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Psychological effects of COVID-19 outbreak in hospital workers during the Italian third phase

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Original article

Key words: Covid-19, mental health, psychological evaluation, post-traumatic stress symptoms, public health

ABSTRACT

Objectives

The aim of the study was to explore the psychological impact of COVID-19 outbreak, during the so-called phase three of the infection in Italy, in healthcare workers and other professionals working in the Public Hospital "SS Antonio e Biagio e Cesare Arrigo" in the Piedmont Region.

Methods

A monocentric prospective observational study was conducted on 113 hospital workers by completing an on-line survey. Data were collected from 29th June to 20th July 2020. The survey assessed self-reported socio-demographic, clinical, work and COVID-19 related information and risk perception. Moreover, it included an online version of validated questionnaires in the Italian language: Impact of Event Scale-Revised (IES-R), Depression, Anxiety and Stress Scale (DASS-21), Insomnia Severity Index (ISI), Coping Orientation to the Problems Experienced: COPE-NVI-25, and the Professional Quality of Life scale (ProQOl-5).

Results

The exploratory analysis revealed that hospital workers showed a high percentage of post-traumatic stress symptoms in the months following the beginning of the pandemic. In general, having higher levels of education seems to be associated to less anxiety, stress, depression insomnia e post-traumatic stress symptoms. Those symptoms were reported among those who had higher risk perception, previous psychological problems, or suffered from a chronic disease. Workers with more than 10 years' experience and low risk perception reported less insomnia symptoms.

Conclusions

The assessment of psychological effects of COVID-19 outbreak might help to create good practices that could be used and improved to implement focused interventions on workers' well-being, especially during Covid-19 and post Covid-19 periods.

Introduction

The novel coronavirus disease (COVID-19) was first reported in December 2019 in the city of Wuhan in China. The World Health Organization (WHO) declared a state of sanitary emergency on 30th January 2020 and announced the outbreak of COVID-19 as a global pandemic on 11th March 2020 (World Health Organization, 2020).

Italy was the first European country affected by the coronavirus outbreak and Northern Italy was the most affected area of the Country. On 9th March a national lockdown was announced (Government of Italy, 9th March 2020) and on 25th April Piedmont was the second Italian region mostly hit by the outbreak (Italian Ministry of Health, 2020).

Reduction of restrictions began on 4th May when Italy entered in the so-called Phase 2. Nearly a month later, on 15th June the so-called Phase 3 began. On 30th June there were 240,455 reported cases of COVID-19, including 29,397 healthcare workers (HCW) (mean age 48 years, 29.8% were males) which represented 12.2% of total cases (Epicentro, 2020).

Early studies in Chinese population showed the impact of COVID-19 on the psychological well-being of HCW (Dai *et al.*, 2020; Lai *et al.*, 2020). Depressive symptoms, anxiety, insomnia and psychological distress were reported in HCW during the months of the pandemic outbreak (Luo *et al.*, 2020; Pappa *et al.*, 2020; Sasaki *et al.*, 2020) and professional working in emergency care settings were at greater risk to develop post-traumatic symptoms (Carmassi *et al.*, 2020; Hegg-Deloye *et al.*, 2014). In addition, HCW were more likely to develop psychological distress during the COVID-19 outbreak compared to non HCW (Rossi *et al.*, 2020; Sasaki *et al.*, 2020).

Positive coping strategies, such as positive attitude towards stressful situations and motivation to learn different skills, were reported to be protective factors against the development of post-traumatic psychopathology and distress. On the other hand, avoidance strategies, female gender, social support seeking, fewer years of work experience, working as a nurse, and working with COVID-19 patients were reported as common risk factors (Babore *et al.*, 2020; Carmassi *et al.*, 2020; Huang *et al.*, 2020; Kang *et al.*, 2020; Luo *et al.*, 2020).

Evidences on Italian population showed that HCW providing direct care to COVID-19 patients were most likely to develop psychological distress and post-traumatic stress symptoms compared to HCW of other wards (Cabarkapa *et al.*, 2020; Di Tella *et al.*, 2020).

So far, to our knowledge, there are few empirical studies regarding the psychological impact on HCW providing direct patient care, other hospital professionals and hospital administrative staff after the lockdown.

The purpose of this study is to carry out an exploratory investigation of the COVID-19 psychological impact and emotional/behavioural characteristics of workers of the "SS. Antonio and Biagio, and Cesare Arrigo Hospital" of Alessandria (one of the major city of Piedmont located in Northwest Italy).

Materials and Methods

Design

A monocentric prospective observational study was performed. The study was conducted in the so called "Italian third phase" from the onset of the COVID-19 pandemic by completing a self-administered online survey.

This study was approved by the clinical research ethics committee of the of the "SS. Antonio e Biagio, e Cesare Arrigo" Hospital of Alessandria, in accordance with the Declaration of Helsinki.

Participants

Between 29th June and 20th July an online survey was conducted on workers of the Hospital "SS. Antonio e Biagio e Cesare Arrigo" of Alessandria. Participants included in the study were all workers of Alessandria Hospital. Trainees, volunteers, workers of third-party companies were excluded from the study.

Materials

The survey assessed different areas: self-reported socio-demographic and clinical information (age, gender, marital status, having/not having children, education level, having/not having a chronic disease, previous psychological problems), work-related information (profession, years of working experience, providing direct patient care, smart working), COVID-19 related information (swab test, serological test, quarantine, type of ward, contacts with COVID-19 positive colleagues, patients or relatives). Risk perception was measured using a Likert scale from 0 to 7.

Moreover, participants were asked to complete an online version of validated questionnaires in Italian language. Impact of event scale-Revised, IES-R (Pietrantonio *et al.*, 2003; Weiss & Marmar, 1996), Depression, Anxiety and Stress Scale, DASS-21 (Bottesi *et al.*, 2015), ISI-Insomnia Severity Index (Castronovo *et al.*, 2016; Morin, 1993) were used to assess the presence and severity of post traumatic symptoms, depression, anxiety, stress and insomnia, respectively. Coping Orientation to the Problems Experienced- New Italian Vesion, COPE-NVI-25, (Foà *et al.*, 2015; Sica *et al.*, 2008) was included to evaluate coping abilities and Professional Quality of Life scale, ProQOl-5 (Stamm, 2009; 2010) was used to assess compassion-satisfaction, burn-out and secondary traumatic stress in a subgroup of HCW providing direct patient care.

IES-R is a 22-item self-report questionnaire which aims to assess subjective distress caused by traumatic events. Total score was given by the sum of 3 subscale scores: Intrusion, Avoidance, and Hyperarousal.

DASS-21 is a 21-item self-report tool that measures emotional states of depression, anxiety, and stress.

The ISI is a 7-item self-reported questionnaire that measures sleep quality and insomnia. In this study the value of Cronbach's alpha for ISI was α=.910.

COPE-NVI-25 assess different coping behaviours or styles towards problems and stressful events, considering five different coping strategies (Positive attitude, Problem solving, Turning to religion, Social support, Avoidance strategies).

ProQOL is a 30-item self-report scale that measures compassion satisfaction and compassion fatigue (burnout and secondary traumatization). This questionnaire was adminstered to HCW providing direct patient care only. The scores are classified as high (≥42), moderate (between 23 and 41) and low (≤22).

Methods

Hospital workers were invited via e-mail to fill an anonymous online survey. The invitation e-mails contained a link to the survey. The survey was administered to 2.486 SS Antonio e Biagio e Cesare Arrigo Hospital workers and data were collected from 29th June to 20th July 2020 using an online self-report survey built on REDCap (Research Electronic Data Capture - Project REDCap <http://projectredcap.org>) web application (Harris *et al.*, 2009; Harvey, 2018; Patridge & Bardyn, 2018; Patridge & Ruhl, 2018).

Informed consent was requested to all participants in order to complete the online survey.

Data Analysis

The internal consistency of the questionnaires was assessed by using Cronbach's alpha coefficients. In this study the values of Cronbach's alpha were the followings: IES-R α =.954, Intrusion α= .919, Avoidance α= .840, and Hyperarousal α= .883; DASS-21 α =.969, Stress α=.937, Anxiety α=.935, and Depression α=.929; COPE NVI-25 α=.877, Social support α=.845, Avoidance strategies α=.648, Positive attitude α=.773, Problem solving α=.767, and Turning to religion α=.959; Pro QOL α=.775, Compassion satisfaction α=.861, Burn-out α=.562 and Secondary traumatization α=.831.

The prevalence of psychological symptoms was derived according to the following cut-off scores: IES-R total score >33; Intrusion, Avoidance, Hyperarousal ≥ 3; DASS-21 Depression >4, Anxiety >3, Stress >7; ISI ≥ 15; ProQol-5 Compassion-satisfaction ≥42, Burn-out ≥ 23, Secondary traumatic stress ≥ 23.Risk perception was dichotomized into middle/high (≥5) and low (≤4).

All statistical analyses were performed using Statistical Package for Social Science, version 25 (IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp.).

Descriptive analyses were carried out including frequencies and percentages for categorical variables, and mean and standard deviation for pseudo-continuous variables. On the basis of the types of variables and the distribution of data, the following tests were performed: Wilcoxon-Kruskal-Wallis test by ranks, Mann Whitney U test for continuous variables, Pearson Chi square test for categorical variable or Fisher's exact test. The statistical significance was set at $p < .05$.

Results

A total of 113 individuals (4.5%) completed the online survey. Of these, the mean age was 46.9; age range 23-65 years, 82.3% were female, 70.8% were married/cohabiting, and 55.8% had children. More than 50% (57.5%) of the respondents was HCW providing direct patient care and the 32.7% worked on COVID-19 wards (Table 1). Three subjects did not clarify whether they provided direct care to patients or not, therefore ProQOL, a specific test completed by HCW providing direct patient care only, has not been administered. The results of the psychological questionnaires are summarized in Table 2.

Table 3 reports the results of the questionnaires considering the following selected variables: socio-demographic, clinical and work-related information and risk perception.

IES-R

About 40% of the participants showed moderate to severe post-traumatic stress symptoms on IES-R. “Hyperarousal” and “Intrusion” were the sub-scales with the highest values.

Moderate to severe symptoms were significantly associated with gender (p=.038), education level (p=.002), profession (p=.016), having/not having children (p=.030), suffering from a chronic disease (p=.026), previous psychological problems (p=.006) and risk perception (p=.000).

In particular, male workers, professionals with higher educational level, and workers with children showed less post-traumatic stress symptoms, whereas suffering from a chronic disease, previous psychological problems and high-risk perception led to higher post-traumatic stress symptoms.

“Intrusion” and “Hyperarousal” were the sub-scales with the highest values. High levels of Intrusion were significantly associated with educational level (p=.035), suffering from a chronic disease (p=.045) and previous psychological problems (p=.001). With regard to Hyperarousal significant associations with chronic disease (p=.001), previous psychological problems (p=.001), and risk perception (p=.017) were found. High levels of Avoidance were significantly associated with previous psychological problems (p=.018).

DASS-21

Mild to severe depression, anxiety and stress symptoms were found on 36.28%, 30.97%, 42.48% of participants, respectively.

With regard to all DASS-21 subscales (“Depression”, “Anxiety” and “Stress”), significant associations with education level (stress p=.015; depression p=.031; anxiety p=.033), suffering from a chronic disease (stress p=.014; depression p=.005; anxiety p=.037), previous psychological problems (stress p=.012; depression p=.010; anxiety p=.002) and risk perception (stress p=.000; depression p=.003; anxiety p=.040) were found.

With regard to depression subscale, significant associations with gender (p=.029) and contact with COVID-19-positive colleagues, patients or relatives (p=.045) were also found.

In particular, workers with high educational level showed less anxiety, stress and depression symptoms, whereas suffering from a chronic disease, previous psychological problems and high-risk perception led to higher stress, anxiety and depression symptoms. In addition, men showed less level of depression whereas

workers who had contacts with COVID-19-positive colleagues, patients or relatives showed higher depression symptoms.

ISI

Moderate-to-severe symptoms on ISI were found on 20.35% of participants and were significantly associated with education level (p=.008), years of working (p=.041), previous psychological problems (p=.001) and risk perception (p=.014).

In particular, high educational level, having more of 10 years of working experience and low risk perception led to less insomnia symptoms.

COPE NVI-25

In our sample the most used coping strategies were Problem Solving and Positive Attitude (see Table 2).

Women used more turning to religion strategies compared to men (p=.028). Avoidance strategies were more common among participants with previous psychological problems (p=.012), administrative employees compared to medical doctors (p=.042), workers who were not in direct contacts with patients (p=.048) or had personal contacts with people tested positive in their private sphere (p=.009) compared to those who had contacts both in their private and public spheres (p=.011).

Positive attitude strategies were more common in HCW providing direct patients care subgroup (p=.035) while participants with previous psychological problems reported more social support strategies (p=.003).

Pro-QOL

In the sub-group of HCW providing direct patient care, high levels of compassion-satisfaction were found on 49.2% of participants, and moderate to low levels of burn-out and secondary traumatic stress symptoms were found on 44,6% and 30,8% of participants, respectively.

Our results showed a statistically significant associations between moderate burn-out symptoms and suffering from a chronic disease (p=.041) and previous psychological problems (p=.029). Secondary traumatic stress symptoms were associated with previous psychological problems (p=.002) and chronic disease (p=.043). Compassion-satisfaction characteristics were associated with marital status (p=.043).

These results are summarized in Table 4 .

Discussion

The current study explored the impact of COVID-19 outbreak, during the phase 3, in hospital workers (HCW providing direct patient care, other hospital professionals and hospital administrative staff). They showed a high percentage of post-traumatic stress symptoms in the months following the beginning of the pandemic.

In general, having higher levels of education seems to be associated to less anxiety, stress, depression insomnia e post-traumatic stress symptoms. Those symptoms were reported among those who had higher risk perception, previous psychological problems, or suffered from a chronic disease. Workers with more than 10 years' experience and low risk perception reported less insomnia symptoms.

Our sample was constituted mainly by women and reflects the gender distribution among workers in our Hospital, nevertheless our results should be considered with caution. In our survey male workers reported fewer post-traumatic stress and depression symptoms compared to female workers, and this result was consistent with other studies (Pappa *et al.*, 2020).

Results of our survey regarding post-traumatic, depression, anxiety, stress, insomnia symptoms are in line with literature, even though different evaluations tools have been used (Buselli, *et al.*, 2020; Lai *et al.*, 2020; Pappa *et al.*, 2020; Riello *et al.*, 2020; Rossi *et al.*, 2020). In addition, working in areas which are worst affected by COVID-19, like Northern Italy, (Simione *et al.*, 2020; Vizheh *et al.*, 2020) has been found to be positively associated with more distress symptoms and mental health disturbance (Vizheh, *et al.*, 2020). In our survey it emerges that those symptoms are still present in the months following the initial emergency phase of the outbreak. This result is in line with what occurred during SARS outbreak, when depression, post-traumatic symptoms and mental health disturbance persisted for a long time after the beginning of the outbreak (Chong *et al.*, 2004; Wu *et al.*, 2009).

Other studies found more symptoms of anxiety and depression in frontline workers (Di Tella *et al.*, 2020) while in our studies they were not significantly associated. Those differences could have been due to a different hospital organization or to the limited sample of frontline respondents.

A subgroup of our sample consisted of HCW providing direct cares to patients. The results show that women reported more symptoms of post-traumatic stress and depression compared to men.

Regarding this subgroup, quality of life has been specifically evaluated. It emerge that professionals suffering from chronic diseases reported more burn out and secondary traumatic stress symptoms. Furthermore, previous psychological problems seem to be possible predisposing factors in the development of secondary traumatic stress symptoms. Compassion Satisfaction is reported from moderate to high in all the subgroup sample and it is positively associated with marital status (it is higher in HCW who are married or cohabiting).

However, our study has several limitation. Despite the distribution of gender in our sample is comparable to the one in hospital workers, our sample is quite small. The survey assess different psychological areas but its length could discouraged the less motivated workers to complete it.

The health sector is characterized by psychosocial risk factors which derive from the intrinsic characteristics of the type of work, aspects relating to health, safety and daily exposure to situations of suffering. Since the onset of the health emergency related to COVID-19, these factors have been amplified and exacerbated.

In conclusion, our preliminary results aimed to define a standardized evaluation methodology for the purpose of creating good practices that can be used and improved in order to implement focused interventions on workers' well-being, especially in COVID-19 and post COVID-19 periods.

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Conflict of interest

The authors declare no conflict of interest.

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Table 1. Socio-demographic and clinical information of participants in the study.

	Tot.				HCW				Other professional				Missing values
	n=113				n=65				n = 45				n = 3
	n	%	M	SD	n	%	M	SD	n	%	M	SD	
Sociodemographic and clinical information													
Gender													
Female	93	82.3			50	76.9			40	88.9			
Male	20	17.7			15	23.1			5	11.1			
Age tot. (years)			46.90	9.58			44.9	9.39			50.2	9.12	
Female age			46.35	10.37			44.36	9.34			50.8	8.15	
Male age			47.01	9.34			46.67	9.63			45.4	15.34	
Age cluster (years)													
Under 40 years	31	27.4			22	33.8			7	15.6			
Between 40 and 55 years	60	53.1			34	52.3			25	55.6			
Over 55 years	22	19.5			9	13.8			13	28.9			
Marital status													
Single	20	17.7			9	13.8			9	20			
Married/cohabiting	80	70.8			47	72.3			32	71.1			
Divorced/separated	13	11.5			9	13.8			4	8.9			
Children													
Yes	63	55.8			35	53.8			27	60			
No	50	44.2			30	46.2			18	40			
Educational Level													
Middle School	3	2.7			2	3.1			1	2.2			
Secondary School	25	22.1			7	10.8			17	37.8			
Bachelor's Degree	23	20.4			18	27.7			4	8.9			
Master Degree	18	15.9			8	12.3			9	20			
Advanced degree	44	38.9			30	46.2			14	31.1			
Chronic Disease													
Yes	25	22.1			11	16.9			14	31.1			
No	88	77.9			54	83.1			31	68.9			
Previous psychological problems													

Yes	33	29.2	19	29.2	14	31.1
No	80	70.8	46	70.8	31	68.9
Work-related information						
Profession						
Medical doctor	26	23	24	36.9	1	2.2
Chemist/biologist	10	8.9	2	3.1	8	17.8
Nurse	35	31	28	43.1	6	13.3
Allied healthcare professional	9	8	6	9.2	3	4.4
Social-care professional	2	1.8	2	3.1	-	
Administrative employee	27	23.9	-		27	60
Other	4	3.5	3	4.6	1	2.2
Direct patient care						
Yes	65	23	65	100		
No	48	77			45	100
Missing values=3						
Smart working						
Yes	29	25.7	8	12.3	21	46.7
No	84	74.3	57	87.7	24	53.3
Covid-related information						
Type of ward						
Covid-19 Wards	37	32.7	30	46.2	6	13.3
Other wards	76	67.3	35	53.8	39	86.7
Work with Covid-19 patients						
Yes	73	64.6	55	84.6	16	35.6
No	40	35.4	10	15.4	29	64.4
Knowing someone tested positive (patients excluded)						
Yes	105	92.9	60	92.3	42	93.3
No	8	7.1	5	7.7	3	6.7
Confirmed cases among:						
Colleagues	83	79	50	83.3	32	76.2
Family members	7	6.7	2	3.3	4	9.5
Relatives	5	4.8	3	5	2	4.8
Friends	40	38.1	28	46.7	11	26.2
Acquaintances	44	41.9	26	43.3	17	40.5
Covid-19 serological test						

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Yes	102	90.3	60	92.3	39	86.7
No	11	9.7	5	7.7	6	13.3
Covid-19 nasal swab test						
Yes	47	41.6	31	47.7	14	31.1
No	66	58.4	34	52.3	31	68.9
Positive Covid-19 nasal swab test						
Yes	8	7.1	3	9.7	5	35.7
No	39	34.5	28	90.3	9	64.3
Ever been quarantined/isolated						
Yes	5	4.4	3	4.6	2	4.4
No	108	95.6	62	95.4	43	95.6
Risk perception						
low	45	39.8	26	40	18	40
middle-high	68	60.2	39	60	27	60

Number (n) , percentage (%), Mean (M) and Standard Deviation (SD).

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Table 2

Impact of event scale-revised (IES-R) total and subscales, Depression, Anxiety and Stress Scale (DASS-21) subscales, Insomnia Severity Index (ISI), Coping Orientation to the Problems Experienced- New Italian Version (COPE-NVI-25) subscales, Professional Quality of Life scale (ProQol-5) subscales scores (mean values, SD, number and percentage of participants scoring above the cut-off and range). The table considers the total sample (n=113) and the subgroups of Healthcare Workers (HCW) providing direct patient care and other professional, and professional working in COVID ward and other ward.

	Total					**HCW**					**Other professionals**					**Missing values**	**p ***	**Covid ward**					**Other wards**					**P***
	n=113					n=65					n = 45					n = 3		n=37					n = 76					
	M	**SD**	**n**	**%**	**r**	**M**	**SD**	**n**	**%**	**r**	**M**	**SD**	**n**	**%**	**r**			**M**	**SD**	**n**	**%**	**r**	**M**	**SD**	**n**	**%**	**r**	
IES-R	30.98	20.8	46	40.7	0-79	30.11	21.04	26	23	0-74	31.47	20.79	18	15.9	2-79	-	1	33.65	19.48	28	24.8	2-65	29.68	21.42	18	15.9	0-79	.308
Intrusion	1.49	1.07	13	11.5	0-4	1.49	1.12	9	13.8	0-3.75	1.48	1.01	4	8.9	0-4	-	.308	1.61	1.03	4	10.8	0-3.25	1.44	1.09	9	11.8	0-4	.903
Avoidance	1.23	0.8	4	3.5	0-3.38	1.18	0.85	1	1.5	0-3	1.24	0.93	3	6.7	0-3.38	-	.187	1.33	0.86	0	0.0	0-2.75	1.17	0.90	4	5.3	0-3.38	.304
Hyperarousal	1.54	1.1	17	15.0	0-4	1.46	1.09	7	10.8	0-3.75	1.61	1.14	9	20	0.17-4	-	.18	1.69	0.98	5	13.5	0-3.33	1.47	1.16	12	15.8	0-4	.97
DASS-21																												
Depression	4.51	5.53	41	36.3	0-21	3.85	5.09	19	16.8	0-21	5.44	6.16	20	17.7	0-19	-	.11	3.8	4	15	13.3	0-16	4.86	6.12	26	23	0-21	.537

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Anxiety	3.59	5.07	35	31.0	0-21	3.35	5.13	16	16.2	0-21	3.91	5.16	18	15.9	0-18	-	.097	2.86	3.75	8	7.1	0-15	3.95	5.59	27	23.9	0-21	.193
Stress	7.45	6.10	48	42.5	0-21	6.83	5.73	24	21.2	0-21	8.13	6.69	22	19.5	0-20	-	.242	7.57	4.87	17	15.0	0-19	7.39	6.65	31	27.4	0-21	.686
ISI	8.56	6.28	23	20.4	0-27	7.85	5.98	11	9.7	1-21	9.62	6.81	12	10.6	0-27	-	.24	9.24	5.89	8	7.1	0-22	8.22	6.48	15	13.3	0-27	.808
COPE-NVI-25																												
Positive attitude	24.38	5.87			7-36	25.52	5.8			7-36	23.11	5.71			9-32	-	.035*	24.68	6.82			7-35	24.24	5.39			7-36	.468
Problem solving	19.19	5.09			6-30	19.58	4.94			6-30	18.93	5.34			6-28	-	.641	19.08	5.25			6-27	19.24	5.05			6-30	.954
Turning to religion	9.45	5.75			4-23	9.14	5.45			4-23	10	6.31			4-23	-	.554	8.43	4.72			4-23	9.95	6.16			4-23	.308
Social support	16.06	5.94			5-28	16.32	5.94			5-28	15.89	6.09			5-27	-	.706	15.8	5.19			5-25	16.54	6.25			5-28	.292
Avoidance strategies	8.88	3.71			5-20	8.25	3.34			5-17	9.69	4.08			5-20	-	.048*	8.68	3.12			5-14	8.97	3.99			5-20	.929
ProQoL-5																												
Compassion-satisfaction						41.09	5.57	32	49.2	27-50								40	5.47	11	9.7	27-49	42.03	5.55	21	18.6	29-50	.083
Burn-out						22.47	4.81	27	41.5	13-32								22.93	4.71	13	11.5	13-32	21.97	4.93	14	12.4	14-30	.806
Secondary traumatic stress						20.34	6.81	19	29.2	11-39								20.4	6.65	9	8.0	11-36	20.29	7.06	10	8.8	11-39	1

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Mean (M), standard Deviation (SD), number (n) , percentage (%) and range (r) of test scores above the set cut off:

IES-R total score >33; Intrusion, Avoidance, Hyperarousal ≥ 3 ; DASS-21 Depression >4, Anxiety >3, Stress >7; ISI ≥ 15; ProQol-5 Compassion-satisfaction ≥42, Burn-out ≥ 23, Secondary traumatic stress ≥ 23

* p < .05

Table 3

Impact of event scale-revised (IES-R) total and subscales, Depression, Anxiety and Stress Scale (DASS-21) subscales, Insomnia Severity Index (ISI), Coping Orientation to the Problems Experienced- New Italian Version (COPE-NVI-25) subscales, Professional Quality of Life scale (ProQol-5) subscales scores (mean values, SD, number and percentage of participants scoring above the cut-off and range). The table considers the total sample (n=113) divided in socio-demographic information (a),clinical information and risk perception (b) type of job (c) and other work-related information (d).

a)

	Men				**Women**				**p***	**Single**				**Married/cohabiting**				**Separate/divorced**				**p***
	n= 20				n = 93					n=20				n=80				n=13				
	M	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**		**M**	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**	
IES-R	20.35	18.56	4	20	33.27	20.63	42	45.2	.038*	34.8	20.49	11	55	27.98	20.91	27	33.8	43.62	15.44	8	61.5	.06
Intrusion	1	0.96	2	10	1.6	1.06	11	11.8	.682	1.57	1.04	1	5	1.37	1.07	9	11.3	2.12	0.89	3	23.1	.177
Avoidance	0.78	0.78	0	0	1.32	0.88	4	4.3	.313	1.43	0.87	1	5	1.08	0.88	3	3.6	1.82	0.62	0	0.0	.813
Hyperarousal	1.02	1.05	2	10	1.65	1.09	15	16.1	.338	1.81	1.13	5	25	1.4	1.11	10	12.5	2.03	0.85	2	15.4	.312
DASS-21																						
Depression	3.25	5.19	3	15	4.78	5.59	38	40.9	.029*	4.65	4.4	9	45	4.35	5.83	26	32.5	5.31	5.45	6	46.2	.427
Anxiety	2.65	5.07	4	20	3.8	5.08	31	33.3	.242	3.5	4.15	8	40	3.44	5.27	21	26.3	4.69	5.36	6	46.2	.223
Stress	5.95	6.04	5	25	7.77	6.1	43	46.2	.081	8.1	6.11	10	50	6.93	6	29	36.3	9.69	6.61	9	69.2	.063
ISI	7.35	6.83	3	15	8.82	6.17	20	21.5	.512	9.55	7.31	5	25	7.98	5.98	15	18.8	10.62	6.29	3	23.1	.797
COPE-NVI-25																						
Positive attitude	23.8	5.91			24.51	5.89			.603	23.65	6.81			24.24	5.43			26.38	6.97			.459
Problem solving	19.55	5.24			19.11	5.08			.898	18.45	6.14			19.08	4.61			21	6.11			.39

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Turning to religion	7.15	4.75			9.95	5.85			.028*	9.35	5.38			9.4	5.77			9.92	6.59	.937
Social support	15.7	5.6			16.14	6.04			.839	16.3	6.67			15.81	5.45			17.23	7.81	.745
Avoidance strategies	8.35	3.95			8.99	3.67			.331	9	3.92			9	3.89			7.92	1.89	.93
	Higher educational level				**Lower educational level**				**p***	**Children**				**No Children**				**p***		
	n= 62				n = 51					n=63				n=50						
	M	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**		**M**	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**			
IES-R	25.47	18.6	17	27.4	37.69	21.53	29	56.9	.002*	28.81	20.14	20	31.8	33.72	21.49	26	52	.030*		
Intrusion	1.23	0.97	4	6.5	1.81	1.1	9	17.7	.035*	1.43	1.03	7	11.1	1.58	1.11	6	12	.638		
Avoidance	0.99	0.76	2	3.9	1.51	0.95	2	3.2	.649	1.14	0.88	1	1.6	1.33	0.89	3	6	.211		
Hyperarousal	1.28	1.03	6	9.7	1.86	1.12	11	21.6	.053	1.38	1.04	8	12.7	1.75	1.16	9	18	.205		
DASS-21																				
Depression	3.37	4.27	17	28.3	5.9	6.53	24	47.1	.031*	3.83	5.44	18	28.6	5.38	5.57	23	46	.056		
Anxiety	2.74	4.36	14	22.6	4.63	5.69	21	41.2	.033*	3.51	5.06	17	27.0	3.7	5.13	18	36	.303		
Stress	6.16	5.42	20	32.3	9.02	6.56	28	54.9	.015*	6.73	5.92	22	34.9	8.36	6.27	26	52	.068		
ISI	7.08	5.62	7	11.3	10.35	6.63	16	31.4	.008*	8.32	6.1	12	19.1	8.86	6.56	11	22	.699		
COPE-NVI-25																				
Positive attitude	23.85	5.67			25.02	6.1			.287	24.19	5.94			24.62	5.83			.602		
Problem solving	19.23	5.22			19.14	4.97			.808	19.05	5.01			19.36	5.23			.6		
Turning to religion	9.76	5.84			9.08	5.68			.594	9.37	5.76			9.56	5.8			.913		
Social support	16.37	5.93			15.69	5.99			.696	15.49	5.83			16.78	6.06			.228		
Avoidance strategies	8.39	3.39			9.47	4.02			.173	8.86	3.43			8.9	4.08			.744		

Mean (M), standard Deviation (SD), number (n) and percentage (%) of test scores above the set cut off:

IES-R total score >33; Intrusion, Avoidance, Hyperarousal ≥ 3

DASS-21 Depression >4, Anxiety >3, Stress >7

ISI ≥ 15

* $p < .05$

b)

	Chronic disease				No Chronic Disease				p*	Previous Psychological Problems				No Previous psychological problems				p*	Knowing COVID-19 positive family/friends				Knowing COVID-19 positive colleagues				Knowing both relatives/friends and colleagues tested positive for COVID-19				p*
	n= 25				n = 88					n= 33				n =80					n=22				n=34				n=57				
	M	SD	n	%	M	SD	n	%		M	SD	n	%	M	SD	n	%		M	SD	n	%	M	SD	n	%	M	SD	n	%	
IES-R	39.44	21.33	15	60	28.58	20.13	31	35.2	.026*	39.55	23.74	20	60.6	27.45	18.49	26	32.5	.006*	38.59	18.66	14	63.6	26.44	19.84	10	29.4	30.75	21.62	22	28.6	.035
Intrusion	1.83	1.14	5	20	1.4	1.03	8	9.1	.045*	1.84	1.22	9	27.3	1.35	0.97	4	5.0	.001*	1.86	0.97	3	13.6	1.29	1.04	3	8.8	1.47	1.1	7	12.3	.815
Avoidance	1.54	0.9	2	8	1.14	0.86	2	2.3	.117	1.59	0.97	3	9.1	1.08	0.8	1	1.3	.018*	1.49	0.92	1	4.5	1	0.72	0	0.0	1.26	0.94	3	5.3	.360
Hyperarousal	2.09	1.21	9	36	1.38	1.02	8	9.1	.001*	2.02	1.29	10	30.3	1.34	0.96	7	8.8	.001*	1.98	1.03	6	27.3	1.36	1.11	5	14.7	1.48	1.1	6	10.5	.288
DASS-21																															
Depression	7.88	6.77	15	60	3.56	4.75	26	29.5	.005*	7.91	7.51	18	54.5	3.11	3.69	23	28.8	.010*	6.05	5.63	13	59.0	3.76	5.48	10	29.4	4.37	5.5	18	31.5	.045*
Anxiety	5.88	6.72	12	48	2.94	4.33	23	26.1	.037*	6.91	7.11	17	51.5	2.23	3.09	18	22.5	.002*	4.05	5.11	8	36.4	3.09	5.48	7	20.6	3.72	4.87	20	35.1	.292
Stress	10.56	6.87	16	64	6.57	5.6	32	36.4	.014*	10.45	7.52	20	60.6	6.21	4.95	28	35.0	.012*	8.41	5.67	10	45.5	6.82	6.14	13	30.2	7.46	6.29	25	43.9	.829
ISI	11.04	6.41	6	24	7.85	6.1	17	19.3	.608	11.42	6.75	13	39.4	7.38	5.71	10	12.5	.001*	10.14	6.25	5	22.7	8.26	6.86	7	20.6	8.12	5.94	11	19.3	.943
COPE-NVI-25																															
Positive attitude	23.44	5.32			24.65	6.02			.263	24.91	5.72			24.16	5.95			.498	23.5	5.29			24.91	6.08			24.4	6.02			.563
Problem solving	19.4	4.43			19.13	5.28			.961	19.7	5.38			18.98	4.98			.5	18.73	4.66			19.38	4.93			19.25	5.41			.787
Turning to religion	9.24	6.27			9.51	5.63			.585	10.03	6.36			9.21	5.51			.547	11.32	5.76			8.97	6.08			9.02	5.5			.148
Social support	16.96	6.29			15.81	5.85			.392	18.85	6.83			14.91	5.15			.003*	16.36	5.51			14.71	6.04			16.75	6			.226
Avoidance strategies	9.72	4.49			8.64	3.45			.342	10.21	4.16			8.33	3.39			.012*	10.5	3.14			8.59	3.47			8.42	3.93			.011*
	Mild-High Risk Perception				**Low Risk Perception**				**p***																						
	n= 68				n =45																										
	M	SD	n	%	M	SD	n	%																							

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IES-R	36.88	20.57	37	54.4	22.07	17.94	9	20.0	.000*
Intrusion	1.78	1.05	9	13.2	1.06	0.95	4	8.9	.213
Avoidance	1.42	0.92	3	4.4	0.94	0.74	1	2.2	.397
Hyperarousal	1.88	1.07	14	20.6	1.02	0.94	3	6.7	.017*
DASS-21									
Depression	5.63	5.75	32	47.1	2.82	4.76	9	20.0	.003*
Anxiety	4.44	5.3	26	28.2	2.31	4.46	9	20.0	.040*
Stress	9.07	6.02	40	58.8	5	5.42	8	17.8	.000*
ISI	10.03	6.59	19	27.9	6.33	5.08	4	8.9	.014*
COPE-NVI-25									
Positive attitude	24.57	6.16			24.09	5.46			.526
Problem solving	19.41	4.95			18.84	5.33			.397
Turning to religion	9.12	5.33			9.96	6.37			.769
Social support	16.31	6.05			15.69	5.82			.567
Avoidance strategies	9.01	3.82			8.67	3.58			.646

Mean (M), standard Deviation (SD), number (n) and percentage (%) of test scores above the set cut off:

IES-R total score >33; Intrusion, Avoidance, Hyperarousal ≥ 3

DASS-21 Depression >4, Anxiety >3, Stress >7

ISI ≥ 15

* $p < .05$

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c)

	Medical doctor				Chemist				Biologist				Obstetrician				Nurse				Laboratory technician			
	n=26				n=1				n=9				n=3				n=35				n=1			
	M	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**
IES-R	24.5	22.22	7	26.9	35	-	1	100	17.67	12.00	1	11.1	17.33	15.50	0	0	36.66	19.97	18	51.4	30.00	-	0	0
Intrusion	1.23	1.22	3	11.5	1.00	-	0	0	0.74	0.5	0	0	0.88	0.76	0	0	1.81	1.03	6	17.1	1.38	-	0	0
Avoidance	0.93	0.76	1	3.8	1.13	-	0	0	0.81	0.60	0	0	0.75	0.90	0	0	1.37	0.92	0	0.0	1.13	-	0	0
Hyperarousal	1.21	1.22	4	15.4	3.00	-	1	100	0.91	0.78	0	0	0.72	0.54	0	0	1.88	0.99	6	17.1	1.67	-	0	0
DASS-21																								
Depression	3.54	5	6	23.1	13.00	-	1	100	3.00	3.20	4	44.4	1.67	2.08	0	0	4.63	5.29	15	42.9	7.00	-	1	100
Anxiety	2.85	5.11	5	19.2	13.00	-	1	100	3.44	5.53	3	33.3	1.67	1.53	0	0	4.17	5.35	12	34.3	3.00	-	0	0
Stress	5.96	5.49	8	30.8	14.00	-	1	100	5.78	6.22	2	22.2	3.33	2.08	0	0	8.8	5.9	20	57.1	9.00	-	1	100
ISI	6.42	5.43	3	11.5	27.00	-	1	100	8.33	7.04	2	22.2	5.00	3.61	0	0	9.43	6.28	8	22.9	14.00	-	0	0
COPE-NVI-25																								
Positive attitude	22.92	6.55			21.00	-			22.56	5.17			26.67	1.15			25.91	5.95			28.00	-		
Problem solving	19.35	5.14			25.00	-			17.11	5.13			18.33	4.62			19.49	5.07			22.00	-		
Turning to religion	8.69	4.71			8.00	-			8.33	5.83			10.00	2.65			9.57	6.22			22.00	-		
Social support	15.69	5.53			25.00	-			13.56	5.46			16.33	5.51			16.11	6.14			21.00	-		
Avoidance strategies	7.23	2.75			11.00	-			9.00	4.00			9.33	4.51			9.26	3.38			11.00	-		

	Radiology technician				Physiotherapist				Social-care professional				Administrative manager				Administrative employee				Other				p*
	n=2				n=3				n=2				n=2				n=25				n=4				
	M	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**	**M**	**SD**	**n**	**%**	

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IES-R	52.00	1.41	2	100	32.00	17.44	2	66.7	45.5	0.71	2	100	25.5	10.61	0	0	36.2	22.67	13	52	14.50	8.70	0	0	.016*
Intrusion	2.44	0.44	0	0	1.54	1.02	0	0	2.06	0.09	0	0	1.44	0.44	0	0	1.74	1.09	4	16	0.53	0.48	0	0	.831
Avoidance	1.94	0.44	0	0	1.21	0.71	0	0	2.06	0.09	0	0	0.75	0.18	0	0	1.53	1.04	3	12	0.84	0.70	0	0	.636
Hyperarousal	2.83	0.24	1	50	1.67	0.88	0	0	2.08	0.12	0	0	1.33	1.41	0	0	1.69	1.19	5	20	0.58	0.29	0	0	.224
DASS-21																									
Depression	11.00	2.83	2	100	3.33	3.51	1	33.3	3.00	0.00	0	0	2.00	1.41	0	0	6.44	7.36	11	44	0.25	0.50	0	0	.113
Anxiety	6.50	2.12	2	100	3.00	3.46	1	33.3	1.50	0.71	0	0	3.00	2.83	1	50	4.08	5.64	10	40	0.25	0.50	0	0	.214
Stress	16.50	3.54	2	100	6.00	1.73	0	0.0	7.50	3.54	1	50	7.50	7.78	1	50	8.36	7.13	12	48	1.00	1.15	0	0	.057
ISI	14.50	9.19	1	50	9.33	2.52	0	0.0	8.50	3.54	0	0	6.00	2.83	0	0	9.52	6.58	8	32	3.75	1.71	0	0	.34
COPE-NVI-25																									
Positive attitude	27.00	1.41			25.67	7.64			26.50	2.12			26.50	3.54			23.24	6.20			25.50	2.89			.737
Problem solving	24.50	3.54			18.33	4.16			24.50	0.71			20.50	2.12			19.00	5.11			14.50	6.86			.356
Turning to religion	7.50	4.95			10.00	5.29			9.50	3.54			11.50	6.36			10.00	6.24			8.75	9.50			.893
Social support	17.00	4.24			17.00	2.00			24.00	5.66			17.00	0.00			16.56	6.35			11.25	7.76			.498
Avoidance strategies	7.50	0.71			8.33	5.77			7.00	1.41			9.50	3.54			10.64	4.51			5.25	0.50			.420

Mean (M), standard Deviation (SD), number (n) and percentage (%) of test scores above the set cut off:

IES-R total score >33; Intrusion, Avoidance, Hyperarousal ≥ 3

DASS-21 Depression >4, Anxiety >3, Stress >7

ISI ≥ 15

* $p < .05$

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d)

	HCW Direct patients care				HCW No direct patient care				p *	Years of work ≤10 years				11-25 years of work				>25 years of work				p *
	n=65				n=45					n=28				n=38				n=47				
	M	SD	n	%	M	SD	n	%		M	SD	n	%	M	SD	n	%	M	SD	n	%	
IES-R	30.11	21.04	26	40.0	31.47	20.79	18	40	1	26.68	21.81	11	39.3	31.03	21.77	16	42.1	33.51	19.37	19	40.4	.973
Intrusion	1.49	1.12	9	13.8	1.48	1.01	4	8.9	.413	1.17	1.07	3	10.7	1.49	1.13	6	15.8	1.69	0.98	4	8.5	.648
Avoidance	1.18	0.85	1	1.5	1.24	0.93	3	6.7	.159	1.13	0.97	2	7.1	1.26	0.85	1	2.6	1.26	0.87	1	2.1	.576
Hyperarousal	1.46	1.09	7	10.8	1.61	1.14	9	20.0	.233	1.39	1.19	3	10.7	1.51	1.13	5	13.2	1.66	1.04	9	19.1	.740
DASS-21																						
Depression	3.85	5.09	19	29.2	5.44	6.16	20	44.4	.101	4.25	5.47	10	35.7	4.37	5.43	13	34.2	4.79	5.74	18	38.3	.924
Anxiety	3.35	5.13	16	24.6	3.91	5.16	18	40	.086	3.36	5.03	7	25	3.84	5.5	12	31.6	3.53	4.84	16	30	.711
Stress	6.83	5.73	24	36.9	8.13	6.69	22	48.9	.211	7	6.59	11	39.3	7.16	5.83	14	36.8	7.96	6.11	23	48.9	.493
ISI	7.85	5.98	11	16.9	9.62	6.81	12	26.7	.217	9.5	7.98	10	35.7	8.03	5.24	4	10.5	8.43	5.98	9	19.1	.041*
COPE-NVI-25																						
Positive attitude	25.52	5.8			23.11	5.71			.035*	24.46	5.67			24.89	5.87			23.91	6.07			.733
Problem solving	19.58	4.94			18.93	5.34			.641	18.32	4.98			20.21	5.46			18.87	4.80			.266
Turning to religion	9.14	5.45			10	6.31			.554	7.71	4.59			10.39	6.28			9.72	5.82			.186
Social support	16.32	5.94			15.89	6.09			.706	16.29	5.71			16.66	6.03			15.45	6.06			.474
Avoidance strategies	8.25	3.34			9.69	4.08			.048*	9.11	4.80			8.79	3.31			8.81	3.34			.877

Mean (M), standard Deviation (SD), number (n) and percentage (%) of test scores above the set cut off:

IES-R total score >33; Intrusion, Avoidance, Hyperarousal ≥ 3

DASS-21 Depression >4, Anxiety >3, Stress >7

ISI ≥ 15

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* p < .05

Table 4

Professional Quality of Life scale (ProQol-5) subscales scores (mean values, SD, number and percentage of participants scoring above the cut-off and range) in Healthcare Workers (HCW) providing direct patient care sample (n=65) divided in selected socio-demographic and clinical information.

	Single				**Married/cohabiting**				**Separate/divorced**				**p***	**Chronic Diseases**				**No Chronic Diseases**				**p***	**Previous Psychological Problems**				**No Previous Psychological Problems**				**p***
	n= 9				n = 47				n= 9					n= 11				n = 54					n= 19				n = 46				
	M	SD	n	%	M	SD	n	%	M	SD	n	%		M	SD	n	%	M	SD	n	%		M	SD	n	%	M	SD	n	%	
ProQoL-5																															
Compassion-satisfaction	41.11	5.37	8	88.9	40.81	5.72	20	42.6	42.56	5.27	4	44.4	.043*	38	6.13	4	36.4	41.7	5.29	28	51.8	.511	39.74	6.86	9	47.4	41.65	4.91	23	50	1
Burn-out	21.22	4.41	2	22.2	22.87	4.22	22	46.8	21.22	5.31	3	33.3	.439	25.45	4.49	8	72.3	21.8	4.59	19	35.2	.041*	25.42	4.43	12	63.1	21.17	4.44	15	32.6	.029*
Secondary traumatic stress	18.33	7.21	1	11.1	20.3	6.85	14	29.8	22.56	6.37	4	44.4	.308	23.08	10.08	6	54.5	19.78	5.92	13	24.1	.067	24.37	7.51	11	57.9	18.67	5.82	8	17.4	.002*

ProQol-5 Compassion-satisfaction ≥42, Burn-out ≥ 23, Secondary traumatic stress ≥ 23

* p < .05