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Psychological Distress of Healthcare Workers in 4 Hospitals Compared to General Population During the First Italian Wave of COVID-19 Pandemic

Gianmarco Russo, MD[1*], Marianna N Vargas, MD[2*], Vittorio Santoro, MD[1], Maria Ginevra Oriani, MD[2], Astrid Focosi, MD[3], Ilaria Capecci, MD[3], Giuseppe Servillo, MD[1], Stefania De Simone, PhD[4], and Maria Vargas, MD[1]

Abstract

COVID-19 caused important consequences on public health, economy, physical, and mental health of people. The aim of this study was to evaluate the impact of COVID-19 on frontline workers, comparing them with their colleagues who had no contact with the patients and with the general population, by administering an online questionnaire based on the Distress Questionnaire—5 (DQ5). The study was carried out during the first Italian wave of COVID-19 pandemic from 1st to 30th of April. Participants were divided in 3 groups: group 1 is general population group that includes the general population which are quarantined but not isolated, group health care staff not working in COVID-19 hospitals, and group 3 healthcare staff group working in COVID-19 hospitals. The survey was carried with the Distress Questionnaire—5 (DQ5) as a tool to detect the psychological distress and mental health problems. A total of 2983 people participated in this survey. Seven hundred and twenty four out of 1123 (64%) were employers of the 4 hospitals included in this study. Particularly among the respondents, 2259 (75.7%) were general population, 502 (16.8%) were health care staff not working in COVID-19 hospitals, while 222 (7.4%) were health care staff working in covid-19 hospitals. Health care personnel working in COVID-19 hospitals (DQ-5 = 13, 10-16) had less psychological distress compared with health care staff not working in COVID-19 hospitals (DQ-5 = 14, 11-16) and general population (DQ-5 = 14, 11-17; $P = .04$). The regression model showed that people aged 26 to 35 (OR: 2.06, 95% CI: 1.21-3.48) and female (OR: 2.35, 95% CI: 1.95-2.83) were significantly at risk to develop a DQ-5 $\geq$ 11. During the first Italian wave of COVID-19 pandemic, healthcare personnel working in COVID-19 hospitals had less psychological distress compared with health care staff not working in COVID-19 hospitals and general population, probably because they were prepared to face situations like outbreak or emergencies.

Keywords

psychological distress, COVID-19, Distress Questionnaire-5 (DQ-5), healthcare workers

What do we already know about this topic?
COVID-19 caused important consequences on public health, economy, physical, and mental health of people.

How does your research contribute to the field?
We evaluate the impact of COVID-19 pandemic on psychological distress of healthcare workers by involving general population, frontline health care workers, and health care workers that did not work in COVID-19 hospitals.

What are your research's implications toward theory, practice, or policy?
During the first Italian wave of COVID-19 pandemic, healthcare personnel working in COVID-19 hospitals had less psychological distress compared with health care staff not working in COVID-19 hospitals and general population, probably because they were prepared to face situations like outbreak or emergencies.

Introduction

COVID-19, the disease caused by the virus SARS-COV-2, caused important consequences on public health, economy, physical, and mental health of people. In December 2020, Italy counts 68790 deaths, (among the higher in the world), and 1 953 000 infected people.[1] The World Health Organization on March 11th 2020 stated the COVID-19 pandemic while Italy was the first European Country being involved by the COVID-19 outbreak. Indeed, 2 days before the Italian

Government already declared a national lockdown, as a consequence, containment measures against the infection such as social distancing, home isolation, tracking of contacts and movements, and lockdown of public services were implemented. However, these measures were insufficient because of the contagion still increased.[2] Public transportations were even restricted. Afraid by the lockdown, by a new and unknown disease spreading quickly in the northern regions of the Italy and by the inability of the hospitals in the northern regions to face the outbreak with an appropriate number of beds in the ward and in the ICU, many people traveled from the north to south of Italy transferring the virus and increasing the contagion in the southern regions.[2] Furthermore, all over the Country there were shortage of individual protection devices and savings strategies for personal protective equipment. Indeed, in COVID-19 hospitals, healthcare workers assisted patients with inappropriate personal protective equipment risking contagion. In many times, healthcare workers in not COVID-19 hospitals had not personal protective equipment available to assist their patients, neither the possibility to screen the positivity of their patients to Sars-Cov-2 virus. As result of this many healthcare workers were infected while doing their work. All this caused important consequences on the psychophysical health of healthcare workers, not only in our country but all over the world, as several studies have shown.[3-6]

According to this, the aim of this study was to evaluate the impact of COVID-19 on frontline workers, comparing them with their colleagues who had no contact with the patients and with the general population, by administering an online questionnaire based on the Distress Questionnaire—5 (DQ5).

Materials and Methods

Settings and Participants

This cross-sectional study was carried out during the first Italian wave of COVID-19 pandemic from 1st to 30th of April. The study was approved by the local ethics committee (University of Naples "Federico II"—CE 155/20). Online informed consent was obtained before inclusion. We included people aged 18 years or older belonging to the study groups. Healthcare staff included medical doctors, nurses, and non-medical personnel.

The survey was carried with the Distress Questionnaire—5 (DQ5) as a tool to detect the psychological distress and mental health problems. 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 (Cronbach's α for this study = .85). A screening cut-off point with high sensitivity and specificity in identifying a range of mental disorders was established at a score of ≥ 11.[7] The DQ5 is a comprehensive measure of psychological distress with better operating characteristics for screening a range of common mental disorders than the Kessler Psychological Distress Scales, K10 and the shorter form K6.[7,8] The questionnaire, completely anonymous, was translated in Italian language and implemented online by using Google Moduli. To collect data on general population the survey was launched from 4 to 10 of April through online social media like Facebook, Twitter, and Reddit from private accounts. Health care staff was engaged by utilizing Google Forms. To collect data on health care workers the online questionnaire was administered in the hospital, while they were working. We included 4 hospitals of Marche region, Fabriano, Jesy, Chiaravalle e Senigallia, since our research group work in those hospitals. At the time of the study, those hospital had 1223 employers.

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 frequencies (%) for categorical variables. Parametric and/or non-parametric ANOVA with post-hoc correction was used for statical analysis. Multivariable logistic regression was used to evaluate risk factors for the development of DQ-5 >11 points. Data were considered statistically significant when $P < .05$. Analyses were performed using SPSS version 20.0 (IBM Co. LTD, Chicago, IL, USA).

Results

A total of 2983 people participated in this survey. Seven hundred and twenty four out of 1123 (64%) were employers of the 4 hospitals included in this study. Particularly among the respondents, 2259 (75.7%) were general population, 502

[1]Department of Neurosciences, Reproductive and Odontostomatological Sciences, University of Naples Federico II, Naples, Italy
[2]ASUR delle Marche, Ancona, Italy
[3]Carlo Urbani—Jesi Hospital, Jesi, Italy
[4]Department of Political Sciences, University of Naples Federico II Largo S. Marcellino, Naples, Italy

*These authors contributed equally to this work.

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Corresponding Author:
Maria Vargas, Department of Neurosciences, Reproductive and Odontostomatological Sciences, University of Naples "Federico II," Via Pansini, Naples 80100, Italy.
Email: vargas.maria82@gmail.com

Table 1. Overall Characteristics of the Respondents.

	General population (n = 2259)		Health care staff no COVID-19 (n = 502)		Health care staff COVID-19 (n = 222)	
	n	%	n	%	n	%
Age						
18-25	521	23.1	37	7.4	23	10.4
26-35	571	25.3	150	29.9	38	17.1
36-45	468	20.7	138	27.5	60	27.0
46-55	349	15.4	100	19.9	62	27.9
56-65	256	11.3	75	14.9	38	17.1
≥66	94	4.2	2	0.4	1	0.5
Gender						
Not declared	0	0.0	25	5.0	16	7.2
Female	1351	59.8	288	57.4	157	70.7
Male	908	40.2	189	37.6	49	22.1
Education						
Not declared	0	0.0	25	5.0	16	7.2
Graduate	1308	57.9	379	75.5	118	53.2
High school diploma	844	37.4	86	17.1	82	36.9
Secondary school or lower	107	4.7	12	2.4	6	2.7

Note. N = 2983. Among the respondents, 2259 (75.7%) were general population, 502 (16.8%) were health care staff not working in COVID-19 hospitals, while 222 (7.4%) were health care staff working in COVID-19 hospitals.

(16.8%) were health care staff not working in COVID-19 hospitals, while 222 (7.4%) were health care staff working in covid-19 hospitals. The overall characteristics of the respondents are synthesized in Table 1. Participants were divided in 3 groups: group 1 (n = 2259; female 59,8%; male 40,2%) is general population group that includes the general population which are quarantined but not isolated, group 2 (n = 502; female 57,4%; male 37,6%; 5% not declared) healthcare staff not working in COVID-19 hospitals and group 3 (n = 222; female 70,7%; male 22,1%; 7,2% not declared) healthcare staff group working in COVID-19 hospitals.

Health care personnel working in COVID-19 hospitals (DQ-5 = 13, 10-16) had less psychological distress compared with health care staff not working in COVID-19 hospitals (DQ-5 = 14, 11-16) and general population (DQ-5 = 14, 11-17; $P = .04$). Table 2 reported the pairwise comparisons between the single domains of DQ-5. We found that the worries overwhelmed more the health care staff not working in COVID-19 hospitals (DQ-5 = 3, 3-4) than health care staff working in COVID-19 hospitals (DQ-5 = 3, 3-4) and general population (DQ-5 = 3, 3-4; $P = .026$). We did not find any statistical differences in the feel of hopeless between the groups ($P = .201$). For health care personnel working in COVID-19 hospitals (DQ-5 = 3, 2-4) the social setting was less upsetting compared with health care staff not working in COVID-19 hospitals (DQ-5 = 4, 3-4) and general population (DQ-5 = 4, 3-5; $P = .042$). Health care personnel working in COVID-19 hospitals (DQ-5 = 3, 2-3) and health care staff not working in COVID-19 hospitals (DQ-5 = 3, 2-3) had less trouble to stay focused on tasks than general population (DQ-5 = 3, 2-4; $P = .000$). Health care personnel working in COVID-19 hospitals (DQ-5 = 2, 1-3) had less anxiety or fear interfered with "my ability to do the things I needed to do at work or at home" compared with health care staff not working in COVID-19 hospitals (DQ-5 = 2, 1-3) and general population (DQ-5 = 2, 1-3; $P = .003$).

A DQ-5 score ≥11 was found in 80.6% (1821) of general population, in 82.5% (414) of health care staff not working in COVID-19 hospitals and in 75.2% (167) of health care personnel working in COVID-19 hospitals. The multivariable logistic regression model showed that people aged 26 to 35 (OR: 2.06, 95% CI: 1.21-3.48) and female (OR: 2.35, 95% CI: 1.95-2.83) were significantly at risk to develop a DQ-5 ≥ 11 (Table 3).

Discussion

In this survey we found that more than 70% (2403/2983) of included people experienced psychological distress, evaluated by the DQ-5 questionnaire, during COVID-19 first Italian wave. Particularly, we found that frontline healthcare personnel working in COVID-19 hospitals (1) had less psychological stress compared with health care staff not working in COVID-19 hospitals and general population, (2) were less upset by the social settings, (3) had less trouble to stay focus, and (4) had less interference from anxiety or fear in doing things at work or at home. Furthermore, according to our multivariable logistic regression model, age between 26 and 35 and female people were at risk to develop psychological distress, although not working in COVID-19 hospitals.

Table 2. Comparison Between the Single Domains of DQ-5.

	General population (n = 2259)	Health care staff no COVID-19 (n = 502)	Health care staff COVID-19 (n = 222)	*P*-value
My worries overwhelmed me	3 (3-4)	3 (3-4)	3 (3-4)	.026
I felt hopeless	2 (1-3)	2 (1-3)	2 81-3)	.201
I found social settings upsetting	4 (3-5)	4 (3-4)	3 (2-4)	.042
I had trouble staying focused on tasks	3 (2-4)	3 (2-3)	3 (2-3)	.000
Anxiety or fear interfered with my ability to do the things I needed to do at work or at home	2 (1-3)	2 (1-3)	2 (1-3)	.003

Note. We found that the worries overwhelmed more the health care staff not working in COVID-19 hospitals (DQ-5 = 3, 3-4) than health care staff working in COVID-19 hospitals (DQ-5 = 3, 3-4) and general population (DQ-5 = 3, 3-4; *P* = .026). We did not find any statistical differences in the feel of hopeless between the groups (*P* = .210). For health care personnel working in COVID-19 hospitals (DQ-5 = 3, 2-4) the social setting was less upsetting compared with health care staff not working in COVID-19 hospitals (DQ-5 = 4, 3-4) and general population (DQ-5 = 4, 3-5; *P* = .042). Health care personnel working in COVID-19 hospitals (DQ-5 = 3, 2-3) and health care staff not working in COVID-19 hospitals (DQ-5 = 3, 2-3) had less trouble to stay focused on tasks than general population (DQ-5 = 3, 2-4; *P* = .000). Health care personnel working in COVID-19 hospitals (DQ-5 = 2, 1-3) had less anxiety or fear interfered with "my ability to do the things I needed to do at work or at home" compared with health care staff not working in COVID-19 hospitals (DQ-5 = 2, 1-3) and general population (DQ-5 = 2, 1-3; *P* = .003).

Table 3. Multiple Regression.

	DQ-5 ≥ 11	
Characteristics	OR (95% CI)	*P*-value
Age		
18-25	1	.997
26-35	2.06 (1.12-3.48)	.007
36-45	1.32 (0.80-2.18)	.270
46-55	1.26 (0.76-2.08)	.368
56-65	0.87 (0.53-1.44)	.597
≥66	1.03(0.61- 1.74)	.900
Gender		
Female	2.35(1.95- 2.82)	.000
Male	1	.000
Education		
Graduate	1.32 (0.85-2.07)	.142
High school diploma	1.38 (0.89-2.13)	.209
Secondary school or lower	1	.188
Work in COVID-19 hospitals	1.04 (0.83-1.31)	.684

Note. The regression model showed that people aged 26 to 35 (OR: 2.06, 95% CI: 1.21-3.48) and female (OR: 2.35, 95% CI: 1.95-2.83) were significantly at risk to develop a DQ-5 ≥ 11.

Our methodological innovations compared with the current literature were (1) the use of the DQ-5 questionnaire as standardized method to detect the psychological distress and mental health problems and (2) the recruiting of the health care workers in the hospitals during their work shift. Our data put in evidence some differences and some similar results with other studies like this one, and we think that the explanation is due to the methods applied. Many studies reported high levels of anxiety, depression, and burnout in frontline healthcare, particularly among young women.[9-14] Moreover, a prospective study conducted over a period of 1 year starting from the beginning of the pandemic, has shown that the share of distressed frontline healthcare workers remained constant throughout the year.[15] Even in a cross-sectional survey, the authors found that the anxiety and depression disorders in health-care workers during the pandemic was not higher than that the commonly recorded in the previous years.[16]

Li et al[17] studied the percentage of indirect trauma caused by COVID-19 outbreak in 740 people, (214 between general population, 234 between frontline health care workers, 292 between health care workers not working in COVID-19 hospitals), finding that healthcare workers had a lower percentage of indirect trauma and stress than remaining sample. Even Tan et al[18] demonstrated that frontline healthcare workers had a lower psychological impact than general population during COVID-19 outbreak. A meta-analysis, including 62 studies and 162 639 people, showed a lower percentage of anxiety in health care workers than the other groups.[19] Our study, using the DQ-5 questionnaire, offered a clear measure of the psychological distress of healthcare workers during the first wave of COVID-19 pandemic. In our analysis, the frontline healthcare personnel working in COVID-19 hospitals had less psychological distress. Our explanation is that COVID-19 hospital healthcare workers, coming from specialistic wards, were prepared to face situations like outbreak or emergencies and where better equipped with PPE than the other groups.

Our results identified that female gender, age between 26 and 35 years, and nurse job to be related to the development on anxiety and burnout. The incidence of anxiety and depression among female medical staffs was higher than male. As stated by the results of an epidemiological studies, women were at a higher risk of depression.[20] There are many reasons for this gap between men and women. For example, genetic factors might play a part, but empirical evidence for their potential to explain the gender gap in depression is still scarce.[9-12,17-19] Even nurses had higher psychological distress compared to doctors.[21-24] These findings highlighted the importance to design interventions to target women, nurses, people with complications or older age, and those

with unstable income, whom may have higher psychological burden.[25,26] Despite the older age was more inclined to psychological distress, we found that younger age was affected too. Probably younger aged people suffered more by social isolation and loneliness.[27-29] Our findings underlined the need of psychological support and the importance to design interventions for women and people aged between 26 and 35. All over the world, Governments faced health, social, and economic emergencies born from the COVID-19 pandemic, it is also important to consider the psychological implications of the pandemic on the general population and healthcare workers.[30]

Conclusions

During the first Italian wave of COVID-19 pandemic, healthcare personnel working in COVID-19 hospitals had less psychological distress compared with health care staff not working in COVID-19 hospitals and general population, probably because they were prepared to face situations like outbreak or emergencies. Female gender and age between 26 and 35 years were critical risk factors for the development psychological distress.

Limitations

(1) We chose to use social networks to recruit the participants through the general population, because of the limitations imposed by the lockdown that Italian Government established for COVID-19 pandemic. (2) This is a cross-sectional study design and no causal relationship can be claimed. (3) The sample was recruited using convenience sampling, which restricts the generalizability of the study findings. (4) The online survey adopted self-reports, which is subject to the bias of social desirability. (5) We used an Italian translation of DQ-5 questionnaire.

Declaration of Conflicting Interests

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ORCID iDs

Gianmarco Russ https://orcid.org/0000-0001-8910-3978
Maria Vargas https://orcid.org/0000-0001-7652-970X

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