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Effects of Sleep Patterns on Mental Health Among Nurses

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Abstract: Sleep plays a vital role in maintaining psychological resilience and cognitive function, particularly among healthcare professionals such as nurses who are frequently exposed to shift-based work schedules. This study explores the relationship between sleep patterns and mental health outcomes among nurses working in tertiary care hospitals in Lucknow, India. Using a cross-sectional design, data were collected from 44 registered nurses through validated instruments: the Pittsburgh Sleep Quality Index (PSQI) and the Depression Anxiety Stress Scale (DASS-21). Results indicated a high prevalence of poor sleep quality, especially among those assigned rotating and frequent night shifts. Nurses reporting reduced sleep duration—often below four hours per night—also experienced elevated symptoms of stress, anxiety, and depression. The study found significant associations between specific sleep disturbances (e.g., difficulty initiating sleep, daytime drowsiness) and psychological distress. These findings highlight the urgent need for evidence-based policy interventions, including shift restructuring, mental health support services, and sleep hygiene education to safeguard nurse well-being and ensure high-quality patient care.

Keywords: *Sleep Quality, Mental Health, Nurses, Shift Work, Anxiety, Depression, Rotating Shifts, Occupational Health, India, DASS-21.*

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I. INTRODUCTION

Mental health is an essential component of overall well-being and is increasingly recognized as a critical factor in occupational performance and quality of life. According to the World Health Organization (2022), mental health is not simply the absence of illness but a state of psychological well-being that enables individuals to cope with daily stress, realize their potential, and contribute productively to their communities. In the healthcare sector, nurses are uniquely vulnerable to mental health challenges due to the emotional labor, demanding schedules, and high-stress environments they navigate daily. In India, where nurse-to-patient ratios are critically low and institutional support is limited, these stressors are often compounded by systemic inefficiencies and cultural expectations, particularly for women. One of the most significant yet underexplored contributors to mental health strain among nurses is disrupted sleep, largely resulting from rotating and night shift schedules. Sleep deprivation not only impairs physical and cognitive functioning but also increases susceptibility to anxiety, depression, and emotional exhaustion. Nurses working irregular shifts often experience circadian misalignment, fragmented sleep, and insufficient recovery time—factors that cumulatively erode mental resilience and job satisfaction. Despite growing evidence internationally on the link between shift work and mental health outcomes, there remains a paucity of localized research in the Indian context. This study addresses this gap by investigating how sleep patterns influenced by shift work impact the psychological well-being of nurses in tertiary care hospitals in Lucknow. The research aims to generate context-specific insights that can inform institutional policies, promote mental health literacy, and drive evidence-based reforms in nurse scheduling and occupational health practices.

II. REVIEW OF LITERATURE

A growing body of literature underscores the significant impact of shift work on sleep patterns and mental health among nurses, revealing a complex interplay between occupational demands, biological rhythms, and psychological outcomes. Shift work, particularly night duties and rotating schedules, disrupts the circadian system—the body's internal clock responsible for regulating sleep–wake cycles—leading to poor sleep quality and increased psychological strain (Akerstedt, 2003; Kecklund & Axelsson, 2016). Nurses, due to their frontline responsibilities and often irregular work schedules, are especially susceptible to sleep disturbances that contribute to emotional exhaustion, burnout, anxiety, and depression.

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In India, Bhuvaneshwari and Radhakrishnan (2014) found that 67% of staff nurses reported moderate to severe sleep disturbances, with strong associations to symptoms of depression and anxiety. Their study highlighted how institutional factors like rigid shift patterns and staff shortages hinder recovery and restorative sleep. Similarly, Ramesh and Raju (2018) demonstrated that nurses working night shifts had significantly lower melatonin levels and elevated cortisol levels, a hormonal profile indicative of circadian misalignment and stress. These biochemical findings correlate with psychological symptoms such as irritability, mood instability, and concentration difficulties.

The international literature provides further validation of these associations. Baglioni et al. (2011) emphasized the bidirectional relationship between insomnia and depression, noting that poor sleep is both a cause and consequence of psychological disorders. Kalmbach et al. (2017) followed newly hired nurses and found that baseline sleep disturbances predicted later development of depressive symptoms and job dissatisfaction. Similarly, Geiger-Brown et al. (2012) reported that long shifts and poor sleep led to reduced alertness, mood regulation issues, and increased clinical error rates. These findings support the argument that sleep is not merely a personal health issue but a critical occupational concern.

Indian studies have also highlighted socio-cultural dimensions of nurse well-being. Jayachitra and Jagannarayan (2021) explored the gendered impact of night shifts and found that female nurses, particularly those with caregiving responsibilities at home, experienced higher levels of sleep disruption and psychological distress. Din and Baba (2022) emphasized the protective role of workplace social support, suggesting that peer relationships and managerial empathy can buffer the negative effects of sleep-related stress.

Pandemic-era research adds another layer of urgency. Gupta et al. (2020) and Sinha and Sarkar (2021) found that during the COVID-19 crisis, sleep deprivation among nurses intensified, leading to heightened levels of anxiety and burnout, particularly in high-risk departments like ICUs and COVID wards. These studies underline the importance of institutional preparedness and mental health support during health emergencies.

Additionally, the SNORE study by Chellaiyan and Nirupama (2025) provided comprehensive national-level data showing that nurses with frequent night shifts reported the highest levels of insomnia and psychological distress, further calling for systemic shift reform and occupational health policy in India.

Overall, the literature clearly illustrates that disrupted sleep, primarily due to shift work, significantly impairs nurses' mental health and job performance. These effects are compounded by institutional rigidity, lack of recovery time, and cultural expectations, particularly for female nurses. The reviewed studies reinforce the necessity of evidence-based interventions such as ergonomic scheduling, sleep hygiene education, and embedded psychological services in healthcare institutions.

III. RESEARCH METHODOLOGY

This study adopted a cross-sectional descriptive design to investigate the association between sleep patterns and mental health outcomes among nurses working in two tertiary care hospitals in Lucknow, India—King George's Medical University (KGMU) and Dr. Ram Manohar Lohia Institute of Medical Sciences (Dr. RMLIMS). These institutions were selected due to their high patient volumes, 24/7 clinical services, and reliance on shift-based staffing, which made them ideal settings for evaluating the effects of shift work. A purposive sampling technique was used to recruit 44 registered nurses who met specific inclusion criteria: at least one year of clinical experience, active engagement in day, night, or rotating shifts, and the ability to understand and complete the questionnaire in English or Hindi. Nurses on medical leave, pregnant, or with a known psychiatric diagnosis were excluded to reduce confounding factors. Data collection was carried out over a four-week period and involved the use of a structured, self-administered questionnaire divided into three parts. The first section captured demographic and work-related details, while the second employed a modified version of the Pittsburgh Sleep Quality Index (PSQI) to assess sleep quality, duration, and disturbances. The third section utilized the Depression Anxiety Stress Scale – 21 items (DASS-21) to evaluate symptoms of psychological distress across three domains. Data collection was conducted during shift changeovers to avoid disruption of clinical duties, and participant anonymity and confidentiality were strictly maintained. Data were coded, entered into Microsoft Excel, and analyzed using SPSS version 26.0. Descriptive statistics such as means, frequencies, and percentages were used for baseline analysis, while inferential statistics including Pearson's correlation, chi-square tests, and independent samples t-tests were applied to explore relationships between sleep variables and psychological outcomes. A p-value of less than 0.05 was considered statistically significant. Despite its methodological rigor, the study acknowledged limitations such as a modest sample size, reliance on self-reported data, and the inability to infer causality due to its cross-sectional nature.

IV. RESULTS

Table 1: Demographic Profile of Respondents

Variable	Category	Frequency	Percentage (%)
Age	21–25	3	6.81
	26–30	34	77.27
	31–35	7	15.90
Gender	Female	39	88.63
	Male	5	11.36
Marital Status	Married	24	54.54
	Single	20	45.45
Education	GNM	28	63.63
	BSc Nursing	16	36.36
Shift Type	Rotating	36	81.81
	Day	6	13.63
	Night	2	4.55

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➢ *Interpretation:*

Most nurses were aged 26–30, predominantly female, and working in rotating shifts. This demographic reflects a young, active nursing workforce experiencing high exposure to shift work stressors.

Table 2: Psychological Distress Symptoms Based on DASS-21 Responses

Symptom	"Sometimes" or More (%)
I couldn't relax	71%
I feel sad or down	70%
I am impatient with small problems	68%
I feel panic for no reason	39%
I found it hard to calm down	52%
I feel like problems are too big	59%
I feel I have no value	56%
Life feels meaningless to me	43%

➢ *Interpretation:*

A large proportion of nurses reported moderate levels of psychological distress. The most commonly endorsed symptoms were sadness, difficulty relaxing, and perceived overwhelm, indicating significant emotional strain linked to occupational stress.

Table 3: Frequency of Night Shifts and Average Sleep Duration

Night Shifts/Month	No. of Nurses	Avg. Sleep Duration
0–4	8	6–7 hours
5–9	14	5–6 hours
10–15	11	4–5 hours
16–30	11	<4 hours

➢ *Interpretation:*

There is a clear inverse relationship between the number of night shifts and sleep duration. Nurses with more than 10 night shifts per month experience critical sleep deprivation (<5 hours), potentially compromising their mental and physical well-being.

Table 4: Sleep Disturbances and Associated Mental Health Symptoms

Sleep Disturbance	% Reporting	Associated Mental Health Indicators
Difficulty falling asleep	68%	Trouble relaxing, overwhelming thoughts
Daytime sleepiness	61%	Irritability, emotional blunting
Waking up frequently at night	55%	Low mood, panic symptoms
Feeling unrefreshed by sleep	50%	Loss of motivation, chronic fatigue
Use of sleep medication	16%	High anxiety, possible self-medication signs

➢ *Interpretation:*

Common sleep disturbances strongly correlate with psychological symptoms. Daytime fatigue and difficulty falling asleep are the most prevalent and have notable overlap with anxiety and depressive symptoms. Use of sleep medication, though less common, signals potentially unmanaged stress.

V. DISCUSSION

The findings of this study offer critical insights into the intersection of occupational sleep disruption and psychological health among nurses working in tertiary care hospitals in India. The data strongly support the hypothesis that shift work—particularly rotating and night duties—has a detrimental impact on both sleep quality and mental well-being. A majority of participants, predominantly young female nurses in rotating shifts, reported experiencing moderate levels of stress, anxiety, and depressive symptoms. These findings align with prior studies conducted both internationally (e.g., Baglioni et al., 2011; Kalmbach et al., 2017) and within India (e.g., Bhuvaneshwari & Radhakrishnan, 2014; Ramesh & Raju, 2018), affirming that healthcare professionals with irregular sleep schedules face heightened risks of emotional exhaustion and psychological distress.

The most compelling pattern observed was the inverse relationship between the number of night shifts worked per month and average sleep duration. Nurses working more than 10 night shifts per month reported critical levels of sleep deprivation, often sleeping less than 5 hours per night. This aligns with Akerstedt's (2003) assertion that sleep disturbance is a primary health complaint among shift workers and is often a precursor to psychological dysfunction. Given that adequate sleep (7–9 hours) is essential for emotional regulation and cognitive performance, the chronic sleep loss seen in this study has serious implications—not only for nurse health but also for clinical safety and quality of patient care.

Further, the prevalence of specific sleep disturbances such as difficulty initiating sleep, frequent awakenings, and daytime sleepiness was high among the participants. These symptoms were closely associated with psychological indicators on the DASS-21 scale, such as sadness, irritability, and a sense of emotional overload. The cyclical nature of this relationship—where poor sleep exacerbates emotional symptoms, which in turn disrupt sleep—is well-documented in sleep science literature (Baglioni et al., 2011; Walker & Stickgold, 2006). The study's findings reiterate this vicious cycle, particularly in environments like Indian public hospitals, where institutional support structures are often lacking.

A noteworthy observation was that nurses using sleep medication also exhibited higher levels of anxiety. This raises concern over self-medication as a coping strategy, potentially reflecting the lack of formal mental health support or reluctance to seek help due to stigma. In line with findings from Gupta et al. (2020) and Sinha & Sarkar (2021), this pattern may also reflect the additional stress imposed by

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pandemic-era workloads, which further taxed the emotional reserves of an already overburdened nursing workforce.

The gendered burden of shift work was another critical dimension. With most participants being women, many of whom likely carry significant domestic responsibilities, the dual pressure of professional and personal caregiving roles may contribute to chronic fatigue and limited recovery time. This is consistent with the findings of Jayachitra & Jagannarayan (2021) and Purohit et al. (2021), who emphasized the compounded stress faced by female nurses in India, particularly those working irregular shifts.

While this study employed validated instruments and provided rich data on sleep and mental health correlations, certain limitations must be acknowledged. The cross-sectional design precludes causal inferences, and the modest sample size limits generalizability beyond the urban tertiary care context. Nonetheless, the internal consistency of the findings across multiple dimensions—sleep quality, shift schedules, and psychological outcomes—reinforces their validity and practical relevance.

In conclusion, this study highlights a critical occupational health issue that warrants immediate institutional attention. Sleep disturbances are not isolated complaints but are deeply intertwined with mental health risks in the nursing profession. The data strongly advocate for systemic reforms, including ergonomic shift scheduling, regular psychological screenings, and sleep hygiene education. In doing so, healthcare institutions can support the resilience of their nursing workforce, ensure safer clinical environments, and uphold the quality of patient care.

VI. CONCLUSION

This study explored the impact of sleep patterns, particularly those influenced by shift work, on the mental health of nurses working in tertiary care hospitals in Lucknow, India. The findings clearly demonstrate that irregular and rotating shift schedules significantly disrupt sleep duration and quality, which in turn are strongly associated with elevated levels of psychological distress, including symptoms of stress, anxiety, and depression. Most participants reported sleeping less than the recommended 7 hours, with those working frequent night shifts averaging under 5 hours of rest per day. These nurses also exhibited greater emotional instability, difficulty relaxing, and persistent fatigue—indicators of a chronic stress response likely exacerbated by circadian rhythm misalignment.

Moreover, the prevalence of specific sleep disturbances—such as difficulty falling asleep, unrefreshing sleep, and daytime drowsiness—correlated with adverse emotional outcomes on the DASS-21 scale. These results are consistent with existing literature and underscore the cyclical relationship between sleep deprivation and psychological strain. Although a smaller proportion of nurses reported using sleep medication, this subgroup showed even higher levels of anxiety, suggesting that self-medication may be an inadequate and potentially harmful coping mechanism in the absence of institutional mental health support.

The study also brings attention to the sociocultural realities faced by Indian nurses, especially women, who often manage both professional and domestic responsibilities. The dual burden intensifies sleep disruption and psychological fatigue, emphasizing the need for gender-sensitive workplace policies.

In light of these findings, it is evident that sleep health and mental well-being are inextricably linked, and addressing one without the other would be insufficient. The study calls for systemic interventions in hospital staffing practices, including shift scheduling reforms, provision of recovery time, establishment of mental health services, and promotion of sleep hygiene education. While the sample size and cross-sectional design impose certain limitations, the consistency of results suggests the urgency and relevance of this issue across broader clinical contexts. Prioritizing nurse well-being is not only an ethical imperative but also a strategic requirement for ensuring quality healthcare delivery in India's high-pressure medical environments.

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