table 1. Questionnaire on demographic and occupational characteristics**

Question number	Question
Q1	Select your age range?
Q2	Which gender do you identify with?
Q3	Do you live with your partner?
Q4	Which is your education level?
Q5	Which is your occupation?
Q6	Where are you currently working?
Q7	Do you work in a COVID-19 unit?
Q8	Have you changed of workplace due to COVID-19?
Q9	Do your current tasks correspond with your training/experience?
Q10	Do you work in night shifts?
Q11	Do you perceive your current role as important?
Q12	Are you afraid of contracting COVID-19?
Q13	Are you afraid of infecting a loved one?
Q14	Are you worried about your co-workers' health status?
Q15	Do you perceive discrimination due to your health-related job?
Q16	Are you worried about supply of protective equipment?
Q17	Do you have difficulties in work-family conciliation?
Q18	Have you contacted the in-house psychological support service?

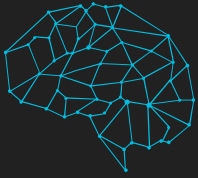
and COVID-19 related factors (see variable list in Table 1), as well as information on the use of the employee psychological support programme (Supplementary Table 1); and 2) the Perceived Stress Scale (PSS) (Remor, 2006).

## MEASUREMENT OF STRESS

The level of stress perceived by participants was evaluated using the Perceived Stress Scale (PSS). The PSS is made up of 14 self-reported questions (7 positive items and 7 negative items), on perceived stress during the last month. It is a Likert-type scale with five possible answers for each item, where 1=never and 5=always, for a total score ranging from 0-56. Higher scores are indicative of greater perceived stress. This scale has been widely used for stress measurement in previous studies. The Spanish version of the PSS has been previously validated, showing good internal consistency (Cronbach's  $\alpha=0.81$ ) and reliability ( $r=0.73$ ) (Remor, 2006). Scores for the PSS were treated as continuous variables and no cut-offs were used.

## STATISTICAL ANALYSES

Two different types of statistical analyses were carried out to assess the possible relation between the answers reg-



istered in the questionnaires and the total score of the PSS. On one hand, this relation was analyzed for each item of the questionnaire separately. This mainly involved performing t tests as most questions had only two possible answers, with the exception of the variables: age, occupation and educational level, which had multiple possible answers. For these variables, one factor ANOVAs were carried out. Additionally, intervals for age were also recoded numerically and evaluated through a correlation analysis.

On the other hand, all items of the questionnaire were included as independent variables in a single linear additive model with the total PSS score as dependent variable. This was carried out in order to discard possible confounding or non-direct effects of the different questionnaire variables (e.g. variables such as age or gender may condition other variables of the questionnaire and, in turn, influence their relation with the PSS values). In both types of analyses the False Discovery Rate (FDR) method proposed by Benjamini and Yekutieli, which allows for any arbitrary dependency among tests, was used to correct for multiple comparisons (Benjamini & Yekutieli, n.d.). Statistical analyses were performed using R (<https://www.r-project.org/>).

## ETHICAL CONSIDERATIONS

This study received approval from the institutional research commission as well as from the Hermanas Hospitalarias ethical board. Participants were not required to sign informed consent, as a measure to guarantee their anonymity. However, the first screen that appeared to participants (before the questionnaire was presented), provided information on the aims of the study, estimated completion time, anonymity and non-traceability of IP addresses. It also stated that participation was voluntary, with the option of answering or not answering the survey. Participants also had the option of skipping any of the questions if they so wished.

## RESULTS

### GENERAL CHARACTERISTICS OF THE SAMPLE

A total of 249 (47%) out of all eligible workers participated in the survey. Table 1 describes participant characteristics. Most participants were in the 40-49 years age group and the majority (73.90%) were women. Around 47% of respondents were nurses or nursing assistants while 16.87% were physicians and 10.04% of participants were hospital workers

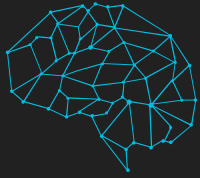
that were not directly involved in patient care. Over 40% of participants were frontline workers, caring directly for patients with COVID-19. While around only half the participants were afraid of contracting COVID-19 themselves, the vast majority (about 90%), were fearful of infecting a loved one or were concerned for the health status of at least one of their fellow co-workers. Over 14% of respondents reported feeling discriminated against because of their occupation during the COVID-19 outbreak and nearly 40% faced difficulties in trying to balance work and family obligations.

For all participants, the median score on the PSS was: 24 IQR:(10.25), with scores ranging from 4-48. No significant differences were found between workers involved in patient care and those with other responsibilities.

### ASSOCIATIONS BETWEEN QUESTIONNAIRE VARIABLES AND PSS SCORE

Results from the statistical tests individually evaluating the association between total PSS scores and each one of the questionnaire variables are reported in Table 2. After applying the FDR correction for multiple comparisons several variables showed a significant link with subjective stress scores. These included, in decreasing order of relevance as quantified by Cohen's d effect sizes, *perceiving current role as important* with individuals perceiving their role as important having less stress than those not perceiving it as important (large effect size,  $d = 0.86$ ), *fear of infecting a loved one* with subjects worried about infecting others being more stressed than those which were not ( $d = 0.85$  [large]), *having faced discrimination* with individuals feeling discriminated for having a health-related job having more stress than those which had not had this experience (large  $d = 0.83$ ), *difficulties in work-family balance* with persons having work-family conciliation difficulties being more stressed than those which were not (medium  $d = 0.73$ ), gender, with women having higher levels of stress than men (small  $d = 0.49$ ), and *fear of contracting COVID-19* with subjects worried about contracting the virus themselves feeling more stressed than those which were not (small  $d = 0.42$ ). Figure 1 shows the boxplots for all the significant variables. No significant association was found for the remaining variables.

A summary of the fitting of the linear model containing all questionnaire variables as independent variables is shown in Table 3. In this analysis, the set of questionnaire variables that are significant is similar to the set that was previously



**Table 2. Associations between participant characteristics and total PSS score**

Variable	N	Test	Statistic	df	Uncorrected p-value	FDR corrected p-value
Age	228	ANOVA	F = 1.695	4, 223	0.152	0.732
		Correlation	r = 0.134	226	0.043	0.262
Gender	227	t test	t = -3.185	225	0.002	0.020**
Lives with partner	227	t test	t = 0.508	225	0.612	1.000
Education level	228	ANOVA	F = 0.943	3, 224	0.420	1.000
Occupation	228	ANOVA	F = 1.022	6, 221	0.412	1.000
Works in hospital/community	226	t test	t = -2.363	224	0.019	0.128
Frontline worker	228	t test	t = -1.474	226	0.142	0.732
Change of workplace*	228	t test	t = -2.575	226	0.011	0.090
Tasks correspond to training/ experience	228	t test	t = 2.365	226	0.019	0.128
Works night shifts	227	t test	t = -0.930	225	0.354	1.000
Perceives current role as important	228	t test	t = 3.516	226	<0.001	0.009**
Fear of contracting COVID-19	228	t test	t = -3.161	226	0.002	0.020**
Fear of infecting a loved one	228	t test	t = -3.705	226	<0.001	0.006**
Worried about co-workers' health status	227	t test	t = -2.580	225	0.010	0.090
Reports having faced discrimination due to working in healthcare	228	t test	t = -4.276	226	<0.001	<0.001**
Worried about supply of protective equipment	228	t test	t = 0.104	226	0.917	1.000
Difficulties in work-family balance	227	t test	t = -5.386	225	<0.001	<0.001**
Has contacted in-house psychological support service	228	t test	t = -1.669	226	0.096	0.542

\*due to hospital requirements related to the COVID-19 pandemic. \*\*Statistically significant

found significant in the individual analyses. Although two of the previously reported variables (*fear of contracting COVID-19 and fear of infecting a loved one*) did not survive the FDR correction, they had a significant uncorrected p-value, suggesting that, with a larger sample, they could surpass the multiple comparison correction.

#### PREFERENCES REGARDING PSYCHOLOGICAL SUPPORT

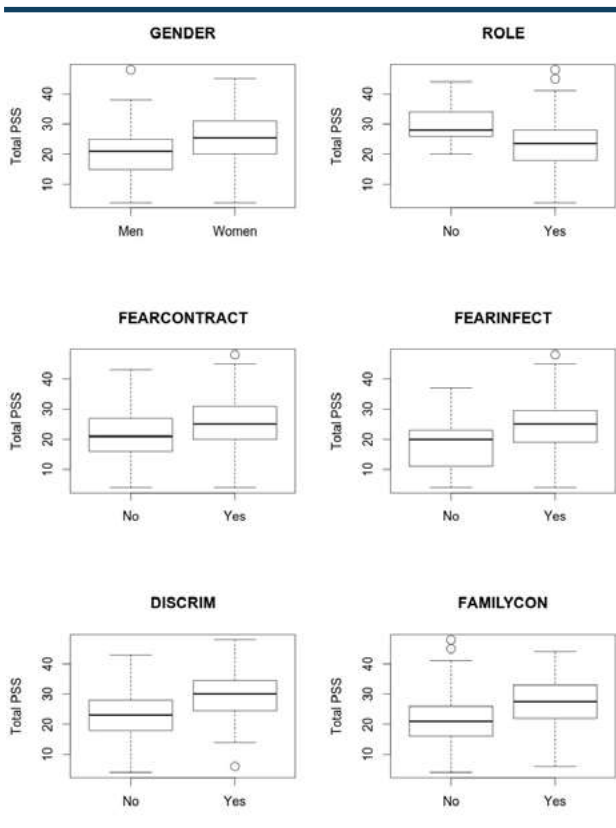
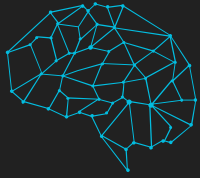
In this survey, only 5 participants (2.01%) reported having contacted the in-house psychological support service. In contrast, 85 participants (34.14%) considered that they were indeed in need of psychological support. When asked the reason for not contacting this service (despite identifying their need for support), participants reported the following issues: 25.88% did not have the time or they could not compatibilize with the schedule for psychological support, 10.60% had con-

cerns about confidentiality, 7.06% felt embarrassment, and the remaining 56.47% referred other barriers.

In addition, participants were also asked about their preference regarding method of delivery of psychological support. In-person counselling was the favored option (80.59%), followed by telephone or videoconference (13.50%), mobile app (4.64%) or other method (1.27%).

#### DISCUSSION

This cross-sectional study on perceived stress in the workers of a psychiatric hospital in Spain during the acute COVID-19 pandemic showed an association between higher levels of perceived stress and *difficulties in work-family balance, having faced discrimination, and female gender*. Uncorrected results also suggest a link with *fear of contracting COVID-19 and fear of infecting loved ones*. Notably, a protec-



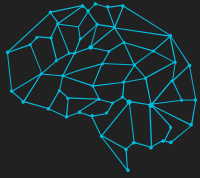
**Figure 1.** Distribution of PSS scores by demographic and occupational factors. *GENDER*: gender of the participant, *ROLE*: perceiving current role as important, *FEARCONTRACT*: fear of contracting COVID-19, *FEARINFECT*: Fear of infecting others, *DISCRIM*: having faced discrimination, *FAMILYCON*: difficulties in work-family balance.

tive association was also documented between *perceiving current role as important* and lower perceived stress. Finally, although around 34% of participants recognized a personal need for psychological support, only 2% had contacted the in-house psychological support service. Not having enough time or the impossibility to compatibilize schedules with the support team was one of the main barriers reducing access to psychological support. No association was found between perceived stress and the other demographic and occupational variables studied. To our knowledge, at this time there are no other cross-sectional studies on perceived stress specifically in the health workers of psychiatric facilities, under the burden of the COVID pandemic.

Interestingly, being a frontline worker was not found to be associated to greater stress. Previous reports have associated this position with symptoms of depression, anxiety, insomnia, somatization, burnout or post-traumatic stress (Giusti et al., 2020; Lai et al., 2020; Zhang et al., 2020). It is possible that this difference is at least partly explained because these studies used instruments more related to screening for specific psychiatric disorders. In this sense, they may have been identifying more severe cases, such as those surpassing diagnostic thresholds. In line with our own findings, an Italian study using the 10-item version of the PSS did not find an association between perceived stress and frontline or second-line worker position.

The fact that we did not find a difference in perceived stress between frontline and second-line workers could also be due to the fact that participating second-line workers likely also faced stress related to significant increase in their work burden. This increment could be linked to factors such as increased demand for mental health care for patients in the community related to the COVID-19 pandemic and lockdown, closure of psychiatric services such as day hospitals, the transferral of health workers from the community setting to the in-patient setting to fill the need for additional personnel at the hospital, or the reduction of the number of psychiatric beds in order to attend COVID-19 demands (Arango, 2020). It is also important to take care of second-line workers as they support the health needs of the rest of the population while also facing complex scenarios in which they face a lack of control and reduced resources to care for their patients (El-Hage et al., 2020). Notably, a Chinese study documented a greater prevalence of burnout in second-line workers compared to frontline workers (Wu et al., 2020). The long-term consequences of increased perceived stress in both frontline and second-line workers are currently unknown, but deserve attention as it is likely that a great proportion of health workers around the world could face increased stress related to the COVID-19 pandemic.

In line with previous reports, we also documented an association between female gender and greater scores on the PSS. A study by Li et al. suggested that female workers could be more vulnerable to stress, anxiety and depression during this pandemic as they may face greater occupational exhaustion, inequality in domestic labour and more difficulties in conciliating work and family responsibilities. In this study, having 2 or more children was associated with more distress. It may also be that these workers have faced a dilemma be-



**Table 3. Summary of the fitting of the linear model containing all questionnaire variables as independent variables**

Variable	Sum Sq	df	F-value	Uncorrected p-value	FDR corrected p-value
Age	238.0	4	1.221	0.303	1.000
Gender	578.4	1	11.869	<0.001	0.015**
Lives with partner	8.6	1	0.176	0.675	1.000
Educational level	109.0	3	0.746	0.526	1.000
Occupation	317.9	6	1.087	0.371	1.000
Works in hospital/community	40.6	1	0.834	0.362	1.000
Frontline worker	30.4	1	0.624	0.430	1.000
Change of workplace*	88.8	1	1.823	0.178	1.000
Tasks correspond to training/experience	37.9	1	0.778	0.379	1.000
Works night shifts	14.8	1	0.303	0.582	1.000
Perceives current role as important	644.2	1	13.217	<0.001	0.011**
Fear of contracting COVID-19	224.6	1	4.609	0.033	0.383
Fear of infecting a loved one	216.1	1	4.433	0.036	0.383
Worried about coworkers' health status	96.9	1	1.987	0.160	1.000
Reports having faced discrimination due to working in healthcare	462.6	1	9.492	0.002	0.037**
Worried about supply of protective equipment	161.4	1	3.311	0.070	0.553
Difficulties in work-family balance	681.5	1	13.984	<0.001	0.011**
Has contacted in-house psychological support service	201.6	1	4.137	0.043	0.389

\*due to hospital requirements related to the COVID-19 pandemic. \*\*Statistically significant

tween maintaining contact or avoiding family members. (Guo Li et al., n.d.). In our study, however, the association between female gender and PSS scores remained after adjusting for other social and occupational variables, suggesting an independent association of the gender of health workers with perceived stress that may merit future research including further variables relating to gender.

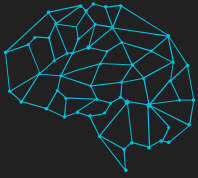
Of note, we found that *difficulties in family-work balance* were strongly associated to greater perceived stress scores. In Spain, schools and day-care facilities were closed starting in March 2020, meaning that health workers (who in many cases do not even have the option of working from home), had to provide their own solutions for child-care, possibly contributing to increased stress.

In addition, it has been recognized in the literature that health workers have faced discrimination during this pandemic (Singh & Subedi, 2020) and we have found that this experience is associated to higher PSS scores.

In this study, even providers of psychiatric healthcare services had difficulties in accessing psychological support offered to them. Even though in-person support was reported as the preferred choice, interestingly, around 20% of participants favored a different method for the delivery of psychological support. This could be partly related to the need for reduced personal contact due to the pandemic, to the increasing comfort of use of new technologies and smartphones in everyday activities and/or to a greater sense of availability and anonymity that these options confer. Easy-to-use, practical and readily available methods (including the option for digital delivery) may play a part in supporting psychological well-being for health workers (Blake et al., 2020; Kang, Ma, et al., 2020; Zhang et al., 2020).

This study has various strengths. It contributes to filling the gap in information regarding the psychological well-being of healthcare workers in Spain and specifically for mental health workers who are also shouldering the burden of the





COVID-19 pandemic. It also addresses the barriers to use of psychological support services and participants' preferences in delivery of psychological support. These data are vital to help prepare health authorities, institutions and workers to prepare the response to this, or a future public health emergency (Kang, Li, et al., 2020). In addition, a continuous measure of perceived stress was used which allows for the inclusion of subclinical manifestations of stress, which are likely more widespread within the study population than clinical diagnoses. Furthermore, this study examines risk factors that have been less taken into account in the literature, such as the personal fear of contracting COVID-19 or infecting a loved one, difficulties in achieving work-family balance or facing discrimination. Importantly, it also proposes potentially modifiable factors in relation to perceived stress such as *difficulties in work-family balance, having faced discrimination and perceiving current role as important*, which could be relevant to protecting the psychological well-being of healthcare workers.

Nevertheless, this study has some limitations. The use of a non-probabilistic sample (which was considered necessary taking into account that it was performed during the peak of the acute COVID-19 epidemic in Spain when health workers were already under enormous strain), may affect the generalizability of the results. However, even though participation was strictly voluntary and not petitioned on a personal level, approximately half of all hospital workers participated. Since a cross-sectional design was used, we could not differentiate new stress attributable solely to COVID-19 from previous stress levels. This is true for most available studies on the mental wellbeing of health workers during this pandemic, where no information is available on preexisting psychiatric diagnoses or stress levels. In another study, participants who reported preexisting psychiatric conditions or insomnia were excluded (Zhang et al., 2020). Another limitation is that we cannot be certain that participants correctly understood the concept of gender and it is not possible to rule out that any participant could have answered this question according to sex instead of gender. Finally, diagnosing specific mental disorders was outside the scope of this study.

Future research should focus on longitudinal, multicenter studies including larger samples of health workers in order to provide information into risk factors associated to the presentation and evolution over time of psychological symptoms in this group and, particularly, which interventions can be

best directed to this group for the primary and secondary prevention of psychopathological manifestations. Further studies providing insights into workers' needs and preferences for psychological attention are also needed (Shanafelt et al., 2020).

Promoting mental well-being in healthcare professionals is essential to ensuring that these individuals will be in capacity to adequately respond to the challenges that potential future outbreaks of COVID-19 or other epidemics could bring (Giusti et al., 2020). Our results suggest that it could be important to stimulate and motivate workers by highlighting the importance of each of their roles as a way of protecting the mental well-being of healthcare workers. Additionally, our findings are in line with the notion that it is advisable to implement measures that favor family-work balance for health workers and strategies to reduce stigmatization of health workers as a way of reducing the amount of stress that they face.

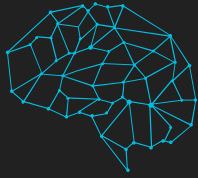
In conclusion, this study showed moderate levels of perceived stress in participating professionals. Risk factors for higher stress include sociodemographic variables some of which are potentially modifiable. Finally, barriers to access psychological support for healthcare workers were also identified.

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