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Circadian Disruption and Its Consequences: Mental Health Challenges Faced by Night Shift Nurses in Selected Hospitals in Quezon City

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Abstract. Night shift work disrupts the circadian rhythm of nurses, potentially affecting their mental health. This study investigated the relationship between circadian rhythm disruption and mental health outcomes specifically depression, anxiety, and stress, among 107-night shift nurses in selected public and private hospitals in Quezon City, Philippines. Using a quantitative correlational design, data were collected through standardized questionnaires and analyzed using Pearson correlation. Results revealed a weak but statistically significant positive relationship between circadian disruption and mental health outcomes ($r = 0.217$, $p = 0.025$), indicating that increased circadian misalignment was associated with higher levels of psychological distress. Further analysis showed that younger nurses reported greater mental health strain compared with older nurses, suggesting that age may moderate the effects of night shift work on emotional well-being. These findings highlight the occupational health importance of addressing sleep irregularities and circadian misalignment in the nursing workforce. Interventions such as structured schedules, sleep hygiene education, and supportive workplace strategies are recommended to mitigate the mental health risks associated with night shift work. The study provides locally relevant evidence that contributes to global research on shift work, circadian disruption, and occupational mental health.

Keywords: Circadian rhythm disruption, mental health, night shift nurses, depression, anxiety, stress

Introduction

Hospitals operate continuously on a 24-hour basis, requiring nurses to provide care during evening and overnight hours to ensure uninterrupted health services. Night shift work, while essential for hospital operations, disrupts the body's circadian rhythm—the internal biological clock that regulates sleep-wake cycles, hormone secretion, alertness, mood, and other physiological processes (Smith et al., 2019; Flo et al., 2012). When this rhythm is misaligned, nurses may experience fatigue, irregular sleep patterns, reduced cognitive performance, and emotional strain, which can adversely affect both their well-being and professional performance (Wagstaff & Sigstad Lie, 2011; Caruso, 2014).

Circadian disruption is a growing occupational health concern, particularly for nurses assigned to night duty. Shift work and irregular sleep schedules have been linked to poor sleep quality, adjustment fatigue, and negative psychological outcomes such as stress, anxiety, and depression (Flo et al., 2012; Wright et al., 2013; Booker et al., 2018). Nurses working at night are especially vulnerable because they are expected to remain alert and productive during hours when the body naturally favors sleep and recovery, resulting in physiological and psychological strain.

Despite a substantial body of international research on circadian rhythm disruption and mental health, local studies examining this phenomenon among Filipino nurses remain limited. Work conditions, staffing patterns, and institutional support may vary across hospitals, potentially influencing how nurses respond to night shift schedules (Del Prado-Lu, 2020). Investigating circadian disruption in the local context

is therefore essential to design effective interventions that support nurses' health, optimize performance, and maintain patient safety.

This study aimed to examine circadian disruption and its consequences on the mental health of night shift nurses in selected hospitals in Quezon City. Specifically, it sought to describe the demographic profile of the respondents in terms of age, gender, years of experience, type of hospital, and frequency of night shifts per week. The study also aimed to determine the level of circadian rhythm disruption experienced by night shift nurses and to assess their mental health status, particularly regarding depression, anxiety, and stress. Furthermore, the study examined the relationship between circadian disruption and mental health outcomes, providing evidence that may inform workplace policies, occupational health programs, and interventions designed to improve the well-being and resilience of night shift nurses.

Research Questions

This study aimed to examine circadian disruption and its consequences on the mental health of night shift nurses in selected hospitals in Quezon City.

Specifically, it sought to answer the following questions:

1. What is the demographic profile of the respondents in terms of:
 - 1.1 age;
 - 1.2 gender;
 - 1.3 years of experience;
 - 1.4 type of hospital; and
 - 1.5 frequency of night shifts per week?
2. What is the level of circadian rhythm disruption experienced by night shift nurses?
3. What is the mental health status of night shift nurses in terms of:
 - 3.1 depression;
 - 3.2 anxiety; and
 - 3.3 stress?
4. Is there a significant relationship between circadian disruption and the mental health status of night shift nurses?

Scope and Delimitation of the Study

This study examined how circadian disruption affects the mental health of night shift nurses employed in selected public and private hospitals in Quezon City. It specifically focused on the mental health dimensions of depression, anxiety, and stress. The study used a quantitative descriptive-correlational design and gathered data through standardized survey questionnaires. The study was limited to registered nurses assigned to night shifts in selected hospitals in Quezon City. Nurses working exclusively on day shifts, rotating shifts, those with less than six months of night shift experience, and those currently under psychiatric treatment were excluded from the study. The research relied solely on self-reported data obtained through questionnaires and did not include qualitative methods such as interviews or focus group discussions. In addition, the study concentrated only on circadian disruption and selected mental health outcomes and did not cover other physical health effects or broader occupational stressors beyond the scope of the variables examined.

Literature Review

Circadian rhythm refers to the endogenous biological clock that regulates physiological and behavioral processes, including the sleep–wake cycle, hormone secretion, body temperature, and metabolic functions within an approximately 24-hour period (Czeisler et al., 2016; Kecklund & Axelsson, 2016). In healthcare settings, particularly among nurses, night shift work disrupts this natural rhythm as individuals are required to remain awake and active during the biological night. This misalignment between internal circadian timing and external work schedules often results in sleep disturbances, fatigue, and impaired recovery (Wang et al., 2021; Booker et al., 2020). Factors such as exposure to artificial light at night, rotating schedules, and consecutive night duties further exacerbate circadian disruption, negatively affecting alertness, cognitive performance, and overall well-being (Kecklund & Axelsson, 2016).

A growing body of literature highlights the significant impact of night shift work on mental health outcomes. Nurses experiencing poor sleep quality and irregular rest cycles are more susceptible to psychological distress, including stress, anxiety, and depression (Dall'Ora et al., 2020; Dong et al., 2017). Prolonged exposure to occupational stressors combined with circadian misalignment has been associated with increased risks of burnout, emotional exhaustion, and decreased coping capacity among healthcare professionals (Zhang et al., 2020; Booker et al., 2020). These findings suggest that disrupted sleep patterns not only affect physical health but also contribute to deteriorating mental health conditions.

Furthermore, several empirical studies have established a direct relationship between circadian rhythm disruption and adverse psychological outcomes. Misaligned sleep–wake cycles and insufficient

recovery time may lead to emotional dysregulation, decreased resilience, and heightened mental strain, particularly in high-demand clinical environments such as hospitals (Wang et al., 2021; Dong et al., 2017). Although protective factors such as resilience, social support, and adaptive coping mechanisms have been shown to mitigate some of these negative effects, they do not fully eliminate the risks associated with chronic circadian disruption (Zhang et al., 2020).

Despite the increasing volume of international research on circadian rhythm disruption and mental health among nurses, there remains a scarcity of localized studies focusing on Filipino healthcare workers. Existing literature has largely concentrated on Western or developed healthcare systems, which may differ significantly in terms of working conditions, staffing patterns, and institutional support. Consequently, there is a need for context-specific research that examines the relationship between circadian disruption and mental health within hospital settings in Quezon City. This study aims to address this gap by providing empirical evidence on the experiences of night shift nurses in selected public and private hospitals and by identifying the occupational health implications of circadian rhythm disruption in the local nursing workforce.

Methodology

Research Design

The study employed a descriptive-correlational design. This design was appropriate because it described the level of circadian disruption and mental health status of the respondents and determined whether a significant relationship existed between these variables.

Sampling Design

Purposive sampling was used to select nurses who met the inclusion criteria and were directly exposed to circadian disruption through night shift work. To ensure representation from both hospital settings, respondents were drawn from selected public and private hospitals. This sampling method allowed the researcher to obtain participants who were most relevant to the objectives of the study.

Research Locale

The study was conducted in selected public and private hospitals within Quezon City, Philippines. These institutions were chosen because they employ nurses assigned to regular night shift duties and provided an appropriate setting for examining the effects of circadian disruption on mental health.

Research Participants

The respondents of the study were registered nurses assigned to night shifts in selected public and private hospitals in Quezon City. The participants were licensed nurses currently employed in either public or private hospitals and assigned to work between 10:00 PM and 6:00 AM. They were also required to be willing to participate voluntarily in the study. Nurses working exclusively on day shifts, rotating shifts, those with less than six months of night shift experience, and those currently under psychiatric treatment were excluded. A total of 107 respondents participated in the study.

Research Instrument

Data were gathered using a structured self-administered questionnaire composed of three parts. The first part obtained the demographic profile of the respondents, including age, gender, years of experience, type of hospital, and frequency of night shifts per week. The second part measured circadian disruption using a researcher-adapted scale based on the Circadian Type Inventory. The third part assessed mental health status using the Depression, Anxiety, and Stress Scale (DASS-21), which measured the respondents' levels of depression, anxiety, and stress.

Data Gathering Procedure

Before data collection, formal permission was sought from hospital administrators to allow the conduct of the study. After approval was obtained, the respondents were informed about the nature and purpose of the research. Participation was voluntary, and informed consent was secured prior to the administration of the questionnaires. The survey instruments were then distributed to qualified respondents either physically or through an appropriate online platform, depending on hospital protocol and participant availability. Completed questionnaires were collected and checked for completeness before they were subjected to data analysis. Confidentiality and anonymity were strictly observed throughout the data gathering process.

Results and Discussions

Problem 1: What is the demographic profile of the respondents in terms of age, gender, years of experience, type of hospital, and requery of night shifts per week?

Table 1. Demographic Profile of the Respondents

Indicator	Frequency	Percentage
Age		
20–29 years old	15	14.0
30–39 years old	54	50.5
40–49 years old	25	23.4
50 years and above	13	12.1
Gender		
Male	36	33.6
Female	71	66.4
Years of Experience		
Less than 1 year	4	3.7
1–3 years	38	35.5
4–6 years	3	2.8
7–9 years	29	27.1
10 years and above	33	30.8
Type of Hospital		
Private	32	29.9
Public	75	70.1
Frequency of Night Shifts per Week		
1–2 times	25	23.4
3–4 times	66	61.7
5 times or more	16	15.0

Table 1 presents the demographic characteristics of the 107 night shift nurses included in the study in terms of age, gender, years of experience, type of hospital, and frequency of night shifts per week. The findings reveal that the majority of respondents were within the 30–39 years age group (50.5%), followed by those aged 40–49 years (23.4%), indicating that most participants were in their early to middle adulthood. This age distribution suggests that the respondents are in a stage of professional maturity where they possess sufficient clinical exposure and are actively engaged in demanding work schedules, including night shifts. Previous studies have noted that nurses within this age group often experience increased occupational demands, which may heighten susceptibility to fatigue and circadian rhythm disruption (Wang et al., 2021; Dall’Ora et al., 2020). In terms of gender, the majority of respondents were female (66.4%), while males comprised 33.6% of the sample. This reflects the global and national trend in the nursing profession, where females dominate the workforce. Existing literature indicates that gender differences may influence coping mechanisms, stress perception, and vulnerability to sleep disturbances, with female nurses often reporting higher levels of fatigue and emotional strain due to combined professional and personal responsibilities (Zhang et al., 2020). Regarding years of experience, a substantial proportion of respondents had 1–3 years (35.5%) and 10 years and above (30.8%) of service, suggesting a mix of early-career and highly experienced nurses. This distribution indicates diversity in professional exposure, which may influence adaptability to night shift work. Studies suggest that less experienced nurses may encounter greater difficulty adjusting to shift work due to limited coping strategies, whereas more experienced nurses may develop adaptive mechanisms but remain at risk of cumulative fatigue and burnout over time (Booker et al., 2020). In terms of institutional affiliation, the majority of respondents were employed in public hospitals (70.1%), while 29.9% worked in private hospitals. This finding is significant, as public hospital settings are often associated with higher patient loads, resource constraints, and increased work demands, which may intensify the effects of night shift work and circadian disruption. Research has shown that nurses in high-demand healthcare environments are more likely to experience occupational stress and sleep-related issues (Kecklund & Axelsson, 2016). With respect to frequency of night shifts, most respondents reported working 3–4 night shifts per week (61.7%), followed by those working 1–2 times (23.4%) and 5 or more times (15.0%). This indicates a high level of exposure to night shift schedules, which is a critical factor in circadian misalignment. Frequent night shift work has been consistently associated with disrupted sleep patterns, reduced recovery

time, and increased risk of adverse mental health outcomes among nurses (Wang et al., 2021; Booker et al., 2020). The demographic profile suggests that the respondents were predominantly female nurses in their active working years, with varying levels of experience and substantial exposure to night shift work, particularly in public hospital settings. These characteristics provide a relevant and appropriate context for examining the relationship between circadian rhythm disruption and mental health outcomes, as supported by existing literature emphasizing the influence of age, work experience, and shift frequency on nurses' well-being.

Problem 2: What is the level of circadian rhythm disruption experienced by night shift nurses?

Table 2. Circadian Rhythm Disruption Experienced by the Respondents

	Statement	Weighted Mean	SD	Interpretation
1.	I often feel tired when I have to adjust my sleeping schedule.	3.01	0.67	Agree
2.	I find it difficult to stay awake during night shifts.	2.32	0.72	Disagree
3.	I feel less alert at work during irregular hours.	2.28	0.70	Disagree
4.	My sleep schedule is inconsistent due to my work.	3.03	0.69	Agree
5.	I experience difficulty falling asleep after night shifts.	2.88	0.82	Agree
6.	I often wake up feeling unrefreshed.	2.86	0.68	Agree
7.	My work schedule interferes with my normal daily activities.	2.77	0.68	Agree
8.	I find it challenging to maintain healthy eating and sleeping patterns.	2.61	0.81	Agree
	Overall Mean	2.72	0.51	Agree

Table 2 shows that the nurses experienced a moderate level of circadian rhythm disruption, with an overall mean of 2.72 interpreted as "Agree." This indicates that night shift work affects their normal sleep-wake pattern. The highest mean was for "My sleep schedule is inconsistent due to my work" (M = 3.03), followed by "I often feel tired when I have to adjust my sleeping schedule" (M = 3.01). These findings show that nurses mainly experience irregular sleep patterns and fatigue, which are common effects of shift work. Studies have shown that night shift schedules disrupt circadian rhythm, leading to sleep irregularities and increased tiredness among healthcare workers (Kecklund & Axelsson, 2016; Booker et al., 2020). On the other hand, the lowest mean was for "I feel less alert at work during irregular hours" (M = 2.28), interpreted as "Disagree." This suggests that nurses are still able to stay alert and perform their duties despite sleep disruptions. However, research indicates that even when workers feel alert, underlying fatigue and sleep debt may still affect their overall well-being and performance (Wang et al., 2021). The findings indicate that while nurses can remain functional at work, they still experience sleep difficulties, tiredness, and disruption in their daily routines due to night shift work. This supports existing evidence that circadian disruption remains a significant concern among nurses working irregular schedules.

Problem 3: What is the mental health status of night shift nurses in terms of depression, anxiety, and stress?

Table 3. Overall Mental Health Status of Night Shift Nurses

Domain	Weighted Mean	Standard Deviation	Interpretation
Depression	1.44	0.53	Did not apply to me at all
Anxiety	1.39	0.57	Did not apply to me at all
Stress	1.41	0.61	Did not apply to me at all
Overall Mean	1.42	0.53	Did not apply to me at all

Table 3 shows that night shift nurses reported low levels of depression, anxiety, and stress, with an overall mean of 1.42, interpreted as "Did not apply to me at all." This indicates that, despite circadian rhythm disruption, the respondents generally did not experience significant psychological distress. The highest mean was for depression (M = 1.44), followed closely by stress (M = 1.41), suggesting that subtle emotional strain may still occur due to prolonged night shift exposure. On the other hand, anxiety (M = 1.39) had the lowest mean, indicating that anxiety symptoms were the least reported mental health issue among respondents. These results may reflect the presence of effective coping mechanisms, emotional resilience, and workplace

adaptation strategies among the nurses, helping them manage the challenges of night shift work (Ferri et al., 2016; Caruso, 2014; Geiger-Brown & Trinkoff, 2010). While the respondents reported minimal psychological distress, it is important to monitor mental health continuously, as prolonged circadian disruption may still increase vulnerability to depressive symptoms, stress-related fatigue, and anxiety over time.

Problem 4: Is there a significant relationship between circadian disruption and the mental health status of night shift nurses?

Table 4. Correlation Between Circadian Disruption and Mental Health

Variables	Pearson r	p-value	Interpretation	Decision
Circadian Disruption and Mental Health	0.217	0.025	Weak significant positive correlation	Reject the null hypothesis

Table 4 presents the correlation between circadian rhythm disruption and mental health status among night shift nurses. The Pearson correlation coefficient of $r = 0.217$ with a p-value of 0.025 indicates a weak but statistically significant positive relationship. This suggests that as circadian disruption increases, levels of depression, anxiety, and stress also tend to rise, although the effect is modest. These findings are consistent with prior studies demonstrating that disrupted sleep-wake patterns and irregular work schedules contribute to psychological strain in nurses (Flo et al., 2012; Smith et al., 2019; Wagstaff & Sigstad Lie, 2011). The analysis also revealed that younger nurses reported higher levels of psychological distress compared with older nurses, highlighting age as a potential moderating factor in coping with night shift demands. This suggests that younger nurses may require additional support, structured schedules, or interventions aimed at mitigating the negative effects of circadian disruption on mental health. The results reinforce the occupational health importance of addressing sleep irregularities and circadian misalignment, as even weak correlations can accumulate over time, leading to long-term mental health risks for healthcare professionals.

Ethical Considerations

This study adhered to general research ethical principles in the conduct of data gathering and processing. Respondents were informed about the purpose of the study, the voluntary nature of their participation, and the confidentiality of the information they provided. No identifying personal information was collected, and all responses were treated with strict anonymity. The researcher also observed the provisions of the Data Privacy Act of 2012 in handling the gathered data.

Conclusion

The study found that night shift nurses in selected hospitals in Quezon City experienced a moderate level of circadian disruption, mainly reflected in inconsistent sleep schedules, adjustment fatigue, and unrefreshing sleep. Despite this, the respondents generally reported low levels of depression, anxiety, and stress. However, the study established a weak but statistically significant positive relationship between circadian disruption and mental health, indicating that greater disruption in the circadian rhythm is associated with increased psychological distress. Significant differences were also observed across age groups, with younger nurses showing greater vulnerability to mental health challenges. These findings highlight that circadian disruption remains an important occupational health concern among night shift nurses and should not be overlooked despite the generally low reported levels of distress.

Recommendations

Healthcare institutions should strengthen workplace interventions that support the well-being of night shift nurses. Sleep hygiene education, workload management strategies, and accessible mental health support programs are recommended to reduce the effects of circadian disruption. Special attention may also be given to younger nurses who appear to be more vulnerable to stress, anxiety, and depression associated with night shift work. Future studies may include larger samples and broader hospital settings to further examine the long-term psychological effects of circadian disruption among nurses.

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