Research Square

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Anxiety Levels and Their Association with Coping Strategies: An Analytical Cross-sectional Study among Nurses in Tertiary care Hospitals Peshawar, Pakistan

Ibad Ur Rahman
Northwest General Hospital and Research Center
Muhammad Mazz
Northwest General Hospital and Research Center
Mian Irfan Ullah
Northwest General Hospital and Research Center
Maghaz Ali
Northwest General Hospital and Research Center
Muhammad Uzair Khan
uzairkhanuk2019@gmail.com

Northwest General Hospital and Research Center
Ikram Ullah
Northwest College Of Nursing
Naeem Ahmad
Northwest General Hospital and Research Center
Abdullah Khan
Hayatabad Medical Complex
Syed Yousaf Shah
Northwest General Hospital and Research Center

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Abstract

Background

Anxiety is the most common occupational mental health issue among nurses. It can impair concentration, clinical performance, and well-being. Workplace stress and limited organizational support may raise psychological distress, and the way nurses cope may shape how they respond.

Aim of the study:

To measure anxiety levels and examine their association with coping strategies among nurses working in teaching hospitals in Peshawar, Pakistan.

Methods

This research study included 242 nurses from one government and one private sector tertiary care hospital in Peshawar, enrolled by convenience sampling. The Generalized Anxiety Disorder scale (GAD-7) was used to determine the level of anxiety, and the COPE inventory was assessed to determine the level of coping. SPSS version 27 was used for data analysis; both descriptive and inferential statistics were applied for the analysis of data.

Results

The mean score of GAD was 7.55 ± 3.69, which is in the mild anxiety range. Mean scores did not differ between the two hospitals ($p = 0.157$), but the distribution of severity categories differed by hospital type ($\chi^2 = 9.257$, $p = 0.026$) and by gender ($\chi^2 = 13.256$, $p = 0.040$). Anxiety and coping were positively correlated ($r = 0.171$, $p = 0.004$), with avoidant coping ($r = 0.373$, $p < 0.001$) and emotion-focused coping ($r = 0.264$, $p < 0.001$). In the multivariable model, gender ($\beta = 0.175$, $p = 0.004$) and only avoidant coping ($\beta = 0.306$, $p < 0.001$) remained significantly associated with anxiety scores.

Conclusion

Nurses in this sample reported mild anxiety on average. Anxiety severity differed between hospital types and between men and women. Of the coping styles studied, avoidant coping was most strongly and independently tied to higher anxiety scores. The results point to a need for mental health support at work, earlier detection of psychological distress, and training that helps nurses build healthier ways of coping.

Introduction

Anxiety is the most common psychological response characterized by an emotional state of apprehension, nervousness, and physiological tension. Although transient apprehension can be adaptive, persistent or severe anxiety may impair cognition, emotional well-being, and daily functioning. Anxiety is the most common health issue worldwide, affecting an estimated 359 million people in 2021 and contributing substantially to years lived with disability (1). Symptoms can be a problem even if they do not meet diagnostic criteria. Higher anxiety can still hurt concentration, decision-making, and interpersonal functioning, all of which are essential in healthcare practice (2).

Health workers often face stressful, emotionally heavy situations. Nurses may be more vulnerable than most, since they are with patients constantly and also deal with heavy workloads, shift work, staff shortages, emergencies, and little organizational support (3). In nurses, anxiety and other psychological distress have been linked to fatigue, poorer attention and clinical decision-making, lower job satisfaction, thoughts of leaving the profession, communication problems, and lower quality of care(4). Higher anxiety has been reported in many nursing settings, especially emergency and critical care, and distress among frontline nurses rose sharply during the COVID-19 pandemic (5–7). The way nurses cope may affect how they deal with work stress. Coping is what people think and do in response to demands that they perceive as stressful or exceeding their resources. It is generally classified into three types: emotion-focused, avoidant-focused, and problem-focused. Problem-focused coping, however, involves directly tackling the problem with active problem-solving, planning, and seeking practical help. Emotion-focused coping includes acceptance, emotional support, religion, positive reframing, and humor. Avoidant approaches comprise denial, behavioral detachment, self-distraction, substance use, emitting, and self-blame (8–10). Generally, adaptive coping is related to better psychological adjustment, whereas avoidant or maladaptive coping is more often related to psychological distress. In Pakistan, nurses work in a health system marked by workforce shortages, high patient loads, and limited mental health resources, and considerable stress, burnout, and psychological distress have been reported among healthcare workers (11). Still, evidence that looks specifically at anxiety and its relationship with coping among nurses, using validated instruments, remains limited, particularly in Peshawar. Local evidence is therefore needed to guide organizational and psychological support interventions suited to the context.

Accordingly, this study aimed to assess anxiety levels and examine their association with coping strategies among nurses working in two teaching hospitals in Peshawar, Pakistan. It also examined whether anxiety differed by selected sociodemographic and institutional factors.

Methodology

This analytical research study was carried out among nurses working at two teaching hospitals (Northwest General Hospital & Research Center and Hayatabad Medical Complex MTI) in Peshawar, Pakistan. The duration of this research study was from November 15, 2025, to May 15, 2026. Moreover, ethical approval was granted by Northwest General Hospital and the Research Center (Reg #: IRB&EC/2025-IHS/0322). Moreover, a simple convenience sampling technique was used for the collection of data. In addition, the sample size was calculated using the Rao-Soft calculator, keeping the

confidence interval at 95% and a margin of error of 5%, and the calculated sample size was 242 respondents. A self-structured questionnaire was used for the collection of data. For anxiety the GAD-7 scale used and each item is scored from 0 ("not at all") to 3 ("nearly every day"), so total scores run from 0 to 21. The score of the group was minimal (0–4), mild (5–9), moderate (10–14), or severe (15–21) anxiety. The reported Cronbach's alpha of scale is 0.92(12). The brief COPE inventory was used to measure coping strategies developed by Carver(10). It consists of 28 items and 14 subscales of two items each: substance use, self-distraction, active coping, instrumental support, denial, behavioral disengagement, emotional support, venting, positive reframing, planning, humor, acceptance, religion, and self-blame. The subscales were grouped as problem-focused coping, emotion-focused coping, and avoidant coping. The reported Cronbach's alpha coefficient for first-order subscales is mostly below 0.70 except for self-blame and religion, there was good alpha estimate for the second-order two-factor EFA model at 0.81 and 0.86 (9). Scores were calculated according to the instrument scoring procedures. The data were analyzed using SPSS version 27. For demographic variable used frequency and percentages and for others, inferential statistics were used.

Results

Sociodemographic Characteristics of Participants

In total, 242 registered nurses took part. Table 1 shows that most respondents were aged 26–35 years (55.0%). In addition, the next largest group was 36–45 years (36.4%), then 46–60 years (7.9%), and only 0.8% were aged 15–25 years. Females accounted for 52.5% of participants and males for 47.5%. Slightly more participants were single (52.9%) than married (47.1%). Overall, 57.0% worked at HMC (public sector) and 43.0% at NWGH&RC (private sector).

Table 1
Sociodemographic characteristics of study respondents (N = 242)

Variable	Category	N	%
Age	15–25 years	2	0.8
	26–35 years	133	55
	36–45 years	88	36.4
	46–60 years	19	7.9
Gender	Male	115	47.5
	Female	127	52.5
Marital status	Single	128	52.9
	Married	114	47.1
Type of Hospital	Private (NWGH&RC)	104	43
	Public (HMC)	138	57

Generalized Anxiety Disorder (GAD-7)

The mean GAD-7 score for the overall sample was 7.55 (SD = 3.69), corresponding to the mild-anxiety range, with observed scores ranging from 0 to 16 (Table 2). Skewness (0.14) and kurtosis (-0.39) indicated an approximately normal distribution, supporting the use of parametric analyses.

Table 2
Descriptive Statistics for the GAD-7 Total Scores (N = 242) When stratified by hospital type (Table 3), the mean GAD-7 score was 7.86 (SD = 3.30) among nurses at HMC and 7.15 (SD = 4.14) among nurses at NWGH&RC. Levene's test showed unequal variances (F = 5.39, p = 0.021); therefore, Welch's independent-samples t-test was applied. The mean anxiety scores of the two hospitals were not statistically different, t(192.15) = -1.42, p = 0.157.

Variable	Min	Max	M	SD
GAD-7 Total Score	0	16	7.55	3.69

Table 3
Independent Sample t-Test for GAD-7 Anxiety Scores by Type of Hospital (N = 242)

Variable	HMC (n = 138)	SD	NWGH&RC (n = 104)	SD	T	Df	P
GAD-7 Total Score	7.86	3.30	7.15	4.14	-1.42	192.15	0.157

Association of Anxiety Severity with Participant Characteristics

The GAD-7 scores were categorized the anxiety as minimal, mild, moderate, or severe anxiety. Anxiety severity was significantly associated with hospital type ($\chi^2 = 9.257$, df = 3, $p = 0.026$), although the association was weak (Cramer's V = 0.196). Among nurses in the private hospital (n = 104), mild anxiety was most common (40.4%), followed by minimal (29.8%), moderate (23.1%), and severe anxiety (6.7%). Among nurses in the public hospital (n = 138), mild anxiety was also most common (55.1%), followed by moderate (25.4%), minimal (16.7%), and severe anxiety (2.9%). Thus, mild and moderate anxiety were proportionally more frequent in the public hospital, whereas minimal and severe anxiety were proportionally more frequent in the private hospital (Fig. 1).

Figure 1: *Distribution of anxiety severity by hospital type. Values are percentages. Pearson's chi-square test showed a significant association between anxiety severity and hospital type ($\chi^2 = 9.257$, df = 3, $p = 0.026$; Cramer's V = 0.196).*

Anxiety severity was also significantly associated with gender ($\chi^2 = 13.256$, df = 3, $p = 0.040$), with a moderate effect size (Cramer's V = 0.234). Mild anxiety was the most common category among both males (49.6%) and females (48.0%). Minimal anxiety was more frequent among males than females (27.8% vs 17.3%), whereas moderate anxiety was more frequent amzong females than males (26.0% vs 22.6%). Severe anxiety was reported by 8.7% of female nurses and by none of the male nurses (Fig. 2).

Figure 2. *Distribution of anxiety severity by gender. Values are percentages. Pearson's chi-square test indicated a significant association between anxiety severity and gender ($\chi^2 = 13.256$, df = 3, $p = 0.040$; Cramer's V = 0.234).*

Correlation between Anxiety and Coping Strategies

The Pearson correlation analysis was used to observe relationships between GAD-7 anxiety scores and coping-strategy scores (Table 4). Anxiety was positively associated with problem-focused coping ($r = 0.171$, $p = 0.004$), emotion-focused coping ($r = 0.264$, $p < 0.001$), and avoidant coping ($r = 0.373$, $p < 0.001$). Problem-focused coping was strongly correlated with emotion-focused coping ($r = 0.636$, $p < 0.001$). Smaller positive correlations were observed between problem-focused and avoidant coping ($r = 0.303$, $p < 0.001$) and between emotion-focused and avoidant coping ($r = 0.432$, $p < 0.001$).

Table 4
Correlations between anxiety and coping strategies among participants (N = 242)

Variables	1	2	3	4
Anxiety level (GAD-7 total score)	1	0.171**	0.264**	0.373**
Problem-focused coping	0.171**	1	0.636**	0.303**
Emotion-focused coping	0.264**	0.636**	1	0.432**
Avoidant coping	0.373**	0.303**	0.432**	1

*Note: Values are Pearson correlation coefficients (r). **p < 0.01. GAD-7 = Generalized Anxiety Disorder-7.*

Factors Associated with Anxiety Scores

A multiple linear regression statistical test was used to examine factors' independent relationship with anxiety scores after accounting for sociodemographic characteristics and coping strategies (Table 5). Age was not significantly associated with anxiety (β = 0.004, p = 0.950). Gender was significantly associated with anxiety scores (β = 0.175, p = 0.004). Among the coping strategies, avoidant coping was significantly related to higher anxiety scores (β = 0.306, p < 0.001), whereas problem-focused coping (β = 0.049, p = 0.528) and emotion-focused managing (β = 0.030, p = 0.718) were not significantly associated with anxiety scores.

Table 5
Association of anxiety score factors with Multiple Linear Regression Analysis (N = 242)

Variables	B	SE	B	T	p-value
Constant	0.501	0.318	—	1.573	0.117
Age of participants	0.004	0.064	0.004	0.063	0.95
Gender of participants	0.28	0.097	0.175	2.881	0.004
Problem-focused coping	0.011	0.018	0.049	0.632	0.528
Emotion-focused coping	0.004	0.011	0.03	0.361	0.718
Avoidant coping	0.049	0.011	0.306	4.574	< 0.001

Note: Dependent variable: GAD-7 anxiety score. B = unstandardized coefficient; SE = standard error; β = standardized coefficient.

Discussion

The aim of this research was to look at how anxious nurses were in two tertiary care hospitals in Peshawar, Pakistan, and whether that was related to how they coped. The mean GAD-7 score was 7.55 (SD = 3.69), which falls in the mild range. Earlier studies report much the same: psychological distress is

widespread among healthcare professionals, and nurses, who face steady demands at work, are especially affected (12, 13). Although mean GAD-7 scores did not differ significantly between the public and private hospitals, the distribution of anxiety severity categories differed by hospital type. Mild and moderate anxiety were proportionally more common among nurses in the public hospital. These results should be taken carefully because the two analyses address different representations of the same outcome: the t-test compares mean continuous scores, whereas the chi-square test compares the distribution across categorized severity levels. Regional studies have documented high patient loads, resource constraints, and work-related stress in public tertiary-care settings, which may provide context for the observed pattern(14–19). Gender was also associated with anxiety. Female nurses had higher proportions of moderate and severe anxiety, and gender continued to be significantly linked with anxiety scores in the adjusted regression model ($\beta = 0.175$, $p = 0.004$). Similar gender differences in anxiety have been reported in previous research(20, 21). Potential explanations may include work-family conflict, caregiving responsibilities, and gender-related workplace stressors; however, these features were not directly measured in the contemporary study and therefore cannot be confirmed as mechanisms (22–26). Anxiety scores were positively associated with all three coping magnitudes. The relationship was strongest for avoidant coping ($r = 0.373$), then emotion-focused managing ($r = 0.264$), and weakest for delinquent-focused coping ($r = 0.171$). The positive associations with problem-focused and emotion-focused managing may merely mean that more anxious nurses' inducement on a wider range of coping responses. They don't show that these strategies raise anxiety (26, 27). After adjustment, avoidant managing was the coping measurement most powerfully connected with higher anxiety scores in the regression model ($\beta = 0.306$, $p < 0.001$). Problem-focused and emotion-focused coping did not reach significance. This design is consistent with literature linking avoidant coping with greater psychological distress(28, 29). From a stress-and-coping perspective, avoidance may provide short-term emotional relief while leaving occupational stressors unaddressed; nevertheless, the cross-sectional design of this study precludes conclusions about temporal sequence or causality(29, 30). These findings recommend that showing for anxiety and classifying maladaptive coping outlines may be useful components of workplace mental health programs for nurses.

Limitations

The limitations of this research study were identified. Firstly, the cross-sectional study does not determine the relationship between anxiety and coping strategies. Secondly, anxiety and coping were assessed using self-administered questionnaires, it may be affected by response, recall, and social-desirability bias. Thirdly, participants were recruited by convenience sampling from only two tertiary care hospitals in Peshawar; consequently, the results may not be generalizable to nurses in other hospitals, levels of care, rural settings, or other regions of Pakistan. Fourth, potentially important confounders, including workload, shift patterns, staffing levels, organizational support, socioeconomic factors, previous mental health history, job satisfaction, and personal stressors, were not measured. Lastly, anxiety and coping may vary over time and in diverse clinical situations, and these variations may not be captured by a single assessment. Future studies should use probability-based sampling, include a

broader range of healthcare settings, measure relevant occupational and personal confounders, and consider longitudinal designs.

Conclusion

The nurses in this study had, on average, mild generalized anxiety. Although mean anxiety scores did not differ significantly between the public and private hospitals, the distribution of anxiety severity categories differed by hospital type. Gender was independently associated with anxiety scores, and female nurses showed a higher proportion of severe anxiety. Among the coping dimensions examined, avoidant coping had the strongest independent association with higher anxiety scores, whereas problem-focused and emotion-focused coping were not significant in the adjusted model. Since this was a cross-sectional study, the results describe associations only and say nothing about cause. Hospitals could benefit from offering routine psychological support, screening early for anxiety symptoms, and running programs that build adaptive coping and make work environments more supportive. Longitudinal and multicenter studies are needed to work out which direction these relationships run and what drives them

Declarations

Conflict of Interest

The author declares no conflict of interest.

Ethical Considerations

Ethical approval for the study was obtained from the Institutional Review Board & Ethical Committee of Alliance Healthcare Private Ltd under approval number IRB&EC/2025-IHS/0322. Written informed consent was obtained from all participants before data collection. Confidentiality and anonymity of participants were maintained throughout the study, and participation was voluntary. The study was conducted in accordance with the ethical principals of the Declaration of Helsinki

Consent for Publication:

Not applicable.

Competing Interests:

The authors declare that they have no competing interests.

Clinical Trial Number

Not applicable.

Funding:

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Author Contribution

I.R. conceptualized the study design, developed the methodology, and prepared the primary manuscript. M.M. did the statistical analysis and interpretation of the findings. Also prepared the figures and tables. M.I.U., M.A., and N.A. did the data collection procedure by distributing questionnaires among the participants. M.U.K. is the corresponding author who wrote the manuscript and is responsible for critical revisions of the manuscript. I.U. and A.M. were the supervisors of the study and responsible for reviewing the manuscript and helped in IRB approval. S.Y.S. is the co-supervisor and guided throughout this process. All authors reviewed the manuscript.

Data Availability

The datasets generated and analyzed during the current study are available from the corresponding author on resonable request.

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Figures

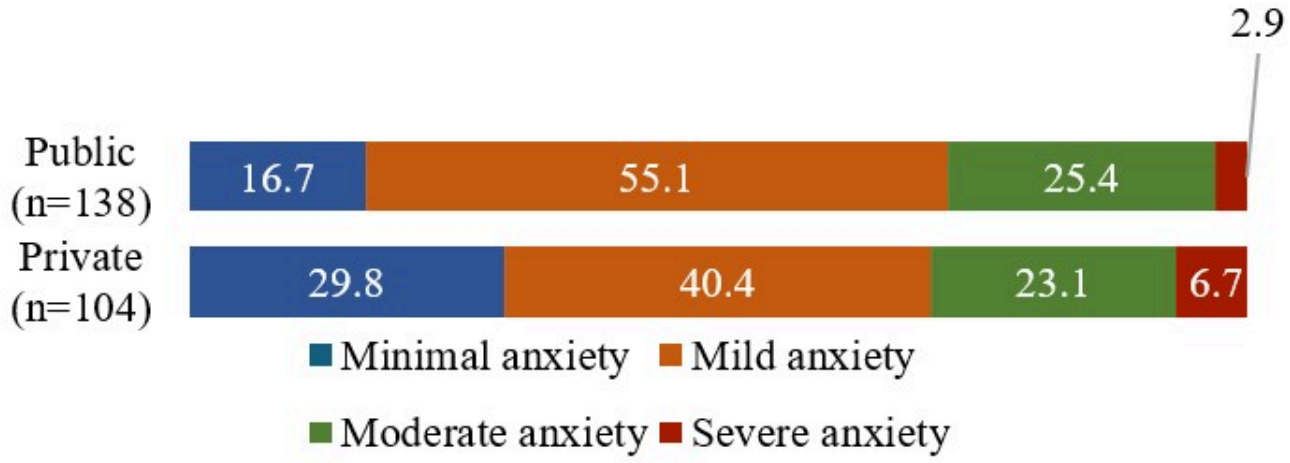

Figure 1

Association between anxiety level and hospital type

Distribution of anxiety severity by hospital type. Values are percentages. Pearson's chi-square test showed a significant association between anxiety severity and hospital type ($\chi^2 = 9.257$, df = 3, p = 0.026; Cramer's V = 0.196).

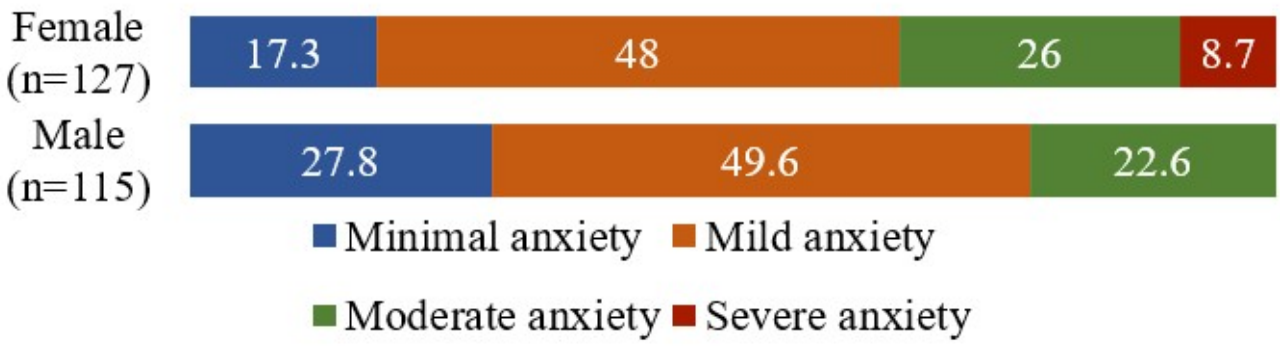

Figure 2

Association between anxiety level and gender

Distribution of anxiety severity by gender. Values are percentages. Pearson's chi-square test indicated a significant association between anxiety severity and gender ($\chi^2 = 13.256$, df = 3, p = 0.040; Cramer's V = 0.234).