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Original Research Article

ASSESSMENT OF NIGHT SHIFT EFFECTS ON NURSES' HEALTH AND WORK

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ABSTRACT

Background: *Night shift work is integral to healthcare delivery but is associated with circadian rhythm disruption, leading to adverse physical, psychological, and occupational outcomes among nurses.* ***Objective:*** *To assess the effects of night shift work on nurses' health, sleep patterns, psychological well-being, work performance, and social life in a tertiary care hospital in Lahore, Pakistan.* ***Study Design:*** *Descriptive cross-sectional study.* ***Setting:*** *Ittefaq Hospital, Lahore, Pakistan.* ***Duration of Study:*** *April to September 2025.* ***Methods:*** *A total of 171 registered nurses were recruited using non-probability convenience sampling. Data were collected using a structured questionnaire that assessed demographic characteristics, physical health symptoms, sleep disturbances, psychological responses, work performance, and social impact. Data were analyzed using SPSS version 25. Descriptive statistics were presented as frequencies and percentages, and inferential analysis was performed using the chi-square test, with statistical significance set at $p < 0.05$.* ***Results:*** *The majority of participants were aged 25–30 years (69.0%) and female (78.4%). A high proportion reported discomfort during night shifts (87.1%) and health-related issues (68.4%). More than half (53.8%) experienced inadequate sleep, while 71.3% reported difficulty initiating sleep. Sleep disturbances adversely affected work performance in 74.3% of nurses. Psychological strain was evident, with many participants reporting feelings of depression, isolation, and dissatisfaction with professional recognition. Work–life imbalance was reported by 74.9% of respondents, along with challenges in maintaining social relationships and daily routines, despite relatively strong family support.* ***Conclusion:*** *Night shift work is associated with substantial physical, psychological, and social burdens among nurses, with significant implications for work performance and overall well-being. Targeted interventions focusing on shift scheduling, mental health support, and sleep hygiene strategies are essential to mitigate these effects and improve nurses' quality of life and productivity.*

Keywords: Night Shift Work, Nurses, Sleep Deprivation, Circadian Rhythm, Occupational Health, Work Performance, Mental Health, Fatigue

INTRODUCTION

The nursing profession is inherently demanding, requiring continuous patient care throughout the day and night. Shift work, particularly night shift work, is an indispensable component of healthcare delivery globally, ensuring round-the-clock patient monitoring and treatment (1,2). However, the nonstandard schedules associated with shift and night work are increasingly recognized as significant occupational hazards with wide-ranging consequences for nurses' physical health, mental well-being, and professional performance (1,3).

Night shift work fundamentally disrupts the human circadian rhythm—the internal biological clock that regulates sleep-wake cycles, hormonal secretion, and metabolic processes (4,5). This circadian misalignment precipitates a cascade of adverse health outcomes, including sleep disturbances, fatigue, burnout, cardiovascular disease, metabolic disorders, and mental health problems such as depression and anxiety (4,6,7). Nurses working night or rotating shifts consistently report shorter sleep durations, averaging as little as 5.7 hours compared to 6.7 hours among daytime counterparts, rendering them particularly susceptible to cumulative fatigue (6). Research demonstrates that night-shift nurses are 10–90% more likely to fall asleep while driving and 1.4–3.1 times more likely to sustain sharps and needle-stick injuries compared to day-shift workers (8).

Beyond physical health, night shift work exerts profound psychological consequences. Burnout—characterized by emotional exhaustion, depersonalization, and diminished personal accomplishment—is significantly more prevalent among nurses on rotating and night-shift schedules (9,10,11). A meta-analysis confirmed a moderate positive correlation ($r = 0.39$) between burnout and sleep disorders in nurses, underscoring the bidirectional and compounding nature of these outcomes (9). Furthermore, occupational fatigue, encompassing cognitive, physical, and emotional dimensions, is substantially elevated among night-shift nurses, negatively affecting clinical decision-making, vigilance, and patient safety (8,12,13).

The consequences of night shift work extend beyond individual nurses to encompass patient safety and organizational outcomes. Sleep-deprived nurses demonstrate impaired cognitive performance, reduced alertness, and increased error rates, with evidence suggesting that each additional hour of work increases the probability of medication errors (13,14). Collectively, these findings underscore the urgent need for systematic investigation into the multifaceted effects of night shift work on nurses' health and professional functioning.

Pakistan's healthcare system faces a severe nursing shortage compounded by inadequate staffing, high patient-to-nurse ratios, and limited regulatory oversight of working conditions (15). In Pakistani hospitals, nurses routinely engage in rotating shift schedules—including morning, evening, and night shifts—often without adequate inter-shift recovery time or institutional support mechanisms (15). A cross-sectional study conducted in Peshawar, Pakistan, identified significant associations between rotating shift work and health problems, including sleep disturbances, fatigue, anger, cognitive impairment, and reduced social role satisfaction among nurses (15). Notably, 24% of nurses in that study reported sleeping only 4 hours per day—a duration far below the recommended 7 to 8 hours—highlighting the severity of sleep deprivation in this population (15). Despite the well-documented global burden of night shift work on nurses' health (1,3,6), research specifically addressing this issue within the Pakistani nursing context remains sparse. The existing literature from Pakistan is limited in scope, often confined to specific geographic regions such as Peshawar, and does not comprehensively

examine the full spectrum of physical, psychological, and occupational consequences of night shift work (15). Furthermore, Pakistan's unique socio-cultural context—including gender dynamics, family obligations, limited access to mental health resources, and systemic healthcare underfunding—may amplify the adverse effects of night shift work on nurses in ways not captured by studies conducted in high-income countries (15). Given that nurses constitute the backbone of Pakistan's healthcare workforce and that their well-being is closely linked to patient safety and care quality (13,14), there is a compelling rationale for conducting a comprehensive, context-specific assessment of the effects of night shifts on nurses' health and work performance in Pakistan.

METHODOLOGY

A descriptive cross-sectional study was conducted to assess the effects of night shift work on nurses' health and work performance at Ittefaq Hospital, Lahore. The study was carried out from April 2025 to September 2025 and included registered nurses currently employed in clinical settings. A total sample of 171 participants was determined using Slovin's formula, based on the estimated population of nurses, and participants were recruited using non-probability convenience sampling.

Eligible participants included male and female registered nurses with active involvement in rotational or permanent night duty schedules. Nurses who were on leave during the data collection period or declined to participate were excluded. Data were collected using a structured, pre-designed questionnaire developed after review of relevant literature. The instrument comprised sections on demographic characteristics, physical health symptoms, sleep-related issues, psychological well-being, work performance, and the impact on social life. Responses were recorded using dichotomous (yes/no) items and Likert-scale measures to capture varying levels of agreement.

Before data collection, ethical approval was obtained from the Institutional Review Committee of Ittefaq College of Nursing, Lahore. Written informed consent was secured from all participants, ensuring voluntary participation, confidentiality, and anonymity. Participants were informed of their right to withdraw at any stage without any consequences.

The collected data were coded and entered into the Statistical Package for the Social Sciences (SPSS), version 25 (or the latest available version). Descriptive statistics were applied to summarize the data, with categorical variables presented as frequencies and percentages. Where applicable, post-stratification analyses were performed to explore associations between variables, and inferential statistics such as the chi-square test were applied. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 171 nurses were included in the analysis. The majority of participants were aged 25–30 years (69.0%), followed by 30–35 years (26.3%), while only a small proportion were aged 35 or older. Most participants were female (78.4%) and married (54.4%). Regarding educational status, 36.8% held a BSN, 32.2% were post-RN, and 31.0% had general nursing qualifications. All participants were registered nurses (100%) (Table 1). A high proportion of nurses reported adverse physical and sleep-related effects associated with night shifts. Most participants experienced discomfort during night duty (87.1%) and reported health problems (68.4%). More than half (53.8%) did not achieve adequate sleep, while 63.7% perceived night shifts as fearful. Additionally, 71.3% reported using stimulants such as tea or coffee during night duty (Table 2).

Table 1: Demographic Characteristics (n = 171)

Variable	Category	n (%)
Age (years)	25–30	118 (69.0)
	30–35	45 (26.3)
	35–40	6 (3.5)
	>40	2 (1.2)
Gender	Female	134 (78.4)
	Male	37 (21.6)
Marital Status	Single	78 (45.6)
	Married	93 (54.4)
Education	BSN	63 (36.8)
	Post-RN	55 (32.2)
	General Nursing	53 (31.0)
Designation	Registered Nurse	171 (100)

Table 2: Physical and Sleep-Related Effects (n = 171)

Variable	Response	n (%)
Discomfort during night shift	Yes	149 (87.1)
	No	22 (12.9)
Health problems after night shift	Yes	117 (68.4)
	No	54 (31.6)
Adequate sleep after duty	Yes	79 (46.2)
	No	92 (53.8)
Night shift is perceived as fearful.	Yes	109 (63.7)
	No	62 (36.3)
Use of tea/coffee	Yes	122 (71.3)
	No	49 (28.7)

Sleep disturbances and work-related impairment were prominent. Approximately 71.3% reported difficulty falling asleep, and 27.5% reported sedative use. A large proportion (74.3%) believed that insufficient sleep negatively affected performance. Furthermore, 59.1% found night shifts uncomfortable, and 74.9% reported disruption of work–life balance (Table 3).

Table 3: Sleep Disturbance and Work Impact (n = 171)

Variable	Response	n (%)
Difficulty falling asleep	Yes	122 (71.3)
	No	49 (28.7)
Use of sedatives	Yes	47 (27.5)
	No	124 (72.5)
Poor sleep affects performance.	Yes	127 (74.3)
	No	44 (25.7)
Night shift comfortable	Yes	70 (40.9)
	No	101 (59.1)
Work–life imbalance	Yes	128 (74.9)
	No	43 (25.1)

Psychological and professional responses demonstrated variability. While a considerable proportion reported maintaining a positive attitude, dissatisfaction with recognition and psychological strain remained evident. Detailed Likert-scale responses are presented in Table 4.

Social and lifestyle impacts indicated notable disruption in interpersonal and daily functioning. Many participants reported difficulty maintaining relationships and managing routine activities, although family support remained relatively strong. Detailed responses are shown in Table 5.

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Table 4: Psychological and Professional Outcomes (Complete Data) (n = 171)

Variable	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
Positive attitude during night shift	22 (12.9)	20 (11.7)	10 (5.8)	64 (37.4)	55 (32.2)
Satisfaction with night schedule	24 (14.0)	50 (29.2)	25 (14.6)	59 (34.5)	13 (7.6)
Do not feel depressed/isolation	23 (13.5)	59 (34.5)	28 (16.4)	42 (24.6)	19 (11.1)
Mentally prepared for decisions	18 (10.5)	37 (21.6)	16 (9.4)	70 (40.9)	30 (17.5)
Recognition vs day shift	49 (28.7)	55 (32.2)	9 (5.3)	38 (22.2)	20 (11.7)

Table 5: Social and Lifestyle Impact (Complete Data) (n = 171)

Variable	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
Maintain social relationships	23 (13.5)	67 (39.2)	17 (9.9)	40 (23.4)	24 (14.0)
Manage family responsibilities	31 (18.1)	47 (27.5)	18 (10.5)	58 (33.9)	17 (9.9)
Family support	8 (4.7)	27 (15.8)	11 (6.4)	74 (43.3)	51 (29.8)
Transportation ease	19 (11.1)	61 (35.7)	15 (8.8)	55 (32.2)	21 (12.3)
Manage routine/social life	28 (16.4)	36 (21.1)	25 (14.6)	57 (33.3)	25 (14.6)

DISCUSSION

The present study assessed the physical, psychological, sleep-related, and social effects of night shift work among 171 registered nurses. The findings reveal a substantial burden of adverse outcomes, broadly consistent with, yet contextually distinct from, the existing international literature.

A striking 87.1% of participants reported discomfort during night duty, and 68.4% reported health problems following night shifts. These findings align closely with those reported by Feng et al., who demonstrated that night-shift nurses exhibited significantly worse health outcomes compared to day-shift counterparts (16). Similarly, Sun et al. established that between 57% and 83.2% of shift nurses worldwide report sleep problems, including disturbances and deprivation (17). The present study found that 53.8% of nurses reported inadequate sleep, a figure supported by Xiao et al., who reported a high prevalence of poor sleep quality among night-shift nurses (18). Furthermore, 71.3% of participants reported difficulty falling asleep, consistent with findings by Shin and Kim, who documented prolonged sleep onset latency among rotating-shift nurses (19).

The high prevalence of stimulant use (71.3% using tea or coffee) and sedative use (27.5%) observed in this study is notable. Membrive-Jiménez et al. similarly reported that nurses working night and rotating shifts frequently rely on stimulants and sleep aids to cope with disrupted circadian rhythms (9).

Regarding psychological outcomes, 48.0% of participants disagreed or strongly disagreed that they did not feel depressed or isolated, indicating considerable psychological strain. Wang et al. reported that shift work is significantly associated with increased psychological distress among nurses, with shift workers demonstrating a higher risk of poor mental health (20). Regarding professional recognition, 60.9% of participants disagreed that they received recognition equivalent to that of day-shift nurses—a finding consistent with Hosseinabadi et al., who identified irregular shift work as significantly associated with burnout and job dissatisfaction (21).

A substantial 74.9% of participants reported work–life imbalance, with many experiencing difficulties maintaining social relationships and fulfilling family responsibilities. Chang and Wang similarly demonstrated that rotating shift work adversely affects nurses' social and family lives (22). Notably, 73.1% of participants reported receiving family support, which may act as a protective factor. This aspect may be particularly relevant in the Pakistani socio-cultural context, where strong family systems often play a central role in coping mechanisms (15).

The use of a single-center design and convenience sampling may limit generalizability.

Self-reported data may introduce response bias and subjective variability.

CONCLUSION

Night shift work among nurses is associated with substantial disruptions in sleep, physical health, psychological well-being, and social functioning. A considerable proportion of nurses experience fatigue, impaired performance, and work–life imbalance, which may compromise both staff well-being and patient care. These findings suggest the need for targeted interventions, including optimized shift scheduling, institutional support systems, and strategies to improve sleep hygiene and mental health among nurses.

DECLARATIONS

Data Availability Statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned. (IRBe; ITCN-2390/25)

Consent for publication

Approved

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Not applicable

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTION

***SANA FATIMA** (Student)*
Manuscript revisions, critical input.
***AMNA GHAFFAR** (Student)*
Conception of Study, Development of Research Methodology Design, Study Design, Review of manuscript, and final approval of manuscript.
***RUKHSAR ASIF** (Student)*
Data entry, data analysis, and drafting an article.
***HUMAIRA SADIQUE** (Assistant Professor)*
Conception of Study, Final approval of manuscript.
***GHUZALA ANWAR** (Assistant Professor)*
Manuscript drafting.
***IQRA YASIN** (Principal)*

Study Design, Review of Literature.

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