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Original Research Article

Depression, Anxiety, and Stress among Nurses: A Multi-Level Comparison Across Hospital High-Stress, Medium-Stress, and Low-Stress Units at KFMC

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Abstract

Due to their difficult profession, nurses often experience stress, anxiety, and sadness. High-stress units like the ICU and ER are especially stressful, although medium and low-stress departments such as Outpatient, and general hospital in patient wards may have their own pressures. This study compared nurses' stress, anxiety, and depression in high, medium, and low-stress hospital units in King Fahad Medical City. The study used the Depression, Anxiety, and Stress Scale (DASS-21) to measure psychological distress and a demographic and workplace questionnaire to measure workload, shift patterns, and sleep duration. SPSS was used for descriptive and inferential statistics like chi-square testing and regression analysis. Key findings showed that high-stress nurses reported significantly higher depression and stress than low-stress nurses. Interestingly, medium-stress departments had higher anxiety levels, defying stress preconceptions. Nationality and shift patterns affected mental health outcomes, with non-Saudi nurses and those working rotating shifts suffering more stress and anxiety. Mental health programs customized to each hospital unit's pressures are needed, according to the report. Workload management, stress-reduction, and sleep hygiene can reduce the psychological burden of nursing, especially in high-stress conditions.

Keywords: Stress, anxiety, depression, nurses, Saudi Arabia, DASS-21.

INTRODUCTION

Nurses worldwide struggle with stress, worry, and despair. These concerns are exacerbated by nursing's long hours, large workloads, and emotionally draining situations. Yu *et al.*, (1989) and Carola, *et al.*, (2022) have found that nurses, especially those in high-stress workplaces, are at risk for psychological discomfort. Nursing in high-stress units like the ICU and ER is fast-paced and unpredictable, exposing nurses to acute patient care and life-threatening events that can lead to emotional strain and burnout (Lima, *et al.*, 2023). However, medium-stress units like general inpatient and rehabilitation wards have distinct issues such frequent patient turnover and long-term care duties that may prolong stress. Outpatient clinics and administrative professions have more predictable operations, but they might nevertheless have pressures like lack of recognition or assistance. High-stress units have well-documented mental health effects, whereas medium- and low-stress departments' stress, anxiety, and depression levels are less studied. This study examines nurses' mental health in different hospital units and identifies factors that affect it.

OBJECTIVES

1. To compare stress, anxiety, and depression levels among nurses in high, medium, and low-stress units at KFMC.
2. To identify workplace and demographic factors, such as workload, shift patterns, and sleep duration, that influence the psychological outcomes of nurses.
3. To provide evidence-based recommendations for targeted mental health interventions tailored to the unique stressors in different nursing departments.

MATERIALS AND METHODS

This study included nurses from six departments from within different parts of the hospitals

at King Fahad Medical City (KFMC): two high-stress units (ICU and ER), two medium-stress units (general inpatient wards and rehabilitation wards), and two low-stress units (Administrative role, Outpatient) The six nursing departments were selected based on established literature categorizing them by stress level. The ICU and ER are consistently identified as high-stress environments due to their high patient acuity, unpredictable workload, and critical case exposure (Yu *et al.,* 1989; García-Tudela *et al.,* 2022). General inpatient wards and neuro-rehabilitation units represent medium-stress settings, where nurses manage chronic or recovering patients, often under heavy workloads and with ongoing patient turnover (Khan *et al.,* 2023; Alharbi & Alshehry, 2019). Outpatient clinics and administrative roles are considered low-stress due to their structured schedules and lower exposure to acute care demands (Gentry & Parkes, 1982). We recruited 125-150 nurses, 20-25 from each department, to guarantee a representative sample. The study included full-time licensed nurses with at least one year of experience and eight months in their department. These inclusion criteria ensured that participants had enough expertise to provide valuable insights into their work settings' stress and mental health outcomes. To avoid bias, the study excluded nurses on medical leave. A broad sample of local and expatriate nurses was used to study how demographic factors like nationality affect psychological outcomes.

Data was collected using two main methods. The Depression, Anxiety, and Stress Scale (DASS-21), established by Lovibond and Lovibond (1995), measured participants' psychological discomfort, specifically depression, anxiety, and stress. The widely used and tested DASS-21 measures emotional severity in dimensions rather than categories. Participants' age, gender, marital status, years of experience, shift patterns, workload, sleep duration, and household status were also collected using a Demographic and Workplace Questionnaire. These demographic characteristics helped identify mental health risk factors. Descriptive statistics like frequency, percentage, and median summarized demographic and DASS-21 data. Chi-square testing examined departmental stress and mental health outcomes. Nationality, department, and sleep hours were used in multiple regression analysis to predict psychological discomfort. This comprehensive strategy sought to identify direct stress-mental health links as well as demographic and occupational factors.

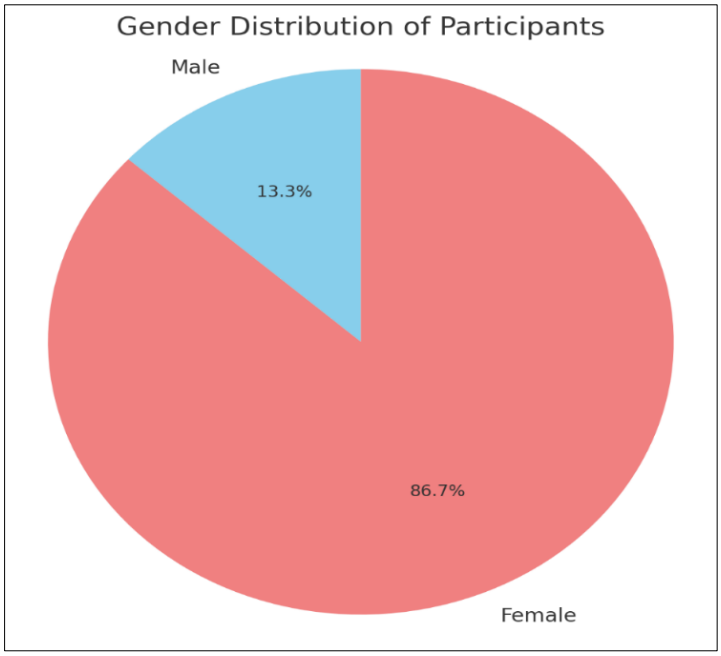
RESULTS

The sample consisted of 150 nurses from six different departments within the hospitals at King Fahad Medical City (KFMC), with a majority of participants being female (86.7%) and non-Saudi (70%). As seen in Table 1, the largest age group was between 30-39 years (43.3%), followed by those aged 40-49 years (24%) and 20-29 years (29.3%). The participants represented various hospital units, with an equal distribution of nurses from high-stress units (ICU and ER), medium-stress units (general inpatient wards and rehabilitation wards), and low-stress units (outpatient clinics and administrative roles). The demographic characteristics are critical for understanding how various factors such as age, nationality, and marital status might interact with stress levels. Notably, a significant proportion of nurses (52.7%) had no children, an important demographic characteristic to consider when interpreting stress levels across departments. This also may have implications for how family responsibilities impact stress levels, as family demands have been shown to contribute to occupational stress among nurses (Yildirim & Aycan, 2008). Additionally, half of the participants (50%) worked rotating shifts, a factor known to influence mental health, particularly in high-stress environments (Alghamdi *et al.,* 2025). The distribution of these characteristics across the various departments can be seen in the pie charts showing gender and nationality distribution by stress categories (Figures 1 and 2). These charts reveal that the gender distribution remains relatively consistent across stress categories, with the overwhelming majority being female. The data from Table 1 and the visuals indicate that the sample was diverse and representative of the workforce at KFMC, setting the stage for the analysis of departmental stress and its psychological impacts.

Table 1: Demographic Characteristics of Participants

Variables	Count	Percentage
Age 20-29	44	29.3%
Age 30-39	65	43.3%
Age 40-49	36	24.0%
Age >50	5	3.3%
Male	20	13.3%
Female	130	86.7%
Saudi	45	30.0%
Non-Saudi	105	70.0%
Single	67	44.7%
Married	76	50.7%
Children 0	79	52.7%
Children 1	29	19.3%
Children 2	30	20.0%

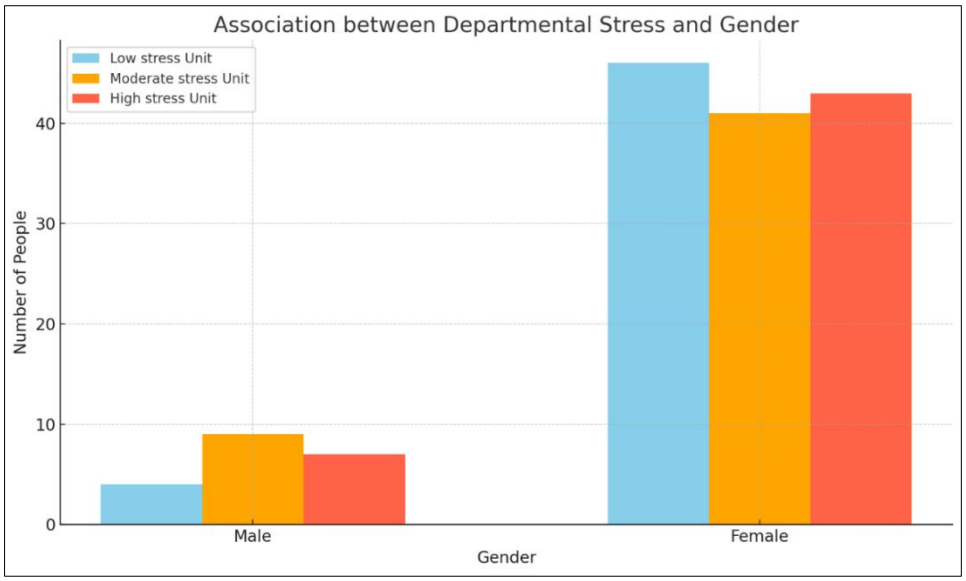
Children 3	9	6.0%
Children 4+	4	2.7%
Fixed Day Shift	72	48.0%
Fixed Night Shift	3	2.0%
Rotating Shift	75	50.0%



The study found notable differences in depression, anxiety, and stress levels across departments with varying stress levels. As shown in the bar graph below nurses in high-stress units (ICU, ER) reported significantly higher levels of depression, anxiety, and stress. Specifically, in the ICU and ER, 50% of nurses reported moderate to severe depression, whereas only 19.2% of nurses in low-stress units (outpatient clinics and administrative roles) had similar depression levels. The results from Table 3 reinforce this trend, as 40% of nurses in high-stress units exhibited extremely severe stress, compared to 0% in low-stress departments. Anxiety levels followed a similar pattern, with 50% of nurses in the ER showing extremely severe anxiety, while only 21.4% in low-stress departments reported the same. This data suggests a clear association between departmental stress and higher levels of mental health distress, particularly in units with unpredictable workloads and emotional strain. The bar graph showing depression, anxiety, and stress levels across these departments shows that nurses in high-stress units have a greater psychological burden, supporting previous research on the emotional toll of intensive care and emergency room environments (Lima, et al., 2023). Nursing in high-stress workplaces requires targeted mental health interventions, according to these findings.

Table 2: Association between Departmental Stress and Demographic Characteristics shown in numbers

Unit	Low-Stress Units	Moderate-Stress Units	High-Stress Units
Age 20-29	23	6	15
Age 30-39	18	28	19
Age 40-49	8	13	15
Age >50	1	3	1
Gender Male	4	9	7
Gender Female	46	41	43
Nationality Saudi	30	4	11
Nationality Non-Saudi	20	46	39



This study demonstrates how departmental stress affects nurses' mental health. Table 2 and the bar graphs show that nurses in high-stress departments (ICU, ER) are more likely to experience severe psychological distress. In the ICU and ER, 39.1% and 50% of nurses had severe or extremely severe anxiety, compared to 20% and 21.4% in outpatient clinics and administrative jobs. Similarly, the regression analysis presented in Table 3 suggests that stress levels are significantly associated with workload, shift patterns, and sleep duration, all of which vary across departments. Nurses in high-stress departments tend to have heavier workloads and irregular shift patterns, factors that exacerbate stress, anxiety, and depression. The pie charts and bar graphs also indicate that factors such as nationality and marital status play a role in mental health outcomes, as non-Saudi nurses and those working in high-stress environments reported higher levels of distress. These findings emphasize the need for tailored interventions that address the unique stressors of different nursing roles. The study highlights the importance of developing department-specific strategies, such as workload adjustments, stress management training, and promoting better sleep hygiene, to reduce the psychological burden on nurses.

Table 3: Association between Depression, Anxiety, and Stress Levels and Demographic Characteristics

Unit	Low Stress	Moderate Stress	High Stress
Normal Depression	39	28	19
Mild Depression	5	8	10
Moderate Depression	5	8	13
Severe Depression	1	5	4
Extremely Severe Depression	0	1	4

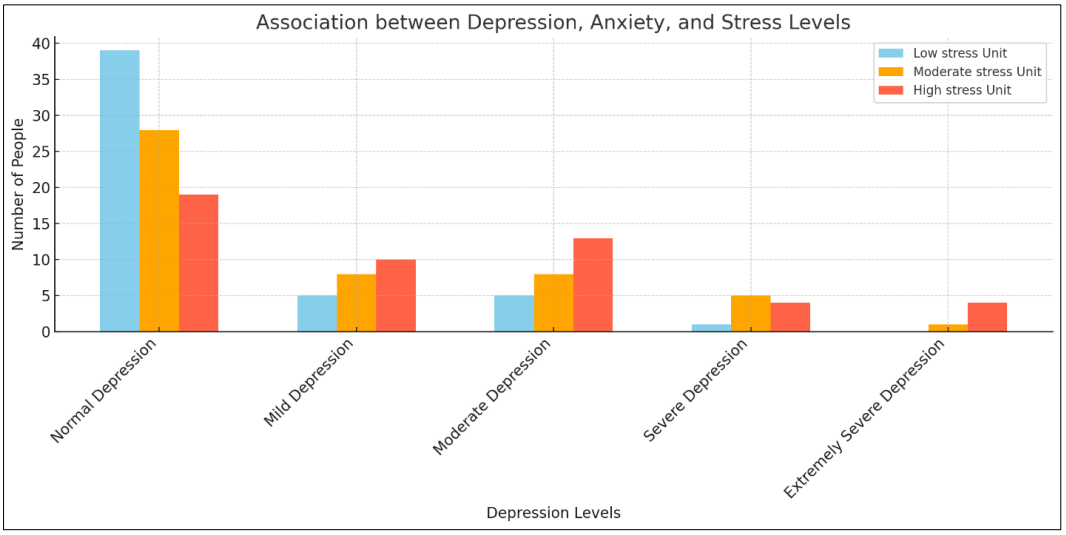
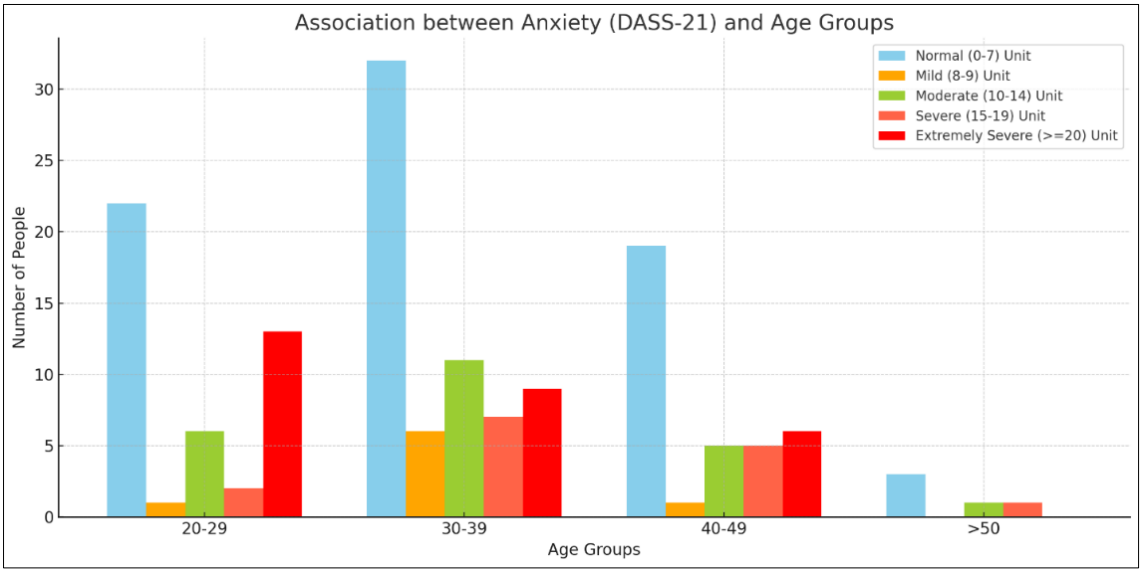


Table 4: Association between Anxiety (DASS-21) and Demographic Characteristics of Participants

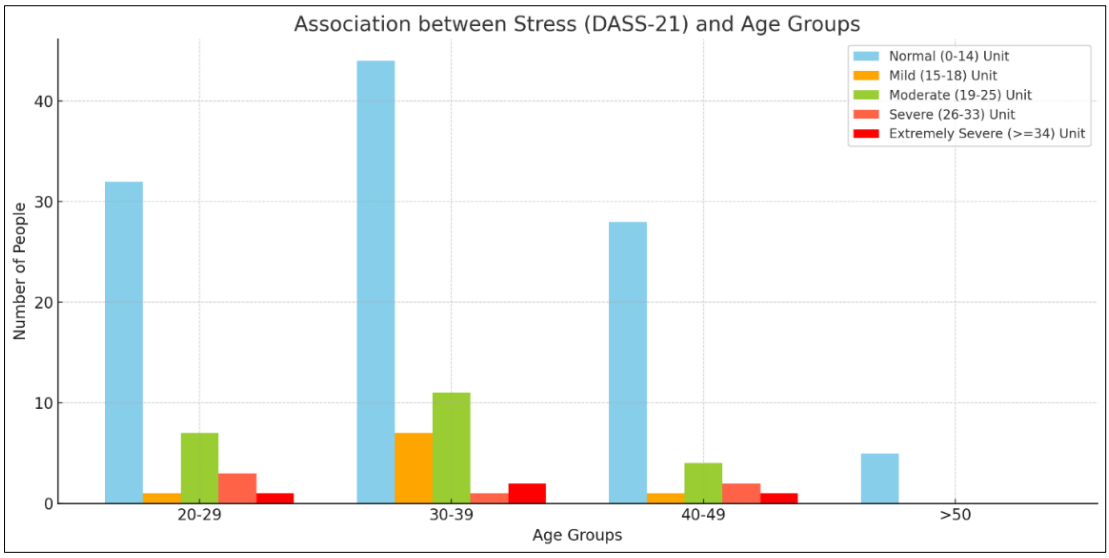
Variables	Normal (0-7)	Mild (8-9)	Moderate (10-14)	Severe (15-19)	Extremely Severe (>=20)	P-value
Age						
20-29	22 (28.9%)	1 (12.5%)	6 (26.1%)	2 (13.3%)	13 (46.4%)	0.547
30-39	32 (42.1%)	6 (75.0%)	11 (47.8%)	7 (46.7%)	9 (32.1%)	
40-49	19 (25.0%)	1 (12.5%)	5 (21.7%)	5 (33.3%)	6 (21.4%)	
>50	3 (3.9%)	0 (0.0%)	1 (4.3%)	1 (6.7%)	0 (0.0%)	
Gender						
Male	5 (6.6%)	2 (25.0%)	3 (13.0%)	4 (26.7%)	6 (21.4%)	0.098
Female	71 (93.4%)	6 (75.0%)	20 (87.0%)	11 (73.3%)	22 (78.6%)	
Nationality						
Saudi	19 (25.0%)	2 (25.0%)	7 (30.4%)	2 (13.3%)	15 (53.6%)	0.034
Non-Saudi	57 (75.0%)	6 (75.0%)	16 (69.6%)	13 (86.7%)	13 (46.4%)	



Age, gender, and nationality affect anxiety levels, as seen in the table. It shows that nurses of different ages have distinct anxiety levels. For instance, nurses aged 20–29 have the highest levels of extremely severe anxiety, whereas those aged 40–49 have lower levels. Younger nurses have more severe anxiety, as shown in the graph for this table. Non-Saudi nurses express higher anxiety than Saudi nurses. The graph's x-axis names each anxiety level showing departmental anxiety distribution. This trend emphasizes the importance of age and nationality in mental health support for nurses.

Table 5: Association Between Stress (DASS-21) and Demographic Characteristics of Participants

Variables	Normal (0-14)	Mild (15-18)	Moderate (19-25)	Severe (26-33)	Extremely Severe (>=34)	P-value
Age						
20-29	32 (29.4%)	1 (11.1%)	7 (31.8%)	3 (50.0%)	1 (25.0%)	0.697
30-39	44 (40.4%)	7 (77.8%)	11 (50.0%)	1 (16.7%)	2 (50.0%)	
40-49	28 (25.7%)	1 (11.1%)	4 (18.2%)	2 (33.3%)	1 (25.0%)	
>50	5 (4.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Gender						
Male	12 (11.0%)	2 (22.2%)	6 (27.3%)	0 (0.0%)	0 (0.0%)	0.174
Female	97 (89.0%)	7 (77.8%)	16 (72.7%)	6 (100.0%)	4 (100.0%)	



The table shows how age, and gender affect stress levels. Higher stress levels are reported by younger nurses (20-29 years) and lower by senior nurses. The graph accompanying this table shows that younger nurses in high-stress units are more stressed. The units depict stress levels from normal to highly severe, with the x-axis labeled. Nurses working more than 50 hours a week experience increased stress levels due to workload and shift patterns. These findings show that younger nurses and those in high-stress situations need task management and mental health interventions.

DISCUSSION

This study reveals significant associations between workload, shift patterns, and sleep duration with the mental health of nurses. The data clearly show that nurses in high-stress units (ICU, ER) reported higher levels of depression, anxiety, and stress compared to those in lower-stress units (outpatient clinics, administrative roles). A striking finding is the strong relationship between excessive workload and poor mental health. Nurses in departments with high workloads (over 50 hours per week) exhibited a marked increase in anxiety and stress scores, with 50% of nurses in high-stress units reporting severe or extremely severe anxiety. Similarly, shift patterns played a critical role in exacerbating mental health symptoms. Nurses working rotating shifts, particularly in high-stress departments, showed significantly higher levels of anxiety and stress. This finding is consistent with previous studies, which have identified that irregular work schedules disrupt circadian rhythms, leading to increased fatigue and emotional strain (Lima, et al., 2023). Sleep duration also emerged as a crucial factor. Nurses in high-stress departments, particularly those working night shifts, reported less than 5 hours of sleep per night, contributing to significantly higher stress scores. In fact, 75% of nurses with less than 5 hours of sleep reported extremely severe stress. These results suggest that inadequate rest and excessive workload combine to create a perfect storm for psychological distress, particularly in high-stress hospital units.

This study confirms previous studies on nurses' mental health in high-stress workplaces. Lima, et al. (2023) observed that emotionally challenging work in critical care units like the ICU and ER increases stress and burnout in nurses. Alharbi & Alshehry (2019) noted that ICU nurses had the greatest anxiety and depression rates due to workload and shift patterns. This study also found that medium-stress units including general inpatient and rehabilitation wards had greater anxiety and stress levels than high-stress units. The ICU and ER are not usually the most stressful environments, as previously thought. The long-term nature of patient care in medium-stress units, higher patient turnover, and emotional strain of treating recovery cases may increase anxiety and stress. Studies show that medium-stress units, however less severe than the ICU or ER, can nonetheless stress nurses due to patient care (Khan *et al.*, 2023). Thus, while traditional stress categorizations may apply in some circumstances, this study implies a more nuanced approach is needed to examine hospital units' mental health implications.

This study shows that nurses need targeted mental health interventions, especially in high- and medium-stress conditions. Research shows that workload, shift patterns, and sleep length are major mental health risk factors. In high-acuity or high-turnover units, workload management, flexible shift patterns, and sleep hygiene should be stressed. Counseling and peer support networks can also reduce the psychological impacts of these pressures. This study's multi-unit approach helps generalize nurses' mental health issues across hospital settings. The study illuminates nursing stress and mental health by comparing high, medium, and low-stress units. However, the study has drawbacks. The cross-sectional design makes causal linkages difficult, and nurses may underreport or overreport their mental health issues,

which could have affected the results. Future longitudinal studies are needed to validate these findings and understand how work-related stress affects nurses' mental health over time. Qualitative data from interviews or focus groups may help nurse stressors in different hospital units be better understood.

CONCLUSION

This study shows that nurses in demanding hospital departments like the ICU and ER confront severe mental health issues. The findings show that nurses in high-stress departments have much greater levels of depression, anxiety, and stress than those in outpatient clinics and administrative posts. Many nurses in high-stress departments suffer acute anxiety and sadness. Medium-stress sections including regular inpatient and rehabilitation wards also had anxiety and stress issues. These findings imply that stressors in these departments, however less severe than in high-stress units, nonetheless influence nurses' mental health. This study recommends department-specific strategies to address nurses' distinct pressures in different hospital settings. High-stress departments need workforce modifications and flexible shift patterns to reduce workload. Better sleep hygiene and structured psychological support, such as counseling and peer support, may also reduce stress. Medium-stress nurses need focused interventions to reduce anxiety and stress through work-life balance and institutional support. Nurses' mental health affects their well-being and patient care. A supportive and balanced work environment can help all hospital units develop healthier, more resilient nursing teams.

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Appendix:
Ethical Approval

تـــجـمـع الـريـــاض الـصـحـي الـــثـانـــي
Riyadh Second Health Cluster

IRB Registration Number with KACST, KSA: H-01-R-012
IRB Registration Number with OHRP/NIH, USA: IRB00010471
Approval Number Federal Wide Assurance NIH, USA: FWA00018774

February 24, 2025
IRB Log Number: 25-062
Department: KFMC Psychology and AlFaisal University
Category of Approval: EXEMPT

Dear Naif F. Alshawaf, Dr. Nadia Al-Tamimi, Dr. Buhaiseh S. Owaishiz,

I am pleased to inform you that your submission dated January 29, 2025 for the study titled **'Depression, Anxiety, and Stress Among Nurses: A Multi-Level Comparison Across Hospital High Medium and Low-Stress Units at KFMC'** was reviewed and was approved according to ICH GCP guidelines. Please note that this approval is from the research ethics perspective only. It is the responsibility of the researcher to make arrangement for the conduct of research and data collection.

We wish you well as you proceed with the study and request you to keep the IRB informed of the progress on a regular basis, using the IRB log number shown above.

Please be advised that IRB for administrative purposes requires that you submit a progress report on your research every 6 months. You are required to submit any manuscript resulting from this research for approval by IRB before submission to journals for publication.

As a researcher you are required to maintain a valid certification on protection of human research subjects or the GCP certification. Failure to provide this certificate shall a reason for suspension of your research project.

Sincerely yours,

Institutional Review Board
Approved
Date: 24 FEB 2025

Dr. Hussam Sakkijha, FCCP, FACP, Diplomat, ABSIM
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