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The Association Between Sleep Quality, Depression, Anxiety, and Job-related Stress Among Nurses in Saudi Arabia

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Abstract

Background: This study examined the mediating role of sleep quality in the relationship between depression, anxiety, and job-related stress among nurses in Saudi Arabia.

Methods: Sociodemographic information, Pittsburgh Sleep Quality Index, depression, anxiety, and work-related stress were evaluated in 851 nurses. Structural equation modeling was used to investigate the mediation effect of sleep quality on mental health and job stress in nurses.

Results: High rates of anxiety (65.9% severe, 34.1% moderate), depression (37.2% moderate to severe), and poor sleep (51.4%) were found. Sex, marital status, education, nationality, and smoking status significantly influenced mental health outcomes. For example, female, college-educated, non-Saudi, and smoker participants reported lower depression levels. Younger participants (aged 26–35) were associated with higher anxiety and lower poor sleep.

Conclusions: This study revealed a significant prevalence of anxiety, depression, and sleep disturbances among nurses. Females and those with lower education levels and in specific age groups were more likely to experience poorer mental health. Poor sleep quality was strongly associated with anxiety and depression. These findings indicate the urgent need for comprehensive mental health assessments and interventions to improve the well-being of nurses.

Keywords: anxiety, depression, nurses, psychological, Saudi Arabia, sleep disorders, stress

INTRODUCTION

Nurses worldwide are subject to extreme strain owing to the healthcare system's inherent demands and their critical role in patient care.[1] The ability of nurses to protect patients and effectively perform their duties can be compromised by the development of severe psychological disorders, including sleep disturbance and anxiety, as a result of persistent workplace stress.[2] The stress levels of nurses in Saudi Arabia are exacerbated by systemic and cultural challenges.[3] Mental health issues among nurses should be promptly addressed, as they have an immediate impact on staff retention, productivity, and service quality, all of which subsequently affect the overall healthcare system.[4] Considering the magnitude of negative job stress on the mental health of Saudi Arabian nurses, it is critical to address their well-being. However, future research should consider specific interventions, and policymakers should employ supportive policies toward eliminating factors influencing the well-being of nurses.

The demands of the healthcare system and the essential function of nurses in patient care have generated considerable stress for nurses worldwide, including those in Saudi Arabia.[1] Persistent exposure to stress can have a profound impact on the mental health of nurses, leading to various psychological issues. Moreover, frequent work-related stress can hinder nurses' ability to effectively perform their duties and protect patients, which may result in severe psychological difficulties, including sleep disturbance and anxiety. Happell *et al*.[2] revealed that the stress levels of nurses in Saudi Arabia are intensified by systemic and cultural issues.[3] Mental health concerns among nurses require immediate attention, as they directly influence staff retention, productivity, and service quality, impacting the broader healthcare system.[4] Studies have shown a significant relationship between psychological problems, such as anxiety and depression, and work stress among nurses.[6] Happell *et al*.[2] reported that heightened stress levels exacerbate anxiety and depression symptoms, hence diminishing general well-being and mental health. The quality of sleep is strongly influenced by stress and mental health conditions. Inadequate sleep can intensify anxiety and depression symptoms.[9] Conversely, research has demonstrated an association between improved sleep quality and better mental health outcomes, indicating that improved sleep quality may act as a mediating element.[10]

Several studies have shown that job environment affects an individual's stress, anxiety, and depression levels and, in some cases, overall sleep quality. A comprehensive understanding of the relationship between these three factors and Saudi nurses remains elusive. Although

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previous studies have shown a negative association between sleep quality and anxiety and depression levels regardless of a particular area of interest including students or healthcare professionals, the same cannot be said with regard to nurses in the Northern region of Saudi Arabia.[11] Such a gap is critical as it can assist in bridging the policy needs and designing culturally appropriate strategies for enhancing the health of Saudi Arabian nurses. Organizational problems and conflicts that are atypical to nurses warrant an extensive investigation of their association to job stress, job-related depression, anxiety, and sleep disorders. An earlier study showed that organizations' understanding of some stressful aspects and improvement of the sleeping scenarios could help in alleviating depression among nurses.[11] Nurses in Saudi Arabia experience job stressors including anxiety, depression, and sleep deprivation. Therefore, it is crucial to focus on their health. Further studies should determine the effectiveness of certain interventions, and policy practitioners should be more proactive in developing favorable policies for a better work setting for nurses.

The present study is relevant as it has the possibility of implementing evidence-based measures that can greatly improve the healthcare system, cost incurred, and rate of nurse attrition. By clarifying the complex link between job stress, anxiety, depression, and sleep quality, the current study is concerned with the enhancement of interventions that aim toward the mental well-being of nurses in Saudi Arabia. Such improvements are essential because they help improve the quality of care, satisfaction, and retention rate of nursing human resources. Significantly, the present study provides additional evidence on the determinants of the mental health of nurses in Saudi Arabia, which will be useful to healthcare policymakers, staff, and health managers. The outcomes of this study are beneficial in addressing institutional arrangements in the healthcare sector in a way that will enhance the work environment of the nurses in the Northern region of Saudi Arabia, which is, in turn, critical for the sustainability of the healthcare services. Therefore, this study aimed to examine the mediating role of sleep quality in the relationship between depression, anxiety, and job-related stress among nurses in Saudi Arabia.

METHODS

This research was approved by the Institutional Review Board Log Number 2024-85, Hail Health Cluster, Hail Region, KSA, ensuring adherence to ethical guidelines. All participants provided informed consent after receiving detailed information about the study's purpose, procedures, and potential risks. Confidentiality was maintained throughout the research process, and participants had the right to withdraw from the study at any time.

A cross-sectional design using an online standardized questionnaire was employed. Eighteen prestigious public and private hospitals, nine located in the eastern region and nine in the northern region of Saudi Arabia, participated in the study. Nurses who met the following inclusion criteria were enrolled in the study by convenience sampling: a minimum of 6 months of hospital service, written and spoken English proficiency, and voluntary participation. The principal cohort consisted of nurses, who comprise the bulk of the hospital staff and are believed to dedicate the greatest amount of time to patient care and hospital visits. The online survey used a standardized questionnaire and was conducted on 851 healthcare professionals.

A Google Form survey was used to gather data, employing a unique link sent to supervisors. The supervisors of each participating hospital served as the contact persons who helped identify nurses who met the inclusion criteria. Individual responses to the survey were acquired from the participants during their free time. Although permission from the respondents to use their data was not requested, it was assumed that they had given it by filling out and submitting the questionnaire. To increase the response rate, a reminder message asking participants to return the completed forms was sent through WhatsApp. The participants' anonymity was maintained with the utmost care. Data gathering was performed from January to April 2024. This research used four questionnaires which are Pittsburgh Sleep Quality Index (PSQI), Beck's Depression Inventory (BDI), Beck Anxiety Inventory (BAI), and Work Stress Screener (WoSS-13).

PSQI consists of 19 self-rated questions and 5 questions rated by a bed partner or roommate if available. Only the self-rated questions were included in the scoring. The 19 self-rated items were combined to form seven component scores, each ranging from 0 to 3 points. A score of 0 indicates no difficulty, whereas a score of 3 indicates severe difficulty. These seven component scores are summed to produce one global score, ranging from 0 to 21 points, wherein 0 indicates no difficulty and 21 indicates severe difficulties in all areas.[12]

BDI is a 21-item self-report rating inventory that measures the characteristic attitudes and symptoms of depression. Developed by Beck *et al*. in 1961,[13] the BDI has multiple forms, including computerized versions, a card form, a 13-item short form, and the BDI-II by Beck, Steer, and Brown.[14] The BDI-II, detailed in sources such as Steer, Rissmiller, and Beck,[15] takes approximately 10 minutes to complete and requires a fifth- to sixth-grade reading level. The BDI exhibits internal consistency ranging from 0.73 to 0.92, with a mean of 0.86; similar reliabilities for the 13-item short form; and alpha coefficients of 0.86 and 0.81 for psychiatric and nonpsychiatric populations, respectively.[14,15]

BAI includes 21 items wherein individuals self-report symptoms using a scale from 0 to 3 to describe the intensity of their symptoms over the past week: 0 represents not at all; 1 indicates mildly, but it didn't bother

me much; 2 means moderately; it wasn't pleasant at times; and 3 represents severely; it bothered me a lot. The total score is calculated by summing the scores of all items. Scores of 0–7 indicate minimal anxiety; 8–15, mild anxiety; 16–25, moderate anxiety; and 30–63, severe anxiety.[16]

WoSS-13 comprises 13 items divided into two parts: Form A and Form B. Form A, which assesses benign stress, includes eight items organized into two subscales. Items 1–5 pertain to positive work-related effects/stress, whereas items 6–8 relate to general positive effects. Form B, which evaluates harmful stress, includes five items. Scores in Form A, subscale 1, can range from 0 to 15, subscale 2 from 0 to 9, and Form B from 0 to 15. Responses were scored as never (0), several days (1), more than half of the days (2), and almost every day (3). A high score in subscale A indicates benign stress, whereas a high score in subscale B signifies malignant or harmful stress.[17]

The present study adapted the original version of the questionnaires, and no modifications were made. The validity of the questionnaire was confirmed by three experts (one with the doctorate in nursing and two psychometricians). A pre-test was conducted in15 participants, and the alpha coefficient was 0.83 for the PSQI, 0.80 for the BDI, 0.85 for the BAI, and 0.84 for the WoSS-13. Such coefficients prove that the measures applied have a considerable level of internal reliability.

SPSS version 21.0 and AMOS 22.0 were used to analyze data. Descriptive statistics were employed to summarize categorical and continuous variables. The Mann–Whitney U and Kruskal–Wallis tests were utilized to assess associations between variables. Multivariate linear regression was performed to predict factors influencing benign and harmful work-related stress. Structural equation modeling (SEM) with the bootstrap method was employed to test the mediating role of sleep quality. The model's fit was evaluated using various indices, with an adequate fit considered when CFI, GFI, NFI, and IFI values exceeded 0.90.

RESULTS

The majority of the study participants were male Saudi Arabian nurses aged >35 years, with a significant portion holding a Bachelor of Science in Nursing (BSN) degree. Most participants had been working as nurses for over 10 years and had a monthly income >10,000 Saudi Riyals (Table 1).

A significant number of participants reported moderate to severe depression and anxiety. The mean scores for work-related stress were elevated, indicating significant work-related strain. These findings reveal the urgent need for effective interventions to address the mental health needs of healthcare professionals and improve their overall well-being (Table 2).

TABLE 1. Sociodemographic data of the nurses (N = 851)

Variable	N	%
Age (year)		
≤25	81	9.5
26–35	195	22.9
>35	575	67.6
Sex		
Male	764	89.8
Female	87	10.2
Marital status		
Single	162	19.0
Married	635	74.6
Divorce	54	6.3
Education		
BSN Graduate	414	48.6
BSN with Master's Unit	152	17.9
Master's Graduate	166	19.5
Master's with PhD Unit	50	5.9
PhD Graduate	69	8.1
Years of experience		
≤5 years	260	30.6
6–10 years	112	13.2
>10 years	479	56.3
Family income		
<5,000 SAR	155	18.2
5,000–10,000 SAR	142	16.7
>10,000 SAR	554	65.1
Nationality		
Saudi Arabian	789	92.7
Non-Saudi Arabian	62	7.3

1 USD = 3.75 Saudi Riyal; SAR: Saudi Riyal

TABLE 2. Depression, anxiety, and work stress scores among nurses

	Mean ± SD	N	%
Overall depression	14.7 ± 13.4		
Overall anxiety	14.1 ±13.5		
Benign stress (Woss A)	8.6 ±7.3		
Harmful stress (Woss B)	4.2 ±4.0		
Severity of depression			
Minimal		484	56.9
Mild		50	5.9
Moderate		162	19.0
Severe		155	18.2
Severity of anxiety			
Low anxiety		642	75.4
Moderate anxiety		122	14.3
Potentially concerning levels of anxiety		87	10.2

Woss: work stress screener; SD: standard deviation

Multivariate linear regression analysis revealed significant associations between demographic factors and sleep quality, depression, and anxiety among nurses. Older age, female sex, longer work experience, specific income brackets, and Saudi Arabian nationality were associated with poorer sleep quality. Female sex, single marital status, specific education levels, certain experience levels, and Saudi Arabian nationality were associated with higher depression levels. Younger age, female sex, single marital status, specific education levels, certain experience levels, and Saudi Arabian nationality were associated with higher anxiety levels. Table 3 presents a detailed breakdown of the statistical significance of these relationships.

Multivariate linear regression analysis showed that benign and harmful work-related stress among nurses were influenced by various demographic factors. Older nurses, divorced nurses, PhD graduates, and nurses with higher family income were more likely to experience higher benign stress levels. In contrast, female nurses, single nurses, BSN graduates, nurses with specific experience levels and specific income brackets, non-Saudi nurses, individuals with higher depression levels, and those with increased anxiety were more likely to experience harmful stress (Table 3).

Multivariate linear regression analysis determined distinct factors influencing benign and harmful work-related stress among nurses. For benign stress, higher educational attainment (postgraduate degrees) was associated with lower benign stress levels, whereas poorer sleep quality was associated with increased benign stress. For harmful stress, older age, non-Saudi Arabian nationality, lower family income, poorer sleep quality, higher depression levels, and increased anxiety were associated with higher harmful stress levels (Table 4).

Mediation analysis revealed significant direct and indirect effects of depression and anxiety on job stress, with sleep quality acting as a mediator. Anxiety and depression directly increased job stress. Additionally, depression negatively impacted sleep quality, which in turn increased job stress. This indicates that a portion of the detrimental effect of depression on job stress is mediated through poor sleep quality. Anxiety and depression significantly contributed to job stress, directly and indirectly (Table 5 and Figure 1).

TABLE 3. Significant values of demographic factors and work-related stress among staff nurses

Variable	Global PSQI	Depression	Anxiety	Woss A	Woss B
Age	<0.001*	0.304	0.011*	0.004*	0.257
Sex	<0.015*	<0.001*	<0.001*	0.273	<0.001*
Marital status	0.153	<0.001*	<0.001*	0.001*	<0.001*
Education	0.056	<0.001*	<0.001*	<0.001*	0.032*
Years of experience	<0.001*	0.004*	<0.001*	0.086	<0.001*
Family income	<0.001*	0.152	0.280	0.009*	<0.001*
Nationality	<0.001*	<0.001*	0.003*	0.089	<0.001*
Depression level				<0.001*	<0.001*
Anxiety level				<0.001*	<0.001*

TABLE 4. Factors influencing benign and harmful work-related stress among nurses (Multivariate Linear Regression)

Variable	Benign Stress		Harmful Stress	
	β (95% CI)	*p*[a]	β (95% CI)	*p*[a]
Age				
≤35 years[Ref]				
>35 years	0.085 (−0.017; 2.682)	0.053	0.204 (1.179; 2.348)	<0.001*
Educational				
BSN Graduate[Ref]				
Postgraduate	−0.173 (−3.460; −1.614)	<0.001*	−0.044 (−0.759; −0.041)	0.078
Years of experience				
≤10 years[Ref]				
>10 years	0.064 (−0.400; 2.269)	0.168	−0.048 (−0.977; 0.191)	0.187
Nationality				
Saudi Arabian[Ref]				
Non-Saudi Arabian	0.043 (−0.680; 3.086)	0.210	−0.165 (−3.386; −1.755)	<0.001*
Family income	0.049 (−0.443; 1.369)	0.320	−0.285 (−1.866; −1.079)	<0.001*
PSQI	0.105 (0.052; −0.424)	0.012*	0.350 (0.360; 0.521)	<0.001*
Depression	0.315 (0.106; 0.239)	<0.001*	0.177 (0.025; 0.082)	<0.001*
Anxiety	0.018 (−0.050; 0.070)	0.752	0.236 (0.044; 0.097)	<0.001*

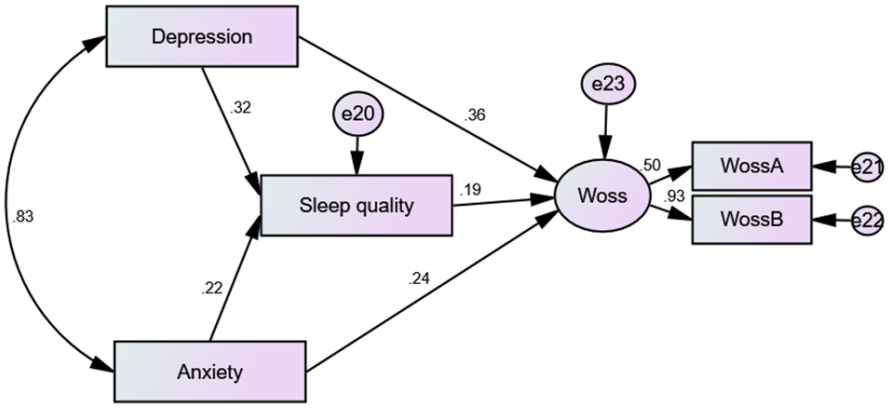
Variables with $p < 0.25$ were included in the multivariable regression. R^2 of benign stress = 19.8. R^2 of harmful stress = 50.6
PSQI: Pittsburgh Sleep Quality Index; CI: confidence interval

TABLE 5. Direct, indirect, and total effects of depression and anxiety on job stress with sleep quality as mediator

Path	Hypothesis	β (Standardized)	*p*	95% CI for β
Direct effects				
Anxiety → Work Stress	H1	0.282	0.001*	(0.18; 0.38)
Depression → Work Stress	H2	0.251	0.001*	(0.14; 0.36)
Anxiety → Sleep Quality	H3	0.011	0.817	(−0.08; 0.10)
Depression → Sleep Quality	H4	0.612	0.001*	(0.48; 0.74)
Sleep Quality → Work Stress	H5	0.316	0.001*	(0.21; 0.42)
Indirect effects				
Anxiety → Sleep Quality → Work Stress	H6	0.004	0.815	(−0.04; 0.05)
Depression → Sleep Quality → Work Stress	H7	0.194	0.001*	(0.10; 0.29)
Total effects				
Anxiety → Work Stress	Combined	0.285	0.001*	(0.19; 0.38)
Depression → Work Stress	Combined	0.445	0.001*	(0.32; 0.57)

Model indices: $\chi^2/df = 4.613$; CFI = 0.997; GFI = 0.996; NFI = 0.996; IFI = 0.997; TLI = 0.983; and RMSEA = 0.065. These indices show a strong overall model fit

CI: confidence interval; χ^2/df: Chi-square divided by degrees of freedom; CFI: Comparative Fit Index; GFI: Goodness of Fit Index; NFI: Normalized Fit Index; IFI: Incremental Fit Index; TLI: Tucker–Lewis Index; RMSEA: Root Mean Square Error of Approximation



Goodness-of-fit indices: $\chi^2/df = 4.613$; $P < 0.010$; CFI = 0.997; GFI = 0.996; NFI = 0.996; IFI = 0.997; TLI = 0.983; and RMSEA = 0.065.

FIGURE 1. Structural equation model on the mediating effect of sleep quality on the relationship between depression, anxiety, and job-related stress. Data are standardized regression coefficients

DISCUSSION

This study investigates the mediating role of sleep quality in the relationship between depression, anxiety, and job-related stress among Saudi Arabian nurses. The majority of the surveyed healthcare workers reported having clinical depression and anxiety accompanied by above-average levels of stress related to work. These results indicate an urgent need for relevant interventions that will meet the mental health needs of health practitioners and improve their other aspects of health. The interaction relationship among work stress, anxiety, and depression is well established in the literature, meaning that these factors influence the mental well-being of healthcare practitioners and the quality of care offered to patients. Previous studies focused on the need to develop organizational and individual measures to assist nurses in overcoming their challenges, particularly in extremely demanding clinical areas.[18] Previous research stresses that while stressful tasks may be alleviated through interventions at the individual level, comprehensive changes to healthcare systems are warranted to tackle stress and burnout at the root source and, therefore, address the organizational aspect. This is consistent with studies that claimed that nurses' mental health can be protected only if targeted measures are integrated into the broader system.[19] This viewpoint is critical because the culture of the particular healthcare unit determines the stress levels of each nurse. In addition, several studies have documented the occurrence of job-related stress among nurses. For example, the work-related stress levels among nurses in primary healthcare centers in Saudi Arabia were reportedly high, which was due to somatic factors, job assignment, and job assistance.[20]

The findings indicate that organized mental health programs can positively enhance nurses' psychological state. The workplace stress, anxiety, and depression levels

among many health professionals are alarming, and response to such a situation should be effective and prompt. Stressors on an individual level and those on a system level affect the staffs' mental health and well-being, and positively influencing these factors is beneficial for patient care. Future investigations should build on the concept and ways of integrating the aforementioned approaches and modes in the healthcare system to preserve the mental health of nurses and other members of the health teams.

Multivariate linear regression showed significant relationships between the demographic characteristics and mental health domains of sleep quality, depression, and anxiety among nurses. The factors associated with poor sleep quality included being older, being female, being experienced, belonging to certain income categories, and being a Saudi national. Furthermore, these findings are supported by those of previous studies that have demonstrated that elderly nurses are at risk of facing additional duties and emotional stresses related to patient handling that may lead to sleep deprivation.[21,22] A study revealed that other demographic aspects, age, in this case, are factors that affect the sleep quality of nurses, indicating that older nurses may be under more strain and, therefore, have high levels of sleep disturbance owing to their various patient care responsibilities.[22] Regarding marital status, being single was associated with a higher risk of depression among female nurses, and female nurses with a certain level of education and average years of experience were more likely to experience depression. These findings align with previous research indicating that female nurses, due to societal expectations and heavy workloads, are more susceptible to stress and depression.[23] Additionally, the link between depression and marital status is validated by studies that point to single nurses possibly being exposed to less social interaction, which can be instrumental in providing stress relief leading to more depressive symptoms.[24]

Younger age-group nurses, female and single nurses, and those with certain education attainment as well as specific experience levels were reported to have higher anxiety levels. These results are consistent with the findings of Cheung and Yip noted that anxiety symptoms are prevalent among younger and relatively inexperienced nurses who lack experiences to effectively cope with the emotional challenges that arise in their profession.[23] Moreover, the increasing levels of anxiety in nurses have been attributed to the stressful nature of the nurses' occupational environment. This was confirmed by a previous study stating that nurses in highly demanding circumstances had higher anxiety levels.[25] The current study clearly highlights the timely need to have focused policies to meet the mental health requirements of nascent healthcare professionals. As healthcare institutions understand the demographic causative factors of sleep quality, anxiety, and depression, support programs that are developmentally appropriate for nurses can be developed. Such programs could involve stress management, mental health, and work environment enhancement programs, all of which would enhance patient care and job satisfaction among nurses.

The outcomes of the statistical analysis based on multivariate linear regression analysis provide useful details concerning the demographic aspects that positively and negatively affect work-related stress among nurses. More specifically, older nurses, divorced nurses, PhD nurses, and those with a higher family income tend to experience more benign stress. This posits that some demographic characteristics allow some individuals to cope with stress better and, in this instance, envisage enhanced coping or a strong financial base which may alleviate some stresses associated with caregiving.[26,27] In contrast, harmful stress is common among female nurses, single nurses, and those with Bachelor of Science in Nursing qualifications and a specific range of income and nursing experiences. Additionally, non-Saudi nurses, depressed individuals, and anxious persons are more prone to harmful stress. This is consistent with studies that established that female nurses suffer high-stress levels from societal expectations and work and emotional labor associated with their work.[28] The higher prevalence of harmful stress among single nurses may be caused by the lack of social support, which is key in dealing with stressors in the field of nursing.[29]

The relationship between educational background and stress levels is notable. For instance, nurses who hold a BSN degree may experience increased stress level as they enter professional practice over the transition stage, especially if support systems are not in place. Conversely, people with advanced degrees such as a PhD may have better coping mechanisms and appreciation of the finer details of patient care, which could relieve some stress.[30] Additionally, the findings show the influence of nationality on stress levels. Non-Saudi nurses may experience stress based on cultural fit and discrimination, which are barriers to acculturation. Nurses in this particular research were more stressed because of cultural factors affecting them in the workplace in such a way that they felt excluded or faced hostility.[31] Furthermore, some recent studies have reported a direct link between depression and anxiety levels with more harm to stress. Several studies have revealed that mental health factors of an individual are a crucial predictor of work-related stress' contestation by nurses, which in turn leads to an increase in stress and degeneration of mental health.[32] This elucidates why mental health requirements should be incorporated as part of the holistic approach to address stress management in the healthcare context. The results of the present study shed light on the relationship between demographic variables and work-related stress using multiple regression among nurses. These relationships are particularly crucial for the design of

strategies that support different groups of nurses who are exposed to various stressors. Such strategies, which are aimed at reducing and/or preventing different forms of stress, are beneficial for assisting healthcare organizations in enhancing the health of their nursing staff and, consequently, of patients.

Nurses with the highest postgraduate degrees reported significantly lower levels of job stress compared to those with lower levels of education. This is based on the literature that indicates that postgraduate education benefits nurses in developing coping mechanisms and problem-solving abilities which enable them to handle stressful activities better.[33] Therefore, enhancing further education and training of nurses should be considered to reduce benign stress. In contrast, all the participants with benign stress conditions reported having poor sleeping quality. Such results are supported by a study that revealed that when people experience inadequate sleep, their stress levels go up, and poor mental health conditions occur.[34] At present, nurses are required to work excessive hours and follow strict work routines, which alter their sleep patterns and increase stress levels. The association between sleep quality and stress level is well established. Sleep deprivation has been associated with cognition and emotion impairment, which further affects stress response.[34] Regarding the other sources of harmful stress, the results indicate that advances in age, non-Saudi citizenship, lower family economic status, poorer sleep quality, greater depression scores, and higher anxiety levels are all predictors of higher harmful stress. The link between advancing age and harmful stress can be attributed to the wear and tear of several years spent in a high-demand job, which contributes to extreme fatigue and emotional depletion.[28] Moreover, non-Saudi nurses may have their own barriers, such as adjusting to a foreign culture and experiences of discrimination that may increase their stress level.[26]

Low family income is also one of the most significant stressors for individuals. Economic hardship can be an added burden that strains nurses as they attempt to care for personal and professional demands. Previous studies have found nursing financial stress to be a significant determinant of nursing stress, which further calls for better remuneration and administrative support in healthcare institutions.[26] Moreover, the results show the devastating impact that mental health has on the exposure of negative stress. The present study has established that depression and anxiety levels above normal lead to an increase in negative stress, thereby increasing the need to seek for solutions for depression and anxiety for nursing personnel. A study established that mental illness adversely affects how nurses cope with workplace stressors, thereby creating a cycle of stress and mental illness.[33] Such findings highlight how demographic variables are related to positive- and negative work-related stressors from the nurse's perspective. Understanding these associations is critical for developing appropriate interventions to meet the needs of the different categories of nurses and the stress they encounter. Healthcare authorities can increase the work conditions of their nurses by adopting approaches that incorporate education, mental assistance, and sleep hygiene, which in turn will benefit the patient care and job satisfaction of the personnel.

This study examined the relationships between mental health factors and job stress among nurses using SEM to assess the relationship between anxiety, depression, sleep quality, and job stress. It was established that depression and anxiety escalate the level of stress experienced by the individual in their profession. The quality of sleep is adversely affected by depression, which in turn leads to increased work-related stress. Thus, this demonstrates the need to discuss the psychological and sleep-related aspects of the problem to reduce the level of stress associated with the nursing profession. Further, a robust study supported the hypothesis that anxiety, depression, and workplace stress are all interrelated activities.[14] Work-related stress often co-occurs with burnout, work stress, and mental health-related problems among nurses, wherein the depletion phase and dissatisfaction from the job remain the key dimensions of mental health.[14] In a similar manner, Cheung and Yip[23] reported that nurses with greater nursing and mood-related disorders suffered from significant stress arising from work and that mental disorders can be a vicious circle enhancing the stress levels.[23] This corroborates the results of earlier studies on job satisfaction and depressed mood as mediating variables in the effects of job stress on the nurses' intent to leave their profession.[35]

Another crucial finding of the present study was that depression, low mood, and medical conditions have a negative correlation with quality of sleep. In some cases, sleep patterns are disturbed, and in most of the suffering individuals, mental disorders arise due to such alterations in sleeping sequences and creases, which are common in high-performing occupations, especially nursing. Chang and Chang observed that dissatisfaction regarding the workplace may influence the quality of rest among nurses, which in turn aggravates their mental health.[36] This relationship is echoed by Huang *et al*.[37] who observed that depression and anxiety among nurses have been significantly correlated with sleep-related complaints, indicating that treating sleep disorders should be a crucial element of treating mental disorders. In addition, the findings provide evidence for the need to consider sleep factors within the frame of job-related stress. Stressful situations may be heightened when sleep inadequacy is left untreated, such circumstances causing cognitive dysfunction and poor emotional regulation.[38] It was demonstrated that a poor quality of sleep was a variable in the prediction of the higher stress experienced on the job among nurses, thus augmenting the call to remediate

the work stress of nurses and improve sleep hygiene as a means of controlling work stress.[37] Moreover, the work environment is a crucial factor affecting the level of job stress other than psychosocial and sleep factors. Introduced areas of supportive leadership and a favorable work environment to lower the level of nursing stress and burnout.[39] This implies that certain clinical interventions, especially organizational ones, that aim at increasing workplace support and facilitating communication may be beneficial in managing stress and promoting the mental well-being of nurses.

This research has crucial implications as it addresses the sleep quality as a mediator between depression, anxiety, and job stress level among nurses in Saudi Arabia. The target population included adult nurses of various age groups who were currently prescribed medications to address sleep disturbances and mental health concerns. The findings show that older people, women, and those in certain income brackets have poorer quality of sleep, which is consistent with existing studies on older nurses with extra responsibilities coupled with emotional strains. Marital status was another interesting variable in the study. However, single nurses were experiencing more depression and anxiety, possibly due to lack of social support. These concepts add a deeper understanding of how demographic factors could impact mental health in nursing, which is critical in formulating nursing interventions. However, the present study raises new questions that require further investigation. Ways of combining psychosocial and sleep-type interventions in nursing workplaces should be investigated to lower the stress levels of nurses. Future research should create global approaches that go beyond the individual to the whole organization and focus on the different facets of stress in nursing.

Owing to its cross-sectional design, the current study is unable to demonstrate cause–effect relationships between the variables, and the convenience sampling may introduce selection bias. Responding through self-surveys may produce social desirability bias, and sample size or focus on the region and language proficiency criteria may have added to the nonavailability of the findings. Longitudinal design, probability sampling, objective measures, larger sample size, multiple regional coverage, and use of advanced statistical techniques in future studies should be considered to overcome the limitations.

CONCLUSIONS

This study highlights the significant prevalence of anxiety, depression, and sleep disturbances among nurses. Female patients and those with lower educational levels and in specific age groups were more likely to experience higher anxiety and depression levels. Poor sleep quality was strongly associated with anxiety and depression. These findings indicate the need for comprehensive mental health assessments and interventions for nurses. Future research should explore deeper into the underlying mechanisms and develop interventions to improve the mental health and overall well-being of this population.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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