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(Article begins on next page)

Mental health of healthcare workers during the COVID-19 pandemic in Italy

Running title: Health workers and COVID-19: Psychological aspects

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Abstract

Background: The COVID-19 pandemic represents one of the most stressful events of recent times. Among the population, healthcare professionals who treat COVID-19 patients are most likely to develop psychological distress and posttraumatic stress symptoms (PTSS). The present study thus aimed to investigate the psychological impact of the COVID-19 outbreak on Italian healthcare workers.

Methods: The responses of 145 healthcare workers (72 medical doctors and 73 nurses) were included in the final dataset. Participants were asked to provide sociodemographic and clinical information, and to complete: 1) quality of life and health-related Visual Analogue Scales, 2) State-Trait Anxiety Inventory-Form Y1, 3) Beck Depression Inventory, and 4) PTSD Checklist for DSM-5.

Results: A comparison between healthcare professionals working in COVID-19 wards and other units revealed that the former reported higher levels of both depressive symptoms and PTSS. Moreover, the results of regression analyses showed that in healthcare professionals working with COVID-19 patients, gender and marital status, and gender and age significantly predicted depressive symptoms and PTSS, respectively. Particularly, being female and not in a relationship were found to be associated with higher levels of depressive symptoms, whereas being female and older were found to be related to higher levels of PTSS.

Conclusions: The current findings suggest that specific predisposing factors could identify healthcare workers who are at high risk of developing mental health symptoms when faced with COVID-19 patients.

Keywords: COVID-19 pandemic, mental health, depressive symptoms, posttraumatic stress symptoms, healthcare workers.

1. INTRODUCTION

The COVID-19 pandemic represents one of the most stressful events in recent times worldwide. This pandemic poses a major challenge to social, economic, and, above all, the psychological resources of the population. Undoubtedly, healthcare workers are the most exposed category. Their psychological burden is likely due to the staff reorganisation, the working intensity, and the anxiety of being exposed to the virus at hospital and, in turn, of bringing the infection home.¹ The healthcare workers directly involved in the care of patients with COVID-19 are at high risk of developing psychological distress and other mental health symptoms such as posttraumatic stress symptoms (PTSS).^{2,3}

The main aim of the present study was to investigate the psychological impact of the COVID-19 outbreak on Italian healthcare workers. First, we compared the levels of psychological distress (i.e., anxiety/depressive symptoms) and PTSS between healthcare professionals working in the front line of COVID-19 and healthcare professionals working in other units. Second, we explored which sociodemographic and clinical factors could significantly predict psychological distress and PTSS levels in the group of healthcare workers involved in the care of COVID-19 patients.

2. METHODS

The data were collected using an online survey from March 19 to April 5, 2020. An anonymised, individual, and unique code to complete the survey was provided to those who agreed to participate in the study. By means of convenient sampling, healthcare workers practicing in Piedmont, one of the most affected Italian regions, were selected to carry out the survey. In order to promote the survey, participants were encouraged to pass the link to other colleagues.

The responses of 145 healthcare workers (72 medical doctors and 73 nurses) were included in the final dataset. Participants were asked to provide sociodemographic and clinical information (age, gender, having/not having children, being/not being in a relationship, having/not having a medical condition), together with work-related data (type of ward and profession). Moreover, participants

were asked to complete: 1) quality of life and health-related Visual Analogue Scales (VAS); 2) State-Trait Anxiety Inventory-Form Y1 (STAI Y1); 3) Beck Depression Inventory (BDI-II); and 4) PTSD Checklist for DSM-5 (PCL-5) to investigate the presence of PTSS.

In order to investigate the psychological impact of the COVID-19 on our group of healthcare workers, descriptive analyses were run first. Secondly, independent *t*-tests were performed to evaluate the presence of possible differences between the healthcare professionals who work in COVID-19 wards and those who work in other facilities, on sociodemographic and clinical variables, quality of life and health-related questions, and psychological variables (anxiety/depressive symptoms and PTSS).

Finally, two multiple regression analyses were run to assess whether sociodemographic and clinical variables were significant predictors of the psychological outcomes in the subgroup of healthcare professionals who work in COVID-19 wards. BDI-II and PCL-5 scores were used as dependent variables for the first and second regression model, respectively. Sociodemographic and clinical variables were entered as independent variables in both regression analyses. The enter method was used to include the variables of the predictor groups. Collinearity was assessed through the statistical factor of tolerance and Variance Inflation Factor (VIF).

All the statistical analyses were conducted using Statistical Package for Social Science, version 26.0 (IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp.).

The study was approved by the University of Turin Ethics Committee and conducted in accordance with the Declaration of Helsinki. All the participants gave their written informed consent to participate in the study.

3. RESULTS

Sociodemographic and clinical characteristics of the total sample are shown in Table 1. The sample had a mean age of 42.9 (SD = 11.2) years, 72% (105) of participants were female, and 43% (63) worked in COVID-19 wards.

The group comparisons of sociodemographic and clinical characteristics, quality of life and health-related data, and psychological measures (BDI, STAI Y2, and PCL-5) are presented in **Fig. 1**.

The results of comparisons showed that healthcare professionals who work in COVID-19 wards were younger (mean \pm SD: 39.1 ± 8.3 vs. 45.9 ± 12.2 , $t(140.91) = -3.993$, $p < .001$, $d = 0.65$) and more likely not in a relationship ($\chi^2(1) = 4.573$, $p = .032$), compared to healthcare professionals working in other facilities.

With regard to the psychological assessment, healthcare professionals who work in COVID-19 wards reported higher levels of both depressive symptoms ($p = .005$, $d = 0.40$) and PTSS ($p = .015$, $d = 0.47$) compared to healthcare professionals working in non-COVID-19 facilities. A chi-square test confirmed the presence of a significant association between participants who scored above the PCL-5 cut-off (≥ 33) and those who worked in COVID-19 wards ($\chi^2(1) = 4.374$, $p = .036$).

Considering the high levels of depressive symptoms and PTSS reported by healthcare professionals who work in COVID-19 wards, two multiple regression analyses were performed to assess whether sociodemographic and clinical variables (age, gender, having/not having children, being/not being in a relationship, having/not having a medical condition) significantly predicted the BDI and PCL-5 scores in this subgroup of healthcare workers (**Table 2**).

With regard to depressive symptoms, the multiple regression model statistically significantly predicted the BDI total score, $F(5, 57) = 4.970$, $p = .001$, adj. $R^2 = .24$. Among the five predictors, gender ($\beta = -0.252$, $p = .032$) and marital status ($\beta = 0.441$, $p = .001$) were statistically significant. Particularly, being female and not in a relationship were found to be associated with higher levels of depressive symptoms.

Regarding PTSS, the multiple regression model statistically significantly predicted the PCL-5 total score, $F(5, 57) = 5.127$, $p = .001$, adj. $R^2 = .25$. Among the five predictors, age ($\beta = 0.554$, $p = .001$) and gender ($\beta = -0.398$, $p = .001$) were statistically significant. Particularly, being female and older were found to be related to higher levels of PTSS.

In both regression analyses, the statistical factor of tolerance and VIF showed that there were no interfering interactions between the variables.

4. DISCUSSION

The present results showed that healthcare professionals who work in COVID-19 wards reported higher levels of depressive symptoms and PTSS than those who work in other healthcare units.

These findings are very understandable in view of the fact that healthcare workers involved in the frontline of COVID-19 are in a daily struggle to keep the patients alive. Furthermore, medical health workers constantly find themselves exposed to highly risky situations, which can make them feel unsafe at work. The relentless spread of the virus, the lack of sufficient rest, the permanent threat of being infected, the workload, the shortage of medical protective equipment, and frequent isolation from family are all factors that can contribute to the high risk of acute mental health conditions in healthcare workers in the long term.⁴⁻⁶ In particular, the prolonged exposure to traumatic events, such as the death of patients and colleagues, may lead to the development of severe anxiety and depressive symptoms, as well as PTSS.⁷

Possible predisposing factors for the mental health symptoms observed in healthcare professionals working in COVID-19 wards were found to be being female and not in a relationship for depressive symptoms and being female and older for PTSS.

With regard to gender differences, our findings are in line with previous studies⁷ that showed a higher prevalence of PTSS in women than men, in both general population and healthcare workers. Regarding age differences, the available evidence is still unclear and, in some cases, no differences have been obtained⁷. Indeed, Liu et al.⁷ found that in the general population, the youngest reported the lowest level of PTSS, but age did not represent a predictive factor for developing PTSS during the COVID-19 epidemic. Furthermore, it is well known that women are more vulnerable to developing depressive symptoms⁸ and that adequate social support provided by partners or spouses represents a protective factor for the psychological well-being.^{9, 10}

Taken together, our findings suggest that healthcare professionals involved in COVID-19 management display high levels of both depressive symptoms and PTSS. Moreover, specific predisposing factors seem to characterise those healthcare worker members who are at high risk of developing depressive symptoms and PTSS when faced with COVID-19 patients. Psychological treatment such as cognitive behavior therapy and mindfulness therapy could be helpful¹¹.

This study is limited by its cross-sectional nature. A previous longitudinal study found that there was no significant clinical changes in depression and PTSD scores between the outbreak and the peak of the COVID-19 pandemic in the general population¹² and further study is required to measure longitudinal changes in healthcare workers.

During the extraordinary events associated with the COVID-19 pandemic, it is essential to take on healthcare workers' needs, providing timely psychosocial and mental health support, particularly for those groups identified at risk. Indeed, healthcare professionals expect to be welcomed, listened to, supported, and protected by their organisations.¹

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Conflict of Interest

The authors declare that they have no conflicts of interest.

Ethical Approval

The study was approved by the University of Turin Ethics Committee (Prot. n. 142069) and was conducted in accordance with the Declaration of Helsinki. All the participants gave their written informed consent to participate in the study.

Fig. 1. Group comparisons on sociodemographic and clinical data, quality of life and health-related items, and psychological outcomes of healthcare professionals working in COVID-19 wards vs other wards (N = 145). (A) Percentages of healthcare workers based on gender, marital status, children, and medical condition. (B) Mean (SE) scores of healthcare workers for the three Visual Analog Scales (0–10), assessing health concern, health evaluation, and life satisfaction. (C) Mean (SE) scores of healthcare workers for the State-Trait Anxiety Inventory (STAI-Y1, range 20–80), Beck Depression Inventory (BDI-II, range 0–55), and Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5, range 0–80).
Note: * p -value < .05; ** p -value < .01.

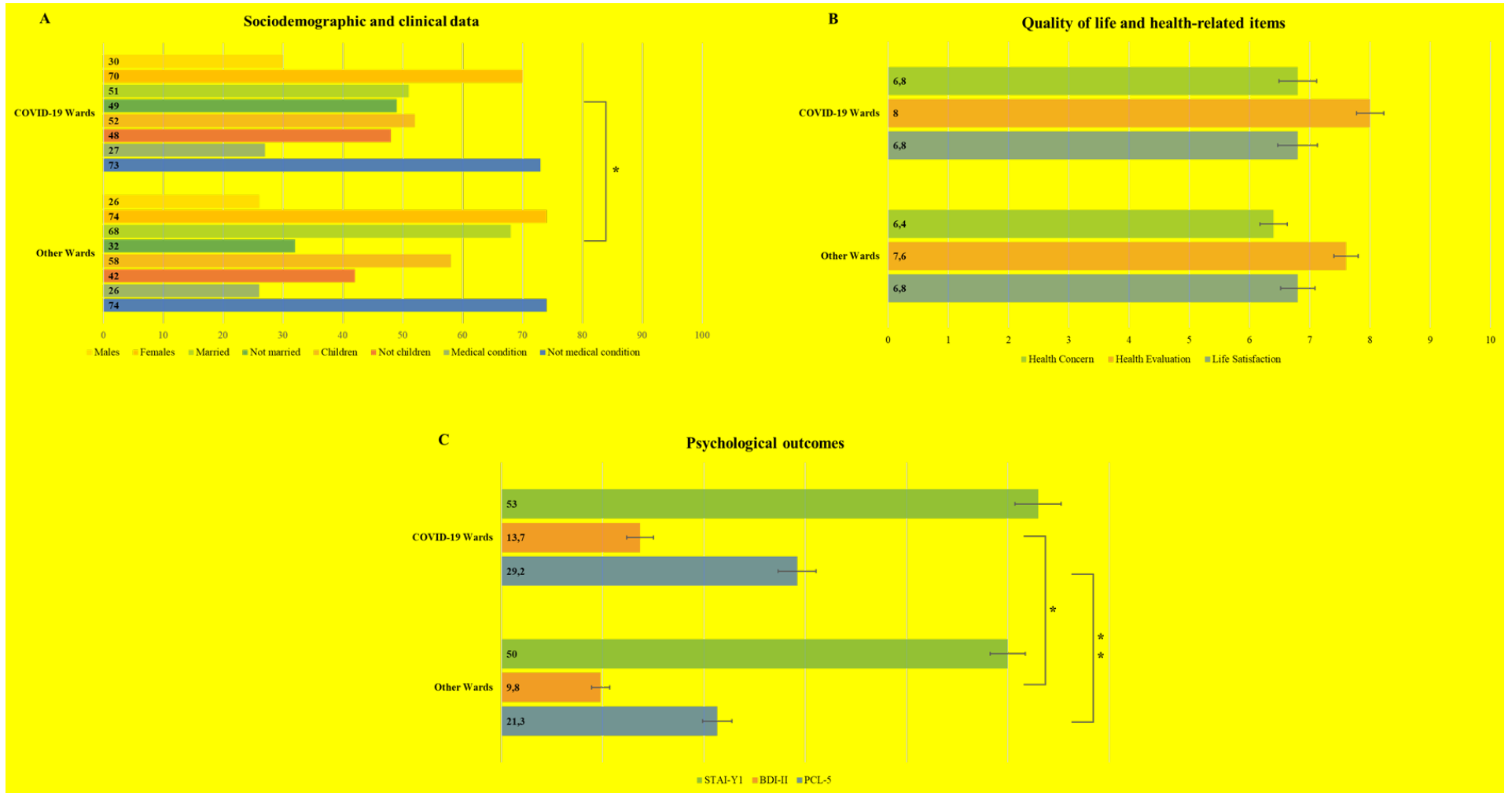


Table 1. Sociodemographic, clinical and work-related information, and psychological data of the healthcare workers ($N = 145$).

	Mean (SD)	n (%)	Range
<i>Sociodemographic and clinical information</i>			
Age (years)	42.9 (11.2)		23-64
<i>Gender</i>			
Female		105 (72.4)	
Male		40 (27.6)	
<i>Marital status</i>			
In a relationship		88 (60.7)	
Not in a relationship		57 (39.3)	
<i>Children</i>			
Yes		81 (55.9)	
No		64 (44.1)	
<i>Medical condition</i>			
Yes		38 (26.2)	
No		107 (73.8)	
<i>Work-related information</i>			
<i>Type of ward</i>			
COVID-19 wards		63 (43.4)	
Other wards		82 (56.6)	
<i>Profession</i>			
Medical doctor		72 (49.7)	
Nurse		73 (50.3)	

<i>Psychological aspects</i>			
Life satisfaction (VAS)	6.8 (2.2)		1-10
Health evaluation (VAS)	7.8 (1.8)		1-10
Health concern (VAS)	6.5 (2.6)		1-10
STAI Y1	51.3 (13.9)	103 (71)*	20-80
BDI-II	11.5 (9.5)	45 (31)*	0-63
PCL-5	24.7 (17.1)	38 (26.2)*	0-80

SD = Standard Deviation; VAS = Visual Analogue Scale; BDI-II = Beck Depression Inventory; STAI Y1 = State-Trait Anxiety Inventory Form Y1;

PCL-5 = PTSD Checklist for DSM-5.

* Participants who scored above the STAI Y1 cut-off point (≥ 41), above the BDI cut-off point (>13), and above the PCL-5 cut-off point (≥ 33).

Table 2. Multiple regressions predicting BDI-II and PCL-5 scores from sociodemographic and clinical variables in the subgroup of healthcare professionals who work in COVID-19 wards ($N = 63$).

<i>BDI-II</i>								
Predictors	B	β	t	p	95% CI	Adj R ²	F	p
<i>Model</i>						0.24	4.970	.001
Age	0.369	0.288	1.876	.066	-0.025; 0.762			
Gender	-5.777	-0.252	-2.192	.032	-11.054; -0.500			
Marital status	9.280	0.441	3.541	.001	4.031; 14.529			
Children	-0.155	-0.007	-0.049	.961	-6.437; 6.127			
Medical condition	-0.269	-0.011	-0.088	.930	-6.401; 5.862			
<i>PCL-5</i>								
<i>Model</i>						0.25	5.127	.001
Age	1.206	0.554	3.626	.001	0.540; 1.873			
Gender	-15.505	-0.398	-3.473	.001	-24.445; -6.566			
Marital status	7.094	0.198	1.598	.116	-1.798; 15.985			
Children	6.529	0.182	1.228	.224	-4.114; 17.171			
Medical condition	5.589	0.139	1.077	.286	-4.798; 15.975			

CI = Confidence Interval; BDI-II = Beck Depression Inventory; PCL-5 = PTSD Checklist for DSM-5.

