The Nigerian Health Journal; Volume 25, Issue 2 – June, 2025
Perceived Impact of Shift Work on Sleep Quality and Alertness
Okwori et al

Original

Perceived Impact of Shift Work on Sleep Quality and Alertness Among Medical National Youth Service Corps (NYSC) Members in Ado Ekiti, Nigeria

¹Joseph M. Okwori, ²Shadrach C. Eze, ³Precious U. Ifeanyichukwu, ⁴Eniibukunoluwa G. Olomola, ³Gerald O. Ozota, ⁵Evaristus C. Odoh, ⁶Precious N. Agenu, ¹Peace O. Oluwayemi

¹Victory Drugs, Festac Town, Lagos, Nigeria.
²Department of Pharmacy, Federal Teaching Hospital Ido-Ekiti, Ado Annex, Ekiti State, Nigeria.
³Department of Clinical Pharmacy and Pharmacy Management, Faculty of Pharmaceutical Sciences, University of Nigeria, Nsukka, Nigeria.
⁴Faculty of Pharmacy, University of Lagos, University Road, Akoka, Lagos, Nigeria.
⁵Department of Pharmacy, Maddibo Adamu University Teaching Hospital Yola, Adamawa State, Nigeria.
⁶Department of Obstetrics and Gynaecology, Federal Medical Center Asaba, Delta State, Nigeria.

Corresponding author: Shadrach Chinecherem Eze, *Department of Pharmacy, Federal Teaching Hospital Ido-Ekiti, Ado Annex, Ekiti State, Nigeria.* shadrachchinecheremeze@gmail.com; +2349160253290

Abstract

Background: Shift work in healthcare is associated with disrupted circadian rhythms, poor sleep quality, and decreased alertness. Despite their critical role in Nigerian healthcare, there is limited research on how shift work affects sleep quality and performance among medical National Youth Service Corps (NYSC) members. This study investigated the perceived impact of shift work on sleep quality and alertness among medical NYSC members in Ado-Ekiti, Nigeria, by comparing outcomes between fixed-day and rotating shift workers. We hypothesized that rotating shift workers would report poorer sleep quality and reduced alertness compared to fixed shift workers.

Methods: A cross-sectional survey was conducted among NYSC members using purposive sampling. Respondents were classified into fixed-day shift workers and rotating shift workers. The Pittsburgh Sleep Quality Index (PSQI) and a five-point alertness scale were used as data collection tools. SPSS v23 was used for descriptive and inferential statistics.

Results: Thirty (30) respondents participated in the study. The prevalence of poor sleep quality (PSQI score > 5) was 83.3%, with no statistically significant differences between fixed-day and rotating shift workers ($p > 0.05$). A significant negative correlation was found between global PSQI scores and alertness levels ($r = -0.592$, $p = 0.001$). Key PSQI components, including subjective sleep quality, daytime dysfunction, and use of sleep medication, were significantly correlated with decreased alertness.

Conclusions: Poor sleep quality is highly prevalent among NYSC members, negatively affecting their alertness. Interventions to address sleep quality in NYSC members are vital for optimizing performance and ensuring long-term well-being.

Keywords: Sleep quality, shift work, alertness, National Youth Service Corps (NYSC), medical corps members, Nigeria, Pittsburgh Sleep Quality Index (PSQI)

How to cite this article

The Nigerian Health Journal, Volume 25, Issue 2
Published by The Nigerian Medical Association, Rivers State Branch.
Downloaded from www.tnhjph.com
Print ISSN: 0189-9287 Online ISSN: 2992-345X

598

The Nigerian Health Journal; Volume 25, Issue 2 – June, 2025
Perceived Impact of Shift Work on Sleep Quality and Alertness
Okwori et al

Introduction

Healthcare systems worldwide rely heavily on shift work to ensure uninterrupted patient care [1,2]. Shift work is defined as a method of organisation of working time in which workers succeed one another at the workplace so that the establishment can operate longer than the hours of work of individual workers.[2] While this approach is indispensable especially in the healthcare sector, studies have shown that it often leads to increased risk of adverse health outcomes and reduced productivity among healthcare professionals. Fixed and rotating shifts are the two predominant scheduling types widely employed in healthcare settings and both involve morning, evening and night shifts [1,2]. Fixed shifts provide a consistent work pattern, while rotating shifts can be continuous or semicontinuous and are often characterised by irregular working hours. Physiologically, rotating shifts require a sleep-wake schedule that disrupts natural circadian rhythms [3,4]. Such disruptions can cause alterations in body functions from the molecular to the behavioural level, and have been strongly associated with poor sleep quality, reduced alertness and overall reduction in quality of life [5–7]. As such, sleep quality is a critical determinant of overall health and workplace productivity.

Studies have noted the existence of a high prevalence of poor sleep quality among healthcare workers, especially those who work fixed nights and/or engage in shifts with longer work hours than the standard working hours. Aside from impairing sleep quality, shift work has been linked to increased risks of vascular disorders such as coronary and cerebrovascular events [8]. The increasing duration of shift work is associated with decreased probability of healthy aging, poorer mental health status, increasing levels of anxiety and depression symptoms, as well as increased risk of dementia due to mid-life shift work history [2,6,9–11]. Repeated exposures to shift work is known to alter the hormonal profile and also affect the expressions of oncogenes to develop cancer thereby increasing the risk of breast cancer, prostate cancer, gastrointestinal abnormalities and reproductive aberrations [8,12]. Additionally, shift work has been found to be associated with childhood obesity and insulin resistance among children born to mothers who engage in maternal shift work [13]. In general, these effects can be particularly concerning for young healthcare workers who are expected to perform optimally under physically and mentally demanding environments, without compromising patient safety and care, and at the same time, maintain a good work-life balance.

In Nigeria, the National Youth Service Corps (NYSC) provides a mandatory year-long service opportunity for young graduates, including healthcare professionals, in a bid to reconstruct, reconcile and rebuild the country after the Nigerian Civil war [14]. Medical NYSC members (herein referred to as medical corps) are often deployed to various healthcare facilities across the country, including resource-limited settings where they are expected to work under demanding conditions. These corps members frequently face unique challenges such as prolonged hours, irregular shift patterns, limited welfare provisions, and often receive little or no additional renumeration [15,16]. Studies have also noted high prevalences of depression, anxiety and stress among corps members [17,18]. Despite the critical role they play in bridging the gaps in healthcare access, there is limited research on how their work schedules affect their sleep quality and overall well-being. This gap is particularly significant in low- and middle-income countries (LMICs) where healthcare systems rely heavily on such junior professionals, and local contextual factors may influence sleep outcomes differently from high-income settings.

This study aimed to investigate the perceived impact of shift work on sleep quality and perceived alertness among medical corps members in Ado-Ekiti, Nigeria. Specifically, the objectives were: to determine the prevalence of poor sleep quality among medical corps members in Ado-Ekiti using the Pittsburgh Sleep Quality Index (PSQI) assessment tool; compare sleep quality and perceived alertness levels between fixed-day and rotating shift workers among medical NYSC members; assess the correlation between sleep quality and perceived alertness levels among medical corps members. Understanding these dynamics is critical for addressing the systemic and individual challenges faced by this workforce and for informing interventions to enhance their health, work-life balance, and job performance.

METHODS

Study Design and Setting

This study employed a cross-sectional survey design to assess the impact of shift work on sleep quality and alertness among medical corps members in Ado-Ekiti,

The Nigerian Health Journal; Volume 25, Issue 2 – June, 2025
Perceived Impact of Shift Work on Sleep Quality and Alertness
Okwori et al

Ekiti State, Nigeria. Ado-Ekiti, the state capital, is a major hub for healthcare services and hosts numerous healthcare facilities where medical corps members provide essential care. Participants were drawn from various healthcare facilities (both public and private) that serve both urban and rural populations within Ado-Ekiti. This ensures a representation of medical corps members from diverse workplace settings with different experiences of shift work.

This study was conducted according to the STROBE's (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines [19].

Participants
The study population comprised medical corps members currently serving in Ado-Ekiti who were engaged in either fixed-day or rotating shift work. Participants were selected using purposive sampling. This non-probability sampling method was chosen to ensure the inclusion of medical corps members from various key medical specialties (doctors, pharmacists, nurses, optometrists, and laboratory scientists) within the accessible population in Ado-Ekiti, despite the small overall number of eligible individuals. Eligibility criteria included medical corps members actively engaged in either fixed-day or rotating shifts in Ado-Ekiti. Exclusion criteria included individuals with prior diagnoses of sleep disorders, or those unwilling to provide informed consent, and non-medical corps members. Of the 41 corps members approached, 30 respondents met the eligibility criteria and completed the survey, yielding a response rate of 73.2%.

Data Collection Tools
Data was collected using a structured, self-administered questionnaire designed for this study. The questionnaire comprised of the following sections:
1. Sociodemographic Profile: Age, gender, marital status, ethnicity, medical specialty, and shift type.
2. Work Schedule Details: Average daily and weekly work hours, and satisfaction with work-life balance.
3. Sleep Quality Assessment: The Pittsburgh Sleep Quality Index (PSQI), a validated instrument, was used to evaluate sleep quality [20,21]. The PSQI assesses seven components of sleep (subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleep medication and daytime dysfunction) and provides a global score ranging from 0 to 21, with higher scores indicating poorer sleep quality. A global PSQI score >5 indicates poor sleep quality and was used as the cutoff point to categorize sleep quality as either good or poor for further analysis.

4. Alertness Levels: Perceived alertness during work hours was measured using a self-reported scale ranging from 1 (very low alertness) to 5 (very high alertness). This ad hoc measure was developed for the purpose of this study to capture participants' subjective assessment of their alertness. Although the alertness scale used in this study was developed ad hoc and lacks formal psychometric validation, similar self-reported rating scales have been widely used in research to capture subjective alertness and fatigue due to their face validity and ease of use [22,23].

Study Procedure
Data collection occurred over a 4-week period between January and February 2024. Questionnaires were administered in-person to participants at NYSC health facilities and during scheduled NYSC meetings. Participants were informed about the study's objectives and procedures by the researchers before providing their informed consent to participate. Each participant completed the questionnaire independently to minimize response bias.

Ethical Considerations
This study was conducted in accordance with the ethical principles for human research. Informed consent was obtained from all participants prior to data collection. Participants were assured of anonymity and confidentiality, and their voluntary participation was emphasized. Due to the rapid nature of data collection within the NYSC program's timeline and the low-risk nature of the survey (collecting self-reported, non-identifiable data), a formal institutional review board (IRB) approval number was not obtained at the time of the study. However, the study strictly adhered to the ethical guidelines of voluntary participation, informed consent, and data anonymity.

Data Analysis
Data were analysed using IBM's Statistical Package for Social Sciences (SPSS Version 23). Descriptive statistics (frequencies, percentages, and means ± standard deviation) were used to summarize participants' sociodemographic and work characteristics.

The Nigerian Health Journal; Volume 25, Issue 2 – June, 2025
Perceived Impact of Shift Work on Sleep Quality and Alertness
Okwori et al

Independent t-tests were conducted to compare mean global PSQI scores and alertness levels between fixed-day and rotating shift workers, while chi-square tests were used for categorical comparisons (e.g., prevalence of poor sleep quality). Pearson correlation analysis was employed to explore the linear relationship between global PSQI scores and alertness, as well as between individual PSQI components and alertness. Assumptions for parametric tests (e.g., approximate normality of residuals for t-tests) were assessed visually and through statistical tests (e.g., Shapiro-Wilk test) and found to be sufficiently met for the application of these tests. No missing data were present, and no outliers were removed. A significance level of $p < 0.05$ was set for all statistical tests. For certain correlations, a more stringent significance level of $p < 0.01$ was also noted where applicable to indicate a stronger statistical association.

RESULTS

Sociodemographic Characteristics

The study included 30 medical corps members (73.2% response rate) with a median age of 26.5 years (IQR: 25.3–30.0 years). **Table 1**. presents the sociodemographic information of respondents categorized by the type of shift work schedule they engaged in. It shows that most participants worked rotating shifts (n = 16, 53.3%), while the remaining 46.7% (n = 14) had fixed-day shifts. Males slightly outnumbered females (53.3% vs. 46.7%), and the majority were single (73.3%), in NYSC batch B category (56.7%) and of Igbo ethnicity (50%). Pharmacists (33.3%) and medical doctors (26.7%) were the most represented, while medical lab scientists, optometrists and nurses accounted for 16.7%, 13.3% and 10.0% of the study population respectively. Notably, 63.4% of participants reported working 8–12 hours daily and 66.7% met the recommended ≤40 work-hours per week.

Table 1: Respondents' Demographic Profile

Categories	Shift Schedule, % (n)		
	Overall	Fixed day	Rotating
Overall	100 (30)	46.7 (14)	53.3 (16)
Age in years (Median (IQR))	26.5 (25.3, 30.0)	27.5 (25.3, 31.8)	26.5 (25.8, 30.0)
Gender			
Male	53.3 (16)	42.9 (6)	62.5 (10)
Female	46.7 (14)	57.1 (8)	37.5 (6)
Ethnicity			

Categories	Shift Schedule, % (n)		
	Overall	Fixed day	Rotating
Igbo	50 (15)	42.9 (6)	56.3 (9)
Yoruba	23.3 (7)	42.9 (6)	6.3 (1)
Others	26.7 (8)	14.3 (2)	37.5 (6)
NYSC Batch			
Batch A	20 (6)	14.3 (2)	25 (4)
Batch B	56.7 (17)	50 (7)	62.5 (10)
Batch C	23.3 (7)	35.7 (5)	12.5 (2)
Marital Status			
Single	73.3 (22)	57.1 (8)	87.5 (14)
Married	26.7 (8)	42.9 (6)	12.5 (2)
Profession			
Pharmacist	33.3 (10)	7.1 (1)	56.3 (9)
Medical Doctor	26.7 (8)	14.3 (2)	37.5 (6)
Lab. Scientist	16.7 (5)	35.7 (5)	0 (0)
Optometrist	13.3 (4)	28.6 (4)	0 (0)
Nurse	10 (3)	14.3 (2)	6.3 (1)
Average work hours per day			
<8 hours	20 (6)	35.7 (5)	6.3 (1)
8 hours	36.7 (11)	35.7 (5)	37.5 (6)
9-12 hours	26.7 (8)	14.3 (2)	37.5 (6)
>12 hours	16.7 (5)	14.3 (2)	18.8 (3)
≤40 work hours per week			
Yes	66.7 (20)	85.7 (12)	50 (8)
No	33.3 (10)	14.3 (2)	50 (8)

IQR => Interquartile Range

Sleep Quality (PSQI Scores) and Alertness Level

Table 2 presents the descriptive statistics of respondents' global PSQI scores, overall alertness scores, and the individual PSQI sleep component scores attained, grouped by the schedule of shift work they reported. As shown, the global PSQI score among the respondents was 7.9 ± 3.28, indicating that the respondents in general have a poor sleep quality. Fixed-day shift workers attained a marginally higher mean global PSQI score compared to rotating shift workers (8.1 ± 4.07 vs 7.8 ± 2.52). Similarly, the overall perceived mean alertness score was 3.57 ± 0.55, reflecting moderate level of alertness across the participants. Fixed-day shift workers exhibited slightly lower alertness scores compared to rotating shift workers (3.51 ± 0.64 vs 3.63 ± 0.47). Although these differences were not statistically significant (p >0.05), this trend suggests that rotating shift workers may experience slightly better subjective alertness and sleep quality compared to their colleagues who engaged in fixed-day shifts.

The Nigerian Health Journal; Volume 25, Issue 2 – June, 2025
Perceived Impact of Shift Work on Sleep Quality and Alertness
Okwori et al

A detailed breakdown of the individual PSQI sleep components revealed that while fixed-day workers exhibited marginally better outcomes across most components, no significant differences were observed between fixed-day and rotating shift workers for any sleep component except the use of sleep medication, which showed borderline significance (p = 0.08).

- **Subjective Sleep Quality**: Both groups reported comparable scores, with fixed-day workers showing a slightly better perception of their sleep quality compared to rotating shift workers (1.0 ± 0.96 points vs 1.1 ± 0.72 points).

- **Sleep Latency:** Fixed-day workers reported a marginally shorter time to fall asleep compared to rotating shift workers (1.4 ± 0.94 points vs 1.6 ± 0.96 points), but this was not statistically significant.

- **Sleep Duration and Efficiency:** Both groups showed comparable sleep duration and efficiency scores without significant differences even though fixed-day shift workers experienced slightly longer sleep duration and better sleep efficiency.

- **Use of Sleep Medication:** Although generally low, a slightly higher reliance on sleep medication was noted among fixed-day workers compared to rotating shift workers (0.9 ± 1.33 points vs 0.2 ± 0.75 points), but this was not significant.

- **Sleep Disturbance and Daytime Dysfunction:** Fixed-day workers exhibited slightly poorer outcomes of sleep disturbance (1.2 ± 0.8 vs 1.1 ± 0.81) and daytime dysfunction (1.4 ± 1.15 vs 1.3 ± 0.93) compared to rotating shift workers, though the differences were also not statistically significant.

Table 2: Descriptive Statistics of Pittsburgh Sleep Quality Index Global and Individual Component Scores Shift Schedule (Mean ± SD)

	Overall	Fixed day	Rotating	p-value
Global PSQI Score [a]	7.9 ± 3.28	8.1 ± 4.07	7.8 ± 2.52	0.750
Overall Alertness Score [b]	3.57 ± 0.55	3.51 ± 0.64	3.63 ± 0.47	0.590
Comp. 1: Subjective sleep quality	1.1 ± 0.83	1.0 ± 0.96	1.1 ± 0.72	0.687
Comp. 2: Sleep latency	1.5 ± 0.94	1.4 ± 0.94	1.6 ± 0.96	0.575
Comp. 3: Sleep duration	1.5 ± 0.9	1.4 ± 1.02	1.6 ± 0.81	0.692
Comp. 4: Sleep efficiency	0.8 ± 1.09	0.8 ± 1.31	0.9 ± 0.89	0.831
Comp. 5: Sleep disturbance	1.2 ± 0.79	1.2 ± 0.8	1.1 ± 0.81	0.764
Comp. 6: Use of sleep medication *	0.5 ± 1.11	0.9 ± 1.33	0.2 ± 0.75	0.080
Comp. 7: Daytime dysfunction	1.3 ± 1.02	1.4 ± 1.15	1.3 ± 0.93	0.780

Key: a => Range: 0-21; b => Range: 1-5; Comp. => PSQI Component (Range: 0-3);
* => Significant at 0.10 alpha level

Prevalence of Poor Sleep Quality

Table 3 presents the prevalence of poor sleep quality among respondents. It shows that poor sleep quality (defined here as global PSQI score > 5) was highly prevalent, affecting 83.3% of respondents. The prevalence of poor sleep quality was slightly higher in males (87.5%) compared to females (78.6%) and higher in those married compared to single. Additionally, the prevalence of poor sleep quality was lowest in Yoruba healthcare workers (57.1%) and highest among the Igbos healthcare workers (93.3%).

Furthermore, analysis by specialty revealed that nurses and optometrists had the highest prevalence of poor sleep quality (100% each), followed by medical doctors (87.5%), pharmacists (80.0%) and then medical laboratory scientists. Those working less than 8 hours or more than 12 hours per day reported a higher prevalence of poor sleep compared to those working between 8–12 hours per day. Participants meeting the recommended ≤40 work hours per week had slightly lower prevalence rates than those exceeding this threshold (90.0% vs. 80.0%).

Interestingly, there was a high prevalence of poor sleep quality in those who believed that work shift induces physical and mental sickness (92.9%). Additionally, those who reported poor satisfaction of their shift

The Nigerian Health Journal; Volume 25, Issue 2 – June, 2025
Perceived Impact of Shift Work on Sleep Quality and Alertness
Okwori et al

schedules as well as those who believed they lacked good work-life balance also demonstrated poor sleep quality (100% and 92.9% respectively).

Table 3: Prevalence of Poor Sleep Quality by Respondents' Demographics

Characteristics	Shift Type		
	Overall	Fixed day	Rotating
Overall	83.30%	78.60%	87.50%
Gender			
Female	78.60%	75.00%	83.30%
Male	87.50%	83.30%	90.00%
Ethnicity			
Yoruba	57.10%	50.00%	100.00%
Igbo	93.30%	100.00%	88.90%
Hausa & Others	87.50%	100.00%	83.30%
NYSC Batch			
Batch A	100.00%	100.00%	100.00%
Batch B	82.40%	71.40%	90.00%
Batch C	71.40%	80.00%	50.00%
Marital Status			
Single	90.90%	87.50%	92.90%
Married	62.50%	66.70%	50.00%
Specialty			
Doctor	87.50%	50.00%	100.00%
Lab. Scientist	60.00%	60.00%	0.00%
Nurse	100.00%	100.00%	100.00%
Optometrist	100.00%	100.00%	0.00%
Pharmacist	80.00%	100.00%	77.80%
Others	0.00%	-	-
Average Hours of Work Per Day			
< 8 hours	83.30%	100.00%	0.00%
8 hours	72.70%	60.00%	83.30%
9-12 hours	87.50%	50.00%	100.00%
> 12 hours	100.00%	100.00%	100.00%
≤40 work hours per week			
Yes	90.00%	100.00%	87.50%
No	80.00%	75.00%	87.50%
Believe shift work induces sickness (physically or mentally)			
Yes	92.90%	100.00%	88.90%
No	75.00%	66.70%	85.70%
Shift schedule satisfaction			
Yes	70.60%	70.00%	71.40%
No	100.00%	100.00%	100.00%
Good work-life balance			
Yes	75.00%	66.70%	85.70%
No	92.90%	100.00%	88.90%

Impact of Sleep Quality on Alertness

Since no statistical significance was found between both comparison groups (fixed-day vs rotating shift workers) in terms of sleep quality and prevalence of poor sleep, we decided to assess the impact of sleep quality on the respondents' levels of alertness. Table 4 presents the results of Pearson's linear correlation analysis between alertness scores and the PSQI scores in order to measure the magnitude and direction of association between sleep quality and alertness. As expected, there is a statistically significant negative linear correlation between sleep quality and alertness (global PSQI scores: $r=-0.592$, $p=0.001$). This indicates that poorer overall sleep quality was significantly associated with reduced perceived alertness. The magnitude of this correlation ($r = -0.592$) suggests a moderate to strong inverse relationship, implying that for each unit increase in PSQI score (indicating poorer sleep), there is a notable decrease in perceived alertness. This finding has practical implications, suggesting that individuals with poorer sleep are more likely to report lower levels of alertness during their work hours, which could affect their performance and patient safety.

Similarly, statistically significant moderate to strong negative linear correlation was observed between perceived alertness and some specific PSQI sleep components such as subjective sleep quality ($r=-0.604$, $p<0.001$), daytime dysfunction ($r=-0.589$, $p=0.001$) and use of sleep medication ($r=-0.511$, $p=0.004$). In other words, perceived alertness was significantly reduced by respondents' use of sleeping medications, daytime dysfunction and subjective sleep quality. Furthermore, a borderline weak but statistically significant negative association between alertness and sleep disturbance was observed ($r=0.355$, $p=0.54$). This indicates that respondents who had greater sleep disturbances were more likely to experience reduced level of perceived alertness. Conversely, PSQI sleep components such as sleep duration, latency and efficiency were not found to be statistically correlated with alertness ($p>0.10$).

The Nigerian Health Journal; Volume 25, Issue 2 – June, 2025
Perceived Impact of Shift Work on Sleep Quality and Alertness
Okwori et al

Table 4: Association Between Sleep Quality and Alertness Level among Respondents

Sleep Quality Component	Alertness (Pearson's correlation coefficient)	P-value
Global PSQI score	-0.592**	.001
Subjective sleep quality	-0.604**	.000
Sleep latency	0.042	.825
Sleep duration	0.056	.769
Sleep efficiency	-0.077	.685
Sleep disturbance	-0.355*	.054
Use of sleep medication	-0.511**	.004
Daytime dysfunction	-0.589**	.001

** => Correlation is significant at the 0.01 level (2-tailed)
* => Correlation is significant at the 0.1 level (2-tailed)

Discussion

This study highlights critical insights into the impacts of shift work on sleep quality and alertness among medical corps members in Ado-Ekiti, Nigeria. Results showed a high prevalence of poor sleep quality among medical corps members with 83.3% of respondents scoring above the PSQI cutoff of 5. This finding aligns with global reports that healthcare workers frequently experience high prevalence of poor sleep quality and other sleep problems [24–26]. This widespread issue can be attributed to factors such as frequent disruption of the circadian rhythm, high work demands, and prolonged work hours. In the Nigerian context, additional factors such as inadequate staffing, limited resources, and the unique pressures faced by NYSC medical corps members (e.g., mandatory service, deployment to unfamiliar or underserved areas, and potentially limited institutional support) may further exacerbate these sleep challenges.

While studies have noted that shift workers, particularly those on frequent night shifts, experience significantly higher rates of sleep problems and fatigue compared to day workers [27–29], this study did not observe statistically significant differences in sleep outcomes or perceived alertness between fixed-day and rotating shift workers – a finding that aligns with previous research such as [30]. In alignment with previous studies, this present study demonstrated a strong negative correlation between poor sleep quality and alertness level thereby reinforcing the findings that healthcare professionals with poor sleep outcomes may experience impaired alertness and were more prone to cognitive impairments and fatigue-related errors [31,32]. Additionally, PSQI components such as subjective sleep quality, daytime dysfunction and use of sleep medications were also significantly associated with reduced alertness. This finding reaffirms the fact that these markers of insufficient restorative sleep directly impair alertness through altered cognitive function and sleep cycles.

Although this study observed marginally worse sleep outcomes and alertness level for fixed-day shift workers compared to rotating shift workers, this may seem counterintuitive but could be explained by adaptation phenomena where workers on rotating shifts may experience initial disruption but gradually develop partial circadian adaptation while fixed-day shift workers on the other hand, may experience cumulative fatigue or dissatisfaction due to repetitive, long-term work schedule [33–35]. This suggests that rotating shift workers may undertake activities that might allow for intermittent recovery by compensating for the misaligned circadian rhythms. It is important to emphasise that regardless of the adaptation phenomenon described here, rotating shift workers may still experience some cumulative health consequences due to the continuous circadian misalignment and differences in individual coping mechanisms. As such, there is need to have a balance between both fixed-day and rotating shift schedules.

The lack of significant differences in sleep quality and alertness level between fixed-day and rotating shift workers may suggest that work schedule has fewer impacts on medical corps members and that these contrasting outcomes highlight the complex nature of sleep disturbances in shift workers especially in resource-limited settings like Nigeria. We believe that beyond shift schedule type, there may be other factors that play a crucial role in determining sleep and alertness outcomes in these young medical corps members. Some of the factors we believe to play significant roles include: workload intensity, working conditions, welfare provision, individual coping mechanisms and the culture of the place of primary assignment (PPA).

The Nigerian Health Journal, Volume 25, Issue 2
Published by The Nigerian Medical Association, Rivers State Branch.
Downloaded from www.tnhjph.com
Print ISSN: 0189-9287 Online ISSN: 2992-345X

604

The Nigerian Health Journal; Volume 25, Issue 2 – June, 2025
Perceived Impact of Shift Work on Sleep Quality and Alertness
Okwori et al

Strengths and Limitations

This study provides valuable insights into the sleep patterns and alertness of medical corps members in Ado-Ekiti, thereby contributing to understanding the sleep challenges faced by this understudied population. However, several limitations warrant consideration. Firstly, the small sample size (n=30) significantly limits the generalizability of our findings to the broader population of NYSC medical corps members or other healthcare professionals in Nigeria. Secondly, reliance on self-reported data introduces potential for recall bias and social desirability bias, which may affect the accuracy of sleep quality and alertness assessments. Thirdly, the cross-sectional design prevents the establishment of causal relationships between shift work, sleep quality, and alertness; it only allows for the identification of associations. Future research would benefit from incorporating objective measures like actigraphy, polysomnography, or tracking of subjects' melatonin levels to provide more robust insights. Additionally, longitudinal studies could explore the long-term impacts of shift work on health and performance, and larger sample sizes would enable more powerful statistical analyses, including subgroup comparisons and adjustment for potential confounding variables such as specific work demands or individual health conditions.

Conclusion

The role of circadian rhythm regulation is central to understanding the impact of shift work on sleep quality and alertness among healthcare workers. While shift work is essential in ensuring round-the-clock service in the healthcare sector, its adverse impact on sleep quality, cognitive performance and general well-being of healthcare workers remains a concern. This study found a strikingly high prevalence of poor sleep quality among medical corps members in Ado-Ekiti. The negative correlation between sleep outcomes and perceived alertness highlights the fact that poor sleep quality compromises performance of medical corps members. Since this study did not find a statistically significant association between specific shift work types (fixed-day vs. rotating) and sleep outcomes or perceived alertness levels, it suggests that factors beyond the simple categorisation of shift schedules (including overall workload, working conditions, welfare provision, and individual coping mechanisms) may be more influential in determining sleep and alertness outcomes in these young medical corps members.

Recommendations and Policy Implications

Based on these findings, we propose several actionable recommendations to improve the sleep health and alertness of medical corps members, particularly within similar low-resource settings:

1. **Education and Awareness:** Implement targeted educational programs on sleep hygiene practices, the importance of sleep, and the risks associated with poor sleep for all medical corps members.
2. **Flexible Scheduling Advocacy:** Advocate for the implementation of more flexible and circadian-aligned scheduling policies where feasible, ensuring adequate rest periods between shifts and minimizing rapid shift rotations.
3. **Institutional Support:** Provide institutional support for stress management programs and access to mental health services, recognizing the high prevalence of stress and anxiety in this population.
4. **Welfare Enhancement:** Improve welfare provisions, including access to comfortable rest areas within healthcare facilities, to facilitate restorative sleep.
5. **Further Research:** Encourage further research using larger sample sizes and objective measures to identify specific determinants of poor sleep quality and impaired alertness in this population.

By prioritizing the sleep health of medical corps members, policymakers and healthcare institutions can enhance the overall quality of care delivered and contribute to the sustainability of healthcare systems within similar contexts

Declarations

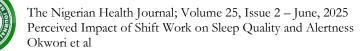The Nigerian Health Journal; Volume 25, Issue 2 – June, 2025
Perceived Impact of Shift Work on Sleep Quality and Alertness
Okwori et al

References

1. Brown JP, Martin D, Nagaria Z, et al. Mental Health Consequences of Shift Work: An Updated Review. *Curr Psychiatry Rep* 2020; 22: 7.

2. Shi H, Huang T, Schernhammer ES, et al. Rotating Night Shift Work and Healthy Aging After 24 Years of Follow-up in the Nurses' Health Study. *JAMA Netw Open* 2022; 5: e2210450.

3. Boivin DB, Boudreau P, Kosmadopoulos A. Disturbance of the Circadian System in Shift Work and Its Health Impact. *J Biol Rhythms* 2022; 37: 3–28.

4. Vyas M V, Garg AX, Iansavichus A V, et al. Shift work and vascular events: systematic review and meta-analysis. *The BMJ* 2012; 345: e4800.

5. Alshahrani SM, Baqays AA, Alenazi AA, et al. Impact of shift work on sleep and daytime performance among health care professionals. *Saudi Med J* 2017; 38: 846–851.

6. Zhang H, Wang J, Zhang S, et al. Relationship between night shift and sleep problems, risk of metabolic abnormalities of nurses: a 2 years follow-up retrospective analysis in the National Nurse Health Study (NNHS). *Int Arch Occup Environ Health* 2023; 96: 1361–1371.

7. Qanash S, Alwafi H, Barasheed S, et al. Impact of night shifts on sleeping patterns, psychosocial and physical well-being among healthcare professionals: A cross-sectional study in a tertiary hospital in Saudi Arabia. *BMJ Open*; 11. Epub ahead of print 2 September 2021. DOI: 10.1136/bmjopen-2020-046036.

8. Rivera AS, Akanbi M, O'Dwyer LC, et al. Shift work and long work hours and their association with chronic health conditions: A systematic review of systematic reviews with meta-analyses. *PLoS One*; 15. Epub ahead of print 2020. DOI: 10.1371/journal.pone.0231037.

9. Afonso P, Fonseca M, Pires JF. Impact of working hours on sleep and mental health. *Occup Med (Lond)* 2017; 67: 377–382.

10. Frazier C. Working Around the Clock: The Association between Shift Work, Sleep Health, and Depressive Symptoms among Midlife Adults. *Soc Ment Health* 2023; 13: 97–110.

11. Bokenberger K, Sjölander A, Dahl Aslan AK, et al. Shift work and risk of incident dementia: a study of two population-based cohorts. *Eur J Epidemiol* 2018; 33: 977–987.

12. Khan S, Duan P, Yao L, et al. Shiftwork-Mediated Disruptions of Circadian Rhythms and Sleep Homeostasis Cause Serious Health Problems. *Int J Genomics* 2018; 2018: 8576890.

13. Liao C-W, Wei C-F, Chen M-H, et al. Association between maternal shift work during pregnancy child overweight and metabolic outcomes in early childhood. *Front Public Health* 2022; 10: 1006332.

14. NYSC - About Scheme, https://www.nysc.gov.ng/aboutscheme.html.

15. Ayodele MO, Obor DO, Okafor EE. Factors and Challenges Affecting Work Performance of National Youth Corps Members in Ibadan, South-West Nigeria. *The Nigerian Journal of Sociology and Anthropology*; 13. Epub ahead of print November 2015. doi: 10.36108/NJSA/5102/13(0270).

16. Nwachukwu CE, Olufunmilayo EO, Chiroma GB, et al. Perception of National Youth Service Corps (NYSC) among corps medical doctors in Nigeria: a cross-sectional study. *BMC Med Educ*; 23. Epub ahead of print 1 December 2023. DOI: 10.1186/s12909-023-04135-1.

17. Nwajei A, Ibuaku J, Esievoadje S, et al. Screening for Depression Among Recent Nigerian Graduates. *Niger J Clin Pract* 2021; 24: 1385–1390.

18. Balami AD. Depression, Anxiety, Stress, and their Associated Factors among Corps Members Serving in Kebbi State. *Niger J Med* 2015; 24: 223–232.

19. Von Elm E, Altman DG, Egger M, et al. *The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies*, www.plosmedicine.org (2007).

20. Shadzi MR, Rahmanian M, Heydari A, et al. Structural validity of the Pittsburgh Sleep Quality Index among medical students in Iran. *Sci Rep*; 14. Epub ahead of print 1 December 2024. DOI: 10.1038/s41598-024-51379-y.

21. Carpenter JS, Andrykowski MA. *Psychometric Evaluation of the Pittsburgh Sleep Quality Index*. 1998.

22. Bermudez EB, Klerman EB, Czeisler CA, et al. Prediction of vigilant attention and cognitive performance using self-reported alertness, circadian phase, hours since awakening, and accumulated sleep loss. *PLoS One*; 11. Epub ahead of print 1 March 2016. DOI: 10.1371/journal.pone.0151770.

The Nigerian Health Journal, Volume 25, Issue 2
Published by The Nigerian Medical Association, Rivers State Branch.
Downloaded from www.tnhjph.com
Print ISSN: 0189-9287 Online ISSN: 2992-345X

606

The Nigerian Health Journal; Volume 25, Issue 2 – June, 2025
Perceived Impact of Shift Work on Sleep Quality and Alertness
Okwori et al

23. Shahid A, Chung SA, Maresky L, et al. The Toronto Hospital Alertness Test scale: Relationship to daytime sleepiness, fatigue, and symptoms of depression and anxiety. In: *Nature and Science of Sleep*. Dove Medical Press Ltd, 2016, pp. 41–45.

24. Alghamdi LA, Alsubhi LS, Alghamdi RM, et al. Prevalence of poor sleep quality among physicians and nurses in a tertiary health care center. *J Taibah Univ Med Sci* 2024; 19: 473–481.

25. Jemilohun AC, Fasesan OA, Ajiro TO, et al. Sleep Quality in a Nigerian Community: Prevalence of Poor Sleep Quality, Risk Factors and Health-Related Quality of Life. *West Afr J Med* 2022; 39: 729–736.

26. Kaur J, Upendra S, Barde S. Prevalence and factors associated with the poor quality of sleep among Indian nurses. *J Educ Health Promot* 2024; 13: 288.

27. Tucker P, Härmä M, Ojajärvi A, et al. Association of rotating shift work schedules and the use of prescribed sleep medication: A prospective cohort study. *J Sleep Res*; 30. Epub ahead of print 1 December 2021. DOI: 10.1111/jsr.13349.

28. Härmä M, Karhula K, Puttonen S, et al. Shift work with and without night work as a risk factor for fatigue and changes in sleep length: A cohort study with linkage to records on daily working hours. *J Sleep Res*; 28. Epub ahead of print 1 June 2019. DOI: 10.1111/jsr.12658.

29. Gao N, Zheng Y, Yang Y, et al. Association between Shift Work and Health Outcomes in the General Population in China: A Cross-Sectional Study. *Brain Sci*; 14. Epub ahead of print 1 February 2024. DOI: 10.3390/brainsci14020145.

30. Åkerstedt T, Ingre M, Broman J, et al. Disturbed Sleep in Shift Workers, Day Workers, and Insomniacs. *Chronobiol Int* 2008; 25: 333–348.

31. Bell T, Sprajcer M, Flenady T, et al. Fatigue in nurses and medication administration errors: A scoping review. *Journal of Clinical Nursing* 2023; 32: 5445–5460.

32. Ganesan S, Magee M, Stone JE, et al. The Impact of Shift Work on Sleep, Alertness and Performance in Healthcare Workers. *Sci Rep* 2019; 9: 4635.

33. Boudreau P, Dumont GA, Boivin DB. Circadian Adaptation to Night Shift Work Influences Sleep, Performance, Mood and the Autonomic Modulation of the Heart. *PLoS One* 2013; 8: e70813.

34. Burch JB, Tom J, Zhai Y, et al. Shiftwork impacts and adaptation among health care workers. *Occup Med (Chic Ill)* 2009; 59: 159–166.

35. Kaufman DM, Milstein MJ. Chapter 17 - Sleep Disorders. In: Kaufman DM, Milstein MJ (eds) *Kaufman's Clinical Neurology for Psychiatrists (Seventh Edition)*. Philadelphia: W.B. Saunders, pp. 365–396.

The Nigerian Health Journal, Volume 25, Issue 2
Published by The Nigerian Medical Association, Rivers State Branch.
Downloaded from www.tnhjph.com
Print ISSN: 0189-9287 Online ISSN: 2992-345X

607