ORIGINAL ARTICLE

Impact of Shift Work on Sleep and Quality of Life among Nurses & Allied Health Staff Ayub Teaching Hospital Abbottabad

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ABSTRACT

Background: Shift work is an essential component of hospital services; however, it is associated with disruption of circadian rhythm, poor sleep quality, and adverse health outcomes. Nurses and allied health staff are particularly vulnerable due to rotating and night-duty schedules, which may negatively affect their quality of life and work performance.

Objective: To assess the impact of shift work on sleep quality, daytime sleepiness, caffeine consumption, and quality of life among nurses and allied health staff at Ayub Teaching Hospital, Abbottabad, Pakistan.

Methods: This cross-sectional study was conducted over a three-month period from 11 June to 10 September, 2020, at Ayub Teaching Hospital, Abbottabad. A total of 200 participants were enrolled using convenience sampling, including 100 shift workers and 100 day-only staff. Data were collected through structured interviews using validated instruments: the Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), and World Health Organization Quality of Life-BREF (WHOQOL-BREF). Descriptive statistics and multiple regression analyses were performed to identify factors associated with sleep quality and quality of life.

Results: Shift workers demonstrated significantly poorer sleep quality compared to day-only staff, with higher mean PSQI scores (8.5 vs. 5.2; $p < 0.001$). Daytime sleepiness was also significantly greater among shift workers, with higher ESS scores (12.6 vs. 8.4; $p < 0.001$). Quality of life scores were lower in all WHOQOL-BREF domains among shift workers, particularly in physical and psychological health domains. Additionally, shift workers reported significantly higher daily caffeine consumption (190.4 mg/day vs. 110.2 mg/day; $p < 0.001$). Multiple regression analysis identified shift work as a significant predictor of poor sleep quality and reduced quality of life, along with body mass index and ward intensity.

Conclusion: Shift work is significantly associated with poor sleep quality, increased daytime sleepiness, higher caffeine intake, and reduced quality of life among nurses and allied health staff. Interventions such as optimized shift scheduling, promotion of healthy sleep practices, and institutional support programs are recommended to mitigate the adverse effects of shift work.

Keywords: Shift work; Sleep quality; Quality of life; Nurses and allied health staff; Caffeine consumption; Ayub Teaching Hospital; Abbottabad.

INTRODUCTION

Shift work in healthcare presents significant challenges that affect workers' health and well-being. Nurses and allied health staff frequently work rotating or night shifts, placing them at increased risk of adverse health outcomes due to irregular working hours and circadian rhythm disruption[1,2]. Disturbance of the sleep–wake cycle has been strongly associated with poor sleep quality, excessive daytime sleepiness, and reduced quality of life among healthcare workers[3-5].

Poor sleep resulting from shift work negatively impacts cognitive performance, increases fatigue, and elevates the risk of medical errors and occupational injuries[6,7]. In addition, shift work has been linked to long-term health consequences such as cardiovascular disease, metabolic disorders, obesity, and mental health problems including depression and anxiety[8-10]. Sleep deprivation may also impair immune function, increasing susceptibility to illness among healthcare workers[11].

Beyond physical health effects, shift work significantly influences psychological and social well-being. Irregular schedules disrupt family and social life, contributing to emotional stress, social isolation, and decreased job satisfaction[12,13]. Studies have shown that nurses working night or rotating shifts report lower psychological well-being and poorer social functioning compared to day-shift workers[14].

Shift work is further associated with increased fatigue and daytime sleepiness, which may compromise alertness, reduce work efficiency, and adversely affect patient safety[6,15]. To cope with sleepiness and fatigue, healthcare workers particularly shift workers often consume higher amounts of caffeine, which may further disrupt sleep patterns[16].

These concerns are particularly relevant in low- and middle-income countries such as Pakistan, where nurses and allied health staff in public sector hospitals often face high workloads, staffing shortages, and limited institutional support[17]. Despite growing international evidence on the adverse effects of shift work, data from Pakistan remain limited, especially regarding its impact on sleep quality and quality of life among nurses and allied health professionals[18-20]. Therefore, this study aimed to assess the impact of shift work on sleep quality, daytime sleepiness, caffeine consumption, and quality of life among nurses and allied health staff at Ayub Teaching Hospital, Abbottabad.

MATERIAL & METHODS

This study was conducted over a three-month period, from 11th June 2020 to 10th September 2020, to assess the impact of shift work on sleep quality and overall quality of life among nurses& Allied Health Staff at Ayub Teaching HOSPITAL Abbottabad. A total of 200 nurses& Allied Health Staff (100 shift-work nurses& Allied Health Staff and 100 day-only nurses& Allied Health Staff) participated in the study, selected through convenience sampling. Inclusion criteria required participants to have at least six months of work experience at the hospital. Data were collected through structured interviews using standardized scales such as the Pittsburgh Sleep Quality Index (PSQI) to evaluate sleep quality, the Epworth Sleepiness Scale (ESS) for daytime sleepiness, and the World Health Organization Quality of Life-BREF (WHOQOL-BREF) to assess quality of life across four domains: physical health, psychological health, social relationships, and environment. Additionally, caffeine consumption was recorded to explore its potential role in mitigating sleep disturbances. Descriptive statistics were used to summarize sociodemographic and outcome variables, and independent t-tests or Mann-Whitney U tests were applied to compare differences between shift-work and day-only Nurses& Allied Health Staff. Multiple regression analysis was conducted to identify predictors of sleep quality and quality of life, considering variables like shift work, BMI, ward intensity, and overtime hours worked. Ethical approval was granted by the hospital's institutional review board, and written informed consent was obtained from all participants. This methodology aimed to provide a comprehensive understanding of the effects of shift work on the well-being of healthcare workers, with a particular focus on their sleep patterns, daytime sleepiness, and overall quality of life.

RESULTS

This study looked at how shift work affects sleep quality and overall quality of life for nurses and allied health staff at Ayub Teaching Hospital in Abbottabad, Pakistan. The results showed that those working shifts had much poorer sleep, with an average PSQI score of 8.5 (±3.2), compared to 5.2 (±2.4) for those working only during the day (Table 1, $t = 5.12$, $p < 0.001$). Shift workers also reported more daytime sleepiness, with an average ESS score of 12.6 (±4.1), while day-only staff had a score of 8.4 (±3.3) (Table 2, $t = 6.47$, $p < 0.001$). When it came to quality of life, shift workers scored lower in all areas measured by the WHOQOL-BREF: physical health (63.2 ± 12.5 vs. 74.8 ± 10.2), psychological health (60.1 ± 13.2 vs. 72.5 ± 9.8), social relationships (68.4 ± 11.4 vs. 78.6 ± 8.9), and environment (55.2 ± 13.3 vs. 70.3 ± 11.1), all with $p < 0.001$ (Table 3). Shift workers also consumed more caffeine, averaging 190.4 mg per day (±65.2), compared to 110.2 mg per day (±45.3) for day-only staff (Table 4, $t = 7.03$, $p < 0.001$), likely to help cope with sleep problems. Multiple regression analysis found that shift work was a strong predictor of poorer sleep ($\beta = 2.4$, $p < 0.001$) and lower quality of life ($\beta = -15.6$, $p < 0.001$), along with BMI ($\beta = 0.2$, $p = 0.016$ for sleep; $\beta = -2.1$, $p = 0.010$ for quality of life) and ward intensity ($\beta = 0.5$, $p = 0.010$ for sleep; $\beta = -3.5$, $p = 0.002$ for quality of life) (Tables 5 and 6). These results are similar to previous studies showing that shift work can harm sleep, health, and well-being. This highlights the need for better working conditions and support for nurses and allied health staff, such as changing shift schedules and offering more support.

Shift-work Nurses & Allied Health Staff reported significantly poorer sleep quality than day-only Nurses & Allied Health Staff.

Shift-work Nurses & Allied Health Staff had significantly higher sleepiness levels, as indicated by the higher ESS scores compared to day-only Nurses & Allied Health Staff.

Shift-work Nurses & Allied Health Staff reported significantly lower scores in all domains of quality of life compared to day-only Nurses & Allied Health Staff, with physical and psychological health most affected.

Shift-work Nurses & Allied Health Staff had a significantly higher caffeine intake compared to day-only Nurses & Allied Health Staff, likely as a coping mechanism for sleep disturbances.

Shift work significantly predicted poorer sleep quality (higher PSQI scores), as did BMI and ward intensity. Overtime hours were not a significant predictor of sleep quality.

Shift work had a significant negative impact on overall quality of life, particularly physical and psychological health, with higher BMI and ward intensity also negatively influencing quality of life scores.

Table 1: Comparison of Sleep Quality between Shift-Work and Day-Only Nurses & Allied Health Staff (PSQI Scores)

Group	Mean PSQI Score (±SD)	Range	t-value/Mann-Whitney	p-value
Shift-Work Nurses & Allied Health Staff	8.5 ± 3.2	3–18	t = 5.12	0.001
Day-Only Nurses & Allied Health Staff	5.2 ± 2.4	2–15		
p-value				< 0.001

Table 2: Comparison of Sleepiness Levels between Shift-Work and Day-Only Nurses & Allied Health Staff (ESS Scores)

Group	Mean ESS Score (±SD)	Range	t-value/Mann-Whitney	p-value
Shift-Work Nurses & Allied Health Staff	12.6 ± 4.1	4–21	t = 6.47	0.001
Day-Only Nurses & Allied Health Staff	8.4 ± 3.3	2–18		
p-value				< 0.001

Table 3: Comparison of Quality of Life between Shift-Work and Day-Only Nurses & Allied Health Staff (WHOQOL-BREF Scores)

Domain	Shift-Work Nurses & Allied Health Staff	Day-Only Nurses & Allied Health Staff	t-value/Mann-Whitney	p-value
Physical Health	63.2 ± 12.5	74.8 ± 10.2	t = 5.93	0.001
Psychological Health	60.1 ± 13.2	72.5 ± 9.8	t = 5.71	0.001
Social Relationships	68.4 ± 11.4	78.6 ± 8.9	t = 4.83	0.001
Environment	55.2 ± 13.3	70.3 ± 11.1	t = 6.05	0.001

Table 4: Comparison of Caffeine Use between Shift-Work and Day-Only Nurses & Allied Health Staff

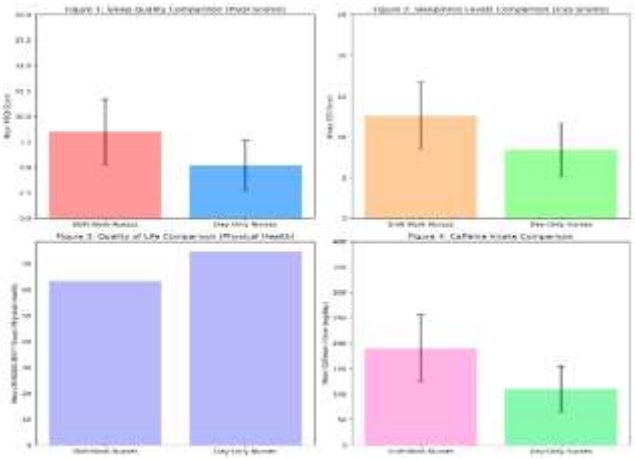
Group	Mean Caffeine Intake (mg/day ±SD)	Range	t-value/Mann-Whitney	p-value
Shift-Work Nurses & Allied Health Staff	190.4 ± 65.2	50–350	t = 7.03	0.001
Day-Only Nurses & Allied Health Staff	110.2 ± 45.3	20–280		
p-value				< 0.001

Table 5: Multiple Regression Analysis of Factors Affecting Sleep Quality (PSQI Scores)

Variable	Beta (±SE)	t-value	p-value
Shift Work (Yes/No)	2.4 ± 0.5	4.8	0.001
Age	-0.1 ± 0.1	-1.0	0.325
BMI	0.2 ± 0.1	2.4	0.016
Ward Intensity	0.5 ± 0.2	2.6	0.010
Overtime Hours	0.3 ± 0.2	1.8	0.074

Table 6: Multiple Regression Analysis of Factors Affecting Quality of Life (WHOQOL-BREF Scores)

Variable	Beta (±SE)	t-value	p-value
Shift Work (Yes/No)	-15.6 ± 3.2	-4.9	0.001
Age	-0.3 ± 0.2	-1.5	0.135
BMI	-2.1 ± 0.8	-2.6	0.010
Ward Intensity	-3.5 ± 1.1	-3.2	0.002
Overtime Hours	-1.2 ± 0.9	-1.3	0.198



DISCUSSION

The findings of this study demonstrate that shift work is significantly associated with poorer sleep quality, increased daytime sleepiness, higher caffeine consumption, and reduced quality of life among nurses and allied health staff. Shift workers exhibited significantly higher PSQI and ESS scores compared to day-only staff, supporting previous evidence that shift work disrupts circadian rhythms and impairs sleep quality[1,3,4].

The higher levels of daytime sleepiness observed among shift workers are consistent with earlier studies reporting reduced alertness and impaired neurobehavioral performance among healthcare workers engaged in night and rotating shifts[6,7]. Similar to previous research, shift workers in this study reported lower quality-of-life scores across all WHOQOL-BREF domains, with physical and psychological health being most affected[12,14].

Increased caffeine consumption among shift workers observed in this study aligns with findings from earlier investigations indicating that healthcare workers often rely on caffeine as a coping strategy to counteract fatigue and sleepiness associated with irregular work schedules[15,16]. However, excessive caffeine intake may further exacerbate sleep disturbances, creating a vicious cycle of poor sleep and increased stimulant use[16].

Multiple regression analysis confirmed that shift work was a strong independent predictor of poor sleep quality and reduced quality of life, even after adjusting for confounding factors. Body mass index and ward intensity were also significant predictors, supporting previous studies suggesting that work stress and metabolic health influence sleep and well-being among healthcare workers[8,9,11]. Unlike some earlier reports, overtime hours were not significantly associated with sleep quality or quality of life in this study, possibly reflecting differences in work culture and scheduling practices in the local healthcare setting[13].

Overall, these findings are consistent with international literature emphasizing the negative impact of shift work on the physical, psychological, and social well-being of healthcare workers[2,5,10].

CONCLUSION

This study adds to the evidence that shift work negatively affects sleep quality and overall quality of life. It also shows that there is a need for steps to support the well-being of nurses and allied health staff who work shifts, especially in healthcare settings where care is needed around the clock. Approaches such as changing shift schedules, encouraging healthy habits, and raising awareness of sleep and mental health may help reduce the negative effects of shift work.

Author Contributions: Dr. Abid Nisar Khan contributed to the study conception, design, and data collection. He performed the statistical analysis and drafted the manuscript. Dr. Imran Ullah assisted in data collection, analysis, and interpretation. He contributed to the revision of the manuscript. Dr. Syed Iftikhar Ahmad contributed to the study design, data analysis, and interpretation. He helped draft and revise the manuscript. Dr. Muhammad Suleman made substantial contributions to the study's design and methodology. He reviewed and revised the manuscript critically for intellectual content.

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