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Stress and depressive symptoms among Italian mental health nurses during the COVID-19 pandemic, a cross-sectional study

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ABSTRACT
This study used the cross-sectional web survey methodology to assess how the COVID-19 pandemic affected Italian psychiatric nurses in terms of stress levels and depressive symptoms. A total of 266 nurses belonging to the Italian Mental Health Departments were interviewed and they were subjected to two validated scales respectively PSS-10 (for the evaluation of stress) and PHQ-9 (for the evaluation of depressive symptoms). Statistical analysis showed moderate stress levels and a prevalence of sub-threshold (borderline) depressive symptoms among responding nurses. Logistic regression analysis reported that frontline nurses on COVID-19 positive patients are at greater risk of reporting higher levels of stress and major depressive symptoms, as are female nurses and juvenile nurses. Age. Monitoring and managing the psychological well-being of nursing staff are to be considered among the priorities of mental health service managers and are part of a process that aims to increase individual and organizational well-being but above all to improve the outcomes resulting from assistance.

Introduction
At the end of December 2019, starting from the city of Wuhan (China), there has been an escalation of infections and deaths related to the new coronavirus disease (COVID-19) all over the world, this situation has led the World Organization of Health to declare a state of pandemic (WHO, 2020).

In Italy to date (April 7, 2021) there have been more than 3.66 million infections from COVID-19 and more than 110.559 people have died (Istituto Superiore di Sanita, 2021).

To cope with the spread of COVID-19 infections, also in the Italian mental health services there has been the implementation of measures to prevent and spread the virus (D’Agostino, Demartini, Cavallotti, & Gambini, 2020; Moreno et al., 2020; Percudani, Corradin, Moreno, Indelicato, & Vita, 2020) as well as the reorganization of operating procedures, these measures included:

- the implementation of telemedicine services to the detriment of the number of acute care beds or the length of hospitalization;
- the creation of specific hospital departments dedicated to Covid-19 positive psychiatric patients.

In this situation, doctors and nurses from the Mental Health Departments were transferred to units dedicated to COVID-19 positive (non-psychiatric) patients, while those who remained in the mental health services witnessed the transformation of the same into structures for COVID-19 patients (dedicated to psychiatry) or even have sometimes found themselves managing the isolation of patients with mental distress in single rooms for weeks.

Most of the daytime psychiatric structures were temporarily closed, while the patients admitted to the residential structures could only partially benefit from exit permits from the structures, remaining in fact confined to the same (De Girolamo et al., 2020) and intensifying in some cases their own restlessness.

In hospital psychiatric services, family visits have been forbidden and all this has very often increased the suffering of patients and the difficulties of the operators in charge of them.

As evidenced by several studies (Greenberg, Docherty, Gnanapragasam, & Wessely, 2020; Ji et al., 2017; Shanafelt, Jonathan, & Mickey, 2020; Zhu et al., 2020), the COVID-19 pandemic is representing one of

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the most stressors of recent times, both for the general population and in particular for patients and healthcare professionals; the main reasons that place the latter at the top of the pyramid are represented by the lack of sufficient rest by the permanent threat of being infected, by the increase of workloads, from prolonged exposure to traumatic events (deaths) and from the continuous redefinition of operating methods in services.

Nurses, being at the forefront of fighting the pandemic and always working closely with the patient, are at high risk of developing high levels of stress, depressive symptoms and other mental health conditions such as post-traumatic stress symptoms (Chew et al., 2020; Liu, Zhang, Wei, et al., 2020; Tan, Chew, Lee, et al., 2020).

On the basis of data from other studies conducted in a tendentially intensive setting, this cross-sectional study aimed to investigate whether alterations in stress levels and depressive symptoms in relation to COVID-19 pandemic.

Methods

Study design, participants and ethical implications

A cross-sectional study was conducted using an anonymous online questionnaire, among nurses working in Italian mental health Departments.

The period of administration of the questionnaire was from 01/27/2021 to 03/30/2021, all nurses provided their informed consent before participating in the study.

The nurses were recruited through the use of the main social networks (Facebook, Instagram, Twitter) and through a notice published on the official website of the Società Italiana di Scienze Infermieristiche in Salute Mentale (S.I.S.I.S.M.).

This highly intelligent recruitment method was chosen to maximize the final sample size and the willingness/freedom of nurses to participate in the study.

The questionnaire was built using the Google Forms platform, to avoid incompleteness in filling in the questionnaires was decided to make it mandatory to answer all questions.

Only and exclusively nurses (including coordinators/manager) were enrolled in the study who, at the time of completing the questionnaire, declared to work in the Italian mental health services.

Before completing the questionnaire, all nurses gave their informed consent after an explanation of the purpose of the study. The data was analyzed in aggregate form in order to guarantee the maximum privacy of the participants. Ethical permission was not obtained from any institution because the research was not interventional as well as the data collected using social media tools.

The questionnaire was not aimed at: nursing students, retired nurses or nurses who at the time of completing the questionnaire were not working in the Italian mental health services.

Responses from 266 nurses were included in the final dataset.

Instrument

The questionnaire consisted of three sections: demographic and occupational information, the Perceived stress scale to 10 items (PSS-10) (Cohen, Kamarck, & Mermelstein, 1983) and the Patient Health Questionnaire-9 (PHQ-9) (Kroenke, Spitzer, & Williams, 2001).

Demographic and personal information included: gender, age (expressed in years), educational level, the mental health context in which the nurse is serving and experience (expressed in years) in mental health settings as a nurse.

Nurses were also asked if they had ever suffered from depressive episodes before the COVID-19 pandemic and if they had cared for COVID-19 positive patients during the pandemic.

The Perceived Stress Scale (PSS) is the most used psychological tool for stress assessment, it’s a measure of the degree to which situations in one’s life are classified as stressful, the questions are of a general nature and therefore are relatively devoid of specific content for any subpopulation group.

The ten questions contained in the PSS-10 analyze feelings and thoughts during the last month, each item is rated on a 5-point scale ranging from 0 to 4. Each participant’s score can range from 0 to 40. The highest scores highs indicate a higher perceived stress, if between 0 and 13 they indicate low stress; if between 14 and 26 moderate stress; and if over 27 severe stress.

The Patient Health Questionnaire-9 (PHQ-9) is a 9-question scale with a score ranging from 0 to 3 for each item and is used for diagnosis, monitoring and determination of the severity of depressive symptoms.

The overall PHQ-9 score has a range between 0 and 27. Scores between 5 and 9 indicate the possible presence of sub-threshold depressive symptoms. The score of 10 is the optimal cut-off for highlighting depressive symptoms of clinical relevance with three different levels of severity depending on the score, in particular with scores between 15 and 19 we talk about moderate depressive symptoms, while with scores starting from 20 one speaks of severe depressive symptoms.

Statistical analysis

SPSS version 20.0 software (IBM Corp., Armonk, New York, United States) was used for data processing.

Descriptive analysis was used to describe the variables considered, frequencies and percentages were used for the counting data.

Subsequently, independent t-tests (for variables with two alternatives) and One-way ANOVA (for variables with 3 or more alternatives) were performed to assess the presence of possible differences (in levels of stress and depressive disorders) among nurses who have cared for COVID-19 positive patients and those who have not cared for this type of patient; the mean scores of the PSS-10 and PHQ-9 scales were also compared also in relation to the socio-demographic and professional variables considered.

Finally, two logistic regression models were applied to assess whether the socio-demographic and occupational variables considered were significant predictors of stress outcomes (major, PSS score > 26; minor, PSS score < 27) and depressive symptoms (major, PHQ-9 score > 9; minor, PHQ-9 score > 10).

The results of the logistic regression model are reported as Odds ratios (OR) and related 95% confidence intervals.

Results

Demographic and personal characteristics

266 questionnaires were included in the analysis, demographics and occupational data are shown in Table 1.

Among the responding nurses, 69.9% were female, while 30.1% were male, the sample showed a higher frequency of nurses over the age of 50 (40.6%), while 15% belonged to less than 30 years of age.

41% of the respondents served at General Hospital Psychiatric Units (GHPUs), 28.9% worked in Community Mental Health Centres (CMHCs), 24.8% in Residential facilities (RFs) while 5.3% were in service at Direction of Mental Health Departments (DMHDS); among responding nurses, 27.4% had less than 5 years of work experience in a mental health setting while 27.8% reported working in mental health for more than 20 years.

Eighty-two (30.8%) nurses reported experiencing depressive episodes before the COVID-19 pandemic while the remaining 69% reported never having suffered from it.

Finally, 117 (44%) nurses reported having cared for COVID-19 positive patients during this pandemic, while 149 (56%) nurses reported not caring for patients with the virus.
19 positive patients, was found to be a predictor of higher stress levels in the logistic regression model illustrated in Table 3, in which having assisted COVID-19 positive patients (OR 2.13). It would appear that the setting in which nursing care was provided may also have played a key role in modifying stress levels, in particular, having worked in semi-residential facilities (RFs) was associated with higher stress scores than those who they worked in DMHDs rather than CMHCs and GHPUs (p < 0.01).

Logistic regression analysis confirmed having an age below 30 years (p < 0.01) as a significant predictor of higher stress levels, a phenomenon already observed in the comparison between the averages; on the contrary, being in possession of a higher qualification such as an MNS/Phd than a Regional School Diploma was a protective factor in increasing stress levels.

Depressive symptoms conditions among nurses

From the analysis of the scores obtained from the administration of the PHQ-9 scale (Cronbach’s alpha coefficient 0.884), a sample mean of 9.95 was obtained, this score appears borderline compared to the scale, which classifies absent/sub-threshold depressive symptoms below the value 10, while mild depressive symptoms above this value.

Nurses who have served COVID-19 positive patients showed an average PHQ-9 score of 10.56 (as described in Table 4). This data describes subjects with mild depressive symptoms, from the comparison with colleagues not exposed to care of COVID-19 positive patients it was found that the latter had a lower mean score on the PHQ-9 scale (9.15).

As was the case with stress, it would seem that having cared for COVID-19 positive patients may be a predictor of moderate/severe depressive symptoms (OR 2.015).

One of the most significant data is that relating to the 73 nurses (out of 111) who before the COVID-19 pandemic declared that they had suffered from depressive disorders before the COVID-19 pandemic (p = 0.04). It would appear that the setting in which nursing care was provided may also have played a key role in modifying stress levels, in particular, having worked in semi-residential facilities (RFs) was associated with higher stress scores than those who they worked in DMHDs rather than CMHCs and GHPUs (p < 0.01).

The mean stress scores obtained from the PSS-10 scale (Cronbach’s alpha coefficient 0.943), the sample average was 19.78, SD 9.85, this score appears borderline compared to the scale, which classifies absent/sub-threshold depressive symptoms below the value 10, while mild depressive symptoms above this value.

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**Table 1**
Socio-demographic characteristics of the sample (N.266 nurses).

| Variables                      | F     | M     | %     | N     | %     |
|--------------------------------|-------|-------|-------|-------|-------|
| Gender                         | 186   | 80    | 69.9% | 266   | 100   |
| Age (y)                        |       |       |       |       |       |
| <30                            | 40    | 15.0% |       | 55    | 20.9% |
| 30-40                          | 108   | 40.6% |       | 156   | 58.8% |
| 41-50                          | 45    | 16.9% |       | 60    | 22.7% |
| Education level                |       |       |       |       |       |
| Regional School Diploma        | 85    | 32.0% |       | 130   | 49.3% |
| MNS/Phd                        | 30    | 11.3% |       | 40    | 15.0% |
| BNS                            | 90    | 33.8% |       | 130   | 49.3% |
| First level University Master   | 61    | 22.9% |       | 111   | 41.0% |
| Care setting                   |       |       |       |       |       |
| Community Mental Health Centres (CMHCs) | 149 | 55.8% |       | 266 | 100 |
| Direction of Mental Health Departments (DMHDs) | 109 | 41.0% |       | 266 | 100 |
| General Hospital Psychiatric Units (GHPUs) | 66 | 24.8% |       | 266 | 100 |
| Residential facilities (RFs)   | 66    | 24.8% |       | 266   | 100   |
| Experience in mental health settings (y) |       |       |       |       |       |
| <5                             | 73    | 27.4% |       | 266   | 100   |
| >20                            | 74    | 27.8% |       | 266   | 100   |
| 5-10                           | 65    | 24.4% |       | 266   | 100   |
| Depressive episodes before the Covid-19 pandemic |       |       |       |       |       |
| No                             | 184   | 69.2% |       | 266   | 100   |
| Yes                            | 82    | 30.8% |       | 266   | 100   |
| Have you cared for Covid-19 positive patients? |       |       |       |       |       |
| No                             | 149   | 56.0% |       | 266   | 100   |
| Yes                            | 117   | 44.0% |       | 266   | 100   |

**Table 2**
Socio-demographic characteristics of the total sample and mean differences on PSS-10.

(Sample mean = 19.78, SD = 19.78).

| Variables                      | Mean (SD) | t/F | p     |
|--------------------------------|-----------|-----|-------|
| Gender                         | 21.16 (8.91) | 3.6 | <0.01 |
| Age (y)                        | 24.60 (8.74) | 8.13 | <0.01 |
| Experience in mental health settings (y) |       |       |       |
| <5                             | 21.57 (9.08) |       |       |
| >20                            | 16.76 (9.85) |       |       |
| 5-10                           | 21.58 (8.68) |       |       |
| Depressive episodes before the Covid-19 pandemic |       |       |       |
| No                             | 18.98 (10.13) | -2.40 | 0.04 |
| Yes                            | 21.63 (9.84) |       |       |

In this study, the Cronbach alpha coefficient was found as 0.943.
mental health of the nurses of the Italian mental health departments. G. Napoli et al., 2021; Bateman et al., 2020), have an important impact on the operative modalities could, as already noted in other settings (Altmayer et al., 2021). Have you cared for Covid-19 positive patients? No 2.52 0.01
Have you cared for Covid-19 positive patients? Yes 10.97 0.01
In this study, the Cronbach alpha coefficient was found as 0.884.

Table 4
Socio-demographic characteristics of the total sample and mean differences on PHQ-9.
(Sample Mean = 9.95, SD = 5.88).

| Gender     | Mean (SD) | t/F | p     |
|------------|-----------|-----|-------|
| F          | 10.56 (5.5) | 2.58 | 0.01 |
| M          | 8.55 (6.51) |     |      |
| Age (y)    |           |     |       |
| <30        | 12.23 (5.43) | 4.03 | <0.01 |
| >50        | 8.68 (5.85) |     |      |
| 30–40      | 10.58 (5.13) |     |      |
| 41–50      | 10.22 (6.23) |     |      |
| Education level | Regional School Diploma | 8.98 (6.40) | 1.30 | 0.274 |
|            | MNS/Phd | 9.9 (5.62) |     |      |
|            | BNS | 10.68 (5.63) |     |      |
|            | First level University Master | 10.28 (5.55) |     |      |
| Care setting | Community Mental Health Centres (CMHCs) | 9.23 (6.13) | 1.2 | 0.295 |
|            | Direction of Mental Health Departments (DMHDs) | 9.89 (6.12) |     |      |
|            | General Hospital Psychiatric Units (GHPUs) | 11.06 (5.14) |     |      |
|            | Residential facilities (RFs) | 11.06 (5.14) |     |      |
| Experience in mental health settings (y) | <5 | 10.58 (5.85) | 1.59 | 0.192 |
|            | >20 | 9.49 (6.18) |     |      |
|            | 11–20 | 8.95 (6.10) |     |      |
|            | 5–10 | 10.96 (5.08) |     |      |
| Depressive episodes before the Covid-19 pandemic | No | 9.35 (5.826) | -2.52 | 0.01 |
|            | Yes | 11.30 (5.832) |     |      |
| Have you cared for Covid-19 positive patients? | No | 9.15 (5.63) | -2.52 | 0.01 |
|            | Yes | 10.97 (6.07) |     |      |

In this study, the Cronbach alpha coefficient was found as 0.884.

Table 3
Influence of different predictors on levels of stress.

| Variable                          | B   | p     | OR  | Lower | Higher |
|-----------------------------------|-----|-------|-----|-------|--------|
| Gender                            |     |       |     |       |        |
| F                                 | 0.409 | 0.239 | 1.505 |       |        |
| M                                 |     |       | 0.762 | 2.973 |        |
| Age (y)                           |     |       |     |       |        |
| <30                               | 1.726 | 0.004 | 5.620 | 1.710 | 18.470 |
| 30–40                             | 0.862 | 0.113 | 2.368 | 0.814 | 6.884  |
| 41–50                             | 0.603 | 0.133 | 1.828 | 0.832 | 4.014  |
| Education level                   |     |       |     |       |        |
| Regional School Diploma           |     |       |     |       |        |
| BNS                               | −0.192 | 0.679 | 0.826 | 0.333 | 2.047  |
| First level University Master     | −0.617 | 0.196 | 0.539 | 0.212 | 1.375  |
| MNS/Phd                           | −1.326 | 0.049 | 0.266 | 0.071 | 0.997  |
| Care setting                      |     |       |     |       |        |
| Mental Health Departments (DMHDs) |     |       |     |       |        |
| Community Mental Health Centres (CMHCs) | −0.419 | 0.591 | 0.658 | 0.143 | 3.034  |
| General Hospital Psychiatric Units (GHPUs) | −0.735 | 0.348 | 0.480 | 0.103 | 2.226  |
| Residential facilities (RFs)      | −0.127 | 0.873 | 0.880 | 0.185 | 4.191  |
| Experience in mental health settings (y) |     |       |     |       |        |
| <5                                | −0.419 | 0.591 | 0.658 | 0.143 | 3.034  |
| 5–10                              | −0.735 | 0.348 | 0.480 | 0.103 | 2.226  |
| 11–20                             | −0.127 | 0.873 | 0.880 | 0.185 | 4.191  |
| Depressive episodes before the Covid-19 pandemic | Yes | 0.332 | 0.300 | 1.394 | 0.744  | 2.614 |
| Have you cared for Covid-19 positive patients? | No |     |     |       |        |
|                                    | −1.823 | 0.032 | 0.162 |     |        |

PSS score was the dependent variable in the multiple linear regression. 0 = Low/Moderate levels of stress (PSS score < 27); 1 = High levels of stress moderate/severe (PSS score > 26). R² = 0.126.

Discussion

The COVID-19 pandemic has determined in the Italian mental health Departments the need to reorganize the operating procedures in order to limit the transmission of the virus and to guarantee a timely response to the needs of the users taken care of by the Departments (Castelpietra et al., 2021).

The care of fragile patients at high risk of contracting the virus (Starace & Ferrara, 2020) (or in some cases already positive), the growing care burden, the fear deriving from the risk of becoming infected (Shah et al., 2020; Bateman et al., 2020), as mentioned, the modification of the operative modalities could, as already noted in other settings (Altmayer et al., 2021; Bateman et al., 2020), have an important impact on the mental health of the nurses of the Italian mental health departments.

This cross-sectional study, conducted through the use of a web questionnaire, involved a total of 266 nurses belonging to the Italian mental health Departments, in order to analyze whether the COVID-19 pandemic affected their respective perceived levels of stress or presence of depressive symptoms.

The average score of the sample, evaluated by the PSS-10 scale, was 19.78, this score showed a general level of moderate stress.

Compared to other studies, generally conducted in intensive settings or totally dedicated to COVID-19 positive patients (Murat, Köse, & Savaşer, 2021), lower stress levels were found in the sample analyzed, while compared to studies conducted on samples of nurses that were not totally firstly, comparable results were obtained (Chatzitofis, Kar & Constantinidou, 2021; Warchoł-Biedermann et al., 2021).

Caring for COVID-19 positive psychiatric patients appeared to be a predictor of high stress levels (OR 2.137). Indeed, these data, although limited in this study to nurses related to mental health services, seem to confirm what other studies (Dai, Hu, Xiong, Qiu, & Yuan, 2020; Ma, Rosenheck, & He, 2020; Murat et al., 2021) 23 previously pointed out that frontline nurses on COVID-19...
Influence of different predictors on levels of depression severity.

| Gender        | B   | p    | OR  | Lower | Higher |
|---------------|-----|------|-----|-------|--------|
| F             | 1.011 | 0.002 | 2.747 | 1.460  | 5.170  |
| M             | Ref. |      | Ref. |       |        |
| Age (y)       |      |      |      |       |        |
| <30           | 1.416 | 0.012 | 4.119 | 1.361  | 12.470 |
| 30-40         | 0.447 | 0.345 | 1.563 | 0.618  | 3.954  |
| 41-50         | 0.326 | 0.353 | 1.386 | 0.696  | 2.759  |
| >50           | Ref. |      | Ref. |       |        |
| Education level |      |      |      |       |        |
| Regional School |      |      |      |       |        |
| Diploma       | 0.227 | 0.582 | 1.254 | 0.560  | 2.809  |
| First level University Master | 0.184 | 0.648 | 1.202 | 0.545  | 2.652  |
| MNS/Phd Direction of Mental Health Departments (DMDHs) | 0.395 | 0.464 | 1.485 | 0.515  | 4.280  |
| Community Mental Health Centres (CMHCs) | -0.087 | 0.897 | 0.917 | 0.247  | 3.407  |
| General Hospital Psychiatric Units (GHPUs) | 0.075 | 0.910 | 1.078 | 0.291  | 3.991  |
| Residential facilities (RFs) | 0.255 | 0.713 | 1.290 | 0.332  | 5.013  |
| Care setting  |      |      |      |       |        |
| >20           | Ref. |      |      |       |        |
| Experience in mental health settings (y) |      |      |      |       |        |
| <5            | 0.086 | 0.865 | 1.090 | 0.404  | 2.943  |
| 5-10          | 0.405 | 0.397 | 1.499 | 0.587  | 3.829  |
| 11-20         | 0.397 | 0.318 | 1.487 | 0.683  | 3.239  |
| Depressive episodes before the Covid-19 pandemic |      |      |      |       |        |
| Yes           | 0.426 | 0.146 | 1.531 | 0.862  | 2.720  |
| Have you cared for Covid-19 positive patients? |      |      |      |       |        |
| No            | Ref. |      |      |       |        |
| Yes           | 0.700 | 0.020 | 2.015 | 1.118  | 3.632  |
| Constant      |      |      |      |       |        |
| No            | -2.272 | 0.003 | 1.030 |       |        |
| Yes           | Ref. |      |      |       |        |

PHQ-9 score was the dependent variable in the multiple linear regression.  
0 = Level of depression severity absent or mild (PHQ-9 score < 10);  
1 = Level of depression severity moderate/severe (PHQ-9 score ≥ 10).  
R² = 0.140.

Nurses in residential/semi-residential (RFs) facilities and General Hospital Psychiatric Units (GHPUs) reported higher levels of stress than those serving in Mental Health Departments and Community Mental Health Centers (CMHCs); the lock-down and the important restrictions envisaged (interruption of visits, blocking of exits) to limit the spread of the coronavirus seem to be at the basis of these results.

Especially in RFs, patients remained hospitalized without the possibility of being able to leave the structure increasing their tension, it is assumed that the activity of nurses in these structures was very complex, at the same time in many cases RFs and GHPUs were transformed into units totally dedicated to patients with COVID-19 positive psychiatric pathologies.

The lower scores obtained by the nurses of the Departments Management could be explained by the fact that the latter may not have provided direct assistance to patients, as they tend to be involved in the reorganization of services and in the management of human resources.

According to Pappa et al. (2020), the COVID-19 pandemic has the potential to significantly affect the mental health of frontline healthcare workers; being able to monitor and intercept changes in the mood of nurses should be a priority for health authorities, the well-being of health professionals is a significant determinant of patient care, supporting staff can improve patient outcomes.

Already during and after the SARS epidemics (Khalid, Khalid, Qabajah, Barnard, & Oshuma, 2016) and Ebola, some health workers had manifested mental distress, some had even been forced to resign from their jobs, and it must be assumed that the media echo and the rapid spread of news could increase the discomfort among health workers also for COVID-19.

From the analysis conducted using the PHQ-9 scale, as happened for the stress variable, the service provided to COVID-19 positive patients seems to be able to increase the risk of developing major depressive symptoms (OR 2.015), this data seems confirm what other studies (Dai et al., 2020; Di Tella, Romeo, Benfante, & Castelli, 2020; Ma et al., 2020) have determined, namely that being at the forefront of managing COVID-19 positive patients seem to have repercussions on depressive disorders, it is easy to understand that these nurses have found themselves working daily to keep patients alive and constantly exposed to the risk of becoming infected.

It is interesting to note that as happened for stress, the subjects who showed a higher prediction for major depressive symptoms were women (OR 2.747) and young nurses (OR 4.119). Unipolar is twice as common (and more persistent) in women than in men (WHO, 2019) but in general this trend has also been found in other studies conducted among health professionals (WHO, 2019; Zhang et al., 2020).

30.8% of the nurses surveyed said they suffered from depressive disorders prior to the COVID-19 pandemic, despite having statistically higher scores on the PHQ-9 scale (p < 0.01) than their colleagues, would not show a statistically greater risk of exacerbating major depressive symptoms following the COVID-19 pandemic.

On the contrary, it was noted that about 65% of nurses who had never suffered from depressive disorders before the pandemic reported at least mild depressive symptoms during the measurement, it is interesting to highlight how about half of these nurses had provided their care to patients. COVID-19 positive.

Implications

In light of the results reported in this study, the need for careful monitoring of stress levels and psychological state emerges among nurses in the Italian mental health Departments, in particular certain classes of nurses (women, young people and frontline nurses) were more likely to exhibit high levels of stress and major depressive symptoms during this COVID-19 pandemic.

Nursing managers have a fundamental role in being able to intercept nurses who find themselves in a difficult condition and in guaranteeing them, support actions; in this sense, encouraging additional training
moments on mental health and assigning the most critical patients based on nursing skills could be solutions to reduce the emotional load, especially among younger nurses.

In addition, setting up psychological support groups, providing rest days or stimulating a work environment based on the sharing of emotions among the members of the team can be additional strategies that can be adopted to help nurses.

Regarding the transmission of COVID-19 in health facilities, it was found that the training of staff in this regard plays a fundamental role in improving mental health levels among nurses (Wu et al., 2020), promote training and updating on the main procedures for containing the virus, involving staff in defining the operating procedures can optimize the response capacity of mental health services to the needs of citizens in a period of significant changes and difficulty.

Limitations

The study was carried out solely by seeking information provided by professionals by filling in a questionnaire and did not include a clinical evaluation of the nurses interviewed, which is why it is not possible to be certain that what the respondents said corresponds to the real conditions of the nurses.

In addition, the calculation of the statistical power of the sample was not provided; it was preferred to choose a sample of convenience and to enroll this through the use of social networks, allowing nurses from all regions of Italy to participate, in order to have a general picture of the Italian situation.

Future studies on larger and medium-long term samples could be useful to provide generalizable outcomes to the nursing population of the Italian mental health Departments, moreover, the use of qualitative research could allow deepening more precisely the mental well-being of these nurses.

Conclusion

This study examined stress levels and the prevalence of depressive conditions among nurses in the Italian Departments of Mental Health during the COVID-19 pandemic using two validated scales. The results showed a moderate level of stress and a prevalence of sub-threshold (borderline) depressive symptoms among responding nurses.

In this study, frontline nurses on COVID-19 positive patients appear to be at greater risk of reporting higher levels of stress or major depressive symptoms as do young or female nurses.

Nurses with higher education levels (MNS/Phd) appear to be less likely to develop high stress conditions, while a history of pre-pandemic depression is not predictive of an increased risk of depressive relapses during the COVID-19 pandemic.

Monitoring and managing the psychological well-being of nursing staff are to be considered among the priorities of mental health service managers and are part of a process that aims to increase individual and organizational well-being but above all to improve the outcomes resulting from assistance.

Declaration of competing interest

None declared.

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References

Altmayer, V., Weiss, N., Cao, A., Marois, C., Demeret, S., Rohaut, B., Le Guemnez, L., & Réa-Neuro-Pépite-Salpêtrière study group. (2021). Coronavirus disease 2019 crisis in Paris: A differential psychological impact between regular intensive care unit staff members and reinforcement workers. Australian Critical Care: Official Journal of the Confederation of Australian Critical Care Nurses, 34(2), 142-145. https://doi.org/10.1111/1440-178X.12506
Bateman, M. E., Hammer, R., Byrne, A., Ravindran, N., Chierico, J., Lasky, S., Denson, R., Brown, M., Myers, L., Zu, Y., & Denson, J. L. (2020). Death Cafés for prevention of burnout in intensive care unit employees: Study protocol for a randomized controlled trial (STOPTHEBURN), Trials, 21(1), 1019. https://doi.org/10.1186/s13063-020-04929-4
Bonati, M., Campi, R., Zanetti, M., Cartabia, M., Scarpellini, F., Clavenn, A., & Segre, G. (2021). Psychological distress among Italians during the 2019 coronavirus disease (COVID-19) quarantine. BMC Psychiatry, 21(1), 20. https://doi.org/10.1186/s12888-020-03027-8
Castelpietra, G., Colli, C., Tossut, D., Furlan, M., Balestri, M., Starace, F., Beghi, M., Barbieri, F., Perulli, A., & Salvador-Carulla, L. (2021). The impact of COVID-19 pandemic on community-oriented mental health services: The experience of Friuli Venezia Giulia region, Italy. Health Policy and Technology, 10(1), 143-150. https://doi.org/10.1016/j.hpt.2020.12.002
Chatziottofs, A., Karanikola, M., Michailidou, K., & Constantinidou, A. (2021). Impact of the COVID-19 pandemic on the mental health of healthcare workers. International Journal of Environmental Research and Public Health, 18(4), 1435. https://doi.org/10.3390/ijerph18041435
Chew, N., Lee, G., Tan, B., Jia, G., Goh, Y., Ngiam, N., Yeo, L., Ahmad, A., Ahmed Khan, F., Napolitan Shammugam, G., Sharma, A. K., Komalkumar, R. N., Meenakshi, P. V., Shah, K., Patel, B., Chan, B., Sunny, S., Chandra, B., Ong, J., Palwai, P., Sharma, V. K., … (2020). A multinational, multicentre study on the psychological outcomes and associated physical symptoms amongst healthcare workers during COVID-19 outbreak. Brain, Behavior, and Immunity, 88, 559-565. https://doi.org/10.1016/j.bbi.2020.04.049
Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24(4), 385-396.
Connor, J., Madhavan, S., Mokashi, M., Amanuel, H., Johnson, N. R., Pace, L. E., & Bartz, D. (2020). Health risks and outcomes that disproportionately affect women during the Covid-19 pandemic: A review. Social Science & Medicine (1982), 266, 113564. https://doi.org/10.1016/j.socscimed.2020.113564
D’Agostino, A., Demartini, B., Cavallotti, S., & Gamboni, O. (2020). Mental health services in Italy during the COVID-19 outbreak. The Lancet. Psychiatry, 7(5), 385–387. https://doi.org/10.1016/S2215-0366(20)30133-4
Dai, Y., Hu, H., Xiong, H., Qiu, H., & Yuan, X. (2020). Psychological impact of the coronavirus disease 2019 (COVID-19) outbreak on healthcare workers in China. medRxiv preprint (6 March 2020). Retrieved from https://www.medrxiv.org/content/10.1101/2020.03.03.20030874v1
De Girolamo, G., Cerveri, G., Clerici, M., Monzani, E., Spinozatti, F., Starace, F., Tura, G., & Vitta, A. (2020). Mental health in the coronavirus disease 2019 emergency-the italian response. JAMA Psychiatry, 77(9), 974-976. https://doi.org/10.1001/jamapsychiatry.2020.1222
Di Telli, M., Romeo, A., Benfante, A., & Castelli, L. (2020). Mental health of healthcare workers during the COVID-19 pandemic in Italy. Journal of Evaluation in Clinical Practice, 26(6), 1583-1587. https://doi.org/10.1111/jpec.13449
Greenberg, N., Docherty, M., Gnanapragasam, S., & Wessely, S. (2020). Managing mental health challenges faced by healthcare workers during covid-19 pandemic. BMJ. https://doi.org/10.1136/bmj.m1211. https://www.who.int/mental-health/prevent/coronavirus/countries/who-mental-health-prevent-italy/informationservice/en/
Istituto Superiore di Sanita’. (2021). Epidemia COVID-19 Aggiornamento nazionale 7 aprile 2021 – ore 12:00. https://www.epicentro.iss.it/coronavirus/bollettino/Bollettino-so-rivelazione-integrata-COVID-19-7-aprile-2021.pdf
Ji, D., Ji, Y.-J., Duan, X.-Z., Li, W.-G., Sun, Z.-Q., & Song, X.-A. (2017). Prevalence of psychological symptoms among Ebola survivors and healthcare workers during the 2014-2015 Ebola outbreak in Sierra Leone: a cross-sectional study. Oncotarget, 8(1), 12784 [PMC free article] [PubMed].
Khali, L., Khalid, T. J., Qabaja, M. R., Barnard, A. G., & Qushmaq, I. A. (2016). Healthcare workers emotions, perceived stressors and coping strategies during a MERS-CoV outbreak. Clinical Medicine & Research, 14(7), 7-14. https://doi.org/10.3121/cmr.2016.1303
Kroeske, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. Journal of General Internal Medicine, 16(9), 666-613. https://doi.org/10.1046/j.1525-1497.2001.01600960.x
Li, X., Zhou, Y., & Xu, X. (2021). Factors associated with the psychological well-being among frontline nurses exposed to COVID-19 in China: A predictive study. Journal of Nursing Management, 29(2), 240-249. https://doi.org/10.1111/jonm.13146
Liu, N., Zhang, F., Wei, C., et al. (2020). Prevalence and predictors of PTSD during Coronavirus outbreak in China’s hardest-hit areas: Gender differences matter. Psychiatry Research, 187, Article 112921. https://doi.org/10.1016/j.psychres.2020.112921
G. Napoli

Ma, Y., Rosenbeck, R., & He, H. (2020). Psychological stress among health care professionals during the 2019 novel coronavirus disease outbreak: Cases from online consulting customers. *Intensive & Critical Care Nursing, 61*, Article 102905. https://doi.org/10.1016/j.iccn.2020.102905

Moreno, C., Wykes, T., Galdieri, S., Nordentoft, M., Crossley, N., Jones, N., Cannon, M., Correll, C. U., Byrne, L., Carr, S., Chen, E., Gorwood, P., Johnson, S., Karkkainen, H., Krystal, J. H., Lee, J., Lieberman, J., López-Jaramillo, C., Männikkö, M., Phillips, M. R., Arango, C., … (2020). How mental health care should change as a consequence of the COVID-19 pandemic. *The Lancet. Psychiatry, 7*(9), 813–824. https://doi.org/10.1016/S2215-0366(20)30307-2

Murata, M., Köse, S., & Savager, S. (2021). Determination of stress, depression and burnout levels of front-line nurses during the COVID-19 pandemic. *International Journal of Mental Health Nursing, 30*(2), 533–543. https://doi.org/10.1111/ijnm.12818

Pappa, S., Niella, V., Giannakou, T., Giannakoulis, V. G., Papoutsi, E., & Katsaounou, P. (2020). Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. *Brain, Behavior, and Immunity, 88*, 901–907. https://doi.org/10.1016/j.bbi.2020.05.026

Percudani, M., Corradin, M., Moreno, M., Indelicato, A., & Vita, A. (2020). Mental health Services in Lombardy during COVID-19 outbreak. *Psychiatry Research, 288*, Article 112980. https://doi.org/10.1016/j.psychres.2020.112980

Preti, E., Di Mattei, V., Perego, G., Ferrari, F., Mazzetti, M., Taranto, P., Di Fierro, R., Madeddu, F., & Galati, R. (2020). The psychological impact of epidemic and pandemic outbreaks on healthcare workers: Rapid review of the evidence. *Current Psychiatry Reports, 22*(8), 43. https://doi.org/10.1007/s11920-020-01166-z

Rossi, R., Soceti, V., Pacitti, F., Di Lorenzo, G., Di Marco, A., Siracusano, A., & Rossi, A. (2020). Mental health outcomes among frontline and second-line health care workers during the coronavirus disease 2019 (COVID-19) pandemic in Italy. *JAMA Network Open, 3*(5), Article e2010185. https://doi.org/10.1001/jamanetworkopen.2020.10185

Sareen, J., Erickson, J., Medved, M. I., Asmundson, G. J., Enns, M. W., Stein, M., Leslie, W., Doupe, M., & Logsetty, S. (2013). Risk factors for post-injury mental health problems. *Depression and Anxiety, 30*(4), 321–327. https://doi.org/10.1002/da.22077

Shah, K., Kamrav, D., Mekala, H., Mann, B., Desai, K., & Patel, R. S. (2020). Focus on mental health during the coronavirus (COVID-19) pandemic: Applying learnings from the past outbreaks. *Careux, 12*(3), Article e7405. https://doi.org/10.7759/careux.7405

Shahrou, G., & Dardas, L. A. (2020). Acute stress disorder, coping self-efficacy and subsequent psychological distress among nurses amid COVID-19. *Journal of Nursing Management, 28*(7), 1686–1695. https://doi.org/10.1111/jonm.13124

Shanafelt, T., Jonathan, R., & Mickey, T. (2020). Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic. *Journal of the American Medical Association, 323*, 2133. https://doi.org/10.1001/jama.2020.5893

Starace, F., & Ferrara, M. (2020). COVID-19 disease emergency operational instructions for mental health departments issued by the italian society of epidemiological psychiatry. *Epidemiology and Psychiatric Sciences, 29*, E116. https://doi.org/10.1017/s11920-020-01166-z

Tan, B. Y. Q., Chew, N. W. S., Lee, G. K. H., et al. (2020). Psychological impact of the COVID-19 pandemic on health care workers in Singapore. *Annals of Internal Medicine, M20-M1083*. https://doi.org/10.7326/M20-1083

Warchol-Biedermann, K., Dzonszewski, P., Bączyk, G., Greberski, K., Bugajski, P., Karpi, J., Mejs, E., Ziarko, M., Jasielska, A., & Samborski, W. (2021). Dysfunctional coping mediates the relationship between stress and mental health in health care staff working amid COVID-19 pandemic. *Medical Principles and Practice: International Journal of the Kuwait University, Health Science Centre*. https://doi.org/10.1159/000516181, Advance online publication. doi:10.1159/000516181

WHO. (2020). *Statement on the Second Meeting of the International Health Regulations (2005) Emergency Committee Regarding the Outbreak of Novel Coronavirus (2019-nCoV)*. https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov).

World Health Organization (WHO). (2019). *Gender and women's mental health*. Wu, J., Wu, X., Wu, F., Díaz, Y., Dechun, C., & Gong, X. (2020). Survey of sleep quality of clinic-al front-line nurses and its influencing factors in the fight against new coronavirus pneumonia. *Nursing Research, 34*(4), 558–562.

Zhang, S. X., Liu, J., Afshar Jahanshahi, A., Nawaser, K., Yousefi, A., Li, J., & Sun, S. (2020). At the height of the storm: Healthcare staff’s health conditions and job satisfaction and their associated predictors during the epidemic peak of COVID-19. *Brain, Behavior, and Immunity, 87*, 144–146. https://doi.org/10.1016/j.bbi.2020.05.010

Zhu, Z., Xu, S., Wang, H., Liu, Z., Wu, J., Li, G., et al. (2020). COVID-19 in Wuhan: Immediate psychological impact on 5062 health workers. *medRxiv*. https://doi.org/10.1101/2020.02.20.20025338