



Original Research Article

ASSESSMENT OF THE HEALTH EFFECTS OF ROTATING SHIFT WORK AMONG HOSPITAL NURSES

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ABSTRACT

Background: Shift work is essential for ensuring continuous patient care in hospitals. However, rotating shifts can disrupt nurses' circadian rhythms and may increase their risk of various health problems, including cardiovascular disease, obesity, diabetes, cognitive dysfunction, and psychological distress. Nurses frequently work under demanding conditions, including staff shortages and high patient workloads. Although increasing evidence from different countries suggests that shift work adversely affects nurses' sleep, fatigue, hormonal regulation, and family and social life, limited studies have examined these effects among nurses in the local setting. The objective is to investigate the effects of rotating shift work on the health of nurses working in tertiary care hospitals. Study Design is Cross-sectional study. This study was conducted at Shaheed Mohtarma Benazir Bhutto Medical College Lyari Karachi from June 2025 to June 2026.

Materials and Methods: This study included 250 male and female nurses employed in tertiary care hospitals who had at least one year of experience working rotating shifts. Participants were selected using a simple random sampling technique. Data were collected through a structured questionnaire administered in person. The questionnaire included demographic characteristics and questions assessing the physical, psychological, and social effects of rotating shift work on nurses.

Results: Of the 250 nurses approached, 210 responded to the questionnaire, yielding a response rate of 84.0%. Among the respondents, 60.0% were male, 77.6% were married, and 70.0% held a Bachelor's degree in Nursing. Only 34.3% of nurses reported sleeping 6–8 hours per day, while the majority reported shorter sleep duration. The most frequently reported physical effects were headache (35.7%), fatigue (25.2%), peptic ulcer symptoms (20.5%), and indigestion/heartburn (18.6%). Psychological effects included difficulty with cognition (26.2%), insomnia (25.2%), changes in eating behavior (24.8%), and sleep deprivation (23.8%). Regarding social effects, 30.9% reported disruption of daily life, 24.3% reported spending less time with family, 23.3% reported reduced participation in social activities, and 21.5% reported reduced participation in community activities.

Conclusion: Despite being essential for providing continuous patient care, rotating shift work is associated with adverse physical, psychological, and social effects among nurses. These include disturbed sleep patterns, digestive problems, fatigue, cognitive difficulties, and reduced family and social interaction. Strategies aimed at improving shift scheduling, sleep opportunities, and workplace support may help reduce the negative health and social consequences of rotating shift work among nurses.

Keywords: Nurses; Shift Work; Rotating Shifts; Hospitals; Physical Health; Psychological Health; Social Health.

INTRODUCTION

Shift work refers to work schedules designed to ensure the continuous provision of services throughout the day and night.^[1] In hospitals and other healthcare facilities, shift work is essential for maintaining uninterrupted patient care.^[2] Nurses constitute a major proportion of the healthcare workforce and frequently work rotating shifts to meet the demands of hospital services. However, exposure to rotating shifts can disrupt the body's circadian rhythm and has been associated with an increased risk of several adverse health outcomes, including cardiovascular disease, obesity, diabetes mellitus, and cognitive impairment.^[3]

Sleep quality and duration are strongly influenced by the circadian rhythm. As a result, daytime sleep is generally shorter and less restorative than nighttime sleep. Because the circadian clock regulates both daytime alertness and the ability to initiate and maintain sleep during the day, shift workers are at increased risk of fatigue, impaired alertness, errors, and occupational accidents compared with individuals working regular daytime schedules.^[4] Rotating shift work has also been associated with a range of physical and psychological health problems, reduced work performance, and an increased risk of obesity, peptic and duodenal ulcers, and certain cancers. These effects may be related to disturbances in glucose metabolism, insulin sensitivity, hormonal regulation, and energy balance.^[5]

Pakistan, as a developing country, has a healthcare system comprising both public and private sector hospitals. The country also faces a substantial shortage of nurses, with an estimated nurse-to-population ratio of approximately 1:50,000.^[6] Previous studies have demonstrated that rotating shift work may contribute to human errors, workplace injuries, reduced quality of patient care, and deterioration in nurses' overall well-being.^[7,8] Despite these concerns, limited research has examined the effects of rotating shift work on the physical, psychological, and social health of nurses in the Pakistani healthcare setting.

Although rotating shifts are necessary to ensure continuous patient care, they may adversely affect nurses' daily routines, health, and overall well-being. Several studies have documented the negative consequences associated with rotating shift schedules.^[9] Khan et al. (2021), in a study of paramedics in Australia, reported that rotating shifts were associated with sleep deprivation, increased stress, fatigue, and excessive daytime sleepiness among workers in an already demanding occupation.^[10] Similarly, Brooks et al. (2020), in a qualitative study conducted in Indiana, USA, found that nurses working rotating shifts experienced sleep deprivation, unhealthy coping behaviors such as excessive caffeine consumption, depressed mood, and family-related distress. The participants

generally perceived night shifts as having a negative impact on their health and well-being.^[11]

A study conducted in 2019 among intensive care nurses at the University of Pittsburgh found that nurses reported poorer health and well-being following night shifts compared with day shifts. Sleep disturbances were also associated with psychological distress, fatigue, and impaired concentration and memory.^[12] Chang (2018), in a study involving 132 nurses, reported that nurses working evening and night shifts had significantly lower cortisol levels and poorer sleep quality than those working day shifts. The study further suggested that cortisol may mediate the relationship between shift work and sleep quality among women.^[13]

Similarly, a 2016 study conducted in Modena, Italy, using the Standard Shift Work Index, found that nurses working rotating shifts experienced chronic fatigue, sleep disturbances, cardiovascular symptoms, and psychiatric symptoms despite being relatively young and having fewer family-related responsibilities.^[14] Portela et al. (2004) also reported that rotating shift work adversely affected the social and family lives of nurses by interfering with family time, holidays, and other social activities.^[15]

Taken together, the available evidence indicates that rotating shift work may have substantial physical, psychological, and social consequences for nurses. However, evidence from Pakistan remains limited, particularly regarding the combined effects of rotating shifts on these three dimensions of nurses' health. Therefore, the present study was conducted to investigate the effects of rotating shift work on the physical, psychological, and social health of nurses working in public and private hospitals.

MATERIALS AND METHODS

Study Design and Participants: A cross-sectional study design was used to assess the effects of rotating shift work on the health of nurses working in tertiary care hospitals. A total of 250 nurses, irrespective of gender and professional designation, were selected using a simple random sampling technique. Nurses were eligible for inclusion if they had at least one year of experience working on rotating shifts. Nurses who did not meet this criterion or were unwilling to participate were excluded from the study.

Ethical Considerations and Data Collection: Prior to data collection, permission was obtained from the administration of the participating tertiary care hospitals. The purpose and procedures of the study were explained to all eligible participants, and written informed consent was obtained before their participation. Participants were informed that their participation was voluntary and that the information provided would be kept confidential.

Study Instrument: Data were collected using a structured questionnaire developed specifically for

this study. The questionnaire was reviewed by experienced nursing professionals to assess its content validity. A pilot study was conducted among 15 nurses to evaluate the clarity, comprehensibility, and appropriateness of the questionnaire. Based on the feedback obtained during the pilot study, necessary modifications were made before the final questionnaire was administered.

The final questionnaire consisted of five sections:

- **Part 1:** Demographic characteristics: age, gender, department, professional designation, years of nursing experience, marital status, and place of employment.
- **Part 2:** Occupational and shift-work characteristics: years of nursing experience, duration of experience in rotating shift work, and knowledge regarding the potential health effects of rotating shift work.
- **Part 3:** Physical health: assessment of physical symptoms and health problems potentially associated with rotating shift work.
- **Part 4:** Psychological health: assessment of psychological and cognitive effects associated with rotating shift work.
- **Part 5:** Social health: assessment of the effects of rotating shift work on family life, social activities, and community participation.

Data Collection Procedure: The questionnaires were administered face-to-face after obtaining

informed consent from the participants. Participants completed the questionnaire independently, while the interviewers were available to clarify the meaning of questions or individual statements when necessary. Care was taken to ensure that clarification did not influence the participants' responses.

Statistical Analysis: This section should be added if it is not present elsewhere in your manuscript. Please send me your statistical analysis method or the relevant SPSS output, and I can write this section accurately without inventing any statistical procedures.

RESULTS

Of the 250 nurses selected for the study, 210 completed the questionnaire, yielding a response rate of 84.0%. Among the respondents, 126 (60.0%) were male and 84 (40.0%) were female. The majority of participants were aged above 25 years (56.2%), while 43.8% were younger than 25 years. Most participants were married (77.6%), and 70.0% held a Bachelor's degree in Nursing. Regarding professional experience, 53.8% had more than five years of nursing experience, while 46.2% had less than five years of experience. The socio-demographic characteristics of the participants are presented in [Table 1]

Table 1: Socio-demographic characteristics of the participants

Variable	n	%
Gender		
Male	126	60.0
Female	84	40.0
Age (years)		
<25	92	43.8
>25	118	56.2
Marital status		
Single	47	22.4
Married	163	77.6
Education		
Diploma in Nursing	58	27.6
Bachelor's degree in Nursing	147	70.0
Master's degree in Nursing	5	2.4
Nursing experience (years)		
<5	97	46.2
>5	113	53.8

Regarding sleep duration, only 72 (34.3%) participants reported sleeping 6–8 hours per day. A larger proportion, 88 (41.9%), reported sleeping 4–6

hours, while 50 (23.8%) reported sleeping approximately 4 hours. The distribution of reported sleep duration is presented in [Table 2]

Table 2: Sleep duration among participants

Sleep duration (hours)	n	%
4	50	23.8
4–6	88	41.9
6–8	72	34.3
Total	210	100.0

The effects of rotating shift work were assessed across three domains: physical, psychological, and social health. Among the reported physical effects, occasional headache was the most frequently

reported symptom, affecting 75 (35.7%) participants, followed by fatigue in 53 (25.2%), peptic ulcer symptoms in 43 (20.5%), and indigestion/heartburn in 39 (18.6%) participants.

Among the psychological effects, difficulty with cognition was the most frequently reported problem, affecting 55 (26.2%) participants, followed by insomnia in 53 (25.2%), changes in food-related behavior in 52 (24.8%), and sleep deprivation in 50 (23.8%).

Regarding social effects, 65 (30.9%) participants reported that their daily life was affected by rotating

shift work. In addition, 51 (24.3%) reported limited time with family, 49 (23.3%) reported that their social activities were affected, and 45 (21.5%) reported an adverse effect on their community life. The distribution of physical, psychological, and social effects is presented in [Table 3]

Table 3: Physical, psychological, and social effects of rotating shift work

Impact	n	%
Physical impacts		
Occasional headache	75	35.7
Indigestion and heartburn	39	18.6
Fatigue	53	25.2
Peptic ulcer symptoms	43	20.5
Psychological impacts		
Sleep deprivation	50	23.8
Insomnia	53	25.2
Changes in food-related behavior	52	24.8
Difficulty with cognition	55	26.2
Social impacts		
Daily life affected	65	30.9
Limited time with family	51	24.3
Social activities affected	49	23.3
Community life affected	45	21.5

DISCUSSION

The present study demonstrates that rotating shift work is associated with a range of adverse physical, psychological, and social effects among nurses working in public and private hospitals. The findings suggest that the consequences of rotating shifts extend beyond sleep disruption and may affect nurses' physical health, cognitive and psychological well-being, and family and social life.

Among the physical effects assessed, occasional headache (35.7%) and fatigue (25.2%) were the most frequently reported complaints. These findings are consistent with previous research indicating that shift-working nurses commonly experience headaches and gastrointestinal disturbances, which may be related to disruption of normal circadian rhythms.^[16] The presence of fatigue among a substantial proportion of participants is also clinically relevant, as inadequate sleep and irregular work schedules may impair recovery and contribute to reduced alertness and work performance.

Cognitive difficulties (26.2%) and insomnia (25.2%) were the most frequently reported psychological and cognitive problems in the present study. These findings are comparable with those reported among intensive care nurses in the United States, where sleep impairment was associated with emotional problems, fatigue, and cognitive difficulties.^[17] Chang (2018) also reported poorer sleep quality among nurses working evening and night shifts compared with those working day shifts.^[13] Similarly, in the present study, only 34.3% of participants reported sleeping 6–8 hours per day, whereas the majority reported shorter sleep durations. These findings suggest that rotating

schedules may interfere with adequate sleep and recovery among nurses.

The present study also identified notable social consequences of rotating shift work. Nearly one-quarter of participants (24.3%) reported limited time with family members, while 21.5% reported that their community life was affected. These findings are consistent with the study by Portela et al. (2004), which demonstrated that rotating shifts could interfere with family schedules, holiday planning, and social activities among hospital nurses.^[15] In addition, 30.9% of participants in the present study reported that their daily life was affected by rotating shift work, highlighting that the consequences of shift work may extend beyond the workplace and influence nurses' personal and family lives.

Similar findings have been reported among other healthcare professionals. Khan et al. reported that rotating shift work among paramedics in Australia was associated with poor sleep, increased stress, fatigue, and excessive sleepiness.^[18] Likewise, a study conducted among rotating shift nurses in Modena, Italy, found that nurses experienced chronic fatigue and sleep disturbances despite being relatively young and having fewer family-related responsibilities.^[14] The consistency of these findings across different healthcare professions and geographical settings suggests that the challenges associated with rotating shift work may be broadly relevant to healthcare workers.

The findings of the present study have important implications for hospital management and nursing workforce planning. In settings where nursing shortages result in frequent or prolonged shifts, nurses may have fewer opportunities for adequate sleep and recovery. Healthcare institutions should therefore consider strategies such as appropriate

staff allocation, balanced and predictable shift schedules, adequate rest periods between shifts, and monitoring of excessive working hours. Such measures may help reduce the potential physical, psychological, and social burden associated with rotating shift work.

The present study has several limitations. First, its cross-sectional design prevents establishing a causal relationship between rotating shift work and the reported health effects. Second, the study relied on self-reported questionnaire data, which may be subject to recall and reporting bias. Third, the study did not differentiate between specific types of rotating schedules, such as forward or backward rotation, nor did it assess the frequency or duration of individual shifts. Finally, because the study was conducted among nurses working in selected tertiary care hospitals, the findings may not be generalizable to all nurses or healthcare settings. Future studies using longitudinal designs and objective measures of sleep and health outcomes should investigate the effects of different shift patterns and identify strategies to minimize their adverse consequences.

CONCLUSION

Rotating shift work is associated with adverse physical, psychological, and social effects among nurses working in public and private hospitals. Headache, fatigue, sleep disturbances, cognitive difficulties, and reduced family and social interaction were commonly reported by the participants. Although rotating shifts are essential for ensuring continuous patient care, healthcare institutions should implement appropriate scheduling practices, adequate rest periods, and workplace support systems to minimize their potential adverse effects on nurses' health and well-being.

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