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TITLE: To burnout or not to burnout. A cross-sectional study in healthcare professionals in Spain during COVID-19 pandemic.

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ABSTRACT

OBJECTIVE: To assess the prevalence of Burnout syndrome in healthcare workers working on the frontline in Spain during COVID-19.

DESIGN: Cross-sectional, online survey-based study.

SETTINGS: Sampling was performed between April 21st and May 3rd, 2020. The survey collected demographic data and questions regarding participants' working position since pandemic outbreak.

PARTICIPANTS: Spanish healthcare workers working on the frontline (FL) or usual ward were eligible. A total of 674 healthcare professionals answered the survey.

MAIN OUTCOMES AND MEASURES: Burnout syndrome was assessed by the Maslach Burnout Inventory-Medical Personnel (MBI).

RESULTS: Of the 643 eligible responding participants, 408 (63.5%) were physicians, 172 (26.8%) were nurses and 63 (9.8%) other technical occupations. 377 (58.6%)

worked on the FL. Most participants were women (472 [73.4%]), aged 31 to 40 years (163 [25.3%]) and worked in tertiary hospitals (>600 beds) (260 [40.4%]). Prevalence of Burnout syndrome was 43.4% (95%CI 39.5; 47.2), higher in COVID-19 FL workers (49.6%, p <0.001) than in non- COVID-19 FL workers (34.6%, p <0.001). Women felt more burnout (60.8%, p=0.016), were more afraid of self-infection (61.9%, p=0.021) and of their performance and quality of care provided to the patients (75.8%, p=0.015) than men. More burnout were those between 20 and 30 years old (65.2%, p=0.026) and those with more than 15 years of experience (53.7%, p=0.035).

Multivariable logistic regression analysis revealed that, working on COVID-19 FL (odds ratio [OR] 1.93; 95%CI 1.37-2.71, p<0.001), being a woman (OR 1.56; 95%CI 1.06-2.29, p=0.022), being under 30 years old (OR 1.75; 95%CI 1.06-2.89, p=0.028), and being a physician (OR 1.64; 95%CI 1.11-2.41, p=0.011) were associated with high risk of Burnout syndrome.

CONCLUSIONS: This survey study of healthcare professionals reported high rates of Burnout syndrome. Interventions to promote mental well-being in healthcare workers exposed to COVID-19 need to be immediately implemented.

Strengths and limitations of this study

- This study was conducted in the middle and late stages of the COVID-19 outbreak, 2 weeks after the peak of the curve was reached in Spain, mainly in a critically epidemic affected area, which was Madrid Community. To our knowledge, this is the first report on burnout prevalence and associated risk factors among healthcare workers in Spain during the COVID-19 pandemic.
- The results show a substantial proportion of burnout among healthcare workers in the front lines, particularly among young women and doctors, are in line with previous reports from China and Italy.
- The main limitation of our study is that it is an online voluntary response survey distributed by mailing lists and social networks. Being voluntary, those professionals most affected may be more interested in answering the survey, so the degree of burnout prevalence may be overestimated; still, the large number of survey responses may have mitigated this effect.
- This study was limited in scope. Most participants (81.2%) were from Madrid autonomous community, limiting the generalization of our findings to less affected regions. Additionally, the study was performed during 2 weeks and lacks longitudinal follow-up.

INTRODUCTION

The current pandemic by the highly contagious novel coronavirus named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) started in Wuhan (China) (1,2).and has rapidly spread worldwide. In May 2020, Spain became Europe's next epicentre of the contagion and was the second country worldwide most severely affected by the coronavirus disease (COVID-19) after the United States. (3). Of note, out of its confirmed coronavirus cases, more than 20% correspond to healthcare professionals, the highest number worldwide (4).

This critical situation was faced by healthcare workers on the COVID-19 frontline (FL) who responded with a display of selflessness, caring for patients despite the risk of infection. The mounting daily number of confirmed and suspected cases, the overwhelming workload, the shortage of personal protection equipment, and lack of effective treatment, may all contribute to the physical and psychological burden of these healthcare professionals. Previous studies on the 2003 SARS outbreak reported adverse psychological impact among healthcare workers (5, 6) who reported experiencing high levels of stress, anxiety, and depression symptoms, which could have long-term

psychological outcomes (7,8). This feeling is what is known as “burnout syndrome”, a feeling which already affected healthcare professionals, especially physicians, meaning that when COVID-19 kicked in, they were already burn out (9, 10).

Burnout is a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed and it is characterized by three dimensions: feelings of emotional exhaustion, depersonalization, and a low feeling of personal accomplishment (9). Its prevalence is high among the different groups of healthcare professionals, and is usually higher in physicians (10,11).

In order to quantify this type of stress, there are numerous scales available; the most validated one to assess the incidence of burnout in healthcare personnel being the Maslach Burnout Inventory, considered the gold standard (12).

This pandemic context has generated a turmoil of all these feelings and emotions in the healthcare professionals in a very short period of time that may have a substantial negative mental health outcome, which is why this kind of study has become of utter importance (13). The main goal of our study was to evaluate the burnout prevalence of healthcare professionals in Spain during COVID-19 pandemic and evaluate the differences between professionals working on the FL versus those working in their usual wards. Secondarily, we aimed at comparing burnout proportions between working on the FL versus working at the usual ward, and finally compared the prevalence of Burnout syndrome during COVID-19 pandemic and pre-COVID-19 pandemic.

METHODS

Study Design

The study is a cross-sectional online survey sampling between April 21st and May 3rd, 2020, the two weeks following the COVID-19 contagion peak in Spain. During this period, the total confirmed cases of COVID-19 exceeded 60.000 in Madrid and over 200.000 in Spain. The survey included 15 demographic questions and questions regarding participants' status in the past two months since pandemic outbreak, and the Maslach Burnout Inventory-Medical Personnel (MBI) to measure Burnout, which is a 22-question survey that has been frequently used in other studies examining burnout in health care workers, including physicians and nurses.

Approval from the clinical research ethics committee of Puerta de Hierro-Majadahonda University Hospital was received before the initiation of this study. The dissemination of the survey was conducted through different national healthcare system email registries and social networks (Instagram and Twitter), with the aim of comparing the differences between working with COVID-19 patients or at the usual wards among healthcare workers in Spain. Because of the self-selected nature of the sample, neither invitations nor response rates could be quantifiable, as reported by American Association for Public

Opinion Research (AAPOR) reporting guideline. Because Madrid Community was most severely affected, the sample in this region is considerably higher.

Patient and Public Involvement (PPI)

The survey was sent as an online questionnaire to healthcare professionals practicing in Spain, who have been actively working during COVID-19 pandemic. Study population comprised physicians, nurses, nursing assistants, and emergency healthcare technicians. A link to an online survey was disclosed through dissemination emails and social networks among the healthcare professionals. Participants were asked about their working position, engagement in clinical activities of diagnosing and treating patients with symptoms or patients with confirmed COVID-19, or if they had stayed in their usual wards. The survey was anonymous, and confidentiality of information was assured. It consisted of the following sections:

1. Sociodemographic variables and working conditions during pandemic: age, gender, marital status, autonomous community of work, occupation, type of hospital, working position (COVID-19 FL or usual ward), medical specialty, practicing years, weekly hours worked, and weekends worked.
2. Maslach Burnout Inventory: consists of 22 questions; responses are rated depending on the degree of agreement or disagreement with the statement. The questions refer to the degree of emotional exhaustion (9 questions), depersonalization (5 questions) and personal fulfilment (8 questions). It is defined as burnout syndrome to have a high percentile of emotional exhaustion, and/or a high percentile of depersonalization and/or a low e percentile of personal achievement. The MBI is the gold standard for

evaluating Burnout syndrome (12). The median (IQR) scores on the classification of Burnout syndrome were defined as high level of emotional exhaustion (EE) 26,2 (20-32), and/or high level of depersonalization (DP) 11,6 (9-14) and low level of personal accomplishment (PA) 29,6 (26-34).

3. Attitude of healthcare workers toward COVID-19 pandemic (self-assessment): six questions rated from 1 to 5 to evaluate participant´s attitude toward i) psychological impact, ii) self-infection, iii) risk of infecting their family, iv) this pandemic going for too long v) patients outcome and vi) their performance and quality of care.

Outcomes and Covariates

The main outcome was to assess prevalence of Burnout syndrome in FL workers. Secondarily to compare burnout proportions between working on the FL vs working at usual ward and a comparison of prevalence of Burnout syndrome in healthcare personnel during COVID-19 pandemic and pre-COVID-19.

Study size

The proportion of healthcare workers with Burnout syndrome was estimated between 35 and 38.7% in several studies before COVID-19 pandemic (10, 14, 15). To achieve 4% precision in estimating a proportion using a 95% bilateral asymptotic confidence interval, assuming the proportion is 35%, it will be necessary to include 547 participants in the study.

Statistical analysis

A descriptive analysis was performed expressing the categorical variables in number and percentage, and the quantitative variables in mean and interquartile range (IQR).

Wald's asymptotic method was used to estimate the prevalence of burnout syndrome in the sample and its 95% CI, as well as to estimate the proportions of burnout syndrome in COVID-19 FL workers and non-COVID-19 FL workers.

A descriptive analysis of Maslach Burnout Inventory's quantitative variables was performed for Maslach items calculating their medians and 25 and 75 percentiles. To proceed to the calculation/or classification of Burnout syndrome, the groups low (= p25 percentile), medium (= p50 percentile), severe/high (= p75 percentile) of each of the Maslach items were defined.

The association between categorical variables was initially analysed with a Chi-Square test (or Fisher's exact test when expected n <5).

Subsequently, a logistic regression model was designed to measure the association of working in the COVID-19 FL on the diagnosis of burnout. The final model decision took into account statistical criteria as well as researchers' criteria. The associated variables resulting from this model are expressed as odds ratio (OR) with a 95% confidence interval (95% CI. The association of the responses of the different Maslach items with the exposure to work in the COVID-19 environment was performed using a univariable logistic regression. This relationship is expressed as an odds ratio (OR) with a 95% confidence interval (95% CI) and a value of p <0.05 was considered significant. Data analysis was performed using Stata statistical software v16 (StataCorp., 1985, USA).

RESULTS

Demographic characteristics

A total of 674 healthcare professionals answered the survey. Out of these 674, 31 were excluded for the following reasons: 15 were duplicate answers, 6 were previous tests of

the survey, 2 did not answer their working position (COVID-19 FL or non-COVID-19 FL) and 8 were non healthcare profiles.

Of the 643 responding participants, 408 (63.5%) were physicians, 172 (26.8%) were nurses and 63 (9.8%) corresponded to other healthcare occupations such as radio diagnostic technicians or nurse assistants. Of the participants, 422 (66%) worked in the Madrid Community, 377 (58.63%) worked on the frontline and 266 (41.37%) in their usual ward.

Most participants were women (472 [73%]), were aged 31 to 40 years (163 [25%]), and 51 to 60 (160 [25%]), 76% had a partner, and worked in tertiary hospitals (260 [40%]). Among the participants' specialties, 63% were Medicine, 20% EMS (out-of-hospital Emergency Medical Services care) and 13% were Surgical (Table 1).

A total of 377 participants (59%) were FL healthcare workers directly engaged in diagnosing, treating, or caring for patients with or suspected of COVID-19. Regarding this FL group, mostly were women, aged 30 to 41 years, married and physicians. The two predominant specialties working in the FL were Medical and EMS, and no differences were observed between FL and usual ward in the surgical specialty. FL workers mostly worked in tertiary hospitals (>600 beds) or Primary Care (the latter were sent to attend at field hospitals). The majority of FL workers had more than 15 years of

experience, worked from 41 to 60 hours per week and had worked during weekends at least once a week or every two weeks during pandemic (Table 1).

Of note, regarding the working position of the surveyed participants (Figure 1), a total of 214 (56.7%) healthcare workers working in FL were physicians, 121 (32%) were nurses, and 42 (11.1%) other healthcare occupations, whereas those who stayed at their usual wards were 194 (72%) physicians, 51 (19%) nurses and 21 (8%) other healthcare occupations .

Attitudes toward COVID-19

Participants were asked about their attitude toward the effect of COVID-19 (Table 2). The main difference observed was that 57.5% of healthcare workers reported a higher burnout level now than pre-pandemic, 60% of the surveyed professionals were afraid of becoming infected at work, 83% were afraid of greatly increasing the risk of infection to their families, while 89% feared for this pandemic going on for too long. Around 85% of the surveyed healthcare workers were worried about their patient´s outcome and 73% were worried about providing correct practice and quality of care. Compared to non-FL, FL healthcare workers (61.5%, $p<0.001$) felt more burnout now than before the COVID-19 crisis. In addition, women felt more burnout now than pre-pandemic (60.8%, $p=0.016$), were more afraid of self-infection (61.9%, $p=0.021$) and of their performance and quality

of care provided to the patients (75.8%, p=0.015) than men. Of note, the segment of age who felt more burnout now than pre-pandemic were those between 20 and 30 years old (65.2%, p=0.026).

Regarding the type of hospital, those healthcare workers working in small hospitals (<300 beds) were the ones more worried over becoming infected (65%, p=0.013). Also reporting a higher burnout level now than pre-pandemic (53.7%, p=0.035) were those healthcare workers with more than 15 years of experience. Additionally, overworked healthcare workers (>60 working hours per week) were more afraid of their performance and quality of care (70%, p=0.022) and those not overworked (<20 working hours per week) were more afraid of becoming infected (39%, p=0.001). Factors such as occupation, marital status, specialty or weekends worked during the pandemic had no significance in the attitude toward COVID-19.

Burnout Prevalence and its association with working position: Maslach Burnout Inventory (MBI)

Results on the MBI are detailed in Table 3, where Burnout prevalence and its association with working positions (COVID-19 FL vs non COVID-19 FL) have been calculated. We found that the prevalence of Burnout syndrome in our sample is 43.4% (95% CI 39.5; 47.2), and the frequency of working in COVID-19 FL with developing Burnout syndrome

is higher in COVID-19 FL workers (49.6%, p <0.001) than in non- COVID-19 FL workers (34.6%, p <0.001).

The description of Maslach items shows a significant association with high levels of EE (p<0.001) and high levels of DP (p=0.006) with working on the COVID-19 FL, but not with PA.

Associated Factors to Burnout syndrome

The potential risk factors associated through the univariate study with Burnout syndrome are shown in Table 4; working on the COVID-19 FL (OR, 1.86; 95% CI 1.35-2.57; p<0.001), age between 20 and 30 years old compared to 31 to 40 (OR 0.56; 95% CI 0.35-0.91; p=0.019) and to 51 to 60 years old (OR 0.48; 95% CI 0.30-0.79; p=0.003), female sex (OR, 1.50; 95% CI 1.04-2.15; p=0.029), and occupation category (being physician or nurse doubles the risk of Burnout syndrome compared to “others”). Being unexperienced (under 5 years of working experience) was also related to a higher risk of Burnout syndrome compared to more experienced workers with over 15 years of practice.

Multivariable logistic regression analysis (Table 5) revealed that, working in COVID-19 FL, being a woman under 30 years old, and being a physician were the main factors associated with high risk of Burnout syndrome.

DISCUSSION

This study was conducted in the middle and late stages of the COVID-19 outbreak, 2 weeks after the peak of the curve was reached in Spain, mainly in a critically epidemic affected area, which was Madrid Community. To our knowledge, this is the first report on burnout prevalence and associated risk factors among healthcare workers in Spain during the COVID-19 pandemic. The results show a substantial proportion of burnout among healthcare workers in the front lines, particularly among young women and doctors, are in line with previous reports from China and Italy (16, 17).

Healthcare workers on the front lines of the healthcare response during COVID-19 pandemic have found themselves in unprecedented positions, making high-stakes decisions for patients and their own personal lives (18, 19). In this context, and due not only to the elevated number of detected cases that have crowded the Spanish hospitals, especially those in the Madrid Community, but also to the grave shortages in protective gear, Spanish FL healthcare workers have defined the situation as “war medicine”.

The proportion of healthcare workers with psychological comorbidities was estimated at 35%, during the 2003 SARS outbreak (7). During the 2003 SARS outbreak, uncertainty and stigmatization were prominent themes for both healthcare professionals and patients (8). This SARS-CoV-2 outbreak is no different. In this study, we report that working in COVID-19 FL doubles the risk of suffering from Burnout syndrome, compared to those professionals working in their usual wards. The other related risk factors, which are being a woman, a doctor and being under 30 years old, are related to the fact that more than 50% of the participants working on the FL were physicians, and more than 70% of the total sample were women. These results are in line with the percentage of employed women, working in the Spanish healthcare system, which is 74.2% according to the Official State Bulletin of Service of Public Administrations. According to these statistics, the most feminized group is the one under the age of 35 and the segment of women over 44 years of age represents 54.7% of the total number of practicing physicians. Therefore, Medicine has 56.4% of women workers and Nursing 84.5%, according to official figures, which matches the numbers obtained in our study.

Despite being the country reporting health care staff accounting for the highest percentage of total infections and deaths, more than being afraid of self-infection or feeling burnout, surveyed healthcare workers in this study reported being more worried

about infecting their families (84%), of this pandemic going for too long (89%) and of their patient´s outcome (85%). Of note, a higher percentage of those participants who were more afraid of becoming infected were non COVID-19 FL workers who worked in small hospitals (<300 beds). This may be related to the unawareness that the virus might have been already among the population while patients were admitted without protective measures in place or testing in any hospital (20) and only those patients coming from Wuhan or Italy were being tested. This may have provoked that medical staff working without adequate protection may have acted like vectors. As a matter of fact, infection rates in the more well protected ICU and emergency departments were lower than in general wards with no early warning of the disease.

A significant proportion of participants working on the COVID-19 FL experienced a high level of emotional exhaustion (71.4%), and a high level of depersonalization (69%) compared to those working in their usual ward (28.6% and 31%, respectively). Personal accomplishment, another key element of burnout, may have played a role in this pandemic scenario. COVID-19 FL workers presented lower levels of PA (61%) compared to those working in their usual ward (39%), which could relate to feeling a deeper sense of failure seeing the direct results of their care in the poor outcomes of their COVID-19 patients.

In the present study, when comparing burnout frequency during COVID-19 pandemic to the usual burnout ratio in the healthcare workers (14, 15, 24), a 4% increase in the prevalence of Burnout was observed, suggesting that during the COVID-19 pandemic the proportion of Burnout syndrome increased. Previous work has suggested that the number of years of experience, the number of hours worked per week, the frequency of working on weekends, and the number of personnel in a person's team or practice may be associated with burnout (14, 24-26). In a previous study during the acute SARS outbreak in 2003, 89% of the health care workers who were at high risk of exposure reported burnout and psychological symptoms such as anxiety or depression (23).

The psychological response and risk of burnout of healthcare workers to an epidemic of infectious diseases is complicated (27, 28). Sources of distress may include feelings of vulnerability or loss of control and concerns about health of self, spread of virus and its high morbidity (2), health of family and others, isolation, additionally to inadequate provision of personal protective equipment (21). Clinicians may have felt shame for thinking of themselves rather than their patients and guilt for putting their families at risk (18-20).

As the current sanitary crisis ultimately abates, we cannot neglect the fact that COVID-19 is not expected to disappear in the short or mid-term, so it is mandatory for clinicians

to take control of their wellbeing (29). An operational definition of wellbeing and a set of measures that provide optimum conditions to survive and prevent burnout or any other psychological condition are needed (30). Healthcare systems must reset in order to cover the existent needs detected during COVID-19 pandemic so that we do not return to the former status quo.

CONCLUSIONS

This survey study of healthcare professionals working in Spanish hospitals in the FL or wards during COVID-19 pandemic, mainly those based in Madrid, the most hardest-hit area in the country, reported high rates burnout syndrome. Especial interventions to promote mental well-being in health care workers exposed to COVID-19 need to be immediately implemented, with women, physicians, and FL workers requiring particular attention.

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Transparency declaration

The lead author affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

Contributorship statement

Dr Maria Torrente: conceptualization, study design, investigation, literature search, writing-original draft

Prof. Pedro A. Sousa: data curation, software, supervision, writing-review and editing, methodology

Dr Ana Sánchez Ramos: study design, data analysis

Dr Joao P. Pimentao : software, data curation, writing-review and editing

Dr Ana Royuela: study design, data analysis, writing-review and editing

Dr Ana Collazo-Lorduy: investigation, literature search

Prof Ernestina Menasalvas: data curation, writing-review and editing

Prof Mariano Provencio: conceptualization, study design, investigation, literature search, writing-review and editing, supervision, validation

Data sharing statement: Extra data is available by emailing cparejo@idiphim.org

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TABLES

Table 1. Baseline characteristics of healthcare workers [n (%)]

Characteristics	Total n (%)	COVID-19 frontline	Non COVID-19 frontline
Overall	***643 (100)***	***377 (58.63)***	***266 (41.37)***
Sex			
Women	***472(73.41)***	*290(76.92)*	*182(68.42)*
Men	***171(26.59)***	*87(23.08)*	*84(31.58)*
Age (yrs)			
20-30	***115(17.88)***	*81(21.49)*	*34(12.78)*
31-40	***163(25.35)***	*98(25.99)*	*65(24.44)*
41-50	***151(23.48)***	*87(23.08)*	*64(24.06)*
51-60	***160(24.88)***	*84(22.28)*	*76(28.57)*
61-70	***53(8.24)***	*27(7.16)*	*26(9.77)*
>70	***1(0.16)***	*0(0.00)*	*1(0.38)*
Marriage status			
Married	***491(76.36)***	*284(75.33)*	*207(77.82)*
Unmarried	***152(23.64)***	*93(24.67)*	*59(22.18)*
Occupation			
Physician	***408(63.45)***	*214(56.76)*	*194(72.93)*
Nurse	***172(26.75)***	*121(32.10)*	*51(19.17)*
Other	***63(9.80)***	*42(11.14)*	*21(7.89)*
Specialty			
Unspecified	***27(4.20)***	*22(5.84)*	*5(1.88)*
EMS (out-of-hospital emergency medical services care)	***128(19.91)***	*101(26.79)*	*27(10.15)*
Medicine	***406(63.14)***	*213(56.50)*	*193(72.56)*
Surgical	***82(12.75)***	*41(10.88)*	*41(15.41)*
Type of hospital (number of beds)			
Primary Care	***123(19.13)***	*90(23.87)*	*33(12.41)*
<300	***106(16.49)***	*68(18.04)*	*38(14.29)*
300-600	***154(23.95)***	*77(20.42)*	*77(28.95)*
>600	***260(40.44)***	*142(37.67)*	*118(44.36)*
Years of experience			
<=5	***119(18.51)***	*82 (21.75)*	*37(13.91)*
6-10	***82(12.75)***	*52(13.79)*	*30(11.28)*
11-15	***83(12.91)***	*41(10.88)*	*42(15.79)*
> 15	***359(55.83)***	*202(53.58)*	*157(59.02)*
Average weekly working hours			
<10	***7(1.09)***	*5(1.33)*	*2(0.75)*
11-20	***23(3.58)***	*13(3.45)*	*10(3.76)*
21-40	***236(36.70)***	*110(29.18)*	*126(47.37)*

41-60	***290(45.10)***	*185(49.07)*	*105(39.47)*
61-80	***62(9.64)***	*44(11.67)*	*18(6.77)*
>80	***25(3.89)***	*20(5.31)*	*5(1.88)*
Weekends worked during pandemic			
Never	***138(21.46)***	*28(7.43)*	*110(41.35)*
Every two weeks	***260(40.44)***	*151(40.05)*	*109(40.98)*
Every week (one day)	***177(27.53)***	*141(37.40)*	*36(13.53)*
Every week (two days)	***68(10.58)***	*57(15.12)*	*11(4.14)*

Table 2. Attitude of healthcare workers toward COVID-19 [*n* (%)]

Characteristics	Total n (%)	COVID-19 frontline	Non COVID-19 frontline		Age (yrs) 20-30	31-40	41-50	51-60		Sex Women	Men	
I feel more burnout now than compared to before COVID-19 crisis				***p***					***p***			***p***
Agree/ strongly agree	***370(57.55)***	*232(61.54)*	*138(51.88)*		*75(65.22)*	*98(60.12)*	*82(54.30)*	*88(55.00)*		*287(60.81)*	*83(48.54)*	
Neither agree or disagree	***120(18.66)***	*77(20.42)*	*43(16.17)*	*<0.001*	*23(20.00)*	*35(21.47)*	*28(18.54)*	*22(13.75)*	*0.026*	*84(17.80)*	*36(21.05)*	*0.016*
Disagree/ strongly disagree	***153(23.79)***	*68(18.04)*	*85(31.95)*		*17(14.78)*	*30(18.40)*	*41(27.15)*	*50(31.25)*		*101(21.40)*	*52(30.41)*	
I am worried about being infected												
Agree/ strongly agree	***384(59.72)***	*218(57.82)*	*166(62.41)*		*62(53.91)*	*98(60.12)*	*91(60.26)*	*94(58.75)*		*292(61.87)*	*92(53.80)*	
Neither agree or disagree	***126(19.60)***	*81(21.49)*	*45(16.92)*	*0.33*	*25(21.74)*	*25(15.34)*	*37(24.50)*	*33(20.63)*	*0.244*	*95(20.13)*	*31(18.13)*	*0.021*
Disagree/ strongly disagree	***133(20.69)***	*78(20.69)*	*55(20.67)*		*28(24.35)*	*40(24.54)*	*23(15.23)*	*33(20.63)*		*85(18.01)*	*48(28.07)*	
I am worried about infecting my family												
Agree/ strongly agree	***538(83.67)***	*318(84.35)*	*220(82.70)*		*100(86.96)*	*142(87.12)*	*128(84.77)*	*124(77.50)*		*403(85.38)*	*135(78.95)*	
Neither agree or disagree	***51(7.93)***	*28(7.43)*	*23(8.65)*	*0.82*	*8(6.96)*	*7(4.29)*	*13(8.61)*	*19(11.88)*	*0.419*	*34(7.20)*	*17(9.94)*	*0.146*
Disagree/ strongly disagree	***54(17.07)***	*31(8.22)*	*23(8.65)*		*7(6.09)*	*14(8.59)*	*10(6.62)*	*17(10.63)*		*35(7.42)*	*19(11.11)*	
I am worried this pandemic goes on for too long												
Agree/ strongly agree	***573(89.11)***	*334(88.60)*	*239(89.85)*		*104(90.43)*	*149(91.41)*	*131(86.75)*	*143(89.38)*		*427(90.47)*	*146(85.38)*	

Neither agree or disagree	***42(6.53)***	*22(5.84)*	*20(7.52)*	*0.15*	*6(5.22)*	*7(4.29)*	*15(9.93)*	*7(4.38)*	*0.294*	*28(5.93)*	*14(8.19)*	*0.161*
Disagree/ strongly disagree	***28(4.36)***	*21(5.57)*	*7(2.63)*		*5(4.35)*	*7(4.29)*	*5(3.31)*	*10(6.25)*		*17(3.60)*	*11(6.43)*	
I am worried about my patient´s outcome												
Agree/ strongly agree	***546(84.91)***	*323(85.68)*	*223(83.84)*		*96(83.48)*	*138(84.66)*	*125(82.78)*	*141(84.91)*		*404(85.59)*	*142(83.04)*	
Neither agree or disagree	***77(11.98)***	*43(11.41)*	*34(12.78)*	*0.81*	*18(15.65)*	*18(11.04)*	*22(14.57)*	*5(9.43)*	*0.607*	*54(11.44)*	*23(13.45)*	*0.727*
Disagree/ strongly disagree	***20(3.11)***	*11(2.92)*	*9(3.38)*		*1(0.87)*	*7(4.29)*	*4(2.65)*	*3(5.66)*		*14(2.97)*	*6(3.51)*	
I am worried for my performance and quality of care provided												
Agree/ strongly agree	***471(73.25)***	*288(76.39)*	*183(68.80)*		*91(79.13)*	*124(76.07)*	*115(76.16)*	*109(68.13)*		*358(75.84)*	*113(66.08)*	
Neither agree or disagree	***84(13.06)***	*44(11.67)*	*40(15.04)*	*0.09*	*11(9.57)*	*18(11.04)*	*21(13.91)*	*24(15.00)*	*0.207*	*60(12.71)*	*24(14.04)*	*0.015*
Disagree/ strongly disagree	***88(13.68)***	*45(11.94)*	*43(16.17)*		*13(11.30)*	*21(12.88)*	*15(9.93)*	*27(16.88)*		*54(11.44)*	*34(19.88)*	

Table 2. Attitude of healthcare workers toward COVID-19 [*n* (%)] (continued)

Characteristics	Type of hospital (number of beds) <300	300-600	>600	Primary Care	p	Years of experience <= 5	6-10	11-15	>15	p	Average weekly working hours <=20	21-40	41-60	>60	p
I feel more burnout now than compared to before COVID-19 crisis															
Agree/ strongly agree	*65(61.62)*	*83(53.90)*	*148(56.92)*	*74(60.16)*	*0.516*	*75(63.03)*	*50(60.98)*	*52(62.65)*	*193(53.76)*	*0.035*	*14(46.67)*	*129(54.66)*	*174(60.00)*	*53(60.92)*	*0.379*
Neither agree or disagree	*21(19.81)*	*34(22.08)*	*42(16.15)*	*23(18.70)*		*21(17.65)*	*21(25.61)*	*15(18.07)*	*63(17.55)*		*10(33.33)*	*47(19.92)*	*49(16.90)*	*14(16.09)*	
Disagree/ strongly disagree	*20(18.87)*	*37(24.03)*	*70(26.92)*	*26(21.14)*		*23(19.33)*	*11(13.41)*	*16(19.28)*	*103(28.69)*		*6(20.00)*	*60(25.42)*	*67(23.10)*	*20(22.99)*	
I am worried about being infected															
Agree/ strongly agree	*69(65.09)*	*87(56.49)*	*141(54.23)*	*87(70.73)*	*0.013*	*66(55.46)*	*42(51.22)*	*58(69.88)*	*218(60.72)*	*0.098*	*23(76.67)*	*152(64.41)*	*175(60.34)*	*34(39.08)*	*0.001*
Neither agree or disagree	*19(17.92)*	*30(19.48)*	*53(20.38)*	*24(19.51)*		*23(19.33)*	*18(21.95)*	*9(10.84)*	*76(21.17)*		*3(10.00)*	*42(17.80)*	*58(20.00)*	*23(26.44)*	
Disagree/ strongly disagree	*18(16.98)*	*37(24.03)*	*66(25.38)*	*12(9.76)*		*30(25.21)*	*22(26.83)*	*16(19.28)*	*65(18.11)*		*4(13.33)*	*42(17.80)*	*57(19.66)*	*30(34.48)*	
I am worried about infecting my family															
Agree/ strongly agree	*98(92.95)*	*122(79.22)*	*213(81.92)*	*105(85.37)*	*0.103*	*102(85.71)*	*69(84.15)*	*75(90.36)*	*292(81.34)*	*0.477*	*28(93.33)*	*193(81.78)*	*251(86.55)*	*66(75.86)*	*0.059*
Neither agree or disagree	*4(3.77)*	*13(8.44)*	*25(9.62)*	*9(7.32)*		*9(7.56)*	*5(6.10)*	*3(3.61)*	*34(9.47)*		*0(0.00)*	*21(8.90)*	*19(6.55)*	*11(12.64)*	
Disagree/ strongly disagree	*4(3.77)*	*19(12.34)*	*22(8.46)*	*9(7.32)*		*8(6.72)*	*8(9.76)*	*5(6.02)*	*33(9.19)*		*2(6.67)*	*22(9.32)*	*20(6.90)*	*10(11.49)*	
I am worried this pandemic goes on for too long															
Agree/ strongly agree	*98(92.45)*	*137(88.96)*	*229(88.08)*	*109(88.62)*	*0.743*	*104(87.39)*	*76(92.68)*	*78(93.98)*	*315(87.74)*	*0.379*	*29(96.67)*	*216(91.53)*	*255(87.93)*	*73(83.91)*	*0.068*
Neither agree or disagree	*5(4.72)*	*11(7.14)*	*16(6.15)*	*10(8.13)*		*8(6.72)*	*2(2.44)*	*4(4.82)*	*28(7.80)*		*0(0.00)*	*16(6.78)*	*20(6.90)*	*6(6.90)*	
Disagree/ strongly disagree	*3(2.83)*	*6(3.90)*	*15(5.77)*	*4(3.25)*		*7(5.88)*	*4(4.88)*	*1(1.20)*	*16(4.46)*		*1(3.33)*	*4(1.69)*	*15(5.17)*	*8(9.20)*	
I am worried about my patient´s outcome															
Agree/ strongly agree	*90(84.91)*	*128(83.12)*	*220(84.62)*	*108(87.80)*		*97(81.51)*	*69(84.15)*	*73(87.95)*	*307(85.52)*		*24(80.00)*	*206(87.29)*	*240(82.76)*	*76(87.36)*	

Neither agree or disagree	*11(10.38)*	*21(13.64)*	*32(12.31)*	*13(10.57)*	*0.839*	*20(16.81)*	*8(9.76)*	*10(12.05)*	*39(10.86)*	*0.156*	*4(13.33)*	*24(10.17)*	*40(13.79)*	*9(10.34)*	*0.69*
Disagree/ strongly disagree	*5(4.72)*	*5(3.25)*	*8(3.08)*	*2(1.63)*		*2(1.68)*	*5(6.10)*	*0(0.00)*	*13(3.62)*		*2(6.67)*	*6(2.54)*	*10(3.45)*	*2(2.30)*	
I am worried for my performance and quality of care provided															
Agree/ strongly agree	*83(78.30)*	*110(71.43)*	*188(72.31)*	*90(73.17)*		*92(77.31)*	*60(73.17)*	*68(81.93)*	*251(69.92)*		*20(66.67)*	*184(77.97)*	*200(68.97)*	*67(77.01)*	
Neither agree or disagree	*11(10.38)*	*24(15.58)*	*34(13.08)*	*15(12.20)*	*0.856*	*11(9.24)*	*10(12.20)*	*9(10.84)*	*54(15.04)*	*0.277*	*2(6.67)*	*24(10.17)*	*51(17.59)*	*7(8.05)*	*0.022*
Disagree/ strongly disagree	*12(11.32)*	*20(12.99)*	*38(14.62)*	*18(14.63)*		*16(13.45)*	*12(14.63)*	*6(7.23)*	*54(15.04)*		*8(26.67)*	*28(11.86)*	*39(13.45)*	*13(14.94)*	

Table 3. Results Maslach Burnout inventory

	Total n (%)	COVID-19 frontline	Non COVID-19 frontline	*p*
Overall	***643(100)***	***377 (58.63)***	***266 (41.37)***	
Emotional exhaustion				***<0.001***
Low	***149(23.17)***	*65(43.62)*	*84(56.38)*	
Intermediate	***340(52.88)***	*202(59.41)*	*138(40.59)*	
High	***154(23.95)***	*110(71.43)*	*44(28.57)*	
Depersonalization				***0.006***
Low	***154(23.95)***	*78(50.65)*	*76(49.35)*	
Intermediate	***356(55.37)***	*207(58.15)*	*149(41.85)*	
High	***133(20.68)***	*92(69.17)*	*41(30.83)*	
Personal accomplishment				***0.078***
Low	***147(22.86)***	*90(61.22)*	*57(38.78)*	
Intermediate	***364(56.61)***	*221(60.71)*	*143(39.29)*	
High	***132(20.53)***	*66(50.00)*	*66(50.00)*	
Burnout syndrome				***<0.001***
Yes	***279(43.39)***	*187(49.60)*	*92(34.59)*	
No	***364(56.61)***	*190(50.40)*	*174(65.41)*	

Table 4. Univariable analysis. Factors associated with Burnout syndrome

Characteristics	(OR 95% CI)	*p*
Working position		
COVID-19 frontline	*1.86(1.35-2.57)*	*<0.001*
Age (yrs)		
20-30 (reference category)		
31-40	*0.56(0.35-0.91)*	*0.019*
41-50	*0.73 (0.45-1.19)*	*0.21*
51-60	*0.48(0.30-0.79)*	*0.003*
61-70	*0.50(0.26-0.97)*	*0.041*
Sex		
Men (reference category)		
Women	*1.50(1.04-2.15)*	*0.029*
Occupation		
Other (reference category)		
Nurse	*2.02(1.06-3.84)*	*0.033*
Physician	*2.64(1.45-4.80)*	*0.002*
How long have you been practising? (yrs)		
=<5 (reference category)		
6-10	*0.66(0.37-1.16)*	*0.154*
11-15	*0.58(0.33-1.03)*	*0.066*
>15	*0.62(0.41-0.94)*	*0.026*

Table 5. Multivariable analysis. Risk factors associated with Burnout syndrome

Characteristics	OR (95% CI)	*p*
Working position		
COVID-19 frontline	1.93 (1.37-2.71)	<0.001
Sex		
Women	*1.56 (1.06 - 2.29)*	*0.022*
Occupation		
Physician	*1.64 (1.11 - 2.41)*	*0.011*
Other	*0.54 (0.27 - 1.05)*	*0.0022*
Age (yrs)		
31-40	*0.62(0.38-1.03)*	*0.066*
41-50	*0.90(0.54-1.50)*	*0.709*
51-60	*0.57(0.34-0.94)*	*0.028*
61-70	*0.61(0.30-1.22)*	*0.166*

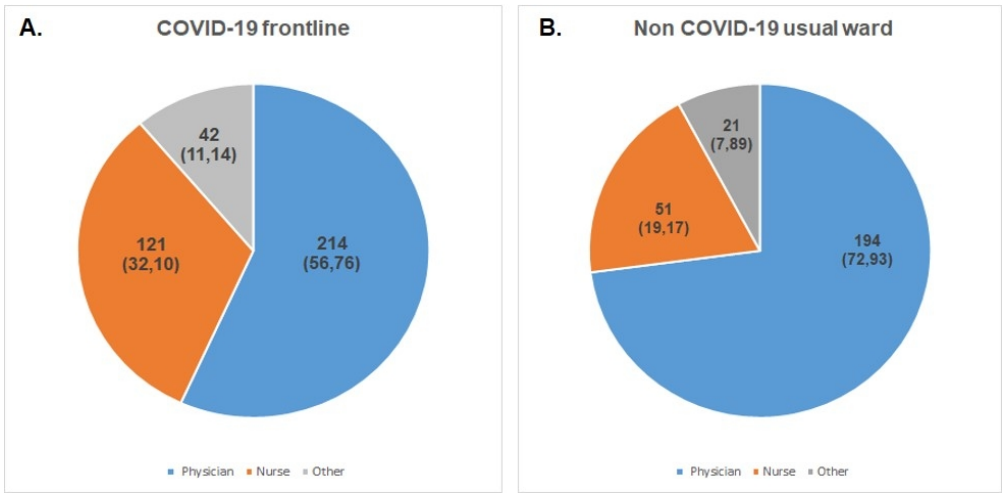

Figure 1. Distribution of occupations (physicians, nurses, others) in COVID-19 frontline (A) vs Non COVID-19 usual ward (B).

165x80mm (150 x 150 DPI)

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7
Bias	9	Describe any efforts to address potential sources of bias	6
Study size	10	Explain how the study size was arrived at	7
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	7
		(*c*) Explain how missing data were addressed	7
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	8
		(b) Give reasons for non-participation at each stage	8
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8
		(b) Indicate number of participants with missing data for each variable of interest	8
Outcome data	15*	Report numbers of outcome events or summary measures	9
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	10

		(*b*) Report category boundaries when continuous variables were categorized	10
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	10
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	11
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	12
Generalisability	21	Discuss the generalisability (external validity) of the study results	13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	13

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

To burnout or not to burnout. A cross-sectional study in healthcare professionals in Spain during COVID-19 pandemic.

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TITLE: To burnout or not to burnout. A cross-sectional study in healthcare professionals in Spain during COVID-19 pandemic.

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ABSTRACT

OBJECTIVE: To assess the prevalence of Burnout syndrome in healthcare workers working on the frontline in Spain during COVID-19.

DESIGN: Cross-sectional, online survey-based study.

SETTINGS: Sampling was performed between April 21st and May 3rd, 2020. The survey collected demographic data and questions regarding participants' working position since pandemic outbreak.

PARTICIPANTS: Spanish healthcare workers working on the frontline (FL) or usual ward were eligible. A total of 674 healthcare professionals answered the survey.

MAIN OUTCOMES AND MEASURES: Burnout syndrome was assessed by the Maslach Burnout Inventory-Medical Personnel (MBI).

RESULTS: Of the 643 eligible responding participants, 408 (63.5%) were physicians, 172 (26.8%) were nurses and 63 (9.8%) other technical occupations. 377 (58.6%) worked on the FL. Most participants were women (472 [73.4%]), aged 31 to 40 years (163 [25.3%]) and worked in tertiary hospitals (>600 beds) (260 [40.4%]). Prevalence of Burnout syndrome was 43.4% (95%CI 39.5; 47.2), higher in COVID-19 FL workers (49.6%, p <0.001) than in non- COVID-19 FL workers (34.6%, p <0.001). Women felt more burnout (60.8%, p=0.016), were more afraid of self-infection (61.9%, p=0.021) and of their performance and quality of care provided to the patients (75.8%, p=0.015) than men. More burnout were those between 20 and 30 years old (65.2%, p=0.026) and those with more than 15 years of experience (53.7%, p=0.035).

Multivariable logistic regression analysis revealed that, working on COVID-19 FL (odds ratio [OR] 1.93; 95%CI 1.37-2.71, p<0.001), being a woman (OR 1.56; 95%CI 1.06-2.29, p=0.022), being under 30 years old (OR 1.75; 95%CI 1.06-2.89, p=0.028), and being a physician (OR 1.64; 95%CI 1.11-2.41, p=0.011) were associated with high risk of Burnout syndrome.

CONCLUSIONS: This survey study of healthcare professionals reported high rates of Burnout syndrome. Interventions to promote mental well-being in healthcare workers exposed to COVID-19 need to be immediately implemented.

Strengths and limitations of this study

- This study was conducted in the middle and late stages of the COVID-19 outbreak, 2 weeks after the peak of the curve was reached in Spain, mainly in a critically epidemic affected area, which was Madrid Community. To our knowledge, this is the first report on burnout prevalence and associated risk factors among healthcare workers in Spain during the COVID-19 pandemic.
- The results show a substantial proportion of burnout among healthcare workers in the front lines, particularly among young women and doctors, are in line with previous reports from China and Italy.
- The main limitation of our study is that it is an online voluntary response survey distributed by mailing lists and social networks. Being voluntary, those professionals most affected may be more interested in answering the survey, so the degree of burnout prevalence may be overestimated; still, the large number of survey responses may have mitigated this effect.
- This study was limited in scope. Most participants (81.2%) were from Madrid autonomous community, limiting the generalization of our findings to less affected regions. Additionally, the study was performed during 2 weeks and lacks longitudinal follow-up.

INTRODUCTION

The current pandemic by the highly contagious novel coronavirus named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) started in Wuhan (China) (1,2) and has rapidly spread worldwide. In May 2020, Spain became Europe's next epicentre of the contagion and was the second country worldwide most severely affected by the coronavirus disease (COVID-19) after the United States (3). Of note, out of its confirmed coronavirus cases, more than 20% correspond to healthcare professionals, the highest number worldwide (4).

This critical situation was faced by healthcare workers on the COVID-19 frontline (FL), who were directly involved in the treatment, diagnosis and care of patients with SARS-CoV-2, who responded with a display of selflessness, caring for patients despite the risk of infection. The mounting daily number of confirmed and suspected cases, the overwhelming workload, the shortage of personal protection equipment, and lack of effective treatment, may all contribute to the physical and psychological burden of these healthcare professionals. Previous studies on the 2003 SARS outbreak reported adverse psychological impact among healthcare workers (5, 6) who reported experiencing high

levels of stress, anxiety, and depression symptoms, which could have long-term psychological outcomes (7,8). This feeling is what is known as “burnout syndrome”, a feeling which already affected healthcare professionals, especially physicians, meaning that when COVID-19 kicked in, they were already burn out (9, 10).

Burnout is a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed and three dimensions characterize it: feelings of emotional exhaustion, depersonalization, and a low feeling of personal accomplishment (9). Its prevalence is high among the different groups of healthcare professionals, and is usually higher in physicians (10, 11).

In order to quantify this type of stress, there are numerous scales available; the most validated one to assess the incidence of burnout in healthcare personnel being the Maslach Burnout Inventory, considered the gold standard (12).

This pandemic context has generated a turmoil of all these feelings and emotions in the healthcare professionals in a very short period of time that may have a substantial negative mental health outcome, which is why this kind of study has become of utter importance (13). The main goal of our study was to evaluate the burnout prevalence of healthcare professionals in Spain during COVID-19 pandemic and evaluate the differences between professionals working on the FL versus those working in their usual

wards. Secondarily, we aimed at comparing burnout proportions between working on the FL versus working at the usual ward, and finally compared the prevalence of Burnout syndrome during COVID-19 pandemic and pre-COVID-19 pandemic.

METHODS

Study Design

The study is a cross-sectional online survey sampling between April 21st and May 3rd, 2020, the two weeks following the COVID-19 contagion peak in Spain. During this period, the total confirmed cases of COVID-19 exceeded 60.000 in Madrid and over 200.000 in Spain. The survey included 15 demographic questions and questions regarding participants' status in the past two months since pandemic outbreak. It also included the Maslach Burnout Inventory-Medical Personnel (MBI) to measure Burnout, which is a 22-question survey that has been frequently used in other studies examining burnout in health care workers, including physicians and nurses (find the complete survey online here: https://forms.gle/nV1JBRHjiEBiV5TeA).

Approval from the clinical research ethics committee of Puerta de Hierro Majadahonda University Hospital was received before the initiation of this study. The dissemination of the survey was conducted through different national healthcare system email registries

and social networks (Instagram and Twitter), with the aim of comparing the differences between working with COVID-19 patients or at the usual wards among healthcare workers in Spain. Because of the self-selected nature of the sample, neither invitations nor response rates could be quantifiable, as reported by American Association for Public Opinion Research (AAPOR) reporting guideline. Because Madrid Community was most severely affected, the sample in this region is considerably higher.

Being a voluntary survey, response bias may exist if those professionals most affected may be more interested in answering the survey, or on the contrary, were either too stressed to respond, or not stressed at all and therefore may have not been interested in answering the survey. Still, the large number of survey responses and the calculation of the needed sample size may have mitigated this effect.

Patient and Public Involvement (PPI)

The survey was sent as an online questionnaire to healthcare professionals practicing in Spain, who had been actively working during COVID-19 pandemic. Study population comprised physicians, nurses, nursing assistants, and emergency healthcare technicians. A link to an online survey was disclosed through dissemination emails and social networks among the healthcare professionals. Participants were asked about their working position, engagement in clinical activities of diagnosing and treating patients with

symptoms or patients with confirmed COVID-19, or if they had stayed in their usual wards. The survey was anonymous, and confidentiality of information was assured. It consisted of the following sections:

1. Sociodemographic variables and working conditions during pandemic: age, gender, marital status, autonomous community of work, occupation, type of hospital, working position (COVID-19 FL or usual ward), medical specialty, practicing years, weekly hours worked, and weekends worked.
2. Maslach Burnout Inventory: consists of 22 questions; responses are rated depending on the degree of agreement or disagreement with the statement. The questions refer to the degree of emotional exhaustion (9 questions), depersonalization (5 questions) and personal fulfilment (8 questions). It is defined as burnout syndrome to have a high percentile of emotional exhaustion, and/or a high percentile of depersonalization and/or a low percentile of personal achievement. The MBI is the gold standard for evaluating Burnout syndrome (12, 13). The median (IQR) scores on the classification of Burnout syndrome were defined as high level of emotional exhaustion (EE) 26,2 (ranged 20-32), and/or high level of depersonalization (DP) 11,6 (ranged 9-14) and low level of personal accomplishment (PA) 29,6 (ranged 26-34).

3. Attitude of healthcare workers toward COVID-19 pandemic (self-assessment): six questions rated from 1 to 5 to evaluate participant´s attitude toward i) psychological impact, ii) self-infection, iii) risk of infecting their family, iv) this pandemic going for too long v) patients outcome and vi) their performance and quality of care.

Outcomes and Covariates

The main outcome was to assess prevalence of Burnout syndrome in FL workers. Secondarily, to compare burnout proportions between working on the FL vs working at usual ward and a comparison of prevalence of Burnout syndrome in healthcare personnel during COVID-19 pandemic and pre-COVID-19.

Study size

The proportion of healthcare workers with Burnout syndrome was estimated between 35% and 38.7% in several studies before COVID-19 pandemic (10, 14, 15). To achieve 4% precision in estimating a proportion using a 95% bilateral asymptotic confidence interval, assuming the proportion is 35%, it will be necessary to include 547 participants in the study.

Statistical analysis

A descriptive analysis was performed expressing the categorical variables in number and percentage, and the quantitative variables in mean and interquartile range (IQR).

Wald's asymptotic method was used to estimate the prevalence of burnout syndrome in the sample and its 95% CI, as well as to estimate the proportions of burnout syndrome in COVID-19 FL workers and non-COVID-19 FL workers.

A descriptive analysis of Maslach Burnout Inventory's quantitative variables was performed for Maslach items calculating their medians and 25 and 75 percentiles. To proceed to the calculation/or classification of Burnout syndrome, the groups low (= p25 percentile), medium (= p50 percentile), severe/high (= p75 percentile) of each of the Maslach items were defined.

The association between categorical variables was initially analysed with a Chi-Square test (or Fisher's exact test when expected n <5).

Subsequently, a logistic regression model was designed to measure the association of working in the COVID-19 FL on the diagnosis of burnout. The final model decision took into account statistical criteria as well as researchers' criteria. The associated variables resulting from this model are expressed as odds ratio (OR) with a 95% confidence interval (95% CI). The association of the responses of the different Maslach items with the exposure to work in the COVID-19 environment was performed using a univariate

logistic regression. This relationship is expressed as an odds ratio (OR) with a 95% confidence interval (95% CI) and a p-value <0.05 was considered significant. Data analysis was performed using Stata statistical software v16 (StataCorp., 1985, USA).

RESULTS

Demographic characteristics

A total of 674 healthcare professionals answered the survey. Out of these 674, 31 were excluded for the following reasons: 15 were duplicate answers, 6 were previous tests of the survey, 2 did not answer their working position (COVID-19 FL or non-COVID-19 FL) and 8 were non healthcare profiles (Table 1).

Of the 643 responding participants, 408 (63.5%) were physicians, 172 (26.8%) were nurses and 63 (9.8%) corresponded to other healthcare occupations such as radio diagnostic technicians or nurse assistants. Of the participants, 422 (66%) worked in the Madrid Community, 377 (58.63%) worked on the frontline and 266 (41.37%) in their usual ward.

Most participants were women (472 [73%]), were aged 31 to 40 years (163 [25%]), and 51 to 60 (160 [25%]), 76% had a partner, and worked in tertiary hospitals (260 [40%]).

Among the participants' specialties, 63% were Medicine, 20% EMS (out-of-hospital Emergency Medical Services care) and 13% were Surgical (Table 1).

A total of 377 participants (59%) were FL healthcare workers directly engaged in diagnosing, treating, or caring for patients with or suspected of COVID-19. Regarding this FL group, mostly were women, aged 30 to 41 years, married and physicians. The two predominant specialties working in the FL were Medical and EMS, and no differences were observed between FL and usual ward in the surgical specialty. FL workers mostly worked in tertiary hospitals (>600 beds) or Primary Care (the latter were sent to attend at field hospitals). The majority of FL workers had more than 15 years of experience, worked from 41 to 60 hours per week and had worked during weekends at least once a week or every two weeks during pandemic (Table 1).

Of note, regarding the working position of the surveyed participants (Figure 1), a total of 214 (56.7%) healthcare workers working in FL were physicians, 121 (32%) were nurses, and 42 (11.1%) other healthcare occupations, whereas those who stayed at their usual wards were 194 (72%) physicians, 51 (19%) nurses and 21 (8%) other healthcare occupations .

Attitudes toward COVID-19

Participants were asked about their attitude toward the effect of COVID-19 (Table 2). The main difference observed was that 57.5% of healthcare workers reported a higher burnout level now than pre-pandemic, 60% of the surveyed professionals were afraid of becoming infected at work, 83% were afraid of greatly increasing the risk of infection to their families, while 89% feared for this pandemic going on for too long. Around 85% of the surveyed healthcare workers were worried about their patient´s outcome and 73% were worried about providing correct practice and quality of care. Compared to non-FL, FL healthcare workers (61.5%, p<0.001) felt more burnout now than before the COVID-19 crisis. In addition, women felt more burnout now than pre-pandemic (60.8%, p=0.016), were more afraid of self-infection (61.9%, p=0.021) and of their performance and quality of care provided to the patients (75.8%, p=0.015) than men. Of note, the segment of age who felt more burnout now than pre-pandemic were those between 20 and 30 years old (65.2%, p=0.026).

Regarding the type of hospital, those healthcare workers working in small hospitals (<300 beds) were the ones more worried over becoming infected (65%, p=0.013). Also reporting a higher burnout level now than pre-pandemic (53.7%, p=0.035) were those healthcare workers with more than 15 years of experience. Additionally, overworked

healthcare workers (>60 working hours per week) were more afraid of their performance and quality of care (70%, p=0.022) and those not overworked (<20 working hours per week) were more afraid of becoming infected (39%, p=0.001). Factors such as occupation, marital status, specialty or weekends worked during the pandemic had no significance in the attitude toward COVID-19.

Burnout Prevalence and its association with working position: Maslach Burnout Inventory (MBI)

Results on the MBI are detailed in Table 3, where Burnout prevalence and its association with working positions (COVID-19 FL vs non COVID-19 FL) have been calculated. We found that the prevalence of Burnout syndrome in our sample is 43.4% (95% CI 39.5; 47.2), and the frequency of working in COVID-19 FL with developing Burnout syndrome is higher in COVID-19 FL workers (49.6%, p <0.001) than in non- COVID-19 FL workers (34.6%, p <0.001).

The description of Maslach items shows a significant association with high levels of EE (p<0.001) and high levels of DP (p=0.006) with working on the COVID-19 FL, but not with PA.

Associated Factors to Burnout syndrome

The potential risk factors associated through the univariate study with Burnout syndrome are shown in Table 4; working on the COVID-19 FL (OR, 1.86; 95% CI 1.35-2.57; p<0.001), age between 20 and 30 years old compared to 31 to 40 (OR 0.56; 95% CI 0.35-0.91; p=0.019) and to 51 to 60 years old (OR 0.48; 95% CI 0.30-0.79; p=0.003), female sex (OR, 1.50; 95% CI 1.04-2.15; p=0.029), and occupation category (being physician or nurse doubles the risk of Burnout syndrome compared to “others”). Being unexperienced (under 5 years of working experience) was also related to a higher risk of Burnout syndrome compared to more experienced workers with over 15 years of practice.

Multivariable logistic regression analysis (Table 5) revealed that, working in COVID-19 FL, being a woman under 30 years old, and being a physician were the main factors associated with high risk of Burnout syndrome.

DISCUSSION

Despite Spain's image being one of the healthiest nations in the world, having a robust universal health care system, and the highest life expectancy in the European Union, the COVID-19 pandemic has severely tested the Spanish health system resilience and

pandemic preparedness. The Spanish health system was already fragile when it was overwhelmed by COVID-19 in March, after a decade of austerity that followed the 2008 financial crisis, which left health services understaffed, under-resourced, and under strain.

The creation in 2004 of a Centre for Coordination of Health Alerts and Emergency, and the tightly calculated design of the Spanish health care system were supposed to ensure that threatening illnesses were quickly detected and treated. Nevertheless, the pandemic laid bare the country's poor coordination among central and regional authorities, the weak surveillance systems and scarcity of personal protective equipment and critical care equipment, or an ageing population and vulnerable disease groups, among other problems (16).

With as many as 65,000 healthcare workers infected, health facilities in the worst affected regions such as Madrid or Catalonia were struggling, with inadequate intensive care capacity and an insufficient number of ventilators in particular (17). Even tertiary hospitals (those with over 600 beds of capacity) cancelled non-emergency surgeries and cleared beds where possible. Policies at health care centres were modified in order to take some of the burden off hospitals or specialist referrals, but the steady stream of

patients has made them a primary source of infection. As a result, there were hardly any open consultation hours, which in turn lead to many undiagnosed diseases.

While hospitals in northern Europe are smaller and well distributed among the population, in Spain they are concentrated in the large cities. In rural areas, there is a shortage, and the hospitals available are small (under 300 beds of capacity). On top of this, Spain has just under 10 intensive care beds per 100,000 inhabitants (16).

This study was conducted in the middle and late stages of the COVID-19 outbreak, two weeks after the peak of the curve was reached in Spain, mainly in a critically epidemic affected area, which was Madrid Community. To our knowledge, this is the first report on burnout prevalence and associated risk factors among healthcare workers in Spain during the COVID-19 pandemic. The results show a substantial proportion of burnout among healthcare workers in the front lines, particularly among young women and physicians, are in line with previous reports from China and Italy (18, 19).

Healthcare workers on the front lines of the healthcare response during COVID-19 pandemic have found themselves in unprecedented positions, making high-stakes decisions for patients and their own personal lives (20, 21). In this context, and due not only to the elevated number of detected cases that have crowded the Spanish hospitals,

especially those in the Madrid Community, but also to the grave shortages in protective gear, Spanish FL healthcare workers have defined the situation as “war medicine”.

The proportion of healthcare workers with psychological comorbidities was estimated at 35%, during the 2003 SARS outbreak (7). During the 2003 SARS outbreak, uncertainty and stigmatization were prominent themes for both healthcare professionals and patients (8). This SARS-CoV-2 outbreak is no different. In this study, we report that working in COVID-19 FL doubles the risk of suffering from Burnout syndrome, compared to those professionals working in their usual wards. The other related risk factors, which are being a woman, a physician, and being under 30 years old, are related to the fact that more than 50% of the participants working on the FL were physicians, and more than 70% of the total sample were women. These results are in line with the percentage of employed women, working in the Spanish healthcare system, which is 74.2% according to the Official State Bulletin of Service of Public Administrations. According to these statistics, the most feminized group is the one under the age of 35 and the segment of women over 44 years of age represents 54.7% of the total number of practicing physicians. Therefore, Medicine has 56.4% of women workers and Nursing 84.5%, according to official figures, which matches the numbers obtained in our study.

Despite being the country reporting health care staff accounting for the highest percentage of total infections and deaths, more than being afraid of self-infection or feeling burnout, surveyed healthcare workers in this study reported being more worried about infecting their families (84%), of this pandemic going for too long (89%) and of their patient´s outcome (85%). Of note, a higher percentage of those participants who were more afraid of becoming infected were non COVID-19 FL workers who worked in small hospitals (<300 beds). This may be related to the unawareness that the virus might have been already among the population while patients were admitted without protective measures in place or testing in any hospital (22) and only those patients coming from Wuhan or Italy were being tested. This may have provoked that medical staff working without adequate protection may have acted like vectors. In fact, infection rates in the more well protected ICU and emergency departments were lower than in general wards with no early warning of the disease.

A significant proportion of participants working on the COVID-19 FL experienced a high level of emotional exhaustion (71.4%), and a high level of depersonalization (69%) compared to those working in their usual ward (28.6% and 31%, respectively). Personal accomplishment, another key element of burnout, may have played a role in this pandemic scenario. COVID-19 FL workers presented lower levels of PA (61%) compared

to those working in their usual ward (39%), which could relate to feeling a deeper sense of failure seeing the direct results of their care in the poor outcomes of their COVID-19 patients.

In the present study, when comparing burnout frequency during COVID-19 pandemic to the usual burnout ratio in the healthcare workers (14, 15, 23), a 4% increase in the prevalence of Burnout was observed, suggesting that during the COVID-19 pandemic the proportion of Burnout syndrome increased. Previous work has suggested that the number of years of experience, the number of hours worked per week, the frequency of working on weekends, and the number of personnel in a person's team or practice may be associated with burnout (14, 24-26). In a previous study during the acute SARS outbreak in 2003, 89% of the health care workers who were at high risk of exposure reported burnout and psychological symptoms such as anxiety or depression (27).

The psychological response and risk of burnout of healthcare workers to an epidemic of infectious diseases is complicated (28, 29). Sources of distress may include feelings of vulnerability or loss of control and concerns about health of self, spread of virus and its high morbidity (2), health of family and others, isolation, additionally to inadequate provision of personal protective equipment (30). Clinicians may have felt shame for

thinking of themselves rather than their patients and guilt for putting their families at risk (20-22).

As the current sanitary crisis ultimately abates, we cannot neglect the fact that COVID-19 is not expected to disappear in the short or mid-term, so it is mandatory for clinicians to take control of their wellbeing (31). An operational definition of wellbeing and a set of measures that provide optimum conditions to survive and prevent burnout or any other psychological condition are needed (32). Healthcare systems must reset in order to cover the existent needs detected during COVID-19 pandemic so that we do not return to the former status quo.

Study Limitations

This study has several limitations. First, it was limited in scope. Most participants (81.2%) were from Madrid autonomous community, limiting the generalization of our findings to less affected regions. Secondly, the study was performed during two weeks and lacks longitudinal follow-up. Because of the arduous situation that it is becoming more intense every week, the psychological symptoms of healthcare workers could become more severe. Thus, these symptoms could have a long-term impact on these populations and a further investigation would be worth to perform.

The third limitation of our study is that it is an online voluntary response survey distributed by mailing lists and social networks. Being voluntary, response bias may exist if those professionals most affected may be more interested in answering the survey, or on the contrary, were either too stressed to respond, or not stressed at all and therefore may have not been interested in answering the survey; still, the large number of survey responses may have mitigated this effect.

CONCLUSIONS

This survey study of healthcare professionals working in Spanish hospitals in the FL or wards during COVID-19 pandemic, mainly those based in Madrid, the most hardest-hit area in the country, reported high rates burnout syndrome. Especial interventions to promote mental well-being in health care workers exposed to COVID-19 need to be immediately implemented, with women, physicians, and FL workers requiring particular attention.

Conflict of interest: None reported.

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Transparency declaration

The lead author affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

Contributorship statement

Dr Maria Torrente: conceptualization, study design, investigation, literature search, writing-original draft

Prof. Pedro A. Sousa: data curation, software, supervision, writing-review and editing, methodology

Dr Ana Sánchez Ramos: study design, data analysis

Dr Joao P. Pimentao : software, data curation, writing-review and editing

Dr Ana Royuela: study design, data analysis, writing-review and editing

Dr Fabio Franco: investigation, literature search

Dr Ana Collazo-Lorduy: investigation, literature search

Prof Ernestina Menasalvas: data curation, writing-review and editing

Prof Mariano Provencio: conceptualization, study design, investigation, literature search, writing-review and editing, supervision, validation

Data sharing statement: Extra data is available by emailing cparejo@idiphim.org

FIGURE LEGEND

Figure 1. Distribution of occupations (physicians, nurses, others) in COVID-19 frontline (A) vs Non COVID-19 usual ward (B).

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TABLES

Table 1. Baseline characteristics of healthcare workers [n (%)]

Characteristics	Total n (%)	COVID-19 frontline	Non COVID-19 frontline
Overall	***643 (100)***	***377 (58.63)***	***266 (41.37)***
Sex			
Women	***472(73.41)***	*290(76.92)*	*182(68.42)*
Men	***171(26.59)***	*87(23.08)*	*84(31.58)*
Age (yrs)			
20-30	***115(17.88)***	*81(21.49)*	*34(12.78)*
31-40	***163(25.35)***	*98(25.99)*	*65(24.44)*
41-50	***151(23.48)***	*87(23.08)*	*64(24.06)*
51-60	***160(24.88)***	*84(22.28)*	*76(28.57)*
61-70	***53(8.24)***	*27(7.16)*	*26(9.77)*
>70	***1(0.16)***	*0(0.00)*	*1(0.38)*
Marriage status			
Married	***491(76.36)***	*284(75.33)*	*207(77.82)*
Unmarried	***152(23.64)***	*93(24.67)*	*59(22.18)*
Occupation			
Physician	***408(63.45)***	*214(56.76)*	*194(72.93)*
Nurse	***172(26.75)***	*121(32.10)*	*51(19.17)*
Other	***63(9.80)***	*42(11.14)*	*21(7.89)*
Specialty			
Unspecified	***27(4.20)***	*22(5.84)*	*5(1.88)*
EMS (out-of-hospital emergency medical services care)	***128(19.91)***	*101(26.79)*	*27(10.15)*
Medicine	***406(63.14)***	*213(56.50)*	*193(72.56)*
Surgical	***82(12.75)***	*41(10.88)*	*41(15.41)*
Type of hospital (number of beds)			
Primary Care	***123(19.13)***	*90(23.87)*	*33(12.41)*
<300	***106(16.49)***	*68(18.04)*	*38(14.29)*
300-600	***154(23.95)***	*77(20.42)*	*77(28.95)*
>600	***260(40.44)***	*142(37.67)*	*118(44.36)*
Years of experience			
<=5	***119(18.51)***	*82 (21.75)*	*37(13.91)*
6-10	***82(12.75)***	*52(13.79)*	*30(11.28)*
11-15	***83(12.91)***	*41(10.88)*	*42(15.79)*
> 15	***359(55.83)***	*202(53.58)*	*157(59.02)*
Average weekly working hours			
<10	***7(1.09)***	*5(1.33)*	*2(0.75)*
11-20	***23(3.58)***	*13(3.45)*	*10(3.76)*
21-40	***236(36.70)***	*110(29.18)*	*126(47.37)*

41-60	***290(45.10)***	*185(49.07)*	*105(39.47)*
61-80	***62(9.64)***	*44(11.67)*	*18(6.77)*
>80	***25(3.89)***	*20(5.31)*	*5(1.88)*
Weekends worked during pandemic			
Never	***138(21.46)***	*28(7.43)*	*110(41.35)*
Every two weeks	***260(40.44)***	*151(40.05)*	*109(40.98)*
Every week (one day)	***177(27.53)***	*141(37.40)*	*36(13.53)*
Every week (two days)	***68(10.58)***	*57(15.12)*	*11(4.14)*

Table 2. Attitude of healthcare workers toward COVID-19 [*n* (%)]

Characteristics	Total n (%)	COVID-19 frontline	Non COVID-19 frontline		Age (yrs) 20-30	31-40	41-50	51-60		Sex Women	Men	
I feel more burnout now than compared to before COVID-19 crisis				***p***					***p***			***p***
Agree/ strongly agree	***370(57.55)***	*232(61.54)*	*138(51.88)*		*75(65.22)*	*98(60.12)*	*82(54.30)*	*88(55.00)*		*287(60.81)*	*83(48.54)*	
Neither agree or disagree	***120(18.66)***	*77(20.42)*	*43(16.17)*	*<0.001*	*23(20.00)*	*35(21.47)*	*28(18.54)*	*22(13.75)*	*0.026*	*84(17.80)*	*36(21.05)*	*0.016*
Disagree/ strongly disagree	***153(23.79)***	*68(18.04)*	*85(31.95)*		*17(14.78)*	*30(18.40)*	*41(27.15)*	*50(31.25)*		*101(21.40)*	*52(30.41)*	
I am worried about being infected												
Agree/ strongly agree	***384(59.72)***	*218(57.82)*	*166(62.41)*		*62(53.91)*	*98(60.12)*	*91(60.26)*	*94(58.75)*		*292(61.87)*	*92(53.80)*	
Neither agree or disagree	***126(19.60)***	*81(21.49)*	*45(16.92)*	*0.33*	*25(21.74)*	*25(15.34)*	*37(24.50)*	*33(20.63)*	*0.244*	*95(20.13)*	*31(18.13)*	*0.021*
Disagree/ strongly disagree	***133(20.69)***	*78(20.69)*	*55(20.67)*		*28(24.35)*	*40(24.54)*	*23(15.23)*	*33(20.63)*		*85(18.01)*	*48(28.07)*	
I am worried about infecting my family												
Agree/ strongly agree	***538(83.67)***	*318(84.35)*	*220(82.70)*		*100(86.96)*	*142(87.12)*	*128(84.77)*	*124(77.50)*		*403(85.38)*	*135(78.95)*	
Neither agree or disagree	***51(7.93)***	*28(7.43)*	*23(8.65)*	*0.82*	*8(6.96)*	*7(4.29)*	*13(8.61)*	*19(11.88)*	*0.419*	*34(7.20)*	*17(9.94)*	*0.146*
Disagree/ strongly disagree	***54(17.07)***	*31(8.22)*	*23(8.65)*		*7(6.09)*	*14(8.59)*	*10(6.62)*	*17(10.63)*		*35(7.42)*	*19(11.11)*	
I am worried this pandemic goes on for too long												
Agree/ strongly agree	***573(89.11)***	*334(88.60)*	*239(89.85)*		*104(90.43)*	*149(91.41)*	*131(86.75)*	*143(89.38)*		*427(90.47)*	*146(85.38)*	

Neither agree or disagree	***42(6.53)***	*22(5.84)*	*20(7.52)*	*0.15*	*6(5.22)*	*7(4.29)*	*15(9.93)*	*7(4.38)*	*0.294*	*28(5.93)*	*14(8.19)*	*0.161*
Disagree/ strongly disagree	***28(4.36)***	*21(5.57)*	*7(2.63)*		*5(4.35)*	*7(4.29)*	*5(3.31)*	*10(6.25)*		*17(3.60)*	*11(6.43)*	
I am worried about my patient´s outcome												
Agree/ strongly agree	***546(84.91)***	*323(85.68)*	*223(83.84)*		*96(83.48)*	*138(84.66)*	*125(82.78)*	*141(84.91)*		*404(85.59)*	*142(83.04)*	
Neither agree or disagree	***77(11.98)***	*43(11.41)*	*34(12.78)*	*0.81*	*18(15.65)*	*18(11.04)*	*22(14.57)*	*5(9.43)*	*0.607*	*54(11.44)*	*23(13.45)*	*0.727*
Disagree/ strongly disagree	***20(3.11)***	*11(2.92)*	*9(3.38)*		*1(0.87)*	*7(4.29)*	*4(2.65)*	*3(5.66)*		*14(2.97)*	*6(3.51)*	
I am worried for my performance and quality of care provided												
Agree/ strongly agree	***471(73.25)***	*288(76.39)*	*183(68.80)*		*91(79.13)*	*124(76.07)*	*115(76.16)*	*109(68.13)*		*358(75.84)*	*113(66.08)*	
Neither agree or disagree	***84(13.06)***	*44(11.67)*	*40(15.04)*	*0.09*	*11(9.57)*	*18(11.04)*	*21(13.91)*	*24(15.00)*	*0.207*	*60(12.71)*	*24(14.04)*	*0.015*
Disagree/ strongly disagree	***88(13.68)***	*45(11.94)*	*43(16.17)*		*13(11.30)*	*21(12.88)*	*15(9.93)*	*27(16.88)*		*54(11.44)*	*34(19.88)*	

Table 2. Attitude of healthcare workers toward COVID-19 [*n* (%)] (continued)

Characteristics	Type of hospital (number of beds)			Primary Care		Years of experience					Average weekly working hours				
	<300	300-600	>600			<= 5	6-10	11-15	>15		<=20	21-40	41-60	>60	
I feel more burnout now than compared to before COVID-19 crisis					***p***					***p***					***p***
Agree/ strongly agree	*65(61.62)*	*83(53.90)*	*148(56.92)*	*74(60.16)*	*0.516*	*75(63.03)*	*50(60.98)*	*52(62.65)*	*193(53.76)*	*0.035*	*14(46.67)*	*129(54.66)*	*174(60.00)*	*53(60.92)*	*0.379*
Neither agree or disagree	*21(19.81)*	*34(22.08)*	*42(16.15)*	*23(18.70)*		*21(17.65)*	*21(25.61)*	*15(18.07)*	*63(17.55)*		*10(33.33)*	*47(19.92)*	*49(16.90)*	*14(16.09)*	
Disagree/ strongly disagree	*20(18.87)*	*37(24.03)*	*70(26.92)*	*26(21.14)*		*23(19.33)*	*11(13.41)*	*16(19.28)*	*103(28.69)*		*6(20.00)*	*60(25.42)*	*67(23.10)*	*20(22.99)*	
I am worried about being infected															
Agree/ strongly agree	*69(65.09)*	*87(56.49)*	*141(54.23)*	*87(70.73)*	*0.013*	*66(55.46)*	*42(51.22)*	*58(69.88)*	*218(60.72)*	*0.098*	*23(76.67)*	*152(64.41)*	*175(60.34)*	*34(39.08)*	*0.001*
Neither agree or disagree	*19(17.92)*	*30(19.48)*	*53(20.38)*	*24(19.51)*		*23(19.33)*	*18(21.95)*	*9(10.84)*	*76(21.17)*		*3(10.00)*	*42(17.80)*	*58(20.00)*	*23(26.44)*	
Disagree/ strongly disagree	*18(16.98)*	*37(24.03)*	*66(25.38)*	*12(9.76)*		*30(25.21)*	*22(26.83)*	*16(19.28)*	*65(18.11)*		*4(13.33)*	*42(17.80)*	*57(19.66)*	*30(34.48)*	
I am worried about infecting my family															
Agree/ strongly agree	*98(92.95)*	*122(79.22)*	*213(81.92)*	*105(85.37)*	*0.103*	*102(85.71)*	*69(84.15)*	*75(90.36)*	*292(81.34)*	*0.477*	*28(93.33)*	*193(81.78)*	*251(86.55)*	*66(75.86)*	*0.059*
Neither agree or disagree	*4(3.77)*	*13(8.44)*	*25(9.62)*	*9(7.32)*		*9(7.56)*	*5(6.10)*	*3(3.61)*	*34(9.47)*		*0(0.00)*	*21(8.90)*	*19(6.55)*	*11(12.64)*	
Disagree/ strongly disagree	*4(3.77)*	*19(12.34)*	*22(8.46)*	*9(7.32)*		*8(6.72)*	*8(9.76)*	*5(6.02)*	*33(9.19)*		*2(6.67)*	*22(9.32)*	*20(6.90)*	*10(11.49)*	
I am worried this pandemic goes on for too long															
Agree/ strongly agree	*98(92.45)*	*137(88.96)*	*229(88.08)*	*109(88.62)*	*0.743*	*104(87.39)*	*76(92.68)*	*78(93.98)*	*315(87.74)*	*0.379*	*29(96.67)*	*216(91.53)*	*255(87.93)*	*73(83.91)*	*0.068*
Neither agree or disagree	*5(4.72)*	*11(7.14)*	*16(6.15)*	*10(8.13)*		*8(6.72)*	*2(2.44)*	*4(4.82)*	*28(7.80)*		*0(0.00)*	*16(6.78)*	*20(6.90)*	*6(6.90)*	
Disagree/ strongly disagree	*3(2.83)*	*6(3.90)*	*15(5.77)*	*4(3.25)*		*7(5.88)*	*4(4.88)*	*1(1.20)*	*16(4.46)*		*1(3.33)*	*4(1.69)*	*15(5.17)*	*8(9.20)*	
I am worried about my patient´s outcome															
Agree/ strongly agree	*90(84.91)*	*128(83.12)*	*220(84.62)*	*108(87.80)*		*97(81.51)*	*69(84.15)*	*73(87.95)*	*307(85.52)*		*24(80.00)*	*206(87.29)*	*240(82.76)*	*76(87.36)*	

Neither agree or disagree	*11(10.38)*	*21(13.64)*	*32(12.31)*	*13(10.57)*	*0.839*	*20(16.81)*	*8(9.76)*	*10(12.05)*	*39(10.86)*	*0.156*	*4(13.33)*	*24(10.17)*	*40(13.79)*	*9(10.34)*	*0.69*
Disagree/ strongly disagree	*5(4.72)*	*5(3.25)*	*8(3.08)*	*2(1.63)*		*2(1.68)*	*5(6.10)*	*0(0.00)*	*13(3.62)*		*2(6.67)*	*6(2.54)*	*10(3.45)*	*2(2.30)*	
I am worried for my performance and quality of care provided															
Agree/ strongly agree	*83(78.30)*	*110(71.43)*	*188(72.31)*	*90(73.17)*		*92(77.31)*	*60(73.17)*	*68(81.93)*	*251(69.92)*		*20(66.67)*	*184(77.97)*	*200(68.97)*	*67(77.01)*	
Neither agree or disagree	*11(10.38)*	*24(15.58)*	*34(13.08)*	*15(12.20)*	*0.856*	*11(9.24)*	*10(12.20)*	*9(10.84)*	*54(15.04)*	*0.277*	*2(6.67)*	*24(10.17)*	*51(17.59)*	*7(8.05)*	*0.022*
Disagree/ strongly disagree	*12(11.32)*	*20(12.99)*	*38(14.62)*	*18(14.63)*		*16(13.45)*	*12(14.63)*	*6(7.23)*	*54(15.04)*		*8(26.67)*	*28(11.86)*	*39(13.45)*	*13(14.94)*	

Table 3. Results Maslach Burnout inventory

	Total n (%)	COVID-19 frontline	Non COVID-19 frontline	*p*
Overall	***643(100)***	***377 (58.63)***	***266 (41.37)***	
Emotional exhaustion				***<0.001***
Low	***149(23.17)***	*65(43.62)*	*84(56.38)*	
Intermediate	***340(52.88)***	*202(59.41)*	*138(40.59)*	
High	***154(23.95)***	*110(71.43)*	*44(28.57)*	
Depersonalization				***0.006***
Low	***154(23.95)***	*78(50.65)*	*76(49.35)*	
Intermediate	***356(55.37)***	*207(58.15)*	*149(41.85)*	
High	***133(20.68)***	*92(69.17)*	*41(30.83)*	
Personal accomplishment				***0.078***
Low	***147(22.86)***	*90(61.22)*	*57(38.78)*	
Intermediate	***364(56.61)***	*221(60.71)*	*143(39.29)*	
High	***132(20.53)***	*66(50.00)*	*66(50.00)*	
Burnout syndrome				***<0.001***
Yes	***279(43.39)***	*187(49.60)*	*92(34.59)*	
No	***364(56.61)***	*190(50.40)*	*174(65.41)*	

Table 4. Univariable analysis. Factors associated with Burnout syndrome

Characteristics	(OR 95% CI)	*p*
Working position		
COVID-19 frontline	*1.86(1.35-2.57)*	*<0.001*
Age (yrs)		
20-30 (reference category)		
31-40	*0.56(0.35-0.91)*	*0.019*
41-50	*0.73 (0.45-1.19)*	*0.21*
51-60	*0.48(0.30-0.79)*	*0.003*
61-70	*0.50(0.26-0.97)*	*0.041*
Sex		
Men (reference category)		
Women	*1.50(1.04-2.15)*	*0.029*
Occupation		
Other (reference category)		
Nurse	*2.02(1.06-3.84)*	*0.033*
Physician	*2.64(1.45-4.80)*	*0.002*
How long have you been practising? (yrs)		
=<5 (reference category)		
6-10	*0.66(0.37-1.16)*	*0.154*
11-15	*0.58(0.33-1.03)*	*0.066*
>15	*0.62(0.41-0.94)*	*0.026*

Table 5. Multivariable analysis. Risk factors associated with Burnout syndrome

Characteristics	OR (95% CI)	*p*
Working position		
COVID-19 frontline	1.93 (1.37-2.71)	<0.001
Sex		
Women	*1.56 (1.06 - 2.29)*	*0.022*
Occupation		
Physician	*1.64 (1.11 - 2.41)*	*0.011*
Other	*0.54 (0.27 - 1.05)*	*0.0022*
Age (yrs)		
31-40	*0.62(0.38-1.03)*	*0.066*
41-50	*0.90(0.54-1.50)*	*0.709*
51-60	*0.57(0.34-0.94)*	*0.028*
61-70	*0.61(0.30-1.22)*	*0.166*

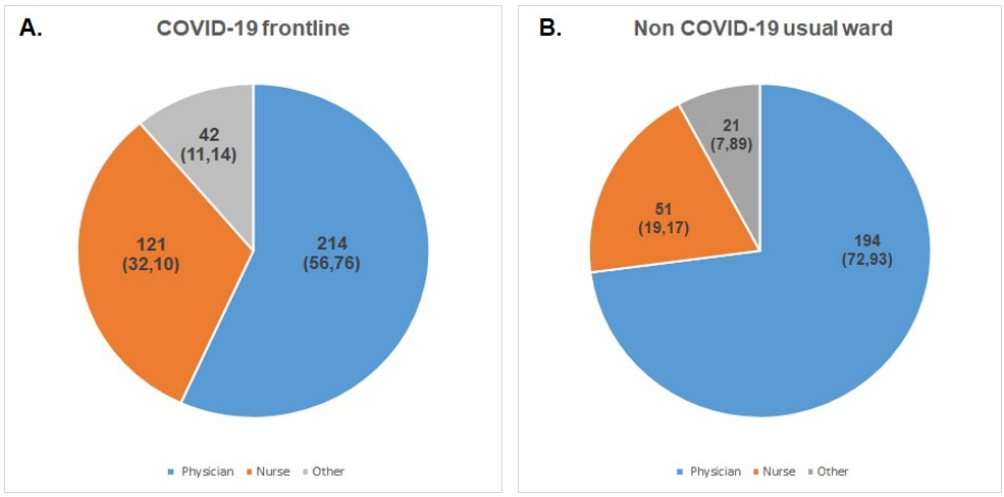

Figure 1. Distribution of occupations (physicians, nurses, others) in COVID-19 frontline (A) vs Non COVID-19 usual ward (B).

165x80mm (150 x 150 DPI)

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7
Bias	9	Describe any efforts to address potential sources of bias	6
Study size	10	Explain how the study size was arrived at	7
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	7
		(*c*) Explain how missing data were addressed	7
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	8
		(b) Give reasons for non-participation at each stage	8
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8
		(b) Indicate number of participants with missing data for each variable of interest	8
Outcome data	15*	Report numbers of outcome events or summary measures	9
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	10

		(*b*) Report category boundaries when continuous variables were categorized	10
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	10
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	11
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	12
Generalisability	21	Discuss the generalisability (external validity) of the study results	13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	13

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.