

General Anxiety Predictors among Frontline Warriors of COVID: Cross-Sectional Study among Nursing Staff in Punjab, Pakistan

Tahir Mehmood Khan^{1,2*}, Humera Tahir³, Muhammad Salman⁴, Zia Ul Mustafa⁵, Muhammad Hussain Raza⁶, Noman Asif^{7,8}, Naureen Shehzadi⁷, Khalid Hussain⁷, Yaser Mohammed Al-Worafi⁹, Mirza R. Baig¹⁰

¹ Institute of Pharmaceutical Science, University of veterinary and animal sciences, City Campus, Outfall Road Lahore, Pakistan. ² School of Pharmacy, Monash University, Bandar Sunway, Selangor 45700 Malaysia. ³ Ruth Pfau College of Nutrition Sciences, Lahore Medical and Dental College, Lahore Pakistan. ⁴ Department of Pharmacy Practice, Faculty of Pharmacy, The University of Lahore. ⁵ District Headquarter Hospital Pakpattan, Punjab, Pakistan. ⁶ Faisalabad Institute of Cardiology, Punjab, Pakistan. ⁷ Punjab University College of Pharmacy, University of the Punjab, Lahore, Pakistan. ⁸ Gulab Devi Educational Complex, Lahore, Pakistan. ⁹ College of Pharmacy, University of Science and Technology of Fujairah, Fujairah, United Arab Emirates. ¹⁰ Department of Clinical Pharmacy & Pharmacotherapeutics, Dubai Pharmacy College for Girls, Dubai, UAE

Abstract

COVID-19 pandemic has increased the generalized anxiety among nursing staff. This cross-sectional questionnaire-based study aimed to determine the generalized anxiety disorders among the nursing staff working in secondary and tertiary care hospitals in Punjab province, Pakistan. A GAD-7 scale was used to assess anxiety. Non-parametric statistics were applied to estimate the difference among the groups. Multiple regression model was adopted to explore the impact of covariates on the GAD-7 score. A total of 133 nurses responded to this survey. It was revealed that being female (7.38 ± 4.20 , $p=0.032$) and having an age of ≥ 31 years (7.68 ± 5.14) might lead to a higher GAD-7 score. 19.6% of the respondents had a high level of generalized anxiety (GAD-7 score ≥ 10), and about 49.6% were falling in the range of mild anxiety. Female nursing staff have the probability of higher GAD-7 score up to 15% [$0.148(-0.450 - 4.697)$, $p=0.049$]. Job experience, especially being new to the field (≤ 3 years) might increase the likelihood of having a higher GAD-7 score by 14%. In conclusion, 19.6% of the respondents were meeting the GAD-7 criteria of moderate-severe level of generalized anxiety and depressive disorder. Being female, having less job experience, and no training on how to handle COVID patients were revealed to be the main factors influencing the GAD-7 score. Risk of getting COVID, transmission of COVID to family members through them, and uncertainty about the consequence of COVID in Pakistan were some of the common stressors reported by the nurses who participated in this study.

Keywords: Nurses, GAD-7, Anxiety, COVID, Pakistan

INTRODUCTION

Health professionals are the frontline warriors fighting the COVID-19 pandemic via involvement in direct patient care [1, 2]. Addressing the situation in Pakistan, involvement in direct patient care put extra responsibility on the nurses to act as a bridge of communication between patient, physician, and family members. Earlier studies conducted among nursing staff on duty reported stress and associated somatic symptoms to be very frequent [3, 4], which latter led to psychological problems like sadness, depression, poor working attitude, lack of self-esteem, and short temper [5]. Along with the environmental factors at the workplace (i.e. noise, time pressure, and long-standing hour) [6], tough routine during COVID-19 and risk of getting an infection can double the risk of stress and psychological problems among nursing staff. Moreover, in current circumstances, the risk of transmitting COVID-19 infection to the loved can be another worry for them to trigger generalized anxiety and stress [7,

8]. This situation can lead to accident and might contribute to absenteeism due to the fear of COVID-19 [9].

It is evident that the current stressful environment and high patients' turnout in the hospitals of Punjab province, Pakistan will increase the likelihood of generalized anxiety and

Address for correspondence: Dr. Tahir Mehmood Khan, Institute of Pharmaceutical Science, University of Veterinary and Animal Science, City Campus, outfall road Lahore, Pakistan.
Email: tahir.khan @ uvas.edu.pk

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How to cite this article: Khan T M, Tahir H, Salman M, Ul Mustafa Z, Raza M H, Asif N, et al. General Anxiety Predictors among Frontline Warriors of COVID: Cross-Sectional Study among Nursing Staff in Punjab, Pakistan. Arch. Pharm. Pract. 2021;12(2):40-4. <https://doi.org/10.51847/A0j3y5qmHp>

psychological problems among nursing and allied health care staff, which in turn leads to the declined performance [10, 11], and thus, increased risk of medical errors and other problems that may endanger the patients’ life and status. Nurses are the backbone of healthcare and they are responsible for the proper care of patients [12]. However, in the Pakistani setting, to date, limited attention has been paid to the stress among nursing staff during the COVID-19 pandemic. Therefore, the current research aimed to determine the generalized anxiety disorders among the nursing staff working in hospitals of Punjab province, Pakistan.

MATERIALS AND METHODS

Study design, settings, and subjects

An online, cross-sectional survey was conducted among the nursing staff working at secondary and tertiary care health settings of the Punjab province. The protocol of the present study was reviewed and approved by the Research Ethics Committee of the Department of Pharmacy Practice, Faculty of Pharmacy, The University of Lahore. Informed consent was obtained from each study participant.

Outcome measure

A universal sampling method was adapted and all nursing staff working at the selected health care facilities were invited for their participation in this study. An online anonymous questionnaire was used to investigate the level of anxiety among nursing staff during the COVID pandemic.

A generalized anxiety scale (GAD-7) was used to assess anxiety [13]. It contains seven items, each of which is scored 0 (not at all) to 3 (nearly every day), providing a 0 to 21 score. Scores of 5-9, 10-14, and ≥ 15 are taken as the cut-off points for mild, moderate, and severe anxiety, respectively. Using a cut-off score of ≥ 10 , the GAD-7 has a sensitivity of 89% and a specificity of 82%. Moreover, it is also moderately good at screening three other common anxiety disorders: panic disorder (sensitivity 74% and specificity 81%), social anxiety disorder (sensitivity 72% and specificity 80%), and post-traumatic stress disorder (sensitivity 66% and specificity 81%).

Statistical analysis

After appropriate coding and data cleaning, the data were imported into SPSS version 22 for the analysis. Non-parametric statistics were applied to estimate the difference among the groups. Multiple regression model was adopted to explore the impact of covariates on the GAD-7 score. Standardized beta was used to interpret the results of regression analysis at the confidence interval of 95%. The effect size was estimated using proportional analysis in STATA version 14®, using a random effect model. I^2 was estimated to see the heterogeneity in the data. A P-value of less than 0.05 was taken for statistical significance.

RESULTS AND DISCUSSION

A total of 133 nurses from 11 hospitals [District Headquarter (DHQ) Hospital Pakpattan, DHQ Hospital Okara, DHQ Hospital Sahiwal, Tehsil Headquarter (THQ) Hospital Arifwala, THQ Hospital Chichawatni, THQ Hospital Wazirabad, Punjab Institute of Cardiology, Faisalabad Institute of Cardiology, Jinnah Hospital, Children Hospital, and Lahore General Hospital] responded to the survey. Upon analysis, it was revealed that a majority of the respondents were female (120, 90.2%), and from the age group of 26-30 years (59, 44.4%). The job experience of most of the staff participated in this study was 1-6 years and the majority 51 (38.3%) were associated with the emergency department of the hospital. About 40% of the nursing staff had received training for COVID-19 and were performing duties at quarantine, ICU, or isolation ward for COVID-19 patients. Details are described in **Table 1**.

Table 1. Demographic of Respondents N=133

Demographics		N (%)
Age	Mean = 28.24 ±4.73 years	
	≤ 25 years	33 (24.8%)
	26- 30 years	59 (44.4%)
	≥ 31 years	41(30.8%)
Gender	Male	13 (9.8%)
	Female	120 (90.2%)
Job Experience	≤ 3 years	50 (37.6%)
	4-6 years	49 (36.8%)
	≥ 7 years	34 (25.6%)
	Medical Specialty	
	Neurology	6 (4.5%)
	Medicine	14 (10.5%)
	Emergency	51 (38.3%)
	Ortho	7 (5.3%)
	Surgery	20 (15.0%)
	Nephrology	5 (3.8%)
	Gynecology	5 (3.8%)
	Pediatrics	10 (7.5%)
	Cardiology	11 (8.3%)
	Others	4 (3.2%)
Placement	Quarantine Facility	7 (5.3%)
	Isolation ward	32 (24.1%)
	COVID ICU	10 (7.5%)
	Other areas	84 (63.2%)
	Received training for COVID	
	Yes	54 (40.6%)
	No	79 (59.4%)

Upon the analysis of GAD-7, among demographics variables, it was revealed that being female (7.38 ± 4.20 , $p=0.032$) and having an age of ≥ 31 years (7.68 ± 5.14) might lead to a higher GAD-7 score. Whilst exploring the difference in GAD-7 based on the job-related parameters, it was observed that those with a job experience of ≤ 3 years (7.39 ± 3.32) and

working in specific specialties (i.e. nephrology [9.50 ± 7.78], surgery [9.10 ± 4.67], and emergency [7.61 ± 3.98]) were observed to have a higher GAD-7 score in comparison with others. It was observed that those nursing staff who received some training regarding COVID were observed to have a significantly lower GAD-7 score (6.12 ± 4.09, 0.048) compared to those who had not received any training. Details are shown in **Table 2**.

Demographics	GAD - 7 Score	p-value
Age		
≤ 25 years	7.03 ± 3.57	0.840
26-30 years	7.20 ± 4.70	
≥ 31 years	7.68 ± 5.14	
Gender		
Male	5.77 ± 4.85	0.032*
Female	7.38 ± 4.20	
Job Experience		
≤ 3 years	7.39 ± 3.32	0.445
4-6 years	6.39 ± 3.44	
≥ 7 years	6.44 ± 3.44	
Medical Specialty		
Neurology	5.83 ± 3.76	0.786
Medicine	5.86 ± 4.38	
Emergency	7.61 ± 3.98	
Ortho	7.29 ± 4.23	
Surgery	9.10 ± 4.67	
Nephrology	9.50 ± 7.78	
Gynecology	6.60 ± 5.22	
Pediatrics	6.80 ± 4.83	
Cardiology	5.91 ± 3.51	
Others	6.01 ± 3.21	
Received training for COVID		
Yes	6.12 ± 4.09	0.048*
No	7.73 ± 4.74	
Placement		
Quarantine Facility	6.57 ± 6.30	0.370
Isolation ward	7.53 ± 5.01	
COVID ICU	8.70 ± 3.23	
Other areas	6.99 ± 3.87	

p-value < 0.05 was considered statistically significant, Mann-Whitney and Kruskal Wallis test was applied to estimate the difference among the groups

Estimation of the cut-off score for the respondents revealed that 19.3% of the respondents had a moderate-severe level of generalized anxiety, and about 49.6% of them fell in the range of mild anxiety (**Figure 1**). Furthermore, multiple regression was applied to rule out the impact of each variable and its probability in resulting generalized anxiety among the nursing staff. It was observed that the effect of age, i.e. being young (≤ 25 years) decreases the likelihood of having a higher GAD-7 score by 7%, and medical specialty have the

probability of 6.0% to affect the GAD-7 score. Keeping in view the standardized beta value, it was observed that being a female nursing staff increases the probability of a higher GAD-7 score up to 15% [0.148(-0.450 – 4.697), p= 0.049]. Job experience, especially being new to the field (≤3 years) might increase the likelihood of having higher GAD-7 score by 14%. The availability of the COVID facilities at the hospital and medical specialty in which staff was practicing was not found to affect the GAD-7 score substantially, however, those staff who received training regarding COVID were 12.0% more likely to have lower GAD-7 score. Details are shown in **Table 3**.

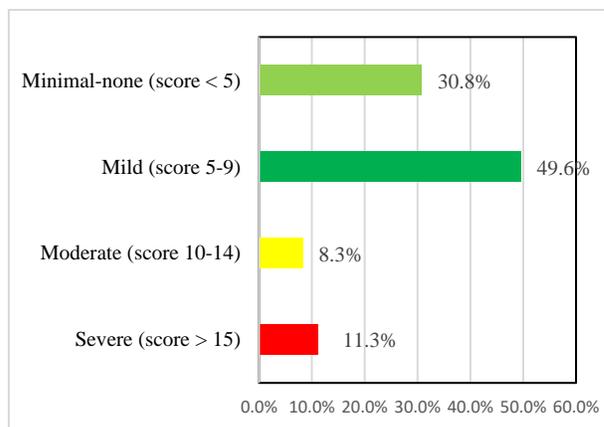


Figure 1. Cut-off score for GAD-7

Covariates	β	Lower Bound	Upper Bound	p-value
Age	-0.059	-0.396	0.265	0.696
Gender	0.148	0.001	0.985	0.049*
Job Experience	0.142	-0.223	0.634	0.345
Medical Specialty	0.059	-0.120	0.238	0.515
Placement	-0.031	-0.873	0.606	0.721
Received training for COVID	0.115	-0.513	2.502	0.194

Multiple logistic regression was applied, GAD-7 score was considered as the dependent variable, p-value< 0.05 was considered statistically significant, β= standardized beta

In addition, perceived sources of distress were also enquired from the respondents. The risk of infection for themselves and family members was of the main worries for the nurses who participated in this study. Moreover, they disclosed the worry to have a poor relationship with the family and friends due to COVID. Details are shown in **Table 4**.

Statement	Yes	No	ES	CI 95%	p-value/ I ²
I might get infected by COVID-19 at any moment	104(78.2%)	29(21.8%)	0.78	0.70 – 0.85	<0.001*/ 0.0%
I worry my family members will be infected because of me	104(78.2%)	29(21.8%)	0.78	0.70 – 0.85	

I am afraid of going to the hospital due to my hectic routine and risk of infection	55(41.4%)	78(58.6%)	0.41	0.33 – 0.50
I feel COVID-19 will persist in Pakistani for a very long time	114(85.7%)	19(14.3%)	0.86	0.79 – 0.91
I feel that it is extremely challenging to treat COVID-19 patients	78(41.4%)	55(41.4%)	0.59	0.50 – 0.67
I feel that COVID-19 patients might have serious consequences	108(81.2%)	25(18.8%)	0.81	0.74 – 0.87
I worry about the poor relationship between my family members/friends due to COVID-19	103(77.4%)	30(22.2%)	0.77	0.69 – 0.84

The effect size was estimated using analysis of proportions, random effect model was utilized to estimate the proportion/confidence interval of each stressor, p-values <0.05 were considered statistically significant

COVID-19 is the most devastating public health crisis since the influenza pandemic in 1918 [14]. To date (May 22, 2021), 165772430 people have globally been infected and 3437545 died due to it [15]. To the best of our knowledge, this is the first study that examined not only the generalized anxiety among nurses that are involved in the COVID-19 +ve patients but also focused to explore the potential factors that may lead to mental distress among the nurses of Punjab province of Pakistan. Regarding the anxiety and depression, a cut-point of ≥ 10 on GAD-7 is considered a “yellow flag” (drawing attention to a possible clinically-relevant condition), while a cut-point of 15 is a “red flag” (individuals in whom active treatment is probably warranted) [16]. In the present study, about 20% of the respondents fell in the range of moderate to severe anxiety. Regardless of the current scenario, i.e. COVID-19, which maximizes the chances of stress among nursing staff, work-related stress was observed as one of the most common problems globally among the professionals affiliated with the nursing profession [17-21]. However, in the sub-continent, i.e. India and Pakistan, stress among nursing staff has been reported as one of the common problems in hospital care settings and 35% to 85% of the respondents have been observed to suffer from a high stress level [4, 22, 23]. Earlier studies reported that approximately 35.0% of the nursing staff of the hospitals in Karachi city work under normal circumstances [23].

About 19.6% of the respondents of the current study were observed to have high level of generalized anxiety. Those with high anxiety should be referred for psychological assessment and care so that the episode of severe anxiety can be prevented. According to the results of our study, age and specialty had a minimal effect on the GAD-7 score of the respondents. However, the GAD-7 score was higher in female nurses ($\beta = 0.148$ CI 0.001- 0.985, $p = 0.049$, $GAD = 7.38 \pm 4.20$) without any training about COVID with a job experience of 1-3 years ($GAD = 7.39 \pm 3.32$). These findings are in line with the finding of other studies that reported a higher stress level among female nurses than the male [24]. Similarly, being a younger nurse with a lower job experience remained to be one of the key factors that are observed globally as a significant factor contributing to stress [25-27]. In light of these findings, policymakers should take note that along with the organization and occupational factors [28], gender and experience of the nurses also have a potential association with stress among the nurses. Overall, it was observed that majority 86% [0.86 (0.79-0.91)] were stressed

because they believed that COVID will persist in Pakistan for a longer duration and due to this patients might have serious consequences [0.81 (0.74-0.87)], which make the nurse worry and led to generalized anxiety. About 78% [0.78(0.70- 0.85)] were concerned that their family members of themselves become infected with COVID and this might lead a poor relationship with their loved ones [0.77(0.69-0.84)].

CONCLUSION

A majority of the nursing staff (49.6%) were found to have mild stress levels, only 19.6% met the GAD-7 criteria (Score ≥ 10) of generalized anxiety disorder. The GAD-7 score was significantly higher among female nursing staff. In addition, those having a lesser job experience and no training on how to handle COVID-19 patients had a higher GAD-7 score. Risk of getting COVID-19, transmission of COVID-19 to family members through them, and uncertainty about the consequence of COVID in Pakistan were some of the common stressors reported by the nurses who participated in this study.

Limitations

This study has not explored the stress among nurses due to work or occupation-related factors. The prime focus of the project was to see the impact of COVID in resulting generalized anxiety among nurses; therefore, the researchers were unable to gauge the impact of work-related and occupational impact resulting in stress among the nursing staff in the Punjab province, Pakistan.

ACKNOWLEDGMENTS: We would like to acknowledge support of all the educational and practice based institutes who assisted in conducting and disseminating the survey to all the participants.

CONFLICT OF INTEREST: None

FINANCIAL SUPPORT: None

ETHICS STATEMENT: The present study was approved by the Research Ethics Committee of the Department of Pharmacy Practice, Faculty of Pharmacy, The University of Lahore. Moreover, the research was conducted according to the ethical principles of the amended Helsinki Declaration. Informed consent was obtained from each study participant.

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