



Evaluating the Impact of Rotating Shift Schedules on Nurses Health Working in Tertiary Care Hospital of Lahore

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ABSTRACT

Background: Nurses working in rotating shifts face numerous challenges due to irregular work patterns, which can negatively impact their physical, psychological, and social well-being. In Pakistan, limited research has been conducted on this topic, especially within tertiary care hospital settings. **Objective:** To evaluate the impact of rotating shift schedules on the physical and psychological health of nurses working in a tertiary care hospital in Lahore. **Methods:** A cross-sectional descriptive study was conducted at tertiary care hospital, Lahore. A total of 108 registered nurses were selected using convenience sampling. Data were collected through a validated structured questionnaire, analyzed using SPSS version 23.0, and interpreted through descriptive statistics. **Results:** The study's findings indicate that 50% nurses perceive it as a barrier to decision-making, 70% acknowledge sleep difficulties, and 54% identify time limits for exercise. 59% are concerned about the quality of communication. 41% believe that religious activities are affected, and 42% identify problems with knowledge transfer when nurses take over responsibilities. Regarding the quality of patient treatment, opinions differ (51% good). Physical health impacts affect 70.4%, social life is disturbed for 60%, and stress levels affect 68.5% of people. Other concerns include poor nutrition (57.4%), fatigued nurses (72.2%), and neglect of children (71.5%), changed elimination patterns (58.4%), expected lifespan (58%), memory issues (57.4%), hormonal disturbances (57.4%), conflicts at work (64.8%), and the likelihood of infection (61.1%). Lastly, 58.4% believe that absenteeism is high. **Conclusions:** Alternating shift schedules have bad impact on health. Irregularity in working hours, mainly in healthcare institutions can cause psychological, physiological, social, and mental disturbances. **Recommendation:** To ensure nurses effective shifts management without any disturbance to their circadian rhythms, it is recommended that implement proper structured six hour shifts with rotating schedules. Furthermore, it is necessary to maintain adequate rest duration between shifts to allow for proper recovery.

Background

Nurses are working in rotating shifts to give 24-hour care to patients (Pélissier et al., 2020). Particular designs are not display to organize shifts. On the other hand, Medical caregivers typically perform two to four duties in a row, moving between morning, evening, and night duties every two to three days (Min et al., 2021). Agreeing to investigate on nurses eight-hour fast rotating shifts are required (Baek et al., 2020). Nurse's works beneath an indicated time period this is depicts as the shifts plans. Shifts work plans can moreover have inadvertent results depending on whether they are rotational and lasting. Concurring to WHO, Universally, 29 million nurses are working in shifts to give 24/7 care to patients (Boniol et al., 2020). In European locale there are evaluated 7.3 million medical caretakers and nurses are working in clinics (WHO European Locale., 2020). This number is not sufficient to fulfill the show and future needs of healthcare. Deficiency of medical caretakers is a worldwide issue in advance. The current evaluated deficiency of medical caretakers in the world is around 7 million and is anticipated to reach around 12.9 million by 2035 (Shamsi & Peyravi., 2020).

On the other hand, in developing countries, the percentage is mainly depending upon the available resources and healthcare demands. A Survey conducted by Pakistan Economics 2020-2021; Total number of registered nurses is 116,659 for population of near 200 million peoples. The nurse-to-patient ration is 1:40 in the general wards of Pakistan's hospitals; But Pakistan Nursing Council (PNC) suggested the nurse-to-patient ration of 3:10 this shortage of nurses leads to alternating shifts and can cause trouble to patients as well as to the nurses (Hassan, 2023). Nurses practice with direct contact with patients resulting in the development of burnout among nurses than other health professionals. 59.1% of clinical nurses are affected by burnout, and irregular schedules, social, personal and environmental factor may increase the severity of burnout (Perveen & Zahida., 2024).

As a nurse, understanding the complexities of rotating nursing shifts plans is essential. Shifts work connected to different wellbeing issues. As the biggest gather of healthcare experts, nurses play an imperative part in the healthcare framework and clinic asset administration (Grötting et al., 2023). Nurses and other wellness care personnel are assigned to rotate shifts in both public and commercial division healing centers in order to provide patient care. Although these irregular shifts allow patients to get care with no any unpleasant effects, nurses' and wellness specialists' schedules might affect patients' wellbeing. According to a study done in the United Kingdom, nurses who work lengthy night hours are more likely to have long-term illness nonattendance rates than nurses who work day shifts (Dall'Ora et al., 2020).

Here we will highlight the previous studies on the impacts of substituting shifts on nurse's counting Physical and Mental wellbeing issues. Past previous studies depict that pivoting shifts plans can cause wounds, compromise quiet care and human blunders (Khan et al., 2022). Nurses are on the front line to keep up the standard and quality care of wellbeing organizations. Another study illustrated the possible effects of occupational variables such as a loss of personal productivity and the possibility of compromising nurses' security and well-being. These effects include mistakes made while providing care to patients, missing care, nursing injuries, socially manipulation, and tired traveling (Khan et al., 2023).

Nurses frequently witness compassion fatigue as they face alternating shift schedules begins to empathize with their pain and nurses with compassion fatigue experience physical and Physiological symptoms including headache, indigestion, sleep diseases, fatigue, depression, and

apathy and may give reduced care for their cases (Ryu et al., 2022). Compassion fatigue can directly affect the physical health of nurses by upping their possibility of injuries, especially musculoskeletal and needle stick injuries. Alternating shift work also has adverse effect on social life, can make troubles in setting up family events. It also disturbs planning, generally made for leaves and other social conditioning.

Rotating shift work interrupts valued timing of family, similar as evening and night timing, when family conditioning generally do. Broad range of habitual conditions, compromised performance rotundity and injuries are the attendant of shift work and long working hours among nurses. Wakefulness is also an effect of doing alternating shifts. Workers who are working in alternate shifts can witness disturbed sleep wake cycles which can beget fatigue and sleep deformation, as day- time sleep does not approach the character of night- time sleep (Roman et al., 2023)

Objectives

To estimate physical and physiological health problems linked with alternating shift schedules or roasters among nurses

Hypothesis

Null Hypothesis (H_0)

There is no significant impact of alternating shift schedules on the physical, psychological and social wellness.

Alternative Hypothesis (H_1)

Alternating shift schedules will have significant impact on nurses including disruption in their physical, psychological and social wellness.

Method & Materials

A descriptive cross-sectional study approach was used to address the research. Cross-sectional descriptive study is a study that looks at data from a population in specific time duration. This study design was suitable for describing the effects of alternating shifts at a particular time in a particular population. The design was chosen to elaborate the effects of alternating shifts schedules on nurses working in private hospital in Lahore, Pakistan, within a specified time period. This study was conducted at tertiary care hospital Lahore, Pakistan. The study's participants were registered nurses who worked different shifts at a private hospital. Sample size was calculated by using an online sample size calculator OpenEpi Version 3.0. The sample size (n) choose generalized sample of total population N size 180 nurses which were working in tertiary care hospitals of Lahore. In this study both male and female nurses will participate through convenience sampling. A convenience sampling is a type of non-probability method of selection in which participants are selected on the basis of readily available rather than random selection in a study. Convenience sampling is often time efficient, easy to implement and cost effective. Sample selection was done on criteria of clinical experience in rotating shifts of nurses. The inclusion criteria based on experience of registered nurses working in alternating shifts having work experience > one year and above. Registered Nurses will not be included in this study that has work experience < one year. A structured questionnaire was used to collect data which was adopted from (Khan et al., 2023). Permission granted via electronic mail. Tool was checked by

three experts and validity assessed at 0.81. The questionnaire was consisting on two sections section A and section B. Section A related to “demographic data” and Section B related to research questions associated with effects related to alternating shifts. Demographic information of research participants was obtained by using demographic profile form. Demographic from consist of following data; Age, Gender, Ethnicity, Marital Status, Job Experience, Family Structure. Study tool (likert scale) is consisting of 20 questions statements with mark able blanks mentioning the following statements: “strongly disagree”, “disagree”, “neutral”, “agree”, “strongly agree”. The participants will be given 20-30 minutes to complete the questionnaire along with consent form. Participants were provided with detailed information about the research beforehand. The data collection process utilized Google Forms, where participants accessed an online questionnaire and submitted their responses, which were recorded. The questionnaire used for this study comprises of 20 questions that are divided into four sections Influence on psychological wellness which includes 1 to 4 questions, Impact on physical wellbeing which includes next 5 to 11 questions, Effects on social connectivity which includes next 12 to 16 questions and Impact on professional fulfillment consists of 17 to 20 questions. Minimum score is 20 and maximum score is 100.

Informed consent was obtained from all participants before data collection. Statistical Package for Social Sciences (SPSS) was used for analysis of data which version was 23.

Results

Table 1: Demographic Data of Nurses

Demographic data	Frequency(n)	Percentage (%)
Gender		
Male	41	38%
Female	67	62%
Qualification		
Masters in Nursing	6	5.6%
BS Nursing	82	75.9%
Post RN	9	8.3%
Diploma in Nursing	11	10.2%
Year of Experience		
1-5 Years	95	88%
6-10 Years	11	10.2%
10 or More	2	1.9%
Average number of shift changes per three months		
1-3 Times	71	65.7%
4-6 Times	28	25.9%
7-9 Times	7	6.5%
10 or More	2	1.9%
Type of shift mostly worked		
Morning	66	61.1%
Evening	15	13.9%
Night	7	6.5%
Rotational	20	18.5%

Regarding qualifications of 108 respondent of this study 6 participants (5.6%) having degree of Masters in nursing. A large group of participants 82(75.9%) have BS Nursing degree, 9(8.3%) respondent were Post RN and 11(10.2%) participants having Diploma in Nursing. Out of 108 respondents 67 were female 62% and 41 male respondent 38% shown in the 95 Respondents having year of experience 1-5 years are 88% on the other hand 11 participants having experience 6-10 years are 10.2% and the 2 nurses having experience 10 or more than 10 year are 1.9% which are mentioned in the .Over the period of three month most of 71 respondents (65.7%) working in 1-3 shift changes, another group of 28 respondent who experienced 4-6 times shift change include (25.9%), few respondents 7(6.5%) experience 7-9 changes, while only 2(1.9%) experience 10 or more shift changes .Out of all respondent most of the respondents 66(61.1%) work in morning shifts, while 15 nurses 13.9% work in evening shifts, few of respondents 7(6.5%) were working in night shifts. 20 respondents (18.5%) was working in the rotational shifts (Table 1).

Table 2: Impact of Rotating Shift Schedules on Nurses Health

Sr. No.	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	I. Influence on psychological wellness					
1	Nurses are unable to make effective decisions due to extended hours of duty. (Patient-related decision)	13.9%	17.6%	18.5%	43.5%	6.5%
2	The stress level of nurses is high during long shifts	9.3%	9.3%	13.0%	44.4%	24.1%
3	The memory of nurses is badly affected by performing longer shifts	9.3%	14.8%	18.5%	40.7%	16.7%
4	Hormonal levels are disrupted due to long duty hours	11.1%	4.6%	26.9%	39.8%	17.6%
	II. Impact on physical wellbeing					
5	Sleeping deficit is common among nurses working for longer shifts	5.6%	4.6%	20.4%	40.7%	28.7%
6	Due to long duty hours, nurses have harmful body effects such as dark circles, weight loss, or gain	4.6%	10.2%	14.8%	41.7%	28.7%
7	Diet intake is adequate, according to the body needs of nurses	6.5%	11.1%	25.0%	38.0%	19.4%
8	Nurses working long shifts are exhausted	5.6%	7.4%	14.8%	49.1%	23.1%
9	The eliminatory pattern is altered due to long duty hours	3.7%	9.3%	28.7%	41.7%	16.7%
10	Life expectancy is affected due to long duty hours	7.4%	5.6%	24.1%	47.2%	15.7%
11	Nurses working longer shifts are more prone to nosocomial infections.	5.6%	7.4%	25.9%	43.5%	17.6%
	III. Effects on social					

	connectivity					
12	Nurses are unable to find time for exercise and leisure activities.	9.3%	9.3%	27.8%	38.0%	15.7%
13	Nurses who perform long duty hours can perform their religious activities on time	6.5%	25.0%	27.8%	30.6%	10.2%
14	The social life of nurses is disrupted due to long shifts	4.6%	8.3%	26.9%	44.4%	15.7%
15	Children care is neglected by parent nurses who work for extended duty hours	5.6%	6.5%	16.7%	49.1%	22.2%
16	Nurses who work long duty hours face more conflicts as compared to nurses working eight duty hours or less	7.4%	9.3%	18.5%	47.2%	17.6%
	IV. Impact on professional fulfillment					
17	While handing over, nurses provide inadequate knowledge to other staff	10.2%	16.7%	31.5%	32.4%	9.3%
18	Nurses who work for 12 hours or more provide the best care to the patient	8.3%	42.6%	19.4%	24.1%	5.6%
19	Communication is not therapeutic or professional for nurses working longer shifts	7.4%	19.4%	31.5%	34.3%	7.4%
20	The absenteeism ratio is high for nurses working longer shifts.	1.9%	13.9%	25.0%	51.9%	7.4%

The questionnaire result show variety of opinion in table 2 about the, nurses is unable to make wise decisions because of long work hours (decisions pertaining to patients). Out of 108 respondents 15 respondents (13.9%) strongly disagree and 19 respondents (17.6%) also disagreed, 20 nurses (18.5%) didn't effected by long duty hours, but on the other hand a large group 47 respondents (43.5%) were agreed and 7 respondents (6.5%) also strongly agreed. 50% participants either agreed or strongly agreed on that extended duty hours have negative effect on decision making of nurses .Results regarding stress level during longer shifts among nurses. 26 respondents (24.1%) were strongly agreed, while 48 respondents (44.4%) were agreed on that the long shifts can leads to high stress level among nurses, on the other hand a group of respondents including 14(13%) were not bearing stress due to extended working hours. Out of 20 half were disagreed (9.3%) and the remaining half (9.3%) was strongly disagreed According to statement few 10 respondents (9.3%) were strongly disagreed while 16 respondents (14.8%) were disagreed. Representing as an intermediary a group about 20 respondents (18.5%) was neutral; on the other hand majority of the respondents 44(40.7%) were agreed while 18 respondents (16.7%) were strongly agreed with statement of the question. Majority of the participants 57.4% reported the hormonal changes due to longer duty hours (strongly agreed: 17.6%, Agreed: 39.8%). 29 respondents (26.9%) were neutral. About 5 respondents (4.6%) disagreed and 12 respondents (11.1%) strongly disagreed .The result of question number 5. Out of 108 respondents 6 respondents (5.6%) strongly disagree and 5 respondents (4.6%) also disagreed, 22 nurses (20.4%)

don't face sleep deficit due to long shift hours, but on the other hand a large group 75 respondents (69.4%) were agreed or strongly agreed on that the sleep deficit is common among nurses working longer shifts. 31 respondents (28.7%) were strongly agreed, while 45 respondents (41.7%) were agreed, on the other hand a group of respondents including 16(14.8%) were not experiencing body effects due to extended working hours. Out of 16, 11 respondents were disagreed (10.2%) and the remaining 5(4.6%) was strongly disagreed. Most of the participants 57.4% reported adequate level of intake of diet, based on the physical requirements of nursing due to longer duty hours (strongly agreed: 19.4%, Agreed: 38%). 27 respondents (25%) were neutral. About 12 respondents (11.1%) disagreed and 7 respondents (6.5%) strongly disagreed. According to statement "Nurses working long shifts are exhausted" only 6 respondents (5.6%) were strongly disagreed while 8 respondents (7.4%) were disagreed. Representing as an intermediary a group about 16 participants (14.8%) neutral; on the other hand majority of the respondents 53(49.1%) were agreed while 25 respondents (23.1%) were strongly agreed. Out of 108 nurses 4 respondents (3.7%) strongly disagree and 10 participants (9.3%) also disagreed, 31 nurses (28.7%) didn't face altered eliminatory pattern due to long shift hours, but on the other hand a large group 45 respondents (41.7%) were agreed and 18 respondents (16.7%) were strongly agreed which means they face eliminatory pattern due to long duty hours, 17 respondents (15.7%) were strongly agreed, while 51 respondents (47.2%) were agreed, 26 respondents (24.1%) were neutral. Only fewer respondents 8(7.4%) were strongly disagreed and 6 respondents (5.6%) disagreed 19 nurses were strongly agreeing (17.6%) and agreed by 47 respondents (43.5%) while 28 were neutral. On the other hand, 6 respondents (5.6%) strongly disagreed and 8(7.4%) were disagreed. 10 nurses (9.3%) strongly disagreed and 10(9.3%) also disagreed. 30 respondents (27.8%) were neutral. The remaining 58 respondents (38% agreed and 15.7% strongly agreed) are unable to find time for exercise and leisure due to long shifts. 7 respondents (6.5%) strongly disagreed and 27 with frequency (25%) disagreed. 30 respondents (27.8%) neutral. 33 nurses (30.6%) were agreed to statement while only 11 participants strongly agreed Only fewer 5 participants (4.6%) strongly disagreed; 9 participants (8.3%) disagreed. 29 nurses (26.9%) were neutral. This statement agreed by 48 participants (44.4%) while 17 participants (15.7%) strongly 6 respondents (5.6%) strongly disagreed; 7 participants (6.5%) disagreed to this statement. 18 participants (16.7%) were neutral. Agreed participants to this statement were 53(49.1%) and strongly agreed 24 participants 8 respondents were strongly disagreed (7.4%), disagreed by 10 respondents (9.3%). Out of 108 nurses 20 were neutral (18.5%). Respondents agreed to this statement were 51(47.2%), 19 respondents (17.6%) strongly agreed on that they face conflicts due to long duty hours.

While handling over, inadequate knowledge provided to other staff is due to longer shift hours, 11 participants (10.2%) strongly disagreed, 18(16.7%) were disagreed while 34(31.5%) neutral, 35(31.5%) agreed and 10(9.3%) were strongly agreed to this statement . Strongly disagreed were chosen by 9 participants (8.3%) while 46 participants (42.6%) disagreed and 21 nurses (19.4%) were neutral, on the other hand 26 respondents (24.1%) agreed and only 6 participants (5.6%) strongly agreed to this statement .Most of participants 37(34.3%) agreed and 8(7.4%) strongly agreed. Some participants 34(31.5%) were neutral. 21 nurses (19.4%) disagreed while 8 respondents (7.4%) strongly disagreed. Many respondents 56(51.9%) agreed on higher absenteeism ratio among nurses working longer shifts, 8(7.4%) strongly agreed. 27 nurses (25%) neutral, disagreed were 15 (13.9%) and only 2(1.9%) strongly disagreed.

Discussion

Many industries deal with extended hours of work in order to meet the demand in efficient way, to tackle with this situation industries continuously adapting the alternating shift schedules. In any

health care system the largest group are nurses, plays vital role for providing continuous and efficient patient care by coordinating with other health care professional (Hashish et al., 2024). Patients' need 24/7 care for this purpose nurses work 24-hour to provide efficient care to sick individuals. Nurses actually work longer shifts than eight hours since they constantly take over for patients. majority of nurses work longer night shifts.. The official work hours should be 9 hours (8 hours plus 30 minutes before and 30 minutes after work) if the takeover time is 30 minutes. As a result, this finding is limited in its ability to represent actual shift extension associated with frequent overtime in environments with an excessive workload. To find out how frequently this happens and whether there are suitable steps to give enough breaks and reduce the buildup of fatigue when shifts are suddenly or expectedly prolonged, more observational studies are advised. (Lee et al., 2021).

Nurses work on extended 12-hour shifts whether day or night. Shift scheduling varied between hospitals. Some hospitals have adopted the pattern of week in a stretch whereas others divided the week into two working sessions. The present study aimed to investigate physical and psychological health outcomes linked with alternating shift schedules or roasters among nurses. The results of this study indicated that there's an alternate relationship between exploration and main factors. In this regard score of negative factors was advanced than normal. The response of descriptive analysis of tone- reported data, the findings revealed that the maturity of nurses displayed reduced physical and Physiological well- being, demonstrating significant suffering. These findings emphasize expansive Physiological challenges among nurses. The circumstance of poor Physiological and physical well- being among nurses is a complex issue told by colorful factors within their work terrain. Conditions which beget stressful working terrain, including emotionally dangerous tasks, high rate of case as compared to nurses contribute to stress overwhelm and collapse. Institutional factors similar as rotating shifts, long working hour and limited growth openings make worse these challenges. Multitudinous studies reported that alternating shifts schedules have adverse effects on Physiological and physical heartiness of nurses. Nurses face major challenges, including high stress, fatigue, internal health issue, and collapse, which can poorly affect their well- being, performance, and effectiveness (Alsayed et al., 2022).

Out of total respondents, 50% participants either agreed or strongly agreed on that extended duty hours have negative effect on decision making. Results regarding stress level, 69% respondents strongly agreed & agreed on that the long shifts can leads to high stress level among nurses According to Kim et al. (2021), nurses in the United States who work longer shifts experience poor internal health, with maturity reporting moderate to high levels of stress. According to recent studies conducted in related societies, nurses' workload is also the main source of stress. Stress causes nurses to witness collapses, which may affect their ability to take on safety-related cases and lead them to think about leaving their jobs (Baydin et al., 2020).

The findings of the study indicate that sleep deficiencies are common among nursing staff who work longer shifts. Sleep disorders are more common among Pakistani nurses who work shifts, particularly at night, according to Arif et al. (2020) stated that nurses who work shifts, especially at night, are more likely to suffer from sleep syndromes. Results of this study shows that longer or interspersed shifts have a detrimental effect on nurses' physical health. When comparing night shift workers to day shift workers, Qanash et al., (2021) discovered that night shift workers' quality of life was worse than that of day shift workers, particularly with regard to sleeping, social, and bodily problems. Our research also reveals that long and intermittent shifts cause nurses to have low social connectivity. Because many family and social conditioning systems are set up in a way

that is out of step with society, nurses who work long or intermittent shifts struggle to maintain social connectivity. Because of the disparity between nurses' free time and the complex relationship of social conditioning, shift work may result in a lack of social connectivity (Ebatetou et al., 2021).

Limitation of Study

- This study is limited to a particular geographic area (Lahore), which means its findings cannot be fully generalized to other regions. Differences in healthcare systems, like policies regarding staff, and conditions of working in other areas may result in varied outcomes.
- Shift schedules vary from hospital to hospital, with differences in length of shift, rotation patterns and frequency. Due to these variations, a common pattern of shift scheduling cannot be equivalently applied across all healthcare institutions
- Every nurse's coping level is different. When a nurse comes to handling shift schedules, factors such as experience, personal resilience, work-life balance, and physical health influence how well a nurse can adapt to varying shift patterns. Some nurses may manage irregular hours or long shifts with ease, while others might find them more exigent.
- High patient-to-nurse ratio might demand longer shifts or further numerous rotations, the scheduling arrangement should be planned in reflection of the number of patients each nurse is accountable for, ensure the stability between workload and the quality of care provided

Conclusion

For any institution to offer patients round-the-clock medical care, rotating shifts or rotational employment are required. For nurses, rotational work is obligatory for the delivery of continual quality care to the patients, but it has some bad effects on the health of nurses as well as on safety of patients. A negative impact might be mental, social, or physiologic. This study's research demonstrates that alternating shifts affect sleep. Effective interaction and physical exercise are also on the decline. Additionally, transfer of knowledge during shifts is inadequate. Nurses said that rotating shift work had decreased their interest in social events in addition to having detrimental effects on their physical health, such as anxiety, tiredness, and altered elimination habits. Possible childcare neglect, memory

Recommendation

To ensure nurses effective shifts management without any disturbance to their circadian rhythms, it is recommended that implement proper structured 6-hour shifts with rotating schedules. Furthermore, it is necessary to maintain adequate rest duration between shifts to allow for proper recovery. By applying this approach, it can minimize fatigue, balance the natural sleep-wake cycle, and enhance overall nurse performance and well-being. By taking into consideration these factors, hospitals can make a work setting that supports both nurse health and high-quality patient care.

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