

Psychological impact of Covid-19 pandemic in mental healthcare workers: a cross-sectional study in an Italian Department of Mental Health

ANTONIO VITA^{1,2}, GABRIELE NIBBIO¹, MARCO MARINI², ALESSANDRA MINELLI^{3,4}, SARA CARLETTO⁵, MARIA ANGELA ABRAMI⁶, ANNAMARIA INDELICATO⁷, MASSIMO LOMBARDO⁸, STEFANO BARLATI^{1,2}

¹Department of Clinical and Experimental Sciences, University of Brescia, Italy; ²Department of Mental Health and Addiction Services, ASST Spedali Civili of Brescia, Italy; ³Genetics Unit, IRCCS Istituto Centro San Giovanni di Dio Fatebenefratelli, Brescia, Italy; ⁴Department of Molecular and Translational Medicine, University of Brescia, Italy; ⁵Department of Neuroscience "Rita Levi Montalcini", University of Torino, Italy; ⁶Clinical Psychology and Psychological Well-being Unit, ASST Spedali Civili of Brescia, Italy; ⁷Social-Healthcare Management, ASST Spedali Civili of Brescia, Italy; ⁸Chief Executive Office, ASST Spedali Civili of Brescia, Italy.

Summary. Aim. The Covid-19 pandemic is having a great impact on the lives of healthcare workers, but its psychological impact on Mental Healthcare Workers (MHWs) remains to be better explored. The aims of the present study were to assess the correlates and predictors of stress and adverse psychological effects in MHWs during the first waves of the Covid-19 pandemic. **Methods.** A total of 124 MHWs (psychiatrist/psychiatry resident, nurse, psychologist/psychotherapist, psychiatric rehabilitation therapist/educator, other mental health professional) working in public facilities of the ASST Spedali Civili of Brescia, Italy, was assessed between June 28, 2020 and August 10, 2020 with an online questionnaire that included sociodemographic, professional and Covid-19 exposure information, the Impact of Event Scale - Revised and the Depression Anxiety Stress Scales 21. Multivariate linear regression models were designed to identify individual predictors of post-traumatic, depressive, anxiety and stress-symptoms. **Results.** The professional role of nurse, having more years of professional experience and experiencing the death of a patient emerged as predictors of more severe post-traumatic symptoms. The professional role of nurse emerged as the only predictor of more severe depressive symptoms; the professional role of nurse and having more years of professional experience emerged as predictors of more severe anxiety symptoms; more years of professional experience, higher workloads, worse team relationships and experiencing the death of a loved one emerged as predictors of more severe stress symptoms. **Conclusions.** Alongside other stressful factors, the professional role of nurse and more years of professional experience emerged as predictors of adverse psychological events. Working as a MHW, particularly with high levels of contact with patients during the Covid-19 pandemic, may be considered strenuous work, requiring dedicated training and interventions to improve resilience.

Key words. Anxiety, Covid-19, depression, mental healthcare workers, stress-related disorder, stressful life events.

Impatto psicologico della pandemia Covid-19 negli operatori della salute mentale: uno studio trasversale in un Dipartimento di Salute Mentale italiano.

Riassunto. Scopo. La pandemia Covid-19 sta avendo un impatto significativo sulle vite dei professionisti sanitari, ma il suo impatto psicologico negli operatori della salute mentale (OSM) deve essere ulteriormente indagato. Lo scopo di questo studio era di valutare i correlati e i predittori di stress ed effetti psicologici avversi negli OSM durante le prime ondate della pandemia. **Metodo.** Un totale di 124 OSM (psichiatri/specializzandi, infermieri, psicologi/psicoterapeuti, tecnici della riabilitazione psichiatrica/educatori, altri) che lavorassero nelle strutture pubbliche dell'ASST Spedali Civili di Brescia è stato valutato tra il 28 giugno 2020 e il 10 agosto 2020 con un questionario online che includeva informazioni sociodemografiche, professionali e legate all'esposizione al Covid-19, la scala Impact of Event Scale - Revised e la scala Depression Anxiety Stress Scales 21. Modelli di regressione lineare multipla sono stati sviluppati per identificare i predittori individuali di sintomi post-traumatici, depressivi, ansiosi e di stress. **Risultati.** Il ruolo di infermiere, più anni di esperienza professionale e la morte di un paziente sono emersi come predittori di sintomi post-traumatici più gravi. Il ruolo di infermiere è emerso come unico predittore di sintomi depressivi più gravi; il ruolo di infermiere e più anni di esperienza professionale sono emersi come predittori di sintomi ansiosi più gravi; più anni di esperienza professionale, un maggiore carico lavorativo, relazioni interpersonali peggiori all'interno del gruppo di lavoro e la morte di una persona cara sono emersi come predittori di sintomi da stress più gravi. **Conclusioni.** Accanto ad altri fattori stressanti, il ruolo di infermiere e più anni di esperienza professionale sono emersi come predittori di eventi psicologici avversi. Lavorare come OSM, soprattutto con alti livelli di contatto con il paziente durante la pandemia Covid-19, può essere considerato un lavoro usurante, che richiede formazione e interventi dedicati a migliorare la resilienza.

Parole chiave. Ansia, Covid-19, depressione, disturbi correlati allo stress, eventi di vita stressanti, operatori della salute mentale.

Introduction

Infectious diseases outbreaks have a well-known impact on the general population and, in particular, on healthcare professionals¹. This is particularly true for the Covid-19 pandemic, with more than 768 million cases and almost 7 million deaths, and which is still strongly affecting the lives of people around the world with its clinical implications and the consequent containment strategies²⁻⁵.

Healthcare workers were especially affected by an intense discomfort due to the sudden call to manage an increased number of patients potentially dying from the disease and to the death of patients, colleagues and loved ones. Strenuous shifts, intensive care units operating over their originally intended capacity, the initial scarcity of Personal Protective Equipment, and a frequently complicated working environment often contributed to increase the feelings of stress^{6,7}. Healthcare workers, especially those confronting directly with Covid-19, experienced strong psychological discomfort and distress: symptoms like insomnia, anxiety and depression were present, and to a considerable extent. Recent literature points out the psychological burden of healthcare professionals, especially those working on the front line in close contact with infected patients: prevalence of sleep disturbances in healthcare workers range from 24% to 44%, anxiety disorders from 15% to 30%, depressive disorders from 15% to 31%; furthermore, the incidence of post-traumatic stress disorder (PTSD) in healthcare professionals was about 21%⁷⁻¹⁰. A study from China, one of the most heavily hit countries by the virus outbreak, showed prevalence rates of 36.9% for subthreshold mental health disturbances, 34.4% for mild disturbances, 22.4% for moderate disturbances, and 6.2% for severe disturbance. In another Chinese study focused on the first wave of the pandemic, a considerable part of healthcare professionals reported symptoms of anxiety (44.4%), depression (50.4%), insomnia (34%) and distress (71.5%); nurses, woman and frontline workers resulted being more frequently and more severely affected^{11,12}.

The Covid-19 pandemic also significantly impacted the work environment, with possible conflicts between professionals leading towards an increased risk of developing a burnout syndrome^{13,14}.

The strict limitations imposed by restrictive containment measures which brought to social isolation and decreased social support, particularly for people most in need, and the economic downturn caused by the pandemic, leading to financial instability and indigence, raised the needs of the general population within the scope of quality of life, physical and mental health. This situation could generate new problems

regarding mental health of previously unaffected individuals and have a negative impact on patients with pre-existing mental disorders^{2,15-18}. Those circumstances raised the vulnerability of Mental Healthcare Workers (MHWs) to psychological distress also related to the newly, necessarily and swiftly adopted practices needed to deliver mental health services during the strict lockdown policies established in Italy in March 2020. Outpatient services had to substantially reorganize their working schedules as well as their modalities of interaction with their users, and started using phone consultations, teletherapy, remote psychiatric and psychosocial interventions without proper training, while some inpatient units were forced to arrange areas for psychiatric patients with Covid-19 infection¹⁹⁻²⁵. Several studies have investigated the impact of the pandemic on healthcare workers^{6,26-29}, but there is far less evidence regarding the impact on professionals working in the mental health field. Available evidence suggests a substantial impact of the Covid-19 outbreak on psychological distress of MHWs^{30,31}. For instance, one study reported that a considerable number of professionals faced moderate to severe levels of burnout (31% in at least one dimension), depression (7%) and anxiety (12%)³². In another study, the risk of developing depression and anxiety symptoms was higher in personnel working closely with quarantined suspected Covid-19 cases; those who received adequate psychiatric training, conversely, showed higher positive emotion and self-efficacy³³.

Therefore, providing further insight on how the Covid-19 pandemic impacted MHWs might be of considerable clinical interest.

Aims

The aims of the present study were to assess the prevalence of significant post-traumatic, depression, anxiety and stress symptoms, as well as the correlates and predictors of stress and adverse psychological effects, in a population of MHWs working in the Department of Mental Health and Addiction Services of the ASST Spedali Civili di Brescia, Italy, in the period of the first restrictive containment measures imposed by the Covid-19 outbreak.

Materials and methods

STUDY DESIGN

The present study represents a cross-sectional survey-based investigation of post-traumatic, depression, anxiety and stress symptoms in several different categories of MHWs, including psychiatrists and psychiatry residents, nurses, psychologists and psychotherapists, psychiatric rehabilitation therapists and educators practicing their profession dur-

ing the first waves of the Covid-19 pandemic. Data collection occurred from June 28, 2020 to August 10, 2020, using a Google Form online survey. An invitation e-mail was initially sent to potential participants, and further subjects were recruited using a snowball sampling procedure by asking participants to disseminate the survey link among their colleagues.

The study was conducted in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of the ASST Spedali Civili di Brescia, Italy (protocol NP4172). Written electronic informed consent was obtained by asking all participants to click a button at the beginning of the online survey informing of their consent to participate.

PARTICIPANTS

Inclusion criteria were: I) being a MHW (psychiatrist/psychiatry resident, nurse, psychologist/psychotherapist, psychiatric rehabilitation therapist/educator, other mental health professional) and II) being employed at mental health public facilities (e.g., hospital wards, residential facilities, and community mental health centres) of the ASST Spedali Civili di Brescia, during the recruitment period. Italy, and specifically the region of Lombardy and the province of Brescia, were heavily impacted by Sars-CoV-2 outbreaks in the first phases of the pandemic^{21,34}.

ASSESSMENT

The online survey took about 15 minutes to be completed.

The first section of the survey included: 1) questions regarding sociodemographic characteristics such as age, gender, educational level, marital and living status; 2) professional information such as profession, workplace, mental healthcare facility, years of professional experience, and age of the user; 3) data regarding Covid-19 exposure, including being positive to Covid-19, having a Covid-19-positive family member, experiencing fear of contagion, experiencing the death of a loved one, experiencing the death of a patient; 4) data related to workplace or personal changes related to the Covid-19 pandemic, such as changes in the workload or in team relationships or having the family divided.

The second section of the survey included the following validated self-report questionnaires:

1. The Impact of Event Scale - Revised (IES-R)³⁵ is a 22-item questionnaire evaluating subjective distress caused by traumatic events. It comprises three subscales assessing intrusion (8 items), avoidance (8 items), and hyperarousal (6 items) symptoms. For the present work, participants were specifically asked to refer to the Covid-19 pandemic emergency when answering questions.

IES-R items are rated on a 5-point scale ranging from 0 ("not at all") to 4 ("extremely"), with a total score ranging from 0 to 88³⁶. While the IER-R represents a quantitative measure of post-traumatic symptoms severity and it is not recommended for use as a diagnostic instrument, a cut-off of ≥ 24 was used to identify significant post-traumatic symptoms³⁷.

2. The Depression Anxiety Stress Scales 21 (DASS-21)³⁸ is a 21-item self-report questionnaire assessing states of depression, anxiety, and stress. Each subscale is composed by 7 different items. Participants were asked to score each item on a scale from 0 ("did not apply to me at all") to 3 ("applied to me very much"). Sum scores are computed by adding up the scores on the items of each subscale and multiplying them by a factor of 2. Scores for each subscale may range between 0 and 42, with higher scores indicating higher depression, anxiety and stress levels. While the DASS-21 represents a quantitative measure of psychological distress and not a categorical instrument for clinical diagnoses, a cut-off of ≥ 10 , 8, and 15 were used to identify significant depression, anxiety and stress symptoms, respectively, according to the scale scoring instructions³⁸.

STATISTICAL ANALYSES

To identify potential predictors of the impact of traumatic events measured by the IER-R scale and of depressive, anxiety and stress symptoms measured by the three subscales of the DASS-21, variables selection analyses were performed³⁹. As the scores of the IES-R scale and of all three subscales of the DASS-21 showed a non-normal distribution (Shapiro-Wilk test $p < 0.001$ in all cases) non-parametric test were used in these analyses. Correlation with continuous variables were assessed with Spearman's Rho test, while for categorical variables the Mann-Whitney U test or the Kruskal Wallis test were used, depending on the number of categories.

All variables emerging as significant in the selection analyses were introduced as potential predictors in multivariate stepwise linear regression models to identify individual predictors of greater impact of traumatic events and depressive, anxiety and stress symptoms.

As the number of potential predictors introduced in each model was lower than one for every twenty observed subjects, which is recommended according to conservative estimates^{40,41}, the number of included potential predictors was considered appropriate.

All analyses were conducted using the statistical software SPSS version 15.0 (SPSS Inc., Chicago, IL, USA, 2005); p values < 0.05 (two tailed) were considered significant.

Results

A total of 124 MHWs responded to questionnaire and were included in the present study.

The mean age of the sample was 45 years, and more than two thirds (70.2%) of the sample is composed by women.

All professional categories of MHWs are represented in the sample, including nurses (33.9%), psychiatrist of psychiatry residents (28.2%), psychiatric rehabilitation therapists and professional educators (13.7%), psychologists and psychotherapists (14.5%) and other MHWs (9.7%). The majority of participants had at least ten years of professional experience.

The vast majority of participants worked in hospitals (92.7%), but MHWs working in outpatient centers (4.0%) and psychiatric residences (3.2%) were also included.

Characteristics of the sample are reported in table 1.

Table 1. Descriptive statistics.

Variable	Mean (\pm SD); n (%)
Age (years)	45.52 (\pm 10.99)
Gender Male Female	37 (29.8%) 87 (70.2%)
Education (years)	17.98 (\pm 3.94)
Marital status Married Unmarried Divorced Widowed	85 (68.5%) 26 (21.0%) 12 (9.7%) 1 (0.8%)
Living condition Cohabiting couples with sons/daughters Cohabiting couples Alone Sons/Daughters Parents	53 (44.2%) 30 (25.0%) 21 (17.5%) 9 (7.5%) 7 (5.8%)
Professional role Nurse Psychiatrist/ Psychiatry Resident PRT/Educator Psychologist/Psychotherapist Other mental health professions	42 (33.9%) 35 (28.2%) 17 (13.7%) 18 (14.5%) 12 (9.7%)
Workplace Hospital Local mental health service Psychiatric residence	115 (92.7%) 5 (4.0%) 4 (3.2%)
Years of professional experience Ten or less More than ten	36 (29.0%) 88 (71.0%)

Continue

Continue Table 1.

Variable	Mean (\pm SD); n (%)
Age of the user Child/Adolescent Adult/Elderly	4 (3.2%) 120 (96.8%)
COVID-19 positive Yes No	12 (9.7%) 112 (90.3%)
Family member COVID-19 positive Yes No	12 (9.7%) 112 (90.3%)
Fear of contagion Yes No	66 (53.2%) 58 (46.8%)
Death of a loved one Yes No	23 (18.5%) 101 (81.5%)
Death of a patient Yes No	24 (19.4%) 100 (80.6%)
Workload Increased Unchanged Decreased	61 (49.2%) 33 (26.6%) 30 (24.2%)
Team relationship Improved Unchanged Got worse	23 (18.5%) 53 (42.7%) 48 (38.7%)
Family divided Yes No	22 (17.7%) 102 (82.3%)
IES-R total (score)	17.67 (\pm 15.94)
DASS Depression (score)	4.71 (\pm 5.59)
DASS Anxiety (score)	3.02 (\pm 4.68)
DASS Stress (score)	9.76 (\pm 7.13)

Legend: DASS= Depression Anxiety Stress Scale; IES-R= Impact of Event Scale - Revised; PRT= psychiatric rehabilitation therapist.

Significant post-traumatic, depression, anxiety and stress symptoms were observed in 29.8% (95% CI 21.9%-38.7%), 16.9% (95% CI 10.8%-24.7%), 16.1% (95% CI 10.1%-23.8%) and 21.8% (95% CI 14.9%-30.1%) of the sample, respectively.

As regards correlation analyses, a higher age was positively correlated with higher IES-R scores ($p=0.008$) and higher DASS-21 depression scores ($p=0.036$).

Year of education were negatively correlated with all outcomes: IES-R score ($p=0.002$), DASS-21 depression ($p=0.010$), anxiety ($p=0.001$) and stress ($p=0.042$) scores.

A higher work burden was correlated with higher IES-R ($p=0.002$), DASS-21 depression ($p=0.004$) and anxiety ($p=0.015$) scores.

Worse team relationships were correlated with higher DASS-21 stress scores ($p=0.041$).

Results of correlation analyses are reported in table 2.

As regards variables selection analyses for categorical variables for IES-R scale, several potential predictors were identified, including the professional role, with nurses showing higher scores ($p=0.011$), having

more years of professional experience ($p<0.001$) and experiencing the death of a patient ($p=0.012$). More details are provided in table 3.

Table 4 shows variables selection analyses for categorical variables for the depressive symptoms subscale of the DASS-21: the professional role ($p=0.031$) and having a Covid-19-positive family member ($p=0.042$) emerged as potential predictors in these analyses.

Table 5 shows variables selection analyses for categorical variables for the anxiety symptoms subscale of

Table 2. Bivariate exploratory analyses.

Variable	IES-R Total		DASS Depression		DASS Anxiety		DASS Stress	
	Spearman's Rho	p-value	Spearman's Rho	p-value	Spearman's Rho	p-value	Spearman's Rho	p-value
Age (years)	0.236	0.008	0.170	0.059	0.189	0.036	0.126	0.164
Education (years)	-0.277	0.002	-0.230	0.010	-0.291	0.001	-0.183	0.042
Workload (Higher to lower)	-0.271	0.002	-0.258	0.004	-0.218	0.015	-0.245	0.066
Team relationship (Better to worse)	0.133	0.213	0.165	0.067	0.084	0.351	0.184	0.041

Legend: DASS= Depression Anxiety Stress Scale; IES-R= Impact of Event Scale-Revised.

Table 3. Univariate exploratory analyses – IES-R Total.

Variable	IES-R Total		
	Score (Mean \pm SD)	Mann-Whitney U/ χ^2	p-value
Gender Male Female	16.89 \pm 2.93 18.00 \pm 15.16	1471.00	0.449
Marital status Married Unmarried Divorced Widowed	18.82 \pm 17.52 14.73 \pm 11.50 15.50 \pm 12.57 22.00 \pm 0.00	0.775	0.855
Living condition Cohabiting couples with sons/daughters Cohabiting couples Alone Sons/Daughters Parents	22.21 \pm 19.39 13.87 \pm 12.33 17.67 \pm 11.06 15.89 \pm 14.73 8.71 \pm 7.39	6.276	0.179
Professional role Nurse Psychiatrist/Psychiatry Resident PRT/Educator Psychologist/Psychotherapist Other mental health professions	25.24 \pm 19.19 13.46 \pm 19.97 16.53 \pm 15.63 11.61 \pm 12.58 14.17 \pm 8.59	13.030	0.011
Workplace Hospital Local mental health service Psychiatric residence	18.08 \pm 16.27 15.60 \pm 11.63 8.50 \pm 6.61	1.252	0.535
Years of professional experience Ten or less More than ten	10.31 \pm 12.07 20.68 \pm 16.39	909.50	<0.001

Continue

Continue **Table 3.**

Variable	IES-R Total		
	Score (Mean \pm SD)	Mann-Whitney U/ χ^2	p-value
Age of the user Child/Adolescent Adult/Elderly	14.50 \pm 16.42 17.78 \pm 15.98	201.00	0.581
Covid-19 positive Yes No	22.92 \pm 11.36 17.11 \pm 16.29	444.00	0.054
Family member COVID-19 positive Yes No	25.58 \pm 18.23 16.82 \pm 15.52	471.00	0.089
Fear of contagion Yes No	19.06 \pm 17.42 16.09 \pm 14.04	1737.00	0.375
Death of a loved one Yes No	19.91 \pm 15.41 17.16 \pm 16.08	1023.50	0.375
Death of a patient Yes No	25.71 \pm 19.63 15.74 \pm 14.37	801.00	0.012
Family divided Yes No	20.59 \pm 15.18 17.04 \pm 16.10	935.50	0.222

Legend: IES-R= Impact of Event Scale - Revised; PRT= psychiatric rehabilitation therapist.

Table 4. Univariate exploratory analyses – DASS Depression.

Variable	DASS Depression		
	Score (Mean \pm SD)	Mann-Whitney U/ χ^2	p-value
Gender Male Female	4.00 \pm 5.48 5.01 \pm 5.64	1391.50	0.220
Marital status Married Unmarried Divorced Widowed	4.78 \pm 5.96 4.70 \pm 5.40 4.34 \pm 3.50 4.00 \pm 0.00	0.140	0.987
Living condition Cohabiting couples with sons/daughters Cohabiting couples Alone Sons/Daughters Parents	5.70 \pm 6.70 3.34 \pm 4.22 5.90 \pm 5.54 3.56 \pm 3.44 2.58 \pm 2.76	5.086	0.279
Professional role Nurse Psychiatrist/Psychiatry Resident PRT/Educator Psychologist/Psychotherapist Other mental health professions	6.90 \pm 6.74 3.82 \pm 5.36 3.76 \pm 4.42 3.12 \pm 3.78 3.34 \pm 3.54	10.623	0.031
Workplace Hospital Local mental health service Psychiatric residence	4.70 \pm 5.78 6.00 \pm 2.00 3.50 \pm 1.92	1.789	0.407
Years of professional experience Ten or less More than ten	3.56 \pm 4.81 5.18 \pm 5.84	1301.50	0.109
Age of the user Child/Adolescent Adult/Elderly	5.50 \pm 8.54 4.68 \pm 5.52	223.00	0.804

Continue

Continue Table 4.

Variable	DASS Depression		
	Score (Mean \pm SD)	Mann-Whitney U/ χ^2	p-value
Covid-19 positive			
Yes	4.34 \pm 3.98	650.50	0.851
No	4.76 \pm 5.74		
Family member Covid-19 positive			
Yes	7.84 \pm 6.30	439.00	0.042
No	4.38 \pm 5.44		
Fear of contagion			
Yes	5.48 \pm 6.44	1664.00	0.197
No	3.82 \pm 4.32		
Death of a loved one			
Yes	4.96 \pm 5.90	1131.50	0.842
No	4.66 \pm 5.54		
Death of a patient			
Yes	5.84 \pm 6.26	1023.00	0.248
No	4.44 \pm 5.42		
Family divided			
Yes	4.36 \pm 5.22	1071.00	.0731
No	4.78 \pm 5.68		

Legend: DASS= Depression Anxiety Stress Scale; PRT= psychiatric rehabilitation therapist.

Table 5. Univariate exploratory analyses – DASS Anxiety.

Variable	DASS Anxiety		
	Score (Mean \pm SD)	Mann-Whitney U/ χ^2	p-value
Gender			
Male	3.13 \pm 5.53	1522.00	0.607
Female	2.96 \pm 4.30		
Marital status			
Married	3.08 \pm 5.18	5.423	0.143
Unmarried	2.24 \pm 3.32		
Divorced	4.00 \pm 3.52		
Widowed	6.00 \pm 0.00		
Living condition			
Cohabiting couples with sons/daughters	3.78 \pm 5.94	9.505	0.050
Cohabiting couples	2.00 \pm 3.44		
Alone	3.14 \pm 3.32		
Sons/Daughters	4.88 \pm 3.88		
Parents	0.58 \pm 0.98		
Professional role			
Nurse	5.58 \pm 6.28	20.291	<0.001
Psychiatrist/Psychiatry Resident	0.80 \pm 1.48		
PRT/Educator	2.58 \pm 3.98		
Psychologist/Psychotherapist	2.34 \pm 3.22		
Other mental health professions	1.08 \pm 1.51		
Workplace			
Hospital	3.02 \pm 4.80	1.091	0.580
Local mental health service	2.40 \pm 2.18		
Psychiatric residence	3.50 \pm 3.42		
Years of professional experience			
Ten or less	1.39 \pm 4.81	1067.50	0.002
More than ten	3.68 \pm 5.08		
Age of the user			
Child/Adolescent	3.50 \pm 4.44	196.50	0.508
Adult/Elderly	3.00 \pm 4.70		
Covid-19 positive			
Yes	4.84 \pm 5.36	532.00	0.202
No	1.41 \pm 2.29		

Continue

Continue Table 5.

Variable	DASS Anxiety		
	Score (Mean \pm SD)	Mann-Whitney U/ χ^2	p-value
Family member Covid-19 positive			
Yes	4.84 \pm 5.42	533.00	0.206
No	2.82 \pm 4.58		
Fear of contagion			
Yes	3.58 \pm 5.40	1648.50	0.152
No	2.38 \pm 3.64		
Death of a loved one			
Yes	3.22 \pm 4.22	1056.00	0.456
No	2.98 \pm 4.80		
Death of a patient			
Yes	3.42 \pm 5.70	1079.00	0.410
No	2.92 \pm 4.42		
Family divided			
Yes	2.72 \pm 4.30	1047.50	0.600
No	3.08 \pm 4.78		

Legend: DASS= Depression Anxiety Stress Scale; PRT= psychiatric rehabilitation therapist.

the DASS-21: the professional role of nurse ($p<0.001$) and having more years of professional experience ($p=0.002$) again emerged as potential predictors.

Finally, variables selection analyses for categorical variables for the stress symptoms subscale of the DASS-21 are shown in Table 6: potential predictors were higher years of professional experience ($p=0.022$) and the death of a loved one ($p=0.042$).

As regards individual predictors of more severe post-traumatic symptoms, the professional role of nurse ($p=0.001$), having more years of professional experience ($p=0.001$) and experiencing the death of a patient ($p=0.009$) emerged as individual predictors of higher IES-R scores in the multivariate linear regression analysis.

The professional role of nurse ($p<0.001$) emerged as the only predictor of more severe depressive symptoms at the DASS-21 depression subscale in the dedicated linear regression analysis; the professional role of nurse ($p=0.001$) and having more years of professional experience ($p=0.032$) emerged as individual predictors of more severe anxiety symptoms at the DASS-21 anxiety subscale; more years of professional experience ($p=0.031$), higher workloads ($p=0.038$), worse team relationships ($p=0.037$) and experiencing the death of a loved one ($p=0.049$) emerged as individual predictors of more severe stress symptoms at the DASS-21 stress subscale.

Results of multivariate linear regression analyses are reported in table 7.

Table 6. Univariate exploratory analyses – DASS Stress.

Variable	DASS Stress		
	Score (Mean \pm SD)	Mann-Whitney U/ χ^2	p-value
Gender			
Male	9.08 \pm 6.94	1481.00	0.481
Female	10.05 \pm 7.23		
Marital status			
Married	9.86 \pm 7.54	0.302	0.960
Unmarried	9.70 \pm 6.94		
Divorced	9.50 \pm 5.76		
Widowed	6.00 \pm 0.00		
Living condition			
Cohabiting couples with sons/daughters	11.44 \pm 8.18	0.302	0.960
Cohabiting couples	7.26 \pm 5.74		
Alone	10.86 \pm 6.86		
Sons/Daughters	8.44 \pm 5.54		
Parents	8.58 \pm 4.72		

Continue

Continue Table 6.

Variable	DASS Stress		
	Score (Mean \pm SD)	Mann-Whitney U/ χ^2	p-value
Professional role			
Nurse	12.38 \pm 7.38	8.141	0.087
Psychiatrist/Psychiatry Resident	7.98 \pm 6.32		
PRT/Educator	8.82 \pm 5.52		
Psychologist/Psychotherapist	8.66 \pm 7.94		
Other mental health professions	9.00 \pm 7.66		
Workplace			
Hospital	9.60 \pm 7.26	1.347	0.510
Local mental health service	11.60 \pm 6.70		
Psychiatric residence	12.00 \pm 2.82		
Years of professional experience			
Ten or less	7.44 \pm 6.24	1169.00	0.022
More than ten	10.70 \pm 7.28		
Age of the user			
Child/Adolescent	10.00 \pm 10.70	236.00	0.955
Adult/Elderly	9.76 \pm 7.04		
Covid-19 positive			
Yes	11.50 \pm 6.66	567.50	0.375
No	9.58 \pm 7.18		
Family member Covid-19 positive			
Yes	13.50 \pm 8.70	479.50	0.102
No	9.36 \pm 6.86		
Fear of contagion			
Yes	10.88 \pm 7.38	1574.50	0.087
No	8.48 \pm 6.66		
Death of a loved one			
Yes	12.60 \pm 7.96	845.00	0.041
No	9.10 \pm 6.80		
Death of a patient			
Yes	11.00 \pm 6.56	1028.50	0.276
No	9.46 \pm 7.26		
Family divided			
Yes	8.46 \pm 7.70	935.50	0.220
No	10.04 \pm 7.00		

Legend: DASS= Depression Anxiety Stress Scale; PRT= psychiatric rehabilitation therapist.

Table 7. Multivariate analyses.

Dependent variable	Individual predictors	Standardized Beta	t	p-value	Adj.R ²
IES-R Total	Professional role: Nurse	0.283	3.479	0.001	0.109
	Years of professional experience	0.263	3.256	0.001	0.169
	Death of a patient	0.213	2.640	0.009	0.208
	Model F = 11.798, R ² = 0.228, Adj. R ² = 0.208			<0.001	
Dependent variable	Individual predictors	Standardized Beta	t	p-value	Adj.R ²
DASS Depression	Professional role: Nurse	0.282	3.250	0.001	0.072
	Model F = 10.560, R ² = 0.080, Adj. R ² = 0.072			0.001	

Continue

Continue Table 7.

Dependent variable	Individual predictors	Standardized Beta	t	p-value	Adj.R ²
DASS Anxiety	Professional role: Nurse	0.371	4.490	<0.001	0.147
	Years of professional experience	0.179	2.165	0.032	0.172
	Model F = 13.787, R ² = 0.186, Adj. R ² = 0.172			0.001	
Dependent variable	Individual predictors	Standardized Beta	t	p-value	Adj.R ²
DASS Stress	Years of professional experience	0.188	2.182	0.031	0.036
	Workload	-0.180	-2.096	0.038	0.062
	Team relationship	0.180	2.108	0.037	0.085
	Death of a loved one	0.171	1.990	0.049	0.107
	Model F = 4.671, R ² = 0.136, Adj. R ² = 0.107			0.002	

Legend: DASS= Depression Anxiety Stress Scale; IES-R= Impact of Event Scale - Revised.

Discussion

The present study aimed to assess which professional and Covid-19-related factors could represent correlates and individual predictors of psychological distress in MHWs evaluating a sample composed by different professional roles. The observed prevalence of clinically relevant post-traumatic, depression, anxiety and stress symptoms was substantially in line with that reported in other studies investigating psychological distress in healthcare workers during the Covid-19 pandemic^{28,32,33}.

The professional role of nurse, compared to other roles, emerged as a significant predictor of higher levels of psychological distress in most of the assessed outcomes, including impact of traumatic events, depression and anxiety symptoms. This finding is in line with previous evidence: several meta-analytic studies have highlighted a greater vulnerability of some specific professional roles, such as nurses, due to a closer and more prolonged contact with the patient and therefore to higher risk of contagion and to high levels of work-related stress^{26,27,42}. The greater psychological impact in nurses may also be related to greater exposure to patients' complication and events related to their death, higher perception of risk and to the initial lack of protective devices^{6,26}, leading to a greater concern regarding the risk of contracting and spreading the infection. While these factors are particularly important in intensive care units and emergency departments⁴²⁻⁴⁸, they may also have a relevant role in nurses working in mental health. Moreover, people living with severe mental disorders are globally more

vulnerable individuals also regarding Covid-19-related issues¹⁶⁻¹⁸, and this could further contribute to a more complex clinical management for MHWs that have a closer and longer contact with patients.

Another factor that emerged as predictor of greater psychological distress in most outcomes, including higher levels of post-traumatic, anxiety and stress symptoms, is having more years of professional experience; this is not an age-related effect, as age did not emerge as a predictor in any of the models and represented a correlate only of post-traumatic and depressive symptoms.

This represents an unexpected finding, as it could be hypothesized that having greater professional experience might lead to a better management of work-related stressful situations.

However, it should also be considered that working as a MHW, with a high level of contact with difficult personal and psychological situations and complex clinical cases, might represent a strenuous work, leading to a higher vulnerability to psychological distress in professionals with a greater burden of working years^{49,50}. Moreover, having a longer professional experience might have contributed to the development of a solid working routine, which was completely dismantled by the emergencies and limitations related to the Covid-19 pandemic.

Higher workloads, worse team relationships and the death of loved one emerged as predictors of higher levels of stress symptoms, and the death of a patient emerged represented a predictor of higher levels of post-traumatic symptoms: this is an expected result, as these represent important stressful factors related to the pandemic^{51,52}.

In light of the increased psychological distress linked to the Covid-19 pandemic, developing resilience and effective coping strategies to face difficult and complex professional situations is essential for the mental well-being of all professional roles: the results of the present study suggests that providing dedicated training that could improve these aspects, particularly in MHWs which may have not received a training focused on mental health issues, may represent a potentially valid intervention^{53,54}.

Moreover, policymakers should consider implementing and promoting prevention and surveillance interventions and programs for healthcare workers after Covid-19: this could represent an effective strategy in particular if these interventions could be integrated in already available and mandatory health-related surveillance programs related to other workplace risks⁵⁵⁻⁵⁷. The present study has some relevant points of strength. While several studies have assessed the impact of the Covid-19 pandemic on healthcare workers, literature dedicate to MHWs is still limited, contributing to the novelty of the present study. Moreover, the assessed sample was drawn from area that was heavily interested by the Covid-19 pandemic, with a very high number of SARS-CoV-2 cases particularly in the first waves of the pandemic, contributing to the specificity of results. Finally, the use of validated measure to assess psychological distress outcomes contributes to the validity and reproducibility of results.

The study, however, shows some limitations. The recruitment strategy, conducted with an electronic questionnaire with “snowball” diffusion, does not guarantee the recruitment of a large population, and might lead to the recruitment of subjects sharing similar traits and characteristics and a sample with excessive internal homogeneity. The assessment was conducted through self-rated questionnaires and might not completely represent the impact of traumatic events or the entity of psychological distress; moreover, this assessment does not allow to confirm clinical diagnoses, which would require a dedicated clinical evaluation; however, this limitation is also linked to the difficulty of providing direct, in-person clinical assessments in the pandemic context. Finally, the present study was conducted in specific population of healthcare workers in a specific working context, so the results of the present study might not be generalized to different healthcare systems of populations affected by the pandemic in a radically different way.

Nevertheless, the results of the present study may contribute to a better understanding of the psychological impact and of the psychopathological consequences of the Covid-19 pandemic in MHWs.

Future studies should focus on long-term psychological and psychopathological consequences of the

Covid-19 pandemic, performing longitudinal observations of healthcare workers in general and MHWs. Further investigating the psychopathological effects of the pandemic with clinical interviews might also provide valuable information and valid scientific evidence.

Conflict of interests: the authors have no conflict of interests to declare.

References

1. Chew NWS, Lee GKH, Tan BYQ, et al. A multinational, multicentre study on the psychological outcomes and associated physical symptoms amongst healthcare workers during COVID-19 outbreak. *Brain Behav Immun* 2020; 88: 559-65.
2. Moreno C, Wykes T, Galderisi S, et al. How mental health care should change as a consequence of the COVID-19 pandemic. *Lancet Psychiatry* 2020; 7: 813-24.
3. Biondi M, Iannitelli A. CoViD-19 and stress in the pandemic: “sanity is not statistical”. *Riv Psichiatr* 2020; 55: e1-e6.
4. Dong E, Du H, Gardner L. An interactive web-based dashboard to track COVID-19 in real time. *Lancet Infect Dis* 2020; 20: 533-4.
5. WHO Coronavirus (COVID-19) Dashboard [Internet]. Available from: <https://covid19.who.int> [cited 2023 Jul 28].
6. Preti E, Di Mattei V, Perego G, et al. The psychological impact of epidemic and pandemic outbreaks on healthcare workers: rapid review of the evidence. *Curr Psychiatry Rep* 2020; 22: 43.
7. Cénat JM, Blais-Rochette C, Kokou-Kpolou CK, et al. Prevalence of symptoms of depression, anxiety, insomnia, posttraumatic stress disorder, and psychological distress among populations affected by the COVID-19 pandemic: a systematic review and meta-analysis. *Psychiatry Res* 2021; 295: 113599.
8. Li Y, Scherer N, Felix L, Kuper H. Prevalence of depression, anxiety and post-traumatic stress disorder in health care workers during the COVID-19 pandemic: a systematic review and meta-analysis. *PLoS One* 2021; 16: e0246454.
9. Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsis E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis. *Brain Behav Immun* 2020; 88: 901-7.
10. Marvaldi M, Mallet J, Dubertret C, Moro MR, Guessoum SB. Anxiety, depression, trauma-related, and sleep disorders among healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis. *Neurosci Biobehav Rev* 2021; 126: 252-64.
11. Feng J, Xu J, Xu S, et al. Psychological impact during the first outbreak of COVID-19 on frontline health care workers in Shanghai. *Front Public Health* 2021; 9: 646780.
12. Lai J, Ma S, Wang Y, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Network Open* 2020; 3: e203976.
13. de Sire A, Marotta N, Raimo S, et al. Psychological distress and work environment perception by physical therapists from Southern Italy during COVID-19 pandemic: the C.A.L.A.B.R.I.A Study. *Int J Environ Res Public Health* 2021; 18: 9676.
14. Chirico F, Afolabi AA, Ilesanmi OS, et al. Prevalence, risk factors and prevention of burnout syndrome among healthcare workers: an umbrella review of systematic

- reviews and meta-analyses. *J Health Soc Sci* 2021; 6: 465-91.
15. Kar SK, Singh A. Mental health of mental health professionals during COVID-19 pandemic: who cares for it? *Asian J Psychiatr* 2020; 53: 102385.
16. Barlati S, Nibbio G, Vita A. Schizophrenia during the COVID-19 pandemic. *Curr Opin Psychiatry* 2021; 34: 203-10.
17. Kozloff N, Mulsant BH, Stergiopoulos V, Voineskos AN. The COVID-19 global pandemic: implications for people with schizophrenia and related disorders. *Schizophr Bull* 2020; 46: 752-7.
18. Mohan M, Perry BI, Saravanan P, Singh SP. COVID-19 in people with schizophrenia: potential mechanisms linking schizophrenia to poor prognosis. *Front Psychiatry* 2021; 12: 666067.
19. Carpiello B, Tusconi M, di Sciascio G, Zanalda E, di Giannantonio M; Executive Committee of the Italian Society of Psychiatry. Mental health services in Italy during the COVID-19 pandemic. *Psychiatry Clin Neurosci* 2020; 74: 442-3.
20. D'Agostino A, Demartini B, Cavallotti S, Gambini O. Mental health services in Italy during the COVID-19 outbreak. *Lancet Psychiatry* 2020; 7: 385-7.
21. Percudani M, Corradin M, Moreno M, Indelicato A, Vita A. Mental Health Services in Lombardy during COVID-19 outbreak. *Psychiatry Res* 2020; 288: 112980.
22. Uphoff EP, Lombardo C, Johnston G, et al. Mental health among healthcare workers and other vulnerable groups during the COVID-19 pandemic and other coronavirus outbreaks: a rapid systematic review. *PLoS One* 2021; 16: e0254821.
23. de Girolamo G, Cerveri G, Clerici M, et al. Mental health in the Coronavirus Disease 2019 emergency - The Italian response. *JAMA Psychiatry* 2020; 77: 974-6.
24. Percudani M, Panariello A, Deste G, et al. Socio-demographic and clinical characteristics of SARS-CoV-2-positive psychiatric in-patients: a case-control study in the psychiatric wards of a Great Metropolitan Hospital in Milan. *Psychiatry Res* 2023; 322: 115042.
25. Barlati S, Nibbio G, Bianchi F, et al. Long-acting injectable antipsychotics during the COVID-19 pandemic in schizophrenia: an observational study in a real-world clinical setting. *Psychiatry Research* 2022; 317: 114878.
26. Kunz M, Strasser M, Hasan A. Impact of the coronavirus disease 2019 pandemic on healthcare workers: systematic comparison between nurses and medical doctors. *Curr Opin Psychiatry* 2021; 34: 413-9.
27. Luo M, Guo L, Yu M, Jiang W, Wang H. The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public: a systematic review and meta-analysis. *Psychiatry Res* 2020; 291: 113190.
28. Vizheh M, Qorbani M, Arzaghi SM, Muhidin S, Javanmard Z, Esmaeili M. The mental health of healthcare workers in the COVID-19 pandemic: a systematic review. *J Diabetes Metab Disord* 2020; 19: 1967-78.
29. Chirico F, Afolabi AA, Ilesanmi O, et al. Workplace violence against healthcare workers during the COVID-19 pandemic: a systematic review. *J Health Soc Sci* 2022; 7: 14-35.
30. de Vroege L, van den Broek A. Post-pandemic self-reported mental health of mental healthcare professionals in the Netherlands compared to during the pandemic - an online longitudinal follow-up study. *Front Public Health* 2023; 11: 1221427.
31. Crocker KM, Gnat I, Haywood D, et al. The impact of COVID-19 on the mental health workforce: a rapid review. *Int J Ment Health Nurs* 2023; 32: 420-45.
32. Rapisarda F, Vallarino M, Cavallini E, et al. The early impact of the Covid-19 emergency on mental health workers: a survey in Lombardy, Italy. *Int J Environ Res Public Health* 2020; 17: 8615.
33. Sun Y, Song H, Liu H, Mao F, Sun X, Cao F. Occupational stress, mental health, and self-efficacy among community mental health workers: a cross-sectional study during COVID-19 pandemic. *Int J Soc Psychiatry* 2021; 67: 737-46.
34. Maruotti A, Jona-Lasinio G, Divino F, Lovison G, Ciccozzi M, Farcomeni A. Estimating COVID-19-induced excess mortality in Lombardy, Italy. *Aging Clin Exp Res* 2022; 34: 475-9.
35. Weiss DS. the impact of event scale: revised. In: Wilson JP, Tang CS (eds). *Cross-cultural assessment of psychological trauma and PTSD* [Internet]. Boston, MA: Springer US, 2007.
36. Creamer M, Bell R, Failla S. Psychometric properties of the Impact of Event Scale - Revised. *Behav Res Ther* 2003; 41: 1489-96.
37. Asukai N, Kato H, Kawamura N, et al. Reliability and validity of the Japanese-language version of the impact of event scale-revised (IES-R-J): four studies of different traumatic events. *J Nerv Ment Dis* 2002; 190: 175-82.
38. Lovibond PF, Lovibond SH. The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behav Res Ther* 1995; 33: 335-43.
39. Heinze G, Wallisch C, Dunkler D. Variable selection: a review and recommendations for the practicing statistician. *Biomet J* 2018; 60: 431-49.
40. Austin PC, Steyerberg EW. The number of subjects per variable required in linear regression analyses. *J Clin Epidemiol* 2015; 68: 627-36.
41. Schmidt FL. The relative efficiency of regression and simple unit predictor weights in applied differential psychology. *Educational and Psychological Measurement* 1971; 31: 699-714.
42. Saragih ID, Tonapa SI, Saragih IS, et al. Global prevalence of mental health problems among healthcare workers during the Covid-19 pandemic: a systematic review and meta-analysis. *Int J Nurs Stud* 2021; 121: 104002.
43. Cai Q, Feng H, Huang J, et al. The mental health of frontline and non-frontline medical workers during the coronavirus disease 2019 (COVID-19) outbreak in China: a case-control study. *J Affect Disord* 2020; 275: 210-5.
44. Dobson H, Malpas CB, Burrell AJ, et al. Burnout and psychological distress amongst Australian healthcare workers during the COVID-19 pandemic. *Australas Psychiatry* 2021; 29: 26-30.
45. Hoseinabadi TS, Kakhki S, Teimori G, Nayyeri S. Burnout and its influencing factors between frontline nurses and nurses from other wards during the outbreak of Coronavirus Disease-COVID-19-in Iran. *Invest Educ Enferm* 2020; 38: e3.
46. Hu D, Kong Y, Li W, et al. Frontline nurses' burnout, anxiety, depression, and fear statuses and their associated factors during the COVID-19 outbreak in Wuhan, China: a large-scale cross-sectional study. *EClinicalMedicine* 2020; 24: 100424.
47. Rossi R, Socci V, Pacitti F, et al. Mental health outcomes among frontline and second-line health care workers during the Coronavirus Disease 2019 (COVID-19) pandemic in Italy. *JAMA Netw Open* 2020; 3: e2010185.
48. Ying Y, Ruan L, Kong F, Zhu B, Ji Y, Lou Z. Mental health status among family members of health care workers in Ningbo, China, during the coronavirus disease 2019 (COVID-19) outbreak: a cross-sectional study. *BMC Psychiatry* 2020; 20: 379.
49. Maslach C, Leiter MP. Understanding the burnout experience: recent research and its implications for psychiatry. *World Psychiatry* 2016; 15: 103-11.

50. Koivunen M, Kontio R, Pitkänen A, Katajisto J, Välimäki M. Occupational stress and implementation of information technology among nurses working on acute psychiatric wards. *Perspect Psychiatr Care* 2013; 49: 41-9.
51. Mazza C, Ricci E, Biondi S, et al. A nationwide survey of psychological distress among Italian people during the COVID-19 pandemic: immediate psychological responses and associated factors. *Int J Environ Res Public Health* 2020; 17: 3165.
52. Kisely S, Warren N, McMahon L, Dalais C, Henry I, Siskind D. Occurrence, prevention, and management of the psychological effects of emerging virus outbreaks on healthcare workers: rapid review and meta-analysis. *BMJ* 2020; 369: m1642.
53. Blake H, Bermingham F, Johnson G, Tabner A. Mitigating the psychological impact of COVID-19 on healthcare workers: a digital learning package. *Int J Environ Res Public Health* 2020; 17: 2997.
54. Chirico F, Nucera G, Magnavita N. Protecting the mental health of healthcare workers during the COVID-19 emergency. *BJPsych Int* 2021; 18: E1.
55. Chirico F, Batra K, Batra R, et al. Spiritual well-being and burnout syndrome in healthcare: a systematic review. *J Health Soc Sci* 2023; 8: 13-32.
56. Di Prinzio RR, Cicchetti A, Marazza M, et al. Return-on-Investment of Workplace Health Promotion programs: New Total Worker Health® strategies in the framework of the “One Health” approach. *J Health Soc Sci* 2022; 7: 355-62.
57. Chirico F, Sacco A, Magnavita N. Integrating mandatory occupational health practice and workplace health promotion programs to reduce the high burden of work-related diseases. *J Health Soc Sci* 2023; 8: 98-102.