Prevalence of psychological morbidities and their influential variables among nurses in a designated COVID-19 tertiary care hospital in India: A cross-sectional study

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ABSTRACT

Background: Nurses are the main part of the health workforce, performing their duties as frontline warriors against the novel coronavirus pandemic. Nurses involved in the care of infected (COVID-19) patients, may feel more discomfort physically and experience greater psychological morbidities. Aims and Objectives: The main aim of the study is to evaluate the prevalence of anxiety and stress among nurses in a designated COVID-19 hospital and variables that influence these psychological problems. Methodology: Nurses working in the designated tertiary care hospital were invited to participate in an online cross-sectional survey (dated, September 5–15, 2020). A self-administered questionnaire regarding sociodemographic characteristics, COVID-19-related experiences, perceived threat regarding COVID-19, and two scales (Generalized Anxiety Disorder -7 and Perceived Stress Scale-10) for the assessment of anxiety and stress was applied to nurses. Chi-square test and multiple regression analysis were used to investigate the predictors (risk and protective) of psychological morbidities in nurses. Results: On analysis of 209 participants, it was revealed that 65 (31.1%) participants have anxiety symptoms and 35.40% have moderate to the high level of stress. Being proud of working in this profession was the only protective factor from such psychological morbidities. The identified risk factors for greater anxiety symptoms and moderate-to-high-level stress were, working experience of > 10 years (odds ratio [OR] = 3.36), direct involvement in the care of suspected/diagnosed patients (OR = 3.4), feeling worried about being quarantined/isolated (OR = 1.69,) and high risk of being infected at the job (OR = 2.3 for anxiety and OR = 2.1 for moderate-to-high stress). Conclusions: Deteriorating the psychic health of nurses is one of the major outcomes during the COVID-19 pandemic in India which warrants the necessity of providing psychological support to nurses and controlling the risk factors related to these problems. Greater focus should be on the frontline and experienced nurses.

Keywords: COVID-19, moderate-to-high-level stress, nurses, psychological symptoms, risk factors

The novel coronavirus 2019 (SARS-CoV-2) pneumonia became apparent in China and afterward, it became a public health issue and produced outrageous reactions across the world within a short period due to its eminent infectious nature and insufficient knowledge.¹ The COVID-19 infection, admission of patients in the hospitals and its associated morbidities has been increasing exponentially day by day with an attack rate of 1.4–4.5² and setting an unparalleled demand on health-care systems to fulfil the needs regarding social care worldwide.³ During

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these extreme circumstances, hospital staff, especially nurses are on the frontline and performing like a force in this combat against the dreadful pandemic. Nurses act as gatekeepers to the health-care system and provide a significant amount of health care. It was observed that nurses participated actively in the care of the patients during similar pandemics in the past, by sacrificing their own needs and making humanitarian contributions beyond their ethical and professional liabilities.

Most of the nurses were in close proximity with SARS-CoV-2 infected/suspected patients, due to which they were at greater risk of this dreadful infection and experienced occupational endangerment. Previous studies on the COVID-19 outbreak and other outbreaks revealed that nurses were highly concerned about infecting themselves or family members with this lethal virus and faced the difficulty in maintaining the equilibrium between this concern and the ethical constraint of continuing to dispense the care. Nurses may face uncertainties about this complicated and uncontrollable infectious disease. Social isolation and discrimination might lead to unwillingness to work and termination of their duties causing scarcity of staff in an already depleted nursing force which may put them under extreme professional pressure and psychological distress. Subjective perceptions as a risk can vary extensively among the nurses with objectively similar degrees of exposure to danger and maybe vigorously associated with psychiatric morbidities. However, nurses were observed to have immense complex psychic responses in the form of anxiety, stress, depression, insomnia, fatigue, anger, frustration, fear, helplessness, loneliness, shame, guilt, and posttraumatic stress disorders. At this crucial time, these acutely stressful and emotionally exhausting experiences not only affect their attention, understanding and skills to solve the problems but they might also impede their executive functions and henceforth, give rise to errors which can put the patient under great risk. These consequences would also make the nurses feel unprotected at their workplaces.

To provide psychological support, improve the mental health of nurses and maintain a balance between their health and professional obligations, it is vital to acknowledge psychological outcomes during this period. As far as we are aware, there are very few studies about the psychological outcomes in the nurses faced with this global disaster in one of the most severely affected countries like India (2nd most affected). Based on this perspective, we aimed at conducting this study which assessed the prevalence of psychiatric morbidities such as anxiety and stress among the nurses working in a designated COVID-19 tertiary care hospital during the current pandemic in India and potential variables that influence the outcome of these psychiatric morbidities.

**METHODOLOGY**

**Study design and settings**
This was a cross-sectional and observational study. It was an online survey, preferred due to the minimal face-to-face interactions and performed in one of the tertiary care center which was designated as a COVID-19 exclusive hospital. This study was carried out after getting Ethical approval from the institutional ethical committee board (UHSR/PS/20/4803) and in accordance with ethical committee standards and the Helsinki declaration. Before taking part in the study, it was compulsory for the participants to read and choose “yes” on the consent form describing the purpose of the study. Only one response per candidate was pertinent and it was encouraged to fill the pro forma independently. During the study, the anonymity and confidentiality of the participants were maintained as questions regarding their personal information like name or contact were not asked.

**Study participants**
The nursing staff, 260 in number, posted in the departments receiving suspected/diagnosed COVID-19 patients, intensive care units and in the emergency department, was requested to take part in the study. The nursing trainees, other medical workers, and nurses having any psychiatric disorder were not included in the study.

**Measurements**
The pro forma prepared by using Google Forms comprised of self-administered 20 questions. This questionnaire was framed based on the information gathered from the CDC. This pro forma was segregated into five segments enclosing, (i) informed consent, (ii) SD, to SD, questions about the socio-demographic characteristics, (iii) AE, to AE, questions regarding the attitude toward COVID-19 or related experiences of nurses, (iv) TP, to TP, questions represents the threat perceived by nurses regarding COVID-19 infection and (v) about the psychological health status of nurses which was interpreted with the help of two scales (Generalized Anxiety Disorder-7 [GAD-7] Scale and Perceived Stress Scale-10 [PSS-10]). Most of the questions were dyadic with Yes/No options and multiple answers were not allowed.

**Generalized Anxiety Disorder-7 Scale**
It is a 7-item self-report questionnaire used in clinical practice for screening and assessing the severity of GAD. Participants were asked, over the last 2 weeks, how often they had been bothered by the anxiety symptoms. Each item is scored from 0 to 3 (where 0 = not at all, 1 = several days, 2 = over half the days, 3 = nearly every day). A total score ranges from 0 to 21. Cut off points of 5, 10, and 15 may be interpreted as mild, moderate, and severe levels.
of anxiety on the GAD-7. A score of >10 would require further evaluation. GAD-7 has good reliability and validity. The Cronbach’s of GAD-7 is 0.82.\[10\]

Perceived Stress Scale-10
It is a 10-item self-report classic stress assessment instrument. The tool was originally developed in 1983, helping us understand how different situations affect our feelings and our perceived stress. The questions in this scale ask about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Each item is scored from 0 to 4 (where 0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, and 4 = very often). Individual scores on the PSS can range from 0 to 40 (where score 0–13 considered low stress, 14–26 considered moderate stress and 27–40 considered high perceived stress). PSS items have been found to have good correlations with other stress measures, self-reported health and health service measures, health behavior measures, and health-seeking behavior.\[17\]

Data collection procedure
The procedure of the study was explained to the superintendent of nurses and head nurses. Then, a WhatsApp link containing the information about the study was shared with them and this link was sent to their WhatsApp group. Data were collected from September 5 to 15, 2020. A total of 236 responses were obtained. The data were examined and 27 responses were removed as 11 were incomplete questionnaires, 9 respondents had psychiatric disorders and 7 nurses clicked “No” on the consent form. Hence, finally, 209 participants were enrolled in the study for further analysis.

Statistical analysis
The data were entered and analyzed using IBM SPSS 25.0 (Armonk, New York, USA). Descriptive statistics for the continuous variables were calculated as mean and standard deviation (SD). Categorical variables were calculated as frequencies and percentages. Chi-square test was used to assess the statistical significance of the risk factors for the psychological outcomes. Multivariable logistic regression analysis was applied to find out the independent factors by adjusting the variables significant in univariate analysis, and odds ratio (ORs) and confidence interval (95% CI) were used to evaluate the strength of association between factors and outcomes. Statistical significance of all two-tailed tests was set at $P < 0.05$.

RESULTS

General characteristics (socio-demographic, attitude and experiences, perceived threat)
In the study, among the 209 enrolled nurses, majority were female (92%) and <40 years old (94%) with a mean age of 31.55 (SD = 6.31) years. Most of the nurses participating in the study were married (86%), having one or more children (76%), and living with their family members (88%). Around 84% of nurses had work experience of <10 years. Only 24 nurses had a history of medical co-morbidities as shown in Table 1. Table 2

Table 1: Sociodemographic characteristics of nurses along with prevalence of anxiety and perceived stress in the characteristic subgroups and their univariate analysis

| Serial number | Groups | Subgroups | Total (n=209) | Nonanxious (n=144) | Anxiety Mild/moderate/severe (n=65) | P | Low stress (n=135) | Moderate to high stress (n=74) | Perceived stress | P |
|---------------|--------|-----------|--------------|-------------------|------------------------------------|---|-------------------|--------------------------|----------------|---|
| SD1 | Age (years) | 21-30 | 112 (54) | 80 (56) | 32 (49) | 0.459 | 77 (57) | 35 (47) | 0.300 |
| | | 31-40 | 84 (40) | 54 (37) | 30 (46) | 0.49 (36) | 49 (36) | 35 (47) | 0.300 |
| | | 41-60 | 13 (6) | 10 (7) | 3 (5) | 0.49 (35) | 7 (5) | 4 (6) | 0.300 |
| SD2 | Gender | Male | 16 (8) | 9 (6) | 7 (11) | 0.424 | 10 (8) | 6 (8) | 0.749 |
| | | Female | 193 (92) | 135 (96) | 58 (89) | 0.424 | 112 (92) | 68 (92) | 0.570 |
| SD3 | Marital status | Married | 179 (86) | 124 (86) | 55 (85) | 0.775 | 137 (87) | 62 (84) | 0.570 |
| | | Unmarried | 30 (14) | 20 (14) | 10 (15) | 0.775 | 18 (13) | 12 (16) | 0.821 |
| SD4 | Having one or more children | Yes | 159 (76) | 109 (76) | 50 (77) | 0.847 | 102 (76) | 57 (77) | 0.821 |
| | | No | 58 (24) | 35 (24) | 15 (23) | 0.847 | 33 (24) | 17 (23) | 0.570 |
| SD5 | Living status | Living alone | 25 (12) | 14 (10) | 11 (17) | 0.382 | 14 (9) | 11 (15) | 0.338 |
| | | Living with family | 184 (88) | 130 (90) | 54 (83) | 0.382 | 121 (91) | 63 (85) | 0.820 |
| SD6 | History of any medical co-morbidities | No | 185 (89) | 127 (88) | 58 (89) | 0.828 | 120 (89) | 65 (88) | 0.820 |
| | | Yes | 24 (11) | 17 (12) | 7 (11) | 0.828 | 15 (11) | 9 (12) | 0.013** |
| SD7 | Working experience (years) | <5 | 56 (27) | 38 (26) | 18 (28) | 0.717 | 40 (30) | 16 (22) | 0.013** |
| | | 5-10 | 120 (57) | 85 (59) | 35 (54) | 0.717 | 81 (61) | 39 (52) | 0.013** |
| | | >10 | 33 (16) | 21 (15) | 12 (18) | 0.39 (29) | 14 (9) | 19 (26) | 0.013** |

Anxious means GAD-γ score is >5. **P<0.05 is statistically significant and two tailed. GAD-γ – Generalised Anxiety Disorder-γ; SD – Socio-demographics
Table 2: Attitude towards COVID-19 and COVID-19 related experiences of nurses along with prevalence of anxiety and perceived stress and their univariate analysis

| Serial number | Variables | Response | Nonanxious (n=144) | Anxiety | Perceived stress n=65 | P | Moderate to high stress n=74 | P |
|---------------|-----------|----------|--------------------|---------|-----------------------|---|------------------------------|---|
| 1 | AE\(_1\) | Have you attended infection prevention training? | Yes | 175 (84) | 116 (81) | 59 (91) | 0.064 | 110 (82) | 65 (88) | 0.234 |
| 2 | | | No | 34 (16) | 28 (19) | 6 (9) | 25 (18) | 9 (12) | 0.189 |
| 3 | AE\(_2\) | Precautionary measures (PPE kit, masks, gloves, etc.) effective in preventing infection | Yes | 166 (79) | 118 (82) | 48 (74) | 0.180 | 111 (82) | 55 (74) | 0.177 |
| 4 | | | No | 43 (21) | 26 (18) | 17 (26) | 24 (18) | 19 (26) | 0.026** |
| 5 | AE\(_3\) | Directly involved in the care of suspected/diagnosed SARS-CoV-2 patients | Yes | 174 (83) | 115 (80) | 59 (91) | 0.049** | 109 (81) | 65 (88) | 0.189 |
| 6 | | | No | 35 (17) | 29 (20) | 6 (9) | 26 (19) | 9 (12) | 0.234 |
| 7 | AE\(_4\) | Assessed for SARS-CoV-2 infection | Yes | 90 (43) | 59 (41) | 31 (48) | 0.364 | 61 (45) | 29 (39) | 0.402 |
| 8 | | | No | 119 (57) | 85 (59) | 34 (52) | 74 (55) | 45 (61) | 0.583 |
| 9 | AE\(_5\) | Getting family support during the pandemic | Yes | 207 (99) | 144 (100) | 63 (97) | 0.003** | 134 (99) | 73 (99) | 0.254 |
| 10 | | | No | 2 (1) | 0 | 2 (3) | 1 (1) | 1 (1) | 0.881 |
| 11 | AE\(_6\) | Confident in self protection | Yes | 188 (90) | 134 (93) | 54 (83) | 0.025** | 125 (93) | 63 (85) | 0.086 |
| 12 | | | No | 21 (10) | 10 (7) | 11 (17) | 10 (7) | 11 (15) | 0.206 |
| 13 | AE\(_7\) | Confident in handling the patient | Normally | 145 (69) | 93 (64) | 52 (80) | 0.304** | 44 (33) | 16 (22) | 0.068 |
| 14 | | | Low | 4 (2) | 2 (1) | 2 (3) | 2 (3) | 3 (2) | 0.028** |
| 15 | AE\(_8\) | Proud to be a nurse | Yes | 197 (94) | 140 (97) | 57 (88) | 0.010** | 131 (97) | 66 (89) | 0.028** |
| 16 | | | No | 12 (6) | 4 (3) | 8 (12) | 4 (3) | 8 (12) | 0.238 |
| 17 | AE\(_9\) | Working overtime during the pandemic | Yes | 27 (13) | 17 (12) | 10 (15) | 0.475 | 14 (19) | 13 (18) | 0.138 |
| 18 | | | No | 182 (87) | 127 (88) | 55 (85) | 121 (91) | 61 (82) | 0.234 |

Anxious means GAD-7 score is >5. **Chi-square P<0.05 is statistically significant and two tailed. GAD-7 – Generalised Anxiety Disorder-7; PPE – Personal protective equipment; AE – Attitude and COVID-19 related experiences.

represents that almost 95% of participants thought that they were confident in handling the patient and in self-protection, got family support and were proud to be nurses during the COVID-19 outbreak. Around 80%–85% of nurses attended the infection prevention training, were involved in the direct care of suspected/diagnosed SARS-CoV-2 patients and thought that precautionary measures were effective in controlling the infection. Only 27 nurses reported that they were working overtime during the pandemic. A high proportion (60%) of nurses was not assessed for the SARS-CoV-2 infection. Around 90% of participants perceived the threat to their close contacts (friends/relatives) and that nurses themselves were at high risk of infection due to their jobs. Other statements, like “worried about being quarantined/isolated” and “stigmatized/distanced from others due to their job” were agreed upon by 62% and 61% of nurses, respectively [Table 3].

Prevalence of psychological morbidities and differences in their outcome levels due to the influential factors

About 31.10% of nurses reported anxiety symptoms, including mild anxiety symptoms (23.40%) and moderate to severe anxiety symptoms (7.70%). The mean score on GAD-7 for anxiety was 3.55 (SD = 3.71) [Table 4]. Statistically significant differences were found in the variables, including direct involvement in the care of suspected/diagnosed SARS-CoV-2 patients (91% vs. 81%) [Table 2] and the thought that their job puts them at high risk of being infected with COVID-19 (97% vs. 85%) [Table 3], with high proportion of nurses having anxiety symptoms. Univariate analysis showed that nurses getting family support during the pandemic (100%), confident in self-protection (93% vs. 83%), confident in handling the patient (98% vs. 97%), and proud to be a nurse (97% vs. 88%) were in the nonanxious group [Table 2].

The prevalence of stress was reported at being about 35.40%, including 33.50% with moderate level stress and 1.90% of nurses with high-level stress. Mean score on PSS-10 for stress was 10.62 (SD = 6.88) [Table 4]. Univariate analysis showed that more percentages of nurses in moderate-to-high-level stress group were working for more than the last 10 years (26% vs. 9%) [Table 1], were worried about being quarantined/isolated (73% vs. 57%) and thought that their job puts them at high risk of being infected with COVID-19 (96% vs. 85%) [Table 3]. A variable “Proud to be a nurse” was found to have statistically significant association, with more nurses having only mild perceived stress (97% vs. 89%) [Table 2].
Table 3: Threat perceptions regarding COVID-19 in nurses along with prevalence of anxiety and perceived stress and their univariate analysis

| Serial number | Statements | Response | Anxious (n=209) | Nonanxious (n=144) | Number (%) | Perceived stress | Mild/moderate/severe (n=65) | P | Moderate to high stress (n=74) | P |
|---------------|------------|----------|-----------------|---------------------|------------|------------------|-----------------------------|---|-----------------------------|---|
| TP<sup>1</sup> | My close contacts (friends/relatives) are at high risk of infection due to my job | Agreed | 188 (90) | 130 (90) | 58 (89) | 0.816 | 123 (91) | 65 (88) | 0.452 |
| | | Disagreed | 21 (10) | 14 (10) | 7 (11) | | 12 (9) | 9 (12) | |
| TP<sup>2</sup> | My job puts me at high risk of being infected with COVID-19 | Agreed | 186 (89) | 123 (85) | 63 (97) | 0.014** | 115 (85) | 71 (96) | 0.017** |
| | | Disagreed | 23 (11) | 21 (15) | 2 (3) | | 20 (16) | 3 (4) | |
| TP<sup>3</sup> | I am concerned about being quarantined/isolated | Agreed | 130 (62) | 84 (58) | 46 (71) | 0.086 | 77 (57) | 53 (73) | 0.038** |
| | | Disagreed | 79 (38) | 60 (42) | 19 (29) | | 58 (43) | 21 (27) | |
| TP<sup>4</sup> | I am stigmatized/distanced from others due to my job | Agreed | 127 (61) | 88 (61) | 39 (60) | 0.879 | 80 (59) | 47 (64) | 0.547 |
| | | Disagreed | 82 (39) | 56 (39) | 26 (40) | | 55 (41) | 27 (36) | |

Anxious means GAD-7 score is >5. **P<0.05 is statistically significant and two tailed. GAD-7 – Generalised Anxiety Disorder-7; TP – Threat perceptions

Table 4: Prevalence of anxiety and stress among nurses

| Scale | n (%) | Mean±SD |
|-------|-------|---------|
| Anxiety on GAD-7 | | |
| Normal | 144 (68.9) | 3.55±3.77 |
| Mild | 49 (23.4) | |
| Moderate | 10 (4.8) | |
| Severe | 6 (2.9) | |
| Perceived stress on PSS-10 | | |
| Low stress | 335 (64.6) | 10.6±6.88 |
| Moderate stress | 70 (33.5) | |
| High stress | 4 (1.9) | |

Number and percentage of nurses showing different level of anxiety and stress on GAD-7 and PSS-10. SD – Standard deviation; PSS – Perceived Stress Scale-10; GAD-7 – Generalised Anxiety Disorder-7

Discussion

This online cross-sectional survey evaluated the prevalence of psychological morbidities in nurses working in a designated hospital for the treatment and care of patients suspected/diagnosed with COVID-19. This study explored about one-third of nurses having problems in their psychological integrity which was influenced by many socio-psychological variables included in the study.

This study investigated the higher prevalence of moderate to the high level of perceived stress (PSS > 14) in 35% of the nurses and around 8% of nurses required further assessment for anxiety symptoms (GAD > 10). The result of the present study in terms of prevalence was higher than the previous study done in China. Previous studies done in India and other countries demonstrated similar results in form of higher prevalence of anxiety and moderate-to-high stress. Aksoy and Koçak, a study done in Turkey on 758 nurses reported that around 30%–35% of nurses were anxious and under psychological stress. A large scale study in China on 4692 nurses revealed that 8% of nurses, similar to the present study, required further evaluation for anxiety symptoms. Previously Zhu et al. also established that participants working in designated COVID-19 hospitals faced serious psychological changes. This could be due to longer work shifts and excessive workload as the outbreak forced high turnover rate of admission and presentation in the hospitals. As compared to the present study, the prevalence of anxiety symptoms was 38%–50% and stress was up to 75% which is much higher. These studies having been done during the initial phases of the pandemic when the situations faced by the participants were more alarming and challenging in nature, might be the reason for this inconsistency from the present study.

According to this study, psychological morbidities occurred mostly in younger participants (<40 years of age) with a
mean age of 31.55 years. Another study also revealed that younger participants (<40 years of age) were affected in higher proportions. This could be because most of the younger nurses were enlisted as frontline workers and their lack of expertise in anti-pandemic work made them highly vulnerable to this infection.

Some studies done across the world investigated the socio-demographic variables as significant predictors of anxiety symptoms. However, in the present study, none of the socio-demographic variables had an influence on the anxiety symptoms, as Indian nurses have greater psychological resilience developed during their career which helped to tide them over the psychological morbidities. Among the socio-demographic variables, the only risk factor was work experience of >10 years which had 3 times higher odds to develop the moderate-to-high stress in nurses. This observation was nearly similar to the findings in other studies where odds increased around 1.5–2 times. This greater psychological stress among experienced nurses might be explained by the presence of more occupational exhaustion, greater family responsibilities, and early evaluation of the risk of infection based on their clinical experience and knowledge.

It is worth mentioning that most of the nurses were confident in self-protection (90%) and in handling the patient (98%) but these factors had no influence on the psychic health of the participants as analyzed by multiple logistic regression analysis. During the pandemic, the involvement of the nurses in the anti-pandemic work makes them more skilled and knowledgeable in controlling the infection. This could be the reason that these variables were not revealed as protective factors in the present study, similar to the findings revealed by the Nie et al. Among the parameters of COVID-19 related experiences, direct involvement in the care of suspected/diagnosed patients (frontline work) is the only risk factor associated with anxiety among the nurses. In the multivariate analysis, frontline nurses were three times more likely to have anxiety symptoms when compared with those who never participated in frontline work (OR = 3.2; 95% CI = 1.03–9.99). Consistent to the present study, psychological survey in China done by Lai et al. and Zhu et al. also found that anxiety was 1.5–3 times more likely in the frontline nurses. Similarly, a study done in India also found that direct involvement in the care of suspected/diagnosed patients was the risk factor for the occurrence of anxiety symptoms. During frontline work,
nurses provide high-quality care and they have to stand in for family members at bedside level for 24 h to provide end life care due to which nurses are propelled in a state of anxiety after a prolonged and sustained period of exposure to deteriorating situations. Fear of nosocomial outspread of the virus to their family/friends/colleagues also contribute to their anxiety level.

The levels of anxiety symptoms and stress were reported to be higher among participants who perceived negative threats like worry about being quarantined/isolated and high risk of being infected at their jobs. In the present study, moderate to high stress had approximately 1.5 times higher odds in nurses worried about being quarantined/isolated. This finding is in line with some studies done globally. As nurses were asked not to go home and were quarantined after work leading to their support being decreased, it could well be the possible explanation for this factor being a risk for the development of greater psychological stress.

Interestingly, it was observed that the most influential factor for the higher risk of anxiety and stress among nurses was the perception regarding the high risk of being infected at their jobs. A study in India by Gupta et al. established an association between a higher risk of psychological problems and this perceived threat. In multivariate analysis, nurses had >2 times higher odds of being anxious and moderate-to-high stress while working in a designated hospital for COVID-19. These findings were consistent with the study done by Zhu et al. but the odds were >4 times higher in a study done by Nie et al. Nurses were highly concerned about being infected because they did not feel that the facilities were sufficient to manage and control the pandemic. Nurses having to wear full set of PPE kit for prolonged periods leading to physical discomfort and debilitating tiredness might be the reason for getting vulnerable to infection.

In the present study, 94% of nurses claimed to be proud to be in this profession and were found to be less anxious and stressed (OR = 0.2) than the participants who regretted to be in this profession during the pandemic. Cui et al. and Chen et al. also observed that pride of being in this profession was statistically significant associated with a lower risk of anxiety and stress. Previously, Lam and Hung established that pride of being in this profession, a positive professional attitude, was a protective predictor for psychological morbidities. During this crisis, nurses fulfilling their roles in the best way and getting confidence in self-protection, confidence in handling the patient, and adequate training before entering into negative pressure, were some of the factors which helped them in being proud of their profession. It helped in encouraging the nurses to participate in anti-pandemic work willingly.

Limitations
This study has several limitations. First, it is an online survey in which the chances of selection bias cannot be ruled out. Due to the stigma prevalent in India, nurses having mental illness might not participate in the study and it would result in under-reporting of psychological morbidities. Second, this study was cross sectional and limited to a single center. So, it is not possible to generalize the findings. The impact of the COVID-19 on psychology of nurses might be long term or changeable, which is not possible to investigate with a cross-sectional design study. Longitudinal studies are required in future to get in-depth information about the mental health of nurses in designated hospitals. The place of the survey may limit the generalization to all the nurses who were working in situations where the severity of the pandemic was different.

CONCLUSIONS
The study findings concluded that around one-third of the nurses in a designated COVID-19 hospital had significant psychological morbidities. Work experience of >10 years, contact with patients, high risk at job and worry about being quarantined/isolated were the risk factors for higher anxiety and moderate to high stress. The only protective factor from psychological morbidities in this study was the feeling of pride of being in this profession. It is necessary to find out more socio-psychological variables which are responsible for promoting anxiety and stress in nurses. Future interventions offering coping strategies and emotional assistance are desired to ameliorate the psychic health of the nurses.

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Conflicts of interest
There are no conflicts of interest.

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