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Brief Report

A Gender Analysis of Hospital Workers during the COVID-19 Pandemic Using the Distress Questionnaire-5: A Cross-Sectional Study

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Abstract: At high risk of experiencing symptoms of stress, female healthcare workers also faced the psychosocial impacts of the COVID-19 pandemic. The aims of this study are to investigate whether women are associated with a high level of psychological distress in comparison to men and to explore the risk factors associated with a high level of psychological distress in women. For this purpose, a multivariable logistic regression model was tested with sex, age and professional role as predictors of psychological distress in women. We found that (1)women working in the four Italian hospitals analyzed during the COVID-19 pandemic experienced more psychological distress than men, (2) being between 26 and 35 years old and being a medical doctor were associated with the risk of women developing psychological distress, (3) being a female medical doctor presents a 23% risk of developing psychological distress, (4) female nurses working in COVID-19s ward had a 50% risk and female non-healthcare personnel working in COVID-19 wards had a 69% risk of developing psychological distress. In conclusion, our results suggest that interventions for supporting and promoting mental well-being among female healthcare workers are mandatory, especially for the professional categories of nurses and non-healthcare workers.

Keywords: women; stress; nurses; non-healthcare professionals; hospitals; survey; Italy

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1. Introduction

Italy was the first European country hit by the COVID-19 outbreak, causing important consequences for public health, for the economy and for physical and mental health. The sudden and prolonged health emergency exposed healthcare workers to a remarkable increase in workload, physical and emotional burden, and also to the risk of becoming victims or vehicles of contagion [1]. These issues had important consequences on the psychophysical status of healthcare workers all over the world [2].

Ensuring the mental health and well-being of the healthcare workforce, especially of female healthcare workers (HCWs), is an ongoing challenge that has been emphasized by the recent health emergency. At high risk of experiencing symptoms of stress, burnout and depression, female HCWs also faced the psychosocial impacts of the COVID-19 pandemic [3]. International research has suggested a higher prevalence of depression and anxiety among women compared to men and among nurses compared to physicians [4]. Women involved in healthcare fields experienced a unique set of work and personal life stressors, often resulting in significant gender-related differences in mental health symptoms and outcomes. Factors affecting the psychological distress of female HCWs included role strain, difficulties establishing and maintaining a work–life balance, consequences associated with pregnancy and motherhood, gender bias and discrimination, imposter syndrome, and a lack of sufficient support systems [5–7]. Female HCWs also experienced significantly higher rates of burnout [5,8], depression and/or depressive symptoms than

their male colleagues [7,9]. Even non-medical personnel have seen that environmental services workers in hospitals were equally, if not more, affected by the pandemic than doctors and nurses [7,9,10].

Based on these findings, we consider the dearth of research jointly exploring the risk factors associated with a high level of psychological distress in women and the categorization of the risk of being a woman and experiencing psychological distress. Our study aimed to investigate whether women are associated with higher levels of psychological distress than men by administering the Distress Questionnaire-5 (DQ5) to healthcare staff working in four Italian hospitals. Furthermore, our study aimed to explore the risk factors associated with a high level of psychological distress in women, as well as the typical profile of the risk of female healthcare workers experiencing psychological distress. For this purpose, a multivariable logistic regression model was tested with sex, age and professional role as the predictors of psychological distress in women.

2. Materials and Methods

2.1. Settings and Participants

This cross-sectional study was carried out during the COVID-19 pandemic from the 1st to 30 April 2020. The study was approved by a local ethics committee (University of Naples Federico, II 03/04/2020—CE 155/20). Informed consent was obtained before inclusion, which was completely voluntary. People aged 18 years or older and part of the healthcare staff, such as medical doctors, nurses and non-medical personnel, were included in this study.

The hypotheses that this study aimed to explore were:

(1) Is being a woman associated with a high level of psychological distress compared to being a man?
(2) Which risk factors are associated with high levels of psychological distress in women?
(3) What is the categorization of the risk of being a woman and experiencing psychological distress?

The survey was carried out using the Distress Questionnaire–5 (DQ5) as a tool to detect psychological distress and mental health problems. The DQ5 has greater sensitivity than other widely used measures (i.e., Kessler 6 and 10) for identifying individuals currently at risk for specific anxiety disorders [6]. The DQ5 had sensitivity of 76% and specificity of 89% for the evaluation of seven common mental health problems and has a high internal consistency (Cronbach alpha = 0.76 - 0.91 in two large population-based samples) [6]. The DQ5 consists of 5 items rated on a 5-point scale from 1 (never) to 5 (always), with total scale scores ranging from 5 to 25. Higher scores indicated greater psychological distress [6]. The completely anonymous questionnaire was translated into Italian and implemented online using Google Moduli. Healthcare staff members used Google Forms to complete the questionnaire. To allow the hospital personnel to fill out the questionnaire, tablets with the questions on were introduced into each ward. The personnel could voluntarily complete the questionnaire at any time during their work shift, from the 1 to 30 April 2020. They were invited to fill out the questionnaire once to avoid duplicates. During their working shift the hospital personnel were invited three times a day (once per working shift), by internal announcements (through the loudspeakers), to participate in this study. No emails or reminders were sent. We included four hospitals from the Marche region, Fabriano, Jesy, Chiaravalle e Senigallia, that at the time of the study had 1223 employees.

Some of the data included in this study were partially published in a previous publication (see reference n° 23). For the purpose of this study, participants were divided by the gender given in their questionnaire. To test the hypothesis of the risk factors associated with the psychological distress of women, the threshold value of the DQ-5 was set to $\geq$11 points [7]. To test the hypothesis on the categorization of the risk of being a woman and experiencing psychological distress, we identified all the women with DQ-5 scores $\geq$ 11 points as the risky category.

2.2. Statistical Analysis

In this study, continuous and abnormally distributed data were described using the median and interquartile range (IQR: 25–75%), while descriptive statistics involved the frequencies (%) of categorical variables. A parametric and/or non-parametric ANOVA with post hoc correction was used for statical analysis. Multivariable logistic regression was used to evaluate the risk factors for the development of DQ-5 > 11 points. A classification of regression tree (CRT) analysis was also made to characterize the risk groups for being a woman and having DQ-5 ≥11 points. Data were considered to be statistically significant when $p < 0.05$. Analyses were performed using SPSS version 20.0 (IBM Co., Ltd., Chicago, IL, USA).

3. Results

During the COVID-19 pandemic, 486 medical and non-medical personnel working in four Italian hospitals participated in this survey (40% of hospital workers). In total, 282 out of 486 (58%) identified as women, while 204 out of 486 (42%) stated their gender as male. The female participants were employed more as nurses and non-healthcare personnel and had a high school degree ($p = 0.000$ and $p = 0.003$). There were no statistical differences in the ages of participating personnel, their wards and their previous anxiety or depression (Table 1). The confirmatory analysis for this study reported a Cronbach's α of 0.775, in line with the internal consistency of the DQ-5.

Table 1. Main characteristics of participants.

Gender		Man, N (%)	Woman, N (%)	*p*
Age	18–25	4 (0.8%)	8 (1.6%)	0.67
	26–35	50 (10.3%)	45 (9.3%)	
	36–45	58 (11.9%)	79 (16.3%)	
	46–55	0	0	
	56–65	36 (7.4%)	61 (12.6%)	
	≥66	56 (11.5%)	89 (18.3%)	
Category of employment	Medical doctor	76 (16.5%)	35 (7.6%)	0.000
	Nurse	76 (16.5)	139 (30.2%)	
	Non-healthcare personnel	42 (9.1%)	92 (20%)	
School degree	Graduate	134 (27.6%)	145 (29.8%)	0.003
	High school diploma	66 (13.6%)	126 (25.9%)	
Ward	Healthcare COVID-19	76 (15.6%)	124 (25.5%)	0.138
	Healthcare non COVID-19	128 (26.3%)	158 (32.5%)	
Previous anxious or depressive disorder	Yes	28 (5.8%)	57 (11.7%)	0.063
	No	176 (36.2%)	225 (46.3%)	

3.1. Is Being a Woman Associated with a High Level of Psychological Distress Compared to Being a Man?

From the DQ-5 questionnaire, we found that worries overwhelmed women more (3.41 ± 0.92 vs. 3.24 ± 0.96, $p = 0.047$) and that they felt more hopeless compared to men (2.16 ± 1.10 vs. 1.90 ± 1.14, $p = 0.013$). Woman had more trouble staying focused on tasks (2.54 ± 0.99 vs. 2.34 ± 1.13, $p = 0.043$) (Table 2). We did not find any statistical significance in the other items of the DQ-5. Women had a total DQ-5 score that was higher than men (12.70 ± 3.75 vs. 13.65 ± 4.00, $p = 0.008$). A DQ-5 ≥ 11 points was seen in 75% of woman (212/282) and 72.5% of men (148/204), with statistical significance ($p = 0.033$).

Table 2. Comparison between the domains of Distress Questionnaire (DQ)-5.

	Gender: Man, N (%)	Gender: Woman, N (%)	*p*
My worries overwhelmed me	3.24 ± 0. 96	3.41 ± 0.92	0.047
I felt hopeless	1.90 ± 1.14	2.16 ± 1.10	0.013
I found social settings upsetting	3.23 ± 1.35	3.40 ± 1.17	0.135
I had trouble staying focused on tasks	2.34 ± 1.13	2.54 ± 0.99	0.043
Anxiety or fear interfered with my ability to do the things I needed to do at work or at home	1.99 ± 0.98	2.15 ± 1.04	0.096
DQ-5 total score	12.70 ± 3.75	13.65 ± 4.00	0.008

3.2. Which Risk Factors Are Associated with a High Level of Psychological Distress in Women?

The multivariable logistic regression model showed that working in COVID-19 healthcare had a protective role for woman against developing a DQ-5 $\geq$ 11 (OR: 0.6, 95% CI: 0.39–0.92, p = 0.02). Women who were between 26 and 35 years old (OR: 2.63, 95% CI: 1.35–5.12, p = 0.004) and a medical doctor (OR: 8.14, 95% CI: 3.63–18.21, p = 0.000) were significantly associated with the risk of being a woman who developed a DQ-5 $\geq$ 11 (Table 3).

Table 3. Multivariable logistic regression model to assess risk factors for high Distress Questionnaire–5 scores in women.

	p	OR	95% CI
Working in			
Healthcare, COVID-19 ward	0.020	0.606	0.397–0.925
Healthcare, non-COVID-19 ward	ref	-	-
Age			
18–25	0.762	1.236	0.314–4.874
26–35	0.004	2.637	1.358–5.122
36–45	0.259	1.373	0.791–2.383
46–55	0.214	0.680	0.370–1.249
56–65	ref	-	-
Middle school			
University degree	0.128	0.624	0.340–1.146
High school diploma	ref	-	-
Categories of employment	0.000	8.141	3.639–18.212
Medical doctor			
Nurse	0.237	1.400	0.802–2.444
Non-healthcare personnel	ref	-	-
Previous anxiety and depressive disorder			
Yes	0.088	0.604	0.338–1.078
No	ref	ref	

According to the variance inflation factor (VIF = 1/1−R square), this regression analysis had VIF values between 1 and 3.03 for each included variable, suggesting the low possibility of multicollinearity and overfitting.

3.3. What Is the Categorization of the Risk of Being a Woman and Experiencing Psychological Distress?

According to the regression tree analysis, a female medical doctor had a risk of 23.4% of having a DQ-5 $\geq$ 11 points (node 1), a female nurse working in a COVID-19 ward had a 50.5% risk of developing a DQ-5 $\geq$ 11 points (node 5), and female non-healthcare personnel working in a COVID-19 ward had a 69% risk of developing a DQ-5 $\geq$ 11 points (node 6).

Figure 1 showed the regression tree analysis depicting the risk groups for being a woman and having a DQ-5 ≥ 11 points.

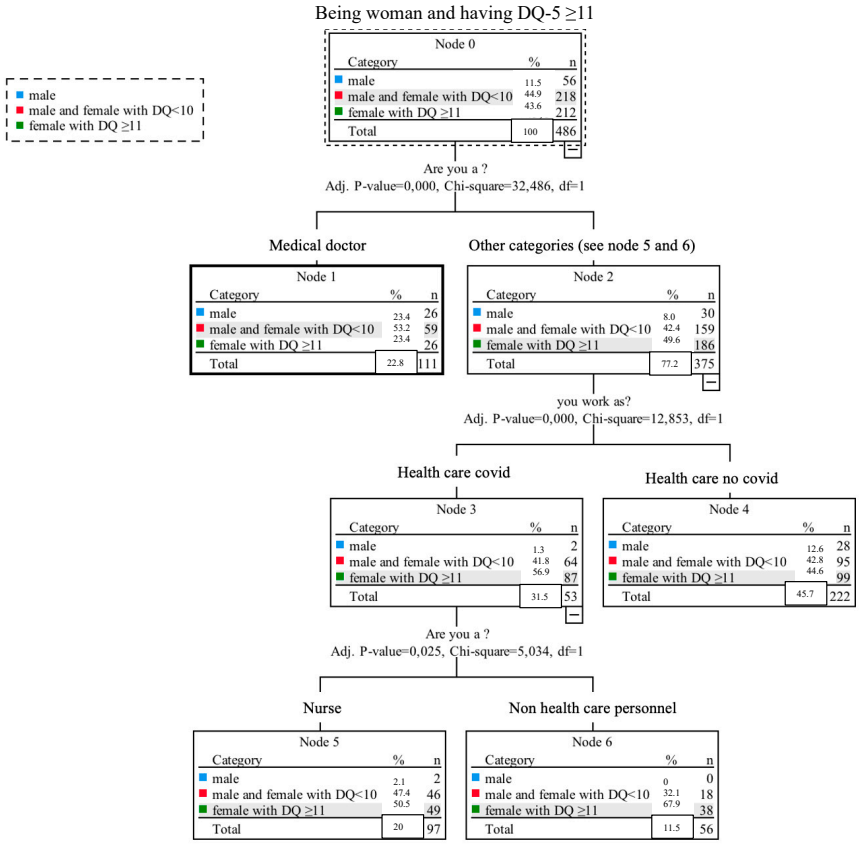

Figure 1. Regression tree analysis depicting the risk groups for being a woman and having a DQ-5 ≥ 11 points.

4. Conclusions

In this study we found that:

(1) Women working in hospitals during the COVID-19 pandemic experienced more psychological distress, according to the DQ-5 score, than men.

(2) Being between 26 and 35 years old and being a medical doctor were factors associated with the risk of women developing psychological distress.

(3) Being a female medical doctor had a 23% of risk of developing psychological distress, being a female nurse and working in a COVID-19 ward had a risk of 50% of developing psychological distress and female non-healthcare personnel working in a COVID-19 ward had a 69% risk of developing psychological distress. Female HCWs represented more than 70% of the global health workforce and 90% of healthcare workers in patient-facing roles [11]. Reports from different parts of the world portrayed the proportion of female HCWs as being up to 80% of healthcare workers [11]. The COVID-19 pandemic exacerbated the inequalities between men and women in healthcare, where female HCWs have been disadvantaged by the scarce availability of personal protective equipment, increased care burdens, unsafe rostering and mental health challenges [10]. According to our sample, which demonstrated that 60% of female HCWs developed significant psychological distress, this may be considered comparable to the current distribution of gender in the healthcare workforce.

(4) Female HCWs had high levels of psychological distress and this trend remained constant or intensified as a result of the COVID-19 pandemic [11]. Several studies have been conducted to evaluate the psychological effects of COVID-19 on the general public [12,13] and healthcare workers [14,15], while studies investigating the particular

experience of women and children, the most vulnerable categories, are scarce. Indeed, the literature is less robust in terms of factors that may psychologically affect women differently than men [16]. In this setting, this study may address this gap in literature by investigating the impact of COVID-19 on psychological distress specifically among female healthcare workers.

A few studies have shown that women were disproportionately affected by the pandemic and found women to express more psychological distress than their male counterparts [17,18]. Due to the lockdown measures and isolation at home, women were at a potentially greater risk of severe distress because of pre-existing intrahousehold inequalities in the sharing of the workload [19]. In line with several previous studies, our first hypothesis was confirmed. During the COVID-19 pandemic, in the hospitals included, female HCWs experienced more psychological distress according to their DQ-5 scores compared to men. A survey from Spain reported that women in the medical field experienced high levels of distress, a worse quality of life and a high risk of mental health disorders during the pandemic [20]. An analysis from the United States on the relationship between the COVID-19 pandemic and healthcare worker attrition found that the female gender was associated with a higher intention to leave the field compared to being male [21].

The work–family spill-over has an undeniable influence on the health and well-being of women [19]. Being between the ages of 26 and 35 and working as a nurse or as a non-healthcare professional represented risk factors for psychological distress among our participants. Our results highlighted that both these professions were specifically exposed to psychological distress during the pandemic. The novelty of our study, with respect to previous research, is that with the regression thee analysis we were able to identify subgroups of female healthcare workers at high risk of psychological distress, for whom it may be useful to provide individual support services in the workplace. According to the regression thee analysis, being a female nurse and working in a COVID-19 ward entailed a 50% risk of developing psychological distress while female non-healthcare personnel working in COVID-19 wards had a 69% risk of such distress. In order to prevent the psychological distress of these professional categories of women, it is important (1) to incorporate behavioral health models into emotional support and mental health initiatives for female HCWs; (2) to develop a variety of services that allow female HCWs to engage with services that correspond to their level of comfort; and (3) to introduce multi-purpose interventions that provide immediate emotional support, as well as assess the needs of female HCWs, to address the development of additional services [3].

Reducing the risk of psychological distress for female HCWs mainly requires change in their organizations, rather than only support for individual physicians. Elements of physician-directed interventions (e.g., mindfulness, communication, educational components) can be effective only if supported by organizational approaches. Organization-directed interventions can involve reductions in the intensity of workload or schedule changes, structural changes, enhanced communication between organizational members and fostering a sense of teamwork and leadership through team meetings. Interventions focused on enhancing teamwork, mentoring and leadership skills might be particularly suitable for young female HCWs dealing with intense workloads and patients with complex care needs [22]. In addition to organization-directed interventions (e.g., shift rotation, alternation of night and day shifts, redefining staff schedules), the implications for management also include enhancing job resources (e.g., social support, autonomy, performance feedback and opportunities for development) that can moderate the influence of workload on psychological distress [23]. Thus, female HCWs who have many job resources, including job autonomy, can fulfil demands at work better and encourage the development of their resources.

This study had a number of limitations. First, it did not include a control group from the general population. Second, the DQ-5 has been largely studied in the general population but only few reports have used it for healthcare workers. Third, we were able to include in the regression analysis only the existence of previous anxiety and mental

disorders, while we did not include other potential life stressors like personal life or work environment factors.

In conclusion, women working in healthcare had high levels of psychological distress and this trend remained constant or intensified as a result of the COVID-19 pandemic. The strength of our study is in suggesting that interventions for supporting and promoting mental well-being among female healthcare workers are necessary, especially for the professional categories of nurses and non-healthcare professionals. For future perspectives, we suggest that the categories of medical and non-medical personnel at risk of psychological distress should be promptly recognized and supported at work. In order to do this, organizational interventions for the improvement of well-being at work may be implemented in the healthcare system to better combat mental distress.

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Data Availability Statement: Data are available from the corresponding author after a motivated request.

Conflicts of Interest: The authors declare no conflicts of interest.

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