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Posttraumatic Stress Disorder among Registered Nurses and Nursing Students in Italy during the COVID-19 Pandemic: A Cross-Sectional Study

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Abstract: (1) Background: Posttraumatic stress disorder (PTSD) is a mental health disorder characterized by a range of syndromal responses to extreme stressors. The present study aimed to explore any differences in PTSD between registered nurses and nursing students, according to sex and nursing experience, during the COVID-19 pandemic. (2) Methods: An observational descriptive study was conducted among Italian nurses and nursing students during the first wave of the COVID-19 pandemic. An online questionnaire was distributed in an anonymous form through the Google function of Google Modules to some social pages and nursing groups. (3) Results: In total, 576 participants were enrolled in this study. Of these, 291 (50.50%) were registered nurses and 285 (49.50%) were nursing students. By considering the Impact of Event Scale—Revised values in nurses and in nursing students according to sex, a significant difference was reported in the avoidance sub-dimension ($p = 0.024$), as female nurses recorded higher levels than nursing students. No further significant differences were suggested by considering both sex and nursing experience, respectively. (4) Conclusion: PTSD could be a serious consequence for both nurses and nursing students during the COVID-19 pandemic.



Citation: Vitale, E. Posttraumatic Stress Disorder among Registered Nurses and Nursing Students in Italy during the COVID-19 Pandemic: A Cross-Sectional Study. *Psych* **2022**, *4*, 387–395. <https://doi.org/10.3390/psych4030032>

Academic Editors: Sarah Prior and Valentina Echeverria

Received: 27 March 2022

Accepted: 6 July 2022

Published: 8 July 2022

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Keywords: COVID-19; nurse; posttraumatic stress disorder; sex; student; work experience

1. Introduction

Posttraumatic stress disorder (PTSD) was officially described in 1980 as a range of syndromal responses to extreme stressors, identifying the diagnosis in the general population. Posttraumatic stress disorder (PTSD) is a mental health disorder characterized by a frightening event either experiencing it or observing it [1]. Its symptoms might involve flashbacks, nightmares, severe anxiety, as well as uncontrollable thoughts about the experienced circumstance. As the symptoms worsen, influencing daily functions, PTSD can arise. PTSD significantly influences social and work circumstances, as well as their linked relationships. PTSD manifestations can be arranged into four typologies, namely: intrusive memories, avoidance, negative challenges in thinking and mood, and alterations in physical and emotional reactions. However, PTSD expression can vary over time and in each individual. Nurses' difficulty in processing the psychological distress consequent to their nursing work activity, especially nurses in frontline care, is well supported by the current literature. In fact, the frequent experience of difficult events, particularly in emergency care settings, can influence mental health and global nursing activities, by causing the development of numerous psychopathological sequelae, such as posttraumatic stress disorder (PTSD), depression, burnout, and anxiety [2–5]. In Italy, there was not much literature available on the psychological impact of the COVID-19 emergency on nurses during the first wave [6–9]. Research on previous viral outbreaks emphasized important psychological comorbidities among nurses, such as distress, depression, anxiety, and burnout, particularly in those providing frontline healthcare activity, with both short- and long-term consequences [10–13]. Several sociodemographic and occupational risk factors have been associated with mental

health disorders' development in nurses both during and after viral pandemics, such as female sex, younger age, working in a high-risk environment as in frontline care, higher awareness, receiving insufficient specialized training, and isolation [14–16]. The COVID-19 pandemic changed healthcare systems throughout the world [17,18]. In this scenario, the literature suggested extreme exhaustion, physical discomfort from long working hours with the enforced wearing of face masks and other personal protective equipment (PPE), fear of contagion, and emotional distress in nurses [19–23]. Therefore, the highest level in nursing professional stress and exhaustion led also to other behavioral and psychiatric disorders, including insomnia, anxiety, vague malaise, asthenia, headache, diffuse pains, dyspepsia, and eating disorders [19–24]. From China [25,26] and Italy [19–24], where the pandemic was widespread during the first wave of the pandemic, it was reported that nurses at the forefront of caring for COVID-19 patients were at an increased risk of mental health disorders than other healthcare workers. These early papers concerning the pandemic's impact on healthcare workers pinpointed frontline exposure to COVID-19 patients as a main risk factor but identified few other variables explaining the reported symptoms of depression, anxiety, insomnia, psychological distress, and posttraumatic stress among nurses [27,28]. Sun et al. [29] suggested that initial negative emotions developed into a combination of positive and negative emotions, as well as fatigue, fear, and anxiety associated with the unknown, all as causes of negative feelings but without recognizing other specific etiologies of stress. Liu et al. [30] described two main dimensions of PTSD, namely, an attitude of responsibility and the work-related atmosphere.

Moreover, university institutions changed their training programs to allow flexibility for students due to the COVID-19 pandemic and its related safety concerns [31]. Students may have lived through increasingly stressful conditions, with all the variation in their university degree course organization and their professional role, especially in nursing, as they directly faced the pandemic emergency, arousing strong emotions of uncertainty for one's professional future. Previous studies have addressed the educational needs, major concerns, and fears of nursing students in relation to influenza and emergency or disaster response [32–34]. However, no studies have focused on PTSD in nursing students, specifically differentiating between sex and years into the nursing degree.

Beginning with the abovementioned assumptions, the present study aimed to explore any differences in PTSD between registered nurses and nursing students, as well as differences due to sex and nursing experience.

2. Materials and Methods

2.1. Study Design

An observational descriptive study was conducted among Italian nurses and nursing students during the first wave of the COVID-19 pandemic, specifically from 25 March 2020 to 25 April 2020. An online questionnaire was advertised in an anonymous form through the Google Modules function.

2.2. Inclusion Criteria

All Italian nurses who were at the forefront of caring for COVID-19 patients and all Italian nursing students who, at the moment of recruitment were attending one of the three years of the Italian nursing degree course in the nursing field were considered as potential participants. Then, those who voluntarily accepted to answer to the online questionnaire were finally included in the present study.

2.3. The Questionnaire

The questionnaire collected some sociodemographic characteristics and also assessed PTSD. In particular, the sociodemographic characteristics concerned:

- Sex, as female or male;
- Years of work experience in the nursing field; specifically, years of work experience for nurses were classified into three subgroups: from zero to 10 years, from 11 to 20 years,

and over 21 years, respectively. For the nursing students, years of work experience were classified as in the first year of the nursing degree course, the second year, and the third year or more, respectively.

Then, the Impact of Event Scale—Revised (IES-R) [35,36] was administered in order to quantify the posttraumatic stress disorder (PTSD) condition of the participants. Previous studies have explored the three sub-dimensions of the IES-R and the validity and reliability of the questionnaire including the relating scores [35,36], with Cronbach's α coefficients varying from 0.87 to 0.91 for the intrusion subscale, 0.84 to 0.85 for the avoidance subscale, and 0.79 to 0.9 for the hyperarousal subscale. The test–retest scores for the 1989 sample ranged from 0.51 to 0.59. The 1994 sample had a shorter interval between the test and retest, and their scores were higher, ranging from 0.89 to 0.94 [37,38].

The IES-R contained a total of 22 items describing a list of difficulties that respondents could experience following event stressors. In this case, the stressor was considered the COVID-19 pandemic; so, the respondents were to answer by considering their own nursing work experience during the COVID-19 pandemic. For each item, a Likert-answer rate was associated, which ranged from 0 for “not at all” to 4 for “extremely”. Additionally, three sub-dimensions of PTSD were also assessed, namely:

- “Avoidance”, by summing items no. 5, 7, 8, 11, 12, 13, 17, 22. These items explored how the subject avoided thinking about the traumatic event;
- “Intrusiveness”, by summing items no. 1, 2, 3, 6, 9, 14, 16, 20. These items defined how the subject could not avoid thinking about the traumatic event;
- “Hyperarousal”, by averaging items no. 4, 10, 15, 18, 19, 21. These items measured how much anger and irritability the participant felt in general.

The maximum mean score of each of the 3 subscales was 4; hence, the maximum total mean score of the IES-R scale was 12. Lower scores were better, and an IES-R total score of 33 or higher out of a maximum score of 88 meant the probable presence of posttraumatic stress disorder (PTSD).

2.4. Data Analysis

All data were collected in an Excel data sheet and processed using SPSS software, version 20. Sex and nursing work experience were considered as categorical variables and presented as frequencies and percentages. The IES-R values both for total and each sub-dimension's scores were assessed as continuous variables and presented as means \pm standard deviations. In this regard, the literature highlighted the good reliability and validity of the IES-R scale, by showing both the IES-R total score and its related sub-dimensions as continuous variables [37]. Differences between the nursing workers and students were performed using the *chi-square* test, as well as for sex and the work experience groups; the *t*-test for independent samples was performed between the two population groups for the IES-R total score and its sub-dimensions. Additionally, one-way ANOVA analysis was used for each sub-dimension of the IES-R according to sex and years of experience in nursing. Finally, a multiple linear regression model was assessed by considering the IES-R total score and its sub-dimensions as outcome variable (*y*) and the nursing group (nurse vs. nursing student) as the main independent variable (*x*₁), whilst controlling for the effect of sex (*x*₂) and work experience (*x*₃). The significance level was assessed at $p < 0.05$.

3. Results

A total of 576 participants were enrolled in this study. Of these, 291 (50.50%) were registered nurses, and 285 (49.50%) were nursing students. Both according to sex and work experience, the two sampling groups were different in their compositions ($p < 0.001$), as well as in their IES-R scores ($p < 0.001$). Specifically, among nurses, 32.50% had worked less than 10 years, 9.40% had been employed between 11 and 20 years, and 8.70% had worked more than 21 years. On the other hand, 42.50% of nursing students were in the first year of the nursing degree, 6.90% were in the second year, and 26.40% of students were

in the third year or more of the nursing degree. Finally, the IES-R values in total and the related sub-dimensions showed low levels of PTSD both in nurses and in nursing students, respectively (Table 1).

Table 1. Sampling characteristics ($n = 576$).

Characteristic	Nurses 291 (50.50%)	Nursing Students 285 (49.50%)	<i>p</i> -Value
Sex			
Female	214 (37.20%) ^a	245 (42.50%) ^a	>0.001 *
Male	77 (13.40%) ^a	40 (6.90%) ^a	
Nursing Work Experience			
1–10 years/First year nursing degree	187 (32.50%) ^a	39 (6.80%) ^a	>0.001 *
11–20 years/Second year nursing degree	54 (9.40%) ^a	94 (16.30%) ^a	
>21 years/Third year or more nursing degree	50 (8.70%) ^a	152 (26.40%) ^a	
IES-R values:			
Avoidance	1.82 ± 0.79 ^b	1.40 ± 0.79 ^b	>0.001 *
Intrusiveness	2.01 ± 0.86 ^b	1.42 ± 0.85 ^b	>0.001 *
Hyperarousal	2.01 ± 0.97 ^b	1.60 ± 0.95 ^b	>0.001 *
IES-R total	5.84 ± 2.40 ^b	4.41 ± 2.38 ^b	>0.001 *

^a: frequency (%); ^b: mean ± standard deviation; * $p < 0.05$ is statistically significant.

By considering the IES-R values in nurses and in nursing students according to sex (Table 2), a significant difference was reported in the avoidance sub-dimension ($p = 0.024$), as female nurses recorded higher levels than nursing students. No further significant differences were suggested by considering sex as the differentiating variable in the IES-R values between nurses and nursing students.

Table 2. IES-R values recorded in Nurses and Nursing Students according to Sex.

IES-R Sub-Dimensions	Sex		C.I. 95%		<i>p</i> -Value
	Female	Male	Female	Male	
Avoidance					
Nurse	1.89 ± 0.78	1.61 ± 0.80	1.790–1.997	1.440–1.785	0.024 *
Nursing Student	1.49 ± 0.79	0.83 ± 0.55	1.396–1.589	0.594–1.073	
Intrusiveness					
Nurse	2.14 ± 0.84	1.64 ± 0.81	2.034–2.255	1.460–1.827	0.182
Nursing Student	1.52 ± 0.84	0.78 ± 0.57	1.415–1.621	0.525–1.035	
Hyperarousal					
Nurse	2.12 ± 0.96	1.70 ± 0.93	1.995–2.247	1.492–1.911	0.152
Nursing Student	1.69 ± 0.95	0.99 ± 0.64	1.579–1.814	0.696–1.278	
IES-R total					
Nurse	6.15 ± 2.34	4.95 ± 2.36	5.845–6.465	4.437–5.470	0.070
Nursing Student	4.70 ± 2.36	2.60 ± 1.52	4.141–4.993	1.880–3.314	

p-values derived from one-way ANOVA. C.I.: confidence interval. * $p < 0.05$ is statistically significant.

By considering work experience (Table 3), the nurses registered higher levels in the IES-R values than nursing students, but this was not statistically significant.

Finally, by considering the IES-R score and its sub-dimensions, as well as the nursing groups, sex, and work experience, the multiple linear regression confirmed all the abovementioned data (Tables 2 and 3), as the IES-R scores and sub-dimensions differed by considering the nursing group (nursing worker or nursing student) and sex, while work experience seemed to not influence any trend in PTSD development among the participants (Table 4).

Table 3. IES-R values recorded in Nurses and Nursing Students according to Nursing Experience.

IES-R Sub-Dimensions	Nursing Experience			C.I. 95%			p-Value
	0–10 y First y	11–20 y Second y	>21 y Third/more	0–10 y First y	11–20 y Second y	>21 y Third/more	
Avoidance							
Nurse	1.79 ± 0.75	1.92 ± 0.76	1.83 ± 0.98	1.673–1.90	1.713–2.135	1.608–2.048	0.379
Nursing Student	1.31 ± 0.76	1.31 ± 0.82	1.48 ± 0.78	1.065–1.562	1.152–1.472	1.350–1.602	
Intrusiveness							
Nurse	1.93 ± 0.85	2.28 ± 0.79	2.01 ± 0.86	1.811–2.056	2.055–2.510	1.776–2.248	0.107
Nursing Student	1.34 ± 0.83	1.35 ± 0.87	1.47 ± 0.84	1.078–1.613	1.176–1.520	1.338–1.609	
Hyperarousal							
Nurse	1.98 ± 0.93	2.15 ± 0.96	1.98 ± 1.12	1.840–2.117	1.891–2.405	1.712–2.247	0.471
Nursing Student	1.64 ± 0.97	1.55 ± 0.96	1.62 ± 0.94	1.334–1.939	1.354–1.744	1.463–1.770	
IES-R total							
Nurse	5.70 ± 2.29	6.35 ± 2.30	5.81 ± 2.85	5.352–6.038	5.712–6.989	5.152–6.479	0.248
Nursing Student	4.29 ± 2.34	4.20 ± 2.47	4.56 ± 2.33	3.540–5.043	3.722–4.690	4.181–4.943	

p-values derived from one-way ANOVA. C.I.: confidence interval.

Table 4. IES-R values recorded in Nurses and Nursing Students according to Sex and Work Experience.

IES-R Sub-Dimensions/ Sampling Variables	Beta	t	p	C.I. 95%
Avoidance				
Nursing group	−0.320	−6.972	>0.001 *	−0.671–−0.376
Sex/	0.207	5.176	>0.001 *	0.260–0.579
Work experience	0.063	1.387	0.166	−0.025–0.145
Intrusiveness				
Nursing group	−0.406	−9.190	>0.001 *	−0.889–−0.576
Sex/	0.261	6.807	>0.001 *	0.417–0.755
Work experience	0.069	1.572	0.116	−0.018–0.163
Hyperarousal				
Nursing group	−0.248	−5.338	>0.001 *	−0.666–−0.308
Sex/	0.217	5.371	>0.001 *	0.335–0.722
Work experience	0.008	0.170	0.865	−0.094–0.112
IES-R total				
Nursing group	−0.350	−7.760	>0.001 *	−2.184–−1.302
Sex/	0.248	6.329	>0.001 *	1.058–2.011
Work experience	0.049	1.088	0.277	−0.114–0.395

p-values derived from multiple linear regression. C.I.: confidence interval. * $p < 0.05$ is statistically significant.

4. Discussion

The present study aimed to explore differences in PTSD between registered nurses and nursing students, as well as differences due to sex or nursing experience.

In this regard, of several studies in the literature showing PTSD among nurses [39] during the COVID-19 pandemic [19–24], few investigated PTSD in nursing students and very few compared nurses and nursing students during the COVID-19 pandemic. The present pilot study aimed to investigate PTSD symptoms in nurses according to sex and nursing experience. As early as the Vietnam War, PTSD was examined among soldiers and its sex-related differences were assessed above all in male soldiers [40]. Then, further studies focused on the general population, highlighting that the risk for PTSD due to a traumatic event was twice as high in females as in males. Additionally, PTSD is more frequent in females than in males.

Nursing, under normal circumstances, has been recognized as one of the professional categories most at risk of developing PTSD. Nurses generally experience traumatic conditions, since they are either directly or indirectly present during trauma. In this regard, the literature reported that between 6.7% and 95.7% of nurses recorded at least one sign or symptom of PTSD during their working experiences, while the diagnosis was between 8.5% and 20.8% [41]. Surely, the COVID-19 pandemic was a traumatic event for many nurses; so, the prevalence of PTSD among nurses should be reassessed, especially among those who were employed in COVID-19 healthcare settings [42]. Nurses might develop coping strategies to complete their heavy workloads and important professional changes, such as improving technical competencies in a very short time. Additionally, lack of PPE availability, perceptions of unsafe work environments, being isolated from family members to avoid contagion, and fear of the unknown new SARS-CoV-2 infection negatively influenced nurses' mental conditions during the pandemic [19–24,43]. In line with previous studies [44–46], a considerable portion of the healthcare workers participating in this survey were provisionally diagnosed with PTSD. The participants described overwhelming intrusive thoughts. Previous research has also identified the COVID-19 pandemic as causing heavy psychological distress [44,45,47,48] and showed that females were more susceptible to psychological distress than males, perhaps due to their additional roles as caregivers at home [49]. Other conditions to consider were changes in work shifts and work experiences. Taken altogether, researchers were in agreement that the COVID-19 pandemic negatively affected healthcare workers' daily lives and increased their possibility of developing depression, stress, anxiety, and PTSD [19–23].

In addition, we considered nursing students; during the pandemic, the nursing degree course switched to remote education instead of in-person classes. Although this transition could provoke acute stress in students due to the lack of time for adaptation, elearning permitted college students to continue their academic routine, which was highlighted as an advantage for mental health and psychological resilience in the long term [50]. The evidence reported a good level of maxi-emergency management among nursing students [33], including a study conducted in Jordan [51]. In this context, the present findings seemed to be in agreement with the current literature, since both nurses and nursing students recorded lower levels of PTSD, and a significant difference was registered only according to sex, as female nurses reported higher IES-R values than males, and female nursing students did too. Specifically, a significant difference was reported in the avoidance sub-dimension, which the considered literature confirmed.

Strengths and Limitations

The present study described a reflection on the difficult psychological phenomenon of PTSD in a group of nurses and nursing students. However, the present study was limited by a small sample size and the choice of a casual and convenience sampling, which constituted an important potential selection bias, thus limiting the generalizability of the present results. Additionally, there was a sex bias in the test group. Unfortunately, both in the case of nurses and students, the percentage of males was very low. There were similar problems with the differentiation of the work experience, as the most numerous were nurses with 0–10 years of work experience, and in the case of the nursing students, the first year students were dominant. This represented a serious limitation of this study and the related reliability of the analyses and results.

5. Conclusions

PTSD represented a serious consequence both in nurses and in nursing students during the COVID-19 pandemic. Healthcare organizations and universities could recognize PTSD as a possible consequence, which may have affected their nurses and nursing students. Therefore, psychological support would be in order to promote the wellbeing of nurses and future nurses.

Funding: This research received no external funding.

Institutional Review Board Statement: Ethical review and approval were waived for this study due to the nature of the study, as it was an online observational study. All Italian nurses and nursing students who voluntarily agreed to participate in the study were enrolled. All the ethical concerns of the study were stated in the first part of the questionnaire in agreement with the principles of the Italian data protection authority (DPA).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study. Written informed consent for publication was obtained from the participating nurses.

Data Availability Statement: Data are available from the corresponding author.

Conflicts of Interest: The author declares no conflict of interest.

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