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The Relationship between Gender Role, Job Role, and Risk and Protective Factors for Posttraumatic Stress Symptomatology among Healthcare Workers during the First Wave of COVID-19

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Abstract

Background: The emotional experiences of healthcare workers during the first wave of COVID-19 warrant further investigation especially regarding gender differences. The purpose of this study was to determine the relationship between gender role, job role and risk and protective factors for the development of Post Traumatic Stress Disorder (PTSD).

Methods: A total of 521 healthcare workers completed the survey during the first pandemic wave. Psychosocial Index (PSI) was used to assess stress, well-being, distress, illness behaviour, and quality of life; the distress caused by stressful events was evaluated with the Impact of Event Scale – Revised (IES-R) and resilience was measured with the Connor-Davidson resilience scale (CD RISC).

Results: Associations were found between female gender and distress with and without sleep disturbance ($p<0.0001$). Assessment of PTSD symptoms showed significance on symptoms of avoidance ($p=0.0006$), intrusiveness of thought ($p=0.0016$), and hyperarousal ($p=0.003$) to the disadvantage of female compared to male. Nurses emerged as the most vulnerable professional role about distress ($p<0.0001$), sleep disturbance ($p<0.0001$), and abnormal illness behaviors ($p<0.0001$). Finally, the study of post-traumatic symptomatology showed significance for avoidance ($p=0.0072$), intrusive thinking ($p=0.0071$), and hyperarousal ($p=0.0019$) to the disadvantage of the medical and nursing role in the female gender compared to the medical and nursing role in the male gender and other professional role in the female gender.

Conclusions: Such findings suggest, there are differences in gender, rather than professional role and resilience factor, in emotional management in a particularly stressful condition, such as that of the first pandemic wave.

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1. Introduction

The COVID-19 pandemic provides an unprecedented example of a long-term stressful condition, especially for healthcare workers (Wang et al., 2020). It provides an opportunity to test new and effective emotional management strategies in positively coping with complex stress.

A substantial portion of the scientific literature considers COVID-19 emergency a marked source of distress, inevitably causing anxiety and tension among healthcare workers (Li et al., 2020; Magnavita et al., 2020). However, the authors hypothesize that adopting resilience processes for the purpose of alleviating and/or preventing job burnout promotes adaptive coping styles among healthcare workers (Hart et al., 2012).

Previous research on the different emotional experiences between genders following pandemic events revealed that men had a lower prevalence of anxiety and depression than women (Olff et al., 2007; Tolin et al., 2006). Recent meta-analyses show that a lower prevalence of anxiety and depression is found among men, nurses, and second-line responders than among women, physicians, and first-line health care workers (Batra et al., 2020; Chew et al., 2020; Du et al., 2020; Lai et al., 2020; Linag et al., 2020; Luo et al., 2020; Pappa et al., 2020).

Olff and colleagues, (2007) suggested that male healthcare workers may feel less at risk for developing PTSD than women in the post-COVID-19 condition. PTSD is traumatic event-related disorder whose central core consists of hyperarousal reactions, avoidance, and intrusion of thoughts, memories, or images related to a stressful event that has threatened physical integrity (5th ed.; DSM–5; American Psychiatric Association, 2013). Tolin & Foa (2006) in their meta-analysis reported that women met the diagnostic criteria for PTSD more frequently than men. Therefore, Olff and colleagues (2007) concluded that women assess and perceive threats differently than men. However, in Italy, preliminary data from the outbreak showed that men were more likely to be infected than women and, once infected, men were more likely to need hospitalization and suffer serious consequences than women (Conti et al., 2020; Trumello et al., 2020). Previous studies of pandemics have revealed that the psychological effects of infectious disease outbreaks can last long after the event, negatively affecting psychological well-being and causing PTSD and depression among healthcare workers (Bisson et al., 2010; Mauder, 2004). In the context of the pandemic crisis, healthcare workers in addition to facing traumatic experiences related to patient care may have also faced unexpected losses of friends, family, and colleagues. As a result, healthcare workers are affected by psychological distress, including

depression, anxiety, and stress (Li et al., 2020). Batra and colleagues (2020) conducted a meta-analysis to provide new evidence regarding the impact of COVID-19 on the psychological well-being of health care workers. Major factors identified as causal in psychological distress include anxiety, depression, stress, post-traumatic stress syndrome, insomnia, psychological distress, and burnout. De Kock and colleagues (2021) confirmed these findings in a review on the impact of COVID-19 in the psychological well-being of healthcare workers. Major factors identified as causal in psychological distress include anxiety, depression, post-traumatic stress syndrome, insomnia, psychological distress, and burnout.

The growing body of gender-specific studies highlights the relative underutilization of health services and symptom reporting by men (Pérez-López et al., 2020). Male gender, concern for one's health, application of social distancing, and use of personal protective equipment do not appear to be factors related to the development of anxiety-depressive states (Lai et al., 2020; Maroianu et al., 2021). The risk of anxiety and severe distress appears to be of concern not only for health and social workers working in institutionalized settings, but also for those working in freelance settings (Ahmed et al., 2020; Ferraro et al., 2021). Anxiety-depressive states among health workers suggest that the presence of psychological distress and risk factors are distributed among health workers rather than associated with particular professional categories (Lai et al, 2020). In Italian society, male healthcare workers appear to suffer less from the pressures of working in the COVID-19 emergency (Conti et al., 2020). In general, men place less importance on their own internal experiences and the emotional states of others than women do (Boniol et al, 2019; Paramita et al, 2021; Maclean, 2020). In contrast, research by Alnazly and colleagues (2021) identifies being male, older, and having more clinical experience as factors that increase the risk of stress during pandemics. Factors determined to be associated with psychological distress were being male, married, 40 years of age or older, and having more clinical experience. Their opposite result suggests male gender as a psychological risk factor during pandemic. We can suppose that this finding was culture-dependent, and that characteristics of gender strength and vulnerability probably also depend on the roles that men and women are expected to play in different cultures.

Gender phenomena are multifactorial, consisting of biological sex, instrumental and expressive psychological traits that are often known as psychological gender, as well as gender role attitudes. Instrumental masculine traits are associated with men consistent with socially approved desirable traits for men (Fleming & Agnew-Brune, 2015). More egalitarian socio-occupational roles between men and women in society influence attitudes and behaviors. The

distinction between historically gendered personality traits appears to be increasingly blurred. From a longitudinal perspective, gender differences in male and female traits have diminished since the second women's movement. Gender attitudes represent individuals' beliefs about what roles are appropriate for men and women, ranging from egalitarian to traditional (Crane & Markus, 1982; Hyde, 2016). More traditional gender attitudes believe that different and mutually exclusive roles are appropriate and socially acceptable for men and women. For example, within a traditional gender role, women are expected to breastfeed and care for children, while boys are expected to have jobs outside the home. The changes are accompanied by changing beliefs that men should not dominate women in the relationship, should value positive emotions, affective, relational, emotional, and interdependent qualities, as well as redefine the role concept of traditional gender roles. Men who adopt a more egalitarian gender role, who believe that gender roles are the same for both men and women, are more likely to engage in healthy behaviors because they are more involved in family caregiving activities than men who adopt more traditional gender roles (Courtenay, 2000; Eliot, 2016; Hart et al., 2019). Because health-promoting behaviors are generally perceived as positive behaviors, men with an egalitarian gender role perspective are more likely to enact healthy behaviors (Hart et al., 2019).

However, it is unclear whether healthcare workers are a subpopulation at risk of developing emotional distress to the point of PTSD when subjected to a chronic stressful condition such as pandemic conditions, particularly during the first wave when the negative implications and preventive measures, such as the vaccine, were not known. In addition, it is unclear whether gender and job role are risk factors or protective factors, such as resilience, psychological well-being, and perceived good quality of life.

Investigating emotional-behavioral gender differences among health care workers during the pandemic, highlighting risk and protective factors, could be useful in order to structure psychological interventions to treat or prevent PTSD. It would be appropriate to develop psychoeducational interventions based on awareness acquisition and emotional management in healthcare settings.

1.1 Objectives and Hypothesis

The purpose of this study was to determine the relationship between gender role and occupational role with risk factors (distress, sleep disturbance, abnormal illness behavior) and protective factors (resilience, psychological well-being, and perceived good quality of life) for the development of PTSD. We hypothesized to find a psychological profile of healthcare

workers characterized by symptoms of psychological distress, symptoms of posttraumatic stress and sleep disturbance; moreover, we hypothesized that these characteristics were affected by job role.

2. Materials and Methods

2.1 Subjects

Between April 2020 and May 2020, we used an online link

(https://docs.google.com/forms/d/e/1FAIpQLSeLuihsZT1PEirVSmxzeOm_dZfcWRuZ42eRqDa4yuJI9iJvvQ/viewform?usp=sf_link)

to invite healthcare workers to take part in a survey on the effects of COVID-19.

518 healthcare workers (n=349 females, n=169 males), aged 22-67 years, participated in the online survey during the first COVID-19 pandemic wave. The sample was recruited from Policlinico Riuniti di Foggia and IRCCS Casa Sollievo della Sofferenza San Giovanni Rotondo (n=373 FG, n=145 CS). The professional profiles involved included 137 physicians, 178 nurses, and 58 other healthcare workers from Policlinico Riuniti, and 49 physicians, 54 nurses, and 42 other healthcare workers from IRCCS Casa Sollievo.

The sample was studied not only in light of professional role but also with respect to gender. Therefore, we considered 108 female physicians and 82 male physicians, 170 female nurses and 64 male nurses, 72 other female healthcare workers and 30 other male healthcare workers. We considered the female gender as highlighted in the literature as more vulnerable to post traumatic stress symptoms in a pandemic condition, so we made possible correlations between resilience values and dimensions related to the current psychopathological state of the subjects involved and dimensions indicative of post traumatic stress disorder symptoms. All healthcare workers involved were on duty during the COVID 19 pandemic from its onset, although with varying levels of involvement and contact with patients infected by the pandemic.

Participants completed the survey only after indicating their consent on a form that described the study aims, participant rights, and data treatment procedure. All data were managed to ensure confidentiality. The survey took approximatively 15 min to complete, and participation was voluntary, anonymous, and free. At the beginning of the survey, the participants were informed that they would be asked to respond to a series of questions, specifying that all data would be treated anonymously, and they were asked to agree with the informed consent by clicking a button, otherwise they were redirected outside of the survey.

In addition, subjects did not receive any compensation either directly or indirectly from their participation in the research. The present study has been conducted in accordance with the Helsinki Declaration (World Medical Association, 2013).

The division of the sample involved in the study is presented in Table 1.

2.2 Psychometric Evaluation

The psychological impact of pandemic COVID-19 was measured using the Impact of Event Scale-Revised (IES-R) Italian version (Pietrantonio et al., 2003), a widely used measure of distressing psychological symptoms due to a specific stressful event (Weiss & Marmar, 1997). The 22-item scale produces three subscale scores for assessment, namely intrusive thoughts (IES-IT), hyperarousal (IES-H), and avoidance symptoms (IES-A) over the previous 7 days concerning the event. Items are rated on a 5-point scale ranging from 0 ("not at all") to 4 ("extremely"). The IES-R produces a total score ranging from 0 to 88, with scores of 33 or higher reflecting probable PTSD (Pietrantonio et al., 2003).

The IES-R showed good reliability (ICC = 1; alfa from 0.75 to 0.93).

The PSI Psychosocial Index is a self-assessment questionnaire that includes 55 items.

The following domains are covered:

(a) Sociodemographic and clinical data.

(b) Stress: 17 questions with a total score ranging from 0 to 17. These questions contain essential information for identifying cases of allostatic overload (Wheatley, 1990).

(c) Well-being: this section (items 31-36) covers several areas of well-being, i.e., positive relationships with others (items 31, 32), environmental mastery (items 33, 34), and autonomy (items 35, 36), with a score ranging from 0 to 6 (Ryff & Singer, 1996).

(d) Psychological distress: total score can range from 0 to 45. Questions 37-40 relate to sleep disturbances (range 0-12) and may also be scored separately from the other questions.

(e) Abnormal Illness Behavior: allows assessment of hypochondriacal beliefs and body concerns (items 52-54). The total score can range from 0 to 9.

(f) Quality of life (item 55): a simple direct question about quality of life is included, following the recommendation of Gill & Feinstein (1994). The score ranges from 0 to 4.

The self-assessment questionnaire provides a dimensional assessment of psychosocial characteristics. Some questions involve specific answers, most require a yes/no response, while

others are rated on a Likert scale (0-3, from 'not at all' to 'very much'); 1 item, quality of life, has 5 possible choices, from excellent to terrible (0-4). The reliability coefficients were 0.88 for rating stress, 0.94 for well-being, 0.89 for psychological distress, and 0.90 for illness behaviour (Sonino & Fava, 1998).

One of the most widely used scales to study resilience is certainly the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003). The authors of this scale define resilience as a measure of ability to cope with stress. The scale, in the version proposed by the authors consisting of 25 items, is designed to be administered individually.

The CD-RISC consists of five factors:

1. personal competence and tenacity (8 items);

2. self-confidence and management of negative emotions (7 items);

3. positive acceptance of change and secure relationships (5 items);

4. control (3 items);

5. spiritual influences (2 items).

The Connor Davidson - Resilience Scale is based on a 5-point Likert scale, ranging from 1 "totally false" to 5 "totally true". The five levels of presence of the characteristic correspond to (0) almost never true, (1) rarely true, (2) true sometimes, (3) often true, and (4) true in almost all cases, the total score can then range between 0 and 100. The higher the score, the greater the level of resilience achieved by the person. The Cronbach alpha values of the scale were 0.88 for the English version. Moreover, CD-RISC has demonstrated good reliability (.87; Connor & Davidson, 2003).

2.3 Statistical Analysis

Statistical analysis was performed using the statistical software Grand Prism 5 (San Diego, CA, USA). Means and standard deviation (SD) have been calculated for each studied parameter, and an alpha level of 0.05 was selected throughout the study. The differences in psychometric dimensions between the groups were compared using nonparametric Kruskal–Wallis test with Dunn's multiple comparison post-hoc testing. The assessments of the relationship between dimensions of Resilience Scale (CD-RISC) and psychological distressing symptoms (IES-R and PSI) were performed using Pearson's correlation.

3. Results

Participants had no history of neurologic, psychiatric disorders or alcohol and other drug dependence disorders. A total of 518 health care professionals (n=349 females, n=169 males), aged 22 to 67 years, were recruited to participate in this study. The sample was recruited from Policlinico Riuniti di Foggia and IRCCS Casa Sollievo della Sofferenza San Giovanni Rotondo (n=373 FG, n=145 CS). The mean age of the physicians surveyed was 42.57 ± 13.34, that of the nurses surveyed was 37.32 ± 11.61, and that of the other healthcare workers surveyed was 42.28 ± 9.89 as shown in Table 1. Thus, there was a statistically significant difference between the age averages of the three subsamples. The average age of the sample of nurses was found to be statistically significantly lower than that of both physicians and other healthcare workers (p=0.0002).

Table 1. Measurements were based on demographic characteristics.

	Female (n)	**Male (n)**	**Age (Years)**
Physicians (190)	108	82	42.57 ± 13.34
Nurses (226)	169	57	37.32 ± 11.61
Other healthcare workers (102)	72	30	42.28 ± 9.89

The results obtained through the analysis of the differences between the averages of the scores obtained from the PSI score between the genders (men, women) suggest significant effects of the condition of distress (p<0.0001), distress with sleep disturbance (p<0.0001), distress without sleep disturbance (p<0.0001) and abnormal disease behavior (p=0.0009) to the disadvantage of the female gender compared to the male gender as presented in Table 2. In addition, through the analysis of differences between the averages of scores obtained from the scoring of the IES for the assessment of symptoms for the diagnosis of PTSD between genders (men, women) we found a significant effect of symptoms of avoidance (p=0.0006), intrusiveness of thought (p=0.0016) and hyperarousal (p=0.003) to the disadvantage of the female gender compared to the male gender (Table 2). The gender differences between the mean of the data collected on resilience through the CD-RISC administration to health workers during the COVID 19 pandemic do not show significant effects on any of the sub-dimensions studied (Personal competence, Trust in one's instincts, Positive acceptance of change, Control, Spiritual influences) as presented in Table 2.

Table 2. Differences in Psychosocial Index (PSI), Impact of Event Scale-Revised (IES-R), and Connor-Davidson Resilience Scale (CD-RISC) averages between genders. Mean ± SD. P = level of significance.

	F (349)	M (169)	p
PSI Stress	3.41±0.11	3.05±0.16	0.0711
PSI Wellbeing	3.87±0.08	4.07±0.12	0.1799
PSI Distress	17.75±0.44	12.62±0.61	<0.0001
PSI Distress with sleep disturbance	5.98±0.15	4.89±0.23	<0.0001
PSI Distress without sleep disturbance	11.76±0.33	7.72±0.44	<0.0001
PSI Abnormal Illness	1.33±0.08	0.85±0.1	0.0009
PSI Quality of Life	2.21±0.05	2.16±0.07	0.5287
PSI Quality of Life+PSI Wellbeing	6.09±0.11	6.23±0.18	0.5204
IES-R avoidance symptoms	1.41±0.04	1.14±0.06	0.0006
IES-R intrusive thoughts	1.63±0.04	1.39±0.06	0.0016
IES-R hyperarousal	1.29±0.04	1.01±0.06	0.0003
IES-R Tot	32.47±1.01	26.21±1.4	0.003
CD-RISC tot	71.57±0.75	71.91±1.11	0.8009
CD-RISC Personal competence	2.99±0.03	3.04±0.05	0.4503
CD-RISC Trust in one's instincts	2.57±0.03	2.61±0.05	0.4953
CD-RISC Positive acceptance of change	3.02±0.03	3.11±0.04	0.1286
CD-RISC Control	2.9±0.04	2.9±0.05	0.9953
CD-RISC Spiritual influences	2.6±0.05	2.6±0.07	0.9581

Analyses conducted through the ANOVA test allowed us to identify significant effects related to distress, specific symptoms of PTSD, and resilience on the professional role condition. In particular, nurses turn out to be the most vulnerable professional role with respect to distress ($p<0.0001$), sleep disorders ($p<0.0001$) and abnormal illness behavior ($p<0.0001$) followed by female physicians and other female professionals as shown in Table 3. In addition, applying the ANOVA test to the data collected through the administration of the IES-R questionnaire for the evaluation of symptoms of post-traumatic stress disorder, we found a significant effect of symptoms of avoidance ($p=0.0072$), intrusiveness of thought ($p=0.0071$) and hyperarousal ($p=0.0019$) to the disadvantage of the role of doctor and nurse in the female gender compared to the role of doctor and nurse in the male gender and to other professional role in the female gender (Table 3). Finally, application of the ANOVA test on data related to resilience among health care workers during the COVID 19 pandemic collected through administration of the CD-RISC does not show significant effects on the professional role for any of its sub-dimensions (Personal competence, Trust in one's instincts, Positive acceptance of change, Control, Spiritual influences) as presented in Table 3.

Table 3. ANOVA of Psychosocial Index (PSI), Impact of Event Scale-Revised (IES-R), and Connor-Davidson Resilience Scale (CD-RISC) scores across professional roles and genders. Mean ± SD. P = level of significance.

	Physicians F	**Physicians M**	**Nurses F**	**Nurses M**	**Healthcare workers F**	**Healthcare workers M**	**p**
PSI Stress	3.36±1.96	2.65±1.75	3.42±2.17	3.56±2.18	3.44±2.18	3.16±2.56	0.0923
PSI Wellbeing	3.83±1.53	3.97±1.72	3.90±1.50	4.17±1.46	3.86±1.51	4.13±1.92	0.6827
PSI Distress	16.13±7.87	11.49±7.92	19.41±7.71	15.02±7.90	16.26±9.26	11.17±7.30	<0.0001
PSI Distress with sleep disturbance	5.65±2.93	4.52±2.99	6.52±2.57	5.47±3.14	5.22±3.18	4.8±3.17	<0.0001
PSI Distress without sleep disturbance	10.47±5.88	6.96±6.04	12.89±6.12	9.54±5.48	11.04±6.82	6.36±5.17	<0.0001
PSI Abnormal Illness	0.85±1.35	0.69±1.22	1.60±1.80	1.17±1.50	1.43±1.53	0.66±1.15	<0.0001
PSI Quality of Life	2.31±0.93	2.18±0.99	2.27±0.96	2.17±0.94	1.93±1.02	2.06±1.04	0.1111
PSI Quality of Life+PSI Wellbeing	6.14±2.13	6.15±2.45	6.18±2.04	6.35±2.10	5.79±2.22	6.20±2.78	0.7791
IES-R avoidance symptoms	1.43±0.88	1.03±0.70	1.42±0.82	1.36±0.96	1.35±0.83	1.04±0.75	0.0072
IES-R intrusive thoughts	1.67±0.81	1.27±0.71	1.65±0.83	1.58±0.88	1.52±0.82	1.34±0.83	0.0071
IES-R hyperarousal	1.32±0.84	0.86±0.61	1.30±0.88	1.24±0.88	1.23±0.87	0.99±0.92	0.0019
IES-R Tot	33.18±18.56	23.18±15.17	32.78±19.08	31.33±20.78	30.71±19.03	24.77±19.46	0.0014
CD-RISC tot	70.23±15.92	70.65±16.72	72±15.86	73.07±11.72	72±15.86	73.17±12.81	0.8771
CD-RISC Personal competence	2.97±0.71	3.02±0.67	3.06±0.68	3.14±0.7	2.88±0.79	2.91±0.54	0.2131
CD-RISC Trust in one's instincts	2.59±0.69	2.64±0.7	2.62±0.73	2.64±0.66	2.41±0.8	2.47±0.62	0.3995
CD-RISC Positive acceptance of change	3.04±0.68	3.17±0.64	3.04±0.7	3.09±0.56	2.92±0.74	2.97±0.73	0.421
CD-RISC Control	2.85±0.8	2.94±0.73	2.98±0.72	2.87±0.65	2.79±0.85	2.84±0.78	0.675
CD-RISC Spiritual influences	2.48±1.09	2.57±1.04	2.71±1.10	2.62±0.98	2.63±1.05	2.55±1.13	0.5368

We considered the female gender as highlighted in the literature as more vulnerable to post thaumatic stress symptoms in a pandemic condition, therefore we made possible correlations between the values of resilience and the dimensions related to the current psychopathological state of the subjects involved and the dimensions indicative of PTSD. All healthcare workers involved were serving during the COVID 19 pandemic since its onset, although with different levels of involvement and contact with the infected pandemic.

In order to study the relationship between emotional distress and resilience, as a protective factor, we conducted correlation analyses in the female population, considered with higher vulnerability of distress and posttraumatic stress symptoms. We found significant negative correlations between resilience scores and those related to distress (r=-0.1521, p=0.0044), intrusiveness of thought (r=-0.1426, p=0.0076) and hyperarousal (r=-0.1757, p=0.001) as shown in Table 4.

Table 4. Correlations (Pearson's r) between Connor-Davidson Resilience Scale (CD-RISC) and psychological dimension scores in female healthcare workers (physicians, nurses, other healthcare workers).

CD-RISC TOT	Corelation Coefficent	p
PSI Psych Distress	-0.1521	0.0044
PSI Ab. Illness behavior	-0.02562	0.6334
IES-R avoidance symptoms	-0.0342	0.5278
IES-R intrusive thoughts	-0.1426	0.0076
IES-R hyperarousal	-0.1757	0.001
IES-R TOT	-0.1494	0.0052

4. Discussions

The spread of Covid-19 disease may exacerbate anxiety, depression, and post-traumatic stress symptoms (Salari et al., 2020) particularly among quarantined individuals (Bonati et al., 2021; Casagrande et al., 2020). There were immediate negative psychological effects of the pandemic and lockdown on population (Casagrande et al., 2020; Passavanti et al., 2021; Rossi et al, 2020). A recent systematic review and meta-analysis (Salari et al., 2020) shows that the prevalences rates of stress, anxiety, and depression due to the pandemic are 29.6, 31.9 and 33.7% respectively in the general population. Recent literature suggests that female gender and younger adults in Italian community sample are more vulnerable to psychological reactions to COVID-19 showing more trait anxiety and stress (Prete et al., 2020). Particularly, the pandemic situation from COVID 19 was a stressful event for all healthcare workers (Li et al., 2020). The literature

has questioned numerous risk factors about the increase in perceived stress in healthcare workers, among which one can certainly consider sleep disturbances, abnormal illness behaviors, and anxious somatization (Huang & Zhao, 2020; Veronese et al, 2021). However, the literature has also questioned the protective factors from job stress for health care workers during the pandemic by identifying resilience, psychological well-being, and good perceived quality of life (Hart et al., 2012; Somma et al., 2020). In addition, symptoms related to the diagnosis of PTSD (avoidance, intrusiveness, hyperarousal) in healthcare workers appear to be increasing (Prete et al., 2020). The chronic stress condition brought about by the pandemic could highlight a different vulnerability of healthcare workers to the development of emotional distress up to post-traumatic stress disorder. Gender role and occupational role could play both the role of risk factors of predisposing conditions and the role of protective factors of predisposing conditions. In order to improve the psychological well-being and quality of work of healthcare workers, this study aims to provide empirical evidence on the relationship of gender role and professional role with risk factors and protective factors for the development of PTSD.

The results obtained through ANOVA analysis suggest a significant effect of distress condition, sleep disturbance, and abnormal illness behavior to the disadvantage of the female gender compared to the male gender. These results replicate previous studies reporting greater emotional distress in female healthcare workers (Pérez-López et al., 2019).

In addition, applying the ANOVA test to the data collected through the administration of the IES-R questionnaire to assess symptoms of PTSD, we found a significant effect of symptoms of avoidance, intrusiveness of thought, and hyperarousal always to the disadvantage of the female gender compared to the male gender in line with a recent meta-analysis (Ortolan et al., 2020).

Finally, data on health care worker resilience during the COVID 19 pandemic, analyzed using the ANOVA test, show no significant effect on gender. Already Hart and colleagues in their 2012 review found adequate resilience in nurses finding no gender differences (Hart et al., 2012).

Analyses conducted through the ANOVA test allowed us to identify significant effects related to distress, specific symptoms of PTSD, and resilience on professional role condition. In particular, female nurses appear to be the professional role most vulnerable with respect to distress, sleep disturbance and abnormal illness behavior followed by female physicians and other female professionals.

In addition, applying the ANOVA test to the data collected through the administration of the IES-R questionnaire for the assessment of symptoms of PTSD, we found a significant effect of symptoms of avoidance, intrusiveness of thought and hyperarousal to the disadvantage of the role of doctor and nurse in the female gender compared to the role of doctor and nurse in the male gender and other professional role in the female gender. Our data appear to be in agreement with Tolin & Foa's (2006) meta-analysis, which reported that women met the diagnostic criteria for PTSD more frequently than men. Other Authors observed an increase of anxiety, depression, and post-traumatic symptoms in pregnant and postpartum women during pandemic period, expecially during the first wawe of coronavirus (Caffieri & Margherita 2021). Moreover, a review by Olff and collegues (2007) concluded that women assess and perceive threats differently than men. Interestingly, Benassi and colleagues (2020) found that working women with children had elevated levels of generalized anxiety due to Covid-19 lockdown compared to working women without children. The authors hypothesized that this difference was due to difficulties in managing the work and mothering roles, in part due to school lockdown.

Therefore, the analysis of our data shows a greater propensity to experience distress and emotional distress in the pandemic situation among nurses compared with other female professional roles but also compared with male nurse colleagues. On the other hand, there do not appear to be significant differences in symptoms related to PTSD between the role of doctor and nurse in the female gender, however, post-traumatic symptomatology is more present in the professional roles of doctor and nurse of female gender compared to male colleagues and also compared to other healthcare workers involved in the pandemic of both genders. Anxiety-depressive states among healthcare workers suggest that the presence of psychological distress and risk factors are distributed among healthcare workers rather than associated with particular professional groups.

Finally, data on the resilience of health care workers during the COVID 19 pandemic, analyzed using the ANOVA test, show no significant effect on professional role. On the other hand, resilience, assessed with the CD-RISC scale, shows overlapping scores between both genders and professional roles. The CD-RISC scale allows for a qualitative analysis of resilience by identifying several dimensions: personal competence, trust in instincts, positive acceptance of change, control, and spiritual influences. The data for personal competence and positive acceptance of change dimensions show higher scores than the other dimensions of the CD-RISC in both the group of physician respondents and the group of nurse respondents. Thus,

we find that in our sample, personal competence and positive acceptance of change are strengths in coping with stressful situations in both genders. These observations are echoed in the literature in the study by Paramita and colleagues (2021). Folkman and colleagues (1986) already considered investment in personal competence and positive acceptance of change as adaptive coping strategies.

In order to study the relationship between emotional distress and resilience, as a protective factor, from correlation analyses in the female population, with high vulnerability of distress and posttraumatic stress symptoms, we found significant negative correlations between resilience scores and those related to distress, abnormal illness behavior, symptoms of avoidance, intrusiveness of thought and hyperarousal.

Our data highlight how sociocultural factors drive differences in the emotional management of COVID 19 patients. The importance of gender in socio-ecological systems has also been indicated in the recognition of ecosystem services, which has shown that there are differences between genders. Social promotion interventions aimed at promoting appropriate changes due to the pandemic should use different communication strategies according to the gender characteristics of individuals. Overcoming the dichotomous vision of gender itself, it would be interesting to investigate the influence of sociocultural factors on the theme of humanization of care, understood as attention to the person in his or her totality, made up of organic, psychological, and relational needs. Therefore, training interventions aimed at health care professionals to improve the humanization of care, and prevention interventions and promotion of good practices to be followed to contain the contagion from COVID 19 should better take into account the sociocultural influences determined by gender characteristics, as a complex construct.

Research examining gender and COVID-19 compliance has generally treated gender as dichotomous (i.e., female vs. male) without considering the social and psychological components as a complex construct (Ortolan et al., 2020). Individuals are expected to prefer behaviors or objects consistent with their self-concept (Edwards & Spence, 1987). Gender role and psychological gender explain individuals' attitudinal and behavioral responses better than biological sex (Deaux, 1985; Skitka & Maslach, 1990). Because previous studies were limited to dichotomous gender difference and ignored gender role and gender psychology, it is likely that existing research does not accurately capture the phenomena of gender responses to COVID-19. We represent gender as biological sex, gender role, and psychological gender as suggested by gender identity theory (Edwards & Spence, 1987). Sex is conceptually defined as innate

structural and physiological characteristics, whereas gender represents all of the complex attributes that a culture ascribes to each of the sexes (Deaux, 1985). Historically, gender differences in cognitive and emotional responses are attributable to biological sex differences (Deaux, 1985). Differences between men and women are not simply associated with biological sex differences, but also with social aspects that are embedded in their gender schema that tell them what is considered appropriate and expected for men and women in a particular society. Consistently, researchers argue that both sex and gender are not mutually exclusive, but interact to influence differences between men and women (Skitka & Maslach, 1990).

5. Limitations

Our study has some limitations: first, this evidence must be considered with caution because of the sample recruitment on only two hospitals belonging to the same territory, however, these results could be aligned with those reported by Hart and colleagues (2012). Indeed, resilience as a protective factor correlated negatively with dimensions related to distress, psychosomatic syndromes, insomnia, and post-traumatic stress symptoms (Xiao et al., 2020). Second, the representativeness of the sample is uncontrolled because the numerosity of the subgroup "other health professionals" is underrepresented compared to the other two subgroups studied (physicians, nurses). The third limitation was to have analyzed the effects of the pandemic on gender by considering it dichotomously, in this sense Paramita and colleagues (2021) highlight how the literature has generally treated gender as dichotomous without considering psychosocial components as a complex construct. Fourth, the cross-sectional nature of the current study does not enable us to explore the duration and timing of the course of symptoms of PTSD. A prospective longitudinal study could clarify the long-term trends in psychological health of both male and female healthworkers. Fifth, the study sample was heterogeneous by having a statistically significant difference between the age averages of the three subsamples. Sixth, male respondents were way less than female. Gender is an important factor in disease prevention. Males are less inclined to seek help regarding health problems, less inclined to participate in programs for health and fewer prone to accept psychological help than females (Ryan et al., 2019). The limited participation of males in health and wellness research is a general limitation of psychological research, so conclusions on males may be underpowered or difficult to generalize. Finally, the administration of an online survey is subject to response bias. Specifically, we can predict that those who agreed to answer the psychological health questions were those who, for example, were psychologically challenged or motivated or practical with the online tool.

6. Conclusions

Our study took into account not only the gender role but also the professional role and considered protective and risk factors, in which it was found that the greatest influence on the emotional management of a stressful condition is determined more by the gender role rather than the professional role and even more by the resilience factor. In other words, this evidence underscores that the risk of maladaptive emotional management found in the female gender may be explained more by socio-cultural components rather than by professional role and the presence of protective factors, such as resilience. Despite the strong links between resilience and health and the well-being of men and women, much health research does not consider gender beyond sex. It seems useful to the understanding of protective factors to incorporate gender sensitivity and also gender specificity and other contextual factors into the conceptualization of resilience. It is hoped that future research will deepen the study of the aforementioned relationships.

Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any potential conflict of interest.

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