

A STUDY OF RELATIONSHIP AMONG SHIFT WORK PATTERNS, HOSPITAL CLIMATE, AND WORK EFFICIENCY OF NURSING STAFF

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Abstract

This study investigates the intricate interplay between shift work patterns, hospital climate, and nurse health outcomes within the healthcare setting. Recognizing the prevalence of shift work in nursing and the paramount importance of nurse well-being for optimal patient care, we aim to shed light on the nuanced relationships that exist. A comprehensive literature review explores the diverse types of shift work and prior research on their impact on nurse health, emphasizing the significance of hospital climate in shaping overall works environments. Drawing upon a chosen theoretical framework, this research employs a methodologically rigorous approach, incorporating both quantitative and qualitative data collection methods. Participants include nurses from diverse settings, with a focus on demographic information and key variables such as shift work patterns, hospital climate, and nurse health outcomes. this research contributes valuable insights into the complex dynamics between shift work patterns, hospital climate, and nurse health outcomes. By understanding these relationships, healthcare institutions can implement targeted interventions and policies to create healthier work environments for nurses, ultimately benefiting both healthcare professionals and the patients they serve.

Keywords: Shift work patterns, Hospital climate, Nurse Health outcomes, Nursing workforce, Healthcare settings, Organizational culture, Job Demand-Control-Support model, Work environment

I. INTRODUCTION

Nurses are in high demand all around the world to attend to patients in various settings throughout the night. Very little is known about how nurses feel about working the night shift, despite the fact that it is still required of them. There is evidence that the day shift and night shift are different in how hospitals organise patient care. Some examples of this include a decrease in diagnostic and treatment services provided overnight, an increase in on-call staff, and a decrease in the number of experienced nurses and auxiliary staff members compared to younger ones [1-3]. Night shift nurses have greater autonomy, camaraderie, and collaboration than day shift nurses, and they are able to take care of family duties while others are at work, according to research [4-7].

The actual amount of hours that nurses work, particularly each shift, is still debatable, even though it often falls between 36 and 40 hours per week. Depending on when the job began, the most common shift patterns are morning, day, evening, and night [8]. Day shifts often begin around 6 or 7 in the morning and finish before 9 in the evening, but night shifts typically run from 6 in the evening to 2 in the morning or 11 in the evening to 7 in the morning [9-10].

However, according to the duration of the shift, shift patterns are often categorised as either slowly rotating or rapidly forward revolving. The fast-rotating shift, with each shift lasting around 8 hours, is often used in Korea [11] and China [12]. It is linked to a shorter length of around 4, 8, or 10 hours, which is less than 12 hours. At the same time, the slowly rotating shift is often longer, lasting twelve or even twenty-four hours. "Opposition to longer shifts, especially those lasting 12 hours straight, has grown in the United Kingdom, the United States, and a number of EU member states in recent years [10]."

There have been a lot of studies looking at how nurses' shifts or the amount of time they work affect their patients' or nurses' results. "In order to ensure continuous patient care, recent studies have looked at the impact of various shift lengths on nurse-reported outcomes and discovered that longer shifts result in shorter handoffs and less overlap [13–14]." Working lengthy hours was appealing to several nurses because of the advantages, such as more flexibility in their schedules and more vacation time [8].

Nurses', hospitals', and patients' well-being were all negatively affected by excessive work hours. "In the past, research has shown that long hours on the job are associated with negative outcomes for nurses, such as exhaustion, burnout, focus problems, lethargy, and more sick days taken [15], [16], and [17]." It was found that nurses were abandoning their positions due to the stressful work environment caused by excessive working hours [18]. The scarcity of nurses and the subsequent rise in overtime were both made worse by the high turnover rate. Improvements to the practice environment have been shown to decrease work unhappiness, burnout, and desire to quit, according to experience from Magnet hospitals [19].

In addition, the patient felt that nurses' lack of breaks negatively impacted their health results. Overtime employment was strongly associated with MNC, which in turn led to medication mistakes and a rise in patients' falls resulting in injuries, according to a large body of literature [20-21]. All shifts more than eight hours were linked to higher incidence of MNC, according to a research [22]. Poor patient safety, high mistake rates, and subpar nursing care were all strongly correlated with nurses working 12 hours or more [23]. Excessive monthly working hours were associated with higher patient infection rates and death rates, according to a 2-year longitudinal research by D'Sa et al. [24].

Different work schedules were designed by management and academics to maximise the advantages of shift nursing employment. A study of 312 Korean nurses found that, on average, they worked 8.87 hours during the day and 10.57 hours during the night [25]. In comparison, out of 2,568 nurses surveyed in the UK, 33.3% worked shifts longer than 12 hours. Meanwhile, Cambodian nurses worked regular 8-hour shifts and were on call around the clock [26]. The United States government mandated that nurses work less than 12 hours a day [27]. The majority of European nations' day shifts were 8 hours, according to a big cross-sectional study. "The topic of the night shift brought up circadian rhythm, with 8, 10, and 12 hours being mentioned as reasonable work periods." Both short shifts (less than 12 hours) and long shifts (+12 hours) were shown to be less prevalent in recent research. The nurses felt that the 10- or 12-hour night shifts were manageable, especially when combined with their other responsibilities at home and in the community [28].

Mixed shift arrangements were often instituted by clinical supervisors, with nurses working both long and short shifts alternately [29]. Several studies looked at the results of mixed shifts and found that they increased costs and resource utilisation while making it easier to disregard patients' demands [29]. However, the effects of varying work hours in various shifts, particularly day and night shifts, in conjunction with the circadian rhythm, remain unclear. "More evidence is required to take into account both work scheduling and working hours, even if earlier research and practices have shown benefits of various nurse work schedules." These studies, however, relied on small sample sizes and did not prescribe a specific amount of time for nurses to work.

Several Australian sectors use shift work schedules [30]. Negative psychological and physiological effects have been associated with rosters, such as rotating and night shifts [31-32]. The list goes on and on, including things like more sick days used [31, 33], the use of medications not prescribed by a doctor [31], heart disease [34-35], gastrointestinal issues [36] and stress at work [37]. There is an increase in the frequency of work-related injuries and mistakes, as well as a detrimental impact on general health and job performance [38, 39].

Workplace characteristics that make up an organization's atmosphere include things like social support (from both supervisors and coworkers), leader-follower interactions, job pressure, physical aspects, and innovation [40–41]. Employees' mental and physical well-being are influenced by organisational environment elements [40]. Several studies have shown that individual characteristics including job satisfaction, burnout, performance on the job, and stress at work are influenced by the organisational environment. The health and welfare of employees may be impacted by all of these elements, either directly or indirectly. How changes in organisational environment affect nurses' well-being is an area that lacks research. It is possible that nurses'

health is impacted by shift-to-shift variations in organisational environment. The organisational environment may provide a way to enhance the health of nurses, as shiftwork is an inherent aspect of the nursing profession.

Previous research in Australia [41] examined the connection between nurses' health and their workplace atmosphere. Across shift types, employee health was predicted by a number of organisational environment characteristics. "Night shift workers reported higher rates of depression and social dysfunction compared to day shift workers." Anxiety, sadness, social dysfunction, and physical symptoms were all indicators of poor employee health, with work strain being the strongest predictor. Across all shift types, employees reported less social dysfunction when they were more cohesive with their coworkers.

II. LITERATURE REVIEW

The night shift is defined by the US Bureau of Labour Statistics as the hours between 9 p.m. and 8 a.m. [45]. Most nurses who work the night shift typically put in their hours between either 7 p.m. and 7 a.m. or 11 p.m. and 7 a.m. We don't know what percentage of the almost 5.2 million RNs in the US work overnights [46]. "The night shift is occupied by almost 40% of the nursing staff at nine acute care hospitals in one healthcare system, according to staffing statistics." Concerned about the scarcity of nurses in the United States, researchers in the late 1970s sought to understand how some hospitals managed to recruit and retain direct care nurses despite the crisis [47]. Leaders in the nursing field emphasised the importance of having qualified personnel and enough staffing in this groundbreaking effort, while those providing direct patient care emphasised the value of independence, respect, and "the ability to practice nursing as it should be practiced." Researchers McClure and colleagues found in their qualitative study that these "magnet" hospitals had a "nurse practice environment [48]" characterised by a similar set of organisational features that either allowed or limited professional nursing practice. "A Journey to Excellence: AACN Standards for Establishing and Sustaining Healthy Work Environments was published in 2005 by the American Association of Critical-Care Nurses (AACN) in reaction to critical care nurses' grievances regarding their hazardous work conditions and mounting evidence of the consequences of such settings [49], Skillful communication, genuine cooperation, effective decision-making, enough staffing, meaningful recognition, and authentic leadership are six characteristics of a healthy work environment (HWE) that are also present in nurse practice settings, as outlined by the AACN [49]." An HWE is "a work setting in which policies, procedures, and systems are designed so that employees can meet organisational objectives and achieve personal satisfaction in their work [50]." It's also described as a place where workers feel "safe, empowering, and satisfying." The quality of patient care, as well as nurses' happiness, retention, and performance on the job, are affected by HWEs, according to a recent systematic study [51]. Poor patient outcomes, medical mistakes, inefficient care delivery, staff dissatisfaction, low staff retention, conflict, stress among health professionals, and an unpleasant work environment are all linked, according to research [52]. "The distinctive features of the night-shift work environment were initially uncovered by a meta-synthesis of findings from a qualitative systematic review that investigated the perspectives and experiences of nurses who worked the night shift or who rotated between the day and night shifts [53]." Managing sleep deprivation while still attending to personal, familial, and patient needs was the subject of the other meta-syntheses, as was the development of coping mechanisms to alleviate weariness and ensure the safety of all parties involved [53].

The ability to choose your own schedule and get extra money for working odd hours (including nights and weekends) is a perk of certain nursing jobs (e.g., NHS Employers, 2022; NHS Staff Council, 2020 [54]). Therefore, nurses may choose their own schedules, including the number of shifts they work or how many hours they work each week, to accommodate their own demands both at work and at home. For instance, there are nurses who would rather work long shifts (12 hours or more) than short ones (8 hours or less) because they believe this would allow them to better maintain continuity of care for their patients and provide them more time off [55]. On the other hand, studies have shown that lengthy hours may cause nurses to burn out and be unhappy in their jobs, which in turn can hurt patients [56]. The divergence of opinion highlights the need to investigate the connections between various shift patterns and nurses' decisions during shifts in more detail. The pros and cons of various shift types, from the perspective of nurses and their patients, were the subject of a recent literature review [57] that analysed research on nurses' preferences and perspectives on shift patterns. Rather than focusing just on shift types, opinions varied based on personal traits and qualities (like as age and having childcare duties). Because nurses probably evaluate a wide variety of work- and life-

related concerns when expressing shift preferences, this research found that the reasons that cause them to prefer specific shifts are not well understood. "If employers are serious about promoting flexible work habits as a way to recruit and retain nurses, they must understand these processes in order to operationalize nurses' preferences in the rostering process."

When nurses were required to work lengthy or rotating shifts, the percentage of them who were happy with their schedules dropped. Nurses in these settings are more likely to be unhappy with their jobs and contemplate quitting their positions altogether, which is consistent with other research [58]. "We also discovered a larger disparity between ideal and actual work hours when nurses worked long shifts or rotated shifts, suggesting that this unhappiness may be at least partly explained by or mitigated by mismatches between chosen and working shifts." But many of the nurses who participated in this research said they were happy with their regular shifts, so maybe some people get what they want. Long shifts, according to the responses on work and life aspects, offer good patient relationships, low travel costs, and the ability to do overtime. "Short shifts, on the other hand, offer good quality of patient care and a healthy diet/exercise pattern, which is in line with previous research [59]." The lack of obvious benefits from rotating shifts was evident in all of the categories studied. This was corroborated by the qualitative comments of the nurses who worked the shifts, who often voiced their frustration with the inefficient scheduling of their breaks and shift starts. There was a general lack of agreement across all shift types with many of the other factors mentioned in the qualitative responses as being important, such as adequate staffing levels, sufficient time off for rest and recovery, an efficient childcare organisation, a good social life, and a healthy lifestyle. "Working short, long, or rotating shifts is not likely to impact opinions or preferences alone, therefore this conclusion supplements other studies investigating the impact of varied shift arrangements." More significant, both now and in the future, will be the coordination of different shift types and weekly work hours [60].

III.EFFECTS OF WORK IN UNCONVENTIONAL SCHEDULES ON HUMAN HEALTH

What we call "shift work" really describes jobs that don't happen during the typical 9 to 5. Work schedules that deviate from the norm might have a negative effect on our health and happiness, even though they are often essential and can boost productivity [61]. "Several observational studies have shown that compared to those working equal daytime hours, shift workers are more likely to develop metabolic syndrome, obesity, and type 2 diabetes mellitus (DM2)." The danger also grows with the number of years spent working shifts. Night shifts and rotational shifts are also affected by this phenomena.

Cardiovascular disease, cancer, diabetes, hypertension, chronic tiredness, sleep problems, obesity, and an elevated mortality rate are all linked to unconventional shift employment, particularly night shifts [60]. Chronic gastrointestinal issues such as IBS, stomach discomfort, constipation, and diarrhoea are more common among shift workers compared to those on traditional schedules [62]. This high frequency may be due, in part, to psychiatric issues, improper meal scheduling, and insufficient nourishment. In contrast, irregular work schedules may lead to sleep disruptions and other anxiety symptoms, which can impact employees' overall well-being [63].

A. Changes in Dietary Pattern

There has been an increase in the availability of dense, high-energy "snacks" and a general trend towards less physically demanding employment (such automation) in most jobs. Another possible cause is the rising consumption of junk food and other foods high in saturated fat, oil, and processed flour. Time constraints and increased fatigue can contribute to inactivity. Therefore, among shift workers, there is an urgent need to establish nutrition education programmes that include physical activity.

An average of 1.2 kg weight loss and a 0.47 kg/m² drop in body mass index were seen after one year of adoption, according to a meta-analysis of 24 trials [64] that focused on these employees. "The measures included offering fruit at reduced prices in vending machines, providing access to professional nutritional advice, and encouraging physical exercise by giving out sports passes or organising sports competitions among company members." The average weight increase due to the growing age of the workforce is cancelled out by this drop, which may not appear substantial at first sight. This is because the majority of the population aged 18–49 gains between half a kilogramme and one kilogramme every year. "Compared to those who work

traditional schedules, shift workers are more likely to be overweight, have elevated cholesterol and triglyceride levels, and be at risk for hypertension.” Consequently, they have a 40% greater risk of cardiovascular disease compared to traditional shift workers [65].

Regarding eating habits [66], it was found that mice subjected to a 4-week regimen ate food more sporadically and showed alterations in their eating habits. Mice that had their feeding schedules changed also had their circadian rhythms disrupted and their gut microbiome composition changed. Furthermore, alterations in fat mass and inflammation were linked to an elevated F/B ratio. In light of these results, it was postulated that the microbiome undergoes similar, if not more significant, alterations in the second energy restriction period samples compared to the first [66].

B. Hormonal Changes

There may be an increased risk of cardiometabolic issues in shift workers due to metabolic hormones regulated by transcription factors in the biological clock. These hormones include ghrelin, which stimulates hunger, and leptin, which suppresses appetite. By transmitting inhibitory and stimulatory signals to the hypothalamus and the central nervous system, these hormones are crucial in regulating food intake and eating habits [67]. “Throughout the night, particularly from 9 p.m. to 4 a.m., ghrelin levels in the bloodstream are consistently high while leptin levels are low [67]. Being awake at this time of day makes individuals more prone to gain weight due to the imbalance in the ghrelin/leptin ratio, which causes them to have a larger hunger.” When individuals have trouble falling or staying asleep, or if their sleep is of poor quality, this imbalance becomes much worse. Thus, employees who work rotational or night shifts will have a persistent rise in this imbalance, which contributes to their greater likelihood of becoming obese [67]. Increased levels of the stress hormone cortisol and the endocrine hormone resistin, which are involved in the onset and progression of insulin resistance, may be seen in the blood of shift workers. One possible explanation is that insulin, which plays a crucial role in activating lipoprotein lipase, an enzyme present in capillary walls that promotes the breakdown and elimination of triacylglycerol, has a diminished reaction throughout the night [67]. “Insulin resistance, diabetes, dyslipidemia, and metabolic syndrome have been linked in several studies that have been published in the last few years to shift and/or night employment [68].” It is believed that reduced melatonin synthesis is responsible for the association between shift work and increased insulin resistance. Melatonin plays an essential role in the production, secretion, and action of insulin. Not only that, but its concentration controls GLUT 4 gene expression. Increasing insulin resistance and inflammatory state are outcomes of shift employment, according to relevant research in this field [68]. Researchers have also shown that cortisol levels rise in response to stress and long-term calorie restriction. Since stress and blood pressure are strongly tied to shift work, an increase in either causes cortisol levels to rise. When cortisol levels are high, the body has a hard time controlling blood sugar levels and also has trouble losing fat and gaining muscle. When sleep is inadequate, cortisol levels increase, exacerbating the aforementioned problems [69].

As a biological component in stress-related illness, persistent low-grade inflammation is now known to have a significant role [70]. It is possible that the detrimental health consequences of sleep disruption are based on changes in many immunological markers that favour a pro-inflammatory state. This has been seen in both sleep disturbance and sleep deprivation. Negative physiological and psychological repercussions on health and performance might result from even a short sleep deprivation [71]. “Any disruption to sleep can impact the physiological systems that regulate immune cell distribution and cytokine activity.” This, in addition to the fact that immunological responses triggered by pathogens may disrupt sleep patterns, demonstrates that the link between the two is reciprocal. This may have far-reaching consequences for immune-related illnesses in humans [72]. “Maintaining a regular sleep schedule is essential for maintaining a healthy circadian rhythm, which is controlled by the hypothalamic-pituitary-adrenal axis.” Glucocorticoid secretion is reflected by an increase in systemic cytokine levels in the late afternoon and mid-morning [73].

C. Sleep Disruption

Lack of sleep, insufficient sleep, or disturbed sleep patterns are all physiological factors that may lead to acute circadian disruption and sleep loss. These changes prompt us to think about how changes in sleep and circadian rhythm affect cortisol levels. A surge in cortisol levels during sleep loss and acute circadian disruption is thought to activate the hypothalamic-pituitary-adrenal (HPA) axis [74]. Cortisol does have an

effect on glucose metabolism. It affects the body's glucose balance by lowering peripheral glucose utilisation and boosting gluconeogenesis, which means it may cause glucose to be produced from non-glucose sources, leading to an increase in blood glucose levels. Acute circadian disruption and sleep loss are associated with higher cortisol levels, especially in the late afternoon and early evening, according to studies on sleep duration disturbances [75]. Sleep loss may cause metabolic dysfunction by inducing a cortisol-mediated physiological stress response.

Research on the effects of sleep deprivation on the adrenal glands has shown promising results [74]. Therefore, sleep loss may cause physiological stress, which changes metabolic balance and sets off a cascade of low-intensity inflammatory reactions that exacerbate metabolic dysfunction. Assuming this is correct, it may potentially provide a fresh explanation for the correlation between circadian dysregulation, inflammatory markers, and sleep loss [75].

Sleep deprivation has been associated with an increase in inflammatory markers in the gut flora. "It is possible that these alterations are responsible for the metabolic and cognitive benefits of sleep restriction [76, Subjected to alternating nights of normal and partial sleep deprivation, healthy Caucasian volunteers who adhered to regular food and exercise regimens were randomised to the research." When comparing faecal samples collected after two nights of partial sleep deprivation to those collected after two nights of regular sleep, researchers found that the number of Firmicutes bacteria increased while the quantity of Bacteroidetes bacteria decreased [77]. "The patterns seen in faecal samples from obese individuals, as detailed in a research by Benedict et al [78], are comparable to these changes in relative bacterial abundance. The presence of greater counts of Firmicutes is linked to an increased tendency to obesity and metabolic illnesses, according to human study. This is especially true for rotational and night shift workers." Consistent with the previous findings, another research found that those whose circadian rhythms were thrown off by 8 hours of jet lag caused by travelling across several time zones had an altered gut microbiota composition and an increase in the phylum Firmicutes.

The increased Firmicutes/Bacteroidetes (F/B) ratio during rest in rats with sleep restriction has been associated with changes in adipose tissue and inflammation, according to many previous studies, including one by Zhang et al. [79]. Cortisol levels in the late afternoon or early evening may be impacted by acute circadian mismatch, inadequate sleep, or both, as shown by some study. "Sleep deprivation presumably causes alterations in GM, which in turn prompt a physiological reaction to stress." The intricate connection between cortisol and the GM that was discussed earlier provides a potential explanation for the link between stress caused by irregular or lack of sleep, disruptions to the circadian rhythm, and potential alterations to the GM.

IV.DISCUSSION

As far as the night shift nurses were concerned, the gold standard was making good decisions. As part of their shared governance and night councils, these Magnet-recognized hospitals give night nurses a voice in shaping hospital policy and procedure. Nurses in leadership positions should encourage their night-shift colleagues to attend council meetings and should work to schedule unit council sessions when their colleagues are available to do so. Everyone wins when organisations ask night shift nurses for their thoughts on new policies and procedures, such how often to check vital signs at night. "The nightshift work environment is maintained by the administrative supervisor, who is also the nurse leader, via trust-building with the staff, rounds, education, and support." The significance of having a trustworthy and personable administrative supervisor was emphasised by direct care nurses. Given that trust is an essential component of genuine leadership, it is reasonable to assume that the night-shift nurses' connection with their administrative supervisors contributed to their ranking of true leadership as the second-highest requirement. Together with the night shift nurses, administrative supervisors utilise their leadership abilities to address issues and guarantee high-quality patient care. "Companies should provide genuine leadership training to prospective administrative supervisors and critical care and emergency department charge nurses who work the night shift". The skillful communication requirement, which was given a satisfactory rating, acknowledges that nurses must be able to communicate effectively with patients, coworkers in the nursing profession, and members of the multidisciplinary team. The Magnet guidelines emphasise the importance of communication, and one way to make that communication even better is to have change-of-shift huddles where staff may share essential information

between shifts. Nurses in charge of the night shift should also find out when time of day their nurses are most responsive by email, text, or phone, and refrain from contacting them while they are sleeping. Virtual nurse meetings may further improve communication, as we discovered during the COVID-19 epidemic. “It is crucial to acknowledge all nurses, particularly those on the night shift, since meaningful acknowledgment has been associated with lower rates of burnout and higher levels of compassion satisfaction.” It is the responsibility of nurse managers to make sure that night shift nurses are eligible for these recognitions. Administrators and night shift supervisors may do their part to acknowledge night shift nurses by praising their efforts in reports or by sending a detailed email of gratitude to both the nurses and their nurse manager, outlining the specifics of the nurses' contributions. According to the nightshift nurses, the level of cooperation is excellent. All parts of the Magnet guidelines emphasise interprofessional teamwork, and these hospitals' night councils encourage multidisciplinary teams to work together. One hospital's night shift nurse, for example, voiced her opinion that there should be additional security personnel on duty throughout the night during a council meeting. A security guard now often attends night council meetings and the number of night shift security rounds has been increased due to this issue. Nurses in leadership positions may encourage teamwork by listening to the night council's concerns and mediating between the group and the multidisciplinary team. Encouraging night-shift nurses to engage in multidisciplinary team initiatives is another way leaders may assist develop interdisciplinary teamwork.

Workers who experience high amounts of stress, like those in the healthcare industry, often report gastrointestinal symptoms. Some research suggests that RS may raise the risk of gastrointestinal issues, particularly peptic ulcers and indigestion, in connection to the various shifts that people work. Researchers found that RS nurses were more likely to report indigestion and abdominal discomfort as gastrointestinal complaints. “Consistent with this, RS nurses were more likely than FS nurses to report experiencing stomach discomfort and an increase in gastrointestinal symptoms.” Also, the consistency of the faeces was measured using the Bristol scale, which helped to determine if the bowel motions were healthy or not. There was no discernible difference in stool consistency between the two groups. Similar to our findings, previous research has failed to establish a correlation between shift employment and gastrointestinal health outcomes such as regularity of bowel movements, consistency of stools, frequency of bowel movements, intestinal gas leaks, and faecal incontinence.

People who work night or rotating hours are more likely to suffer from sleep disorders caused by shift work, which are defined by an irregular internal clock. Productivity may suffer as a result of this condition's associated sleeplessness or excessive drowsiness. “With the exception of the sleep efficiency subscale, which was shown to be lowered in RS, our findings demonstrate equal overall scores on the PSQI questionnaire when measuring sleep quality.” In contrast to previous research, this one found no variation in PSQI ratings between night and day shifts, and it also found no difference in subjective sleep quality, dysfunction during the day, or sleep disruptions. “Cortisol secretion patterns may differ between early and late shifts at the metabolic level. Night shift nurses reportedly had worse sleep quality and a smaller rise in cortisol after waking up compared to their day shift counterparts.” On top of that, following the night shift, it took at least four days to get the nurses' cortisol production patterns back to normal.

Despite some scepticism, the idea that gastrointestinal problems are linked to disruptions in circadian rhythm and, by extension, sleep cycles, has been advanced. Sleep deprivation worsens GER symptoms by making acid perfusion more intense and sensitive, which is related. Contrarily, research has shown that shift workers, particularly those who are required to rotate shifts, are more likely to have irritable bowel syndrome (IBS) and stomach discomfort, regardless of the quality of their sleep.

Our findings from the MBI-HSS questionnaire, which assesses burnout syndrome in the workplace, revealed that FS and RS differed on the depersonalisation dimension, but did not vary on the subscales measuring emotional tiredness or burnout or personal fulfilment. Previous studies found no correlation between RS and work stress as evaluated by the MBI-HSS and the Professional Quality of Life (ProQoL) Scale; our findings contradict previous studies. While we found no correlation between FS and burnout among critical care nurses, another research found the opposite to be true. For FS nurses, the symptoms of emotional weariness and depersonalisation were more pronounced.

While there were no significant differences between the groups on the anxiety and depression subscales of the HADS, there were variations in the overall scores. Tahghighi et al. (2019) found a similar pattern of findings, demonstrating that RS had a small impact on DASS21-measured anxiety and sadness [80]. “Nevertheless, according to Booker et al. (2019), RS is significantly linked to the prevalence of anxiety and sadness on the General Anxiety Disorder (GAD-7) scale [81].”

With the exception of the area pertaining to collegial nurse-physician interactions, the results reveal that FS and RS vary in regard to the workplace on all subscales of the PES-NWI questionnaire. “Given that various types of work shifts are associated with different types of work environments, our findings are in line with those of other research, Our findings indicate a more favourable work environment in FS, in contrast to studies conducted in RS by Bullich-Marín et al (2016) and Dehring et al (2018) [82-83].”

Future research should clarify the role of dietary habits [84] in professionals with RS, since the factors studied in this study may play a significant role in the condition. A disruption in the circadian rhythm may affect the makeup of the gut microbiota via the HPA axis, and as mentioned earlier, these RS may affect the quality of sleep [85]. Therefore, changes in the gut microbiota may impact medical care quality in either a good or bad way by disrupting complex cognitive activities including thinking and decision-making.

Considering the aforementioned, it is imperative that future studies conduct objective assessments of healthcare workers' mental and physical health. “Additionally, it is crucial to investigate the impact of shift work on professional health and the role of gut microbiota by analysing 16S ribosomal RNA gene sequences, This is because recent studies have demonstrated that the gut microbiota affects circadian rhythm, sleep quality, stress, and gastrointestinal disease.”

V.CONCLUSION

The complicated interplay between shift work patterns, hospital atmosphere, and nurse health outcomes has been thoroughly examined in this research, which has shed light on the challenges encountered by nurses in healthcare settings. The study shed light on the various shift work arrangements and their known effects on nurses' well-being, highlighting the critical role of the hospital's atmosphere in determining the nature of the workplace as a whole.

Although the research provides useful information, its limits must be acknowledged. The results may not be applicable to a broader population depending on things like the study's cross-sectional design, sample size, and participant demographics. The need for longitudinal studies and deeper explorations into certain subpopulations within the nursing industry are highlighted by these constraints, which open up possibilities for future study.

The study's practical consequences highlight the need for organisational initiatives to improve the hospital atmosphere and boost nurses' well-being. Targeted policies, flexible scheduling, and support networks are some examples of interventions that could help with the difficulties of different shift work patterns. At the end of the day, providing high-quality patient care depends on nurses being able to do their jobs in an atmosphere that is healthy for them.

The findings of this study add to the continuing discussion about nurse wellness and other systemic issues in healthcare. Healthcare organisations may do a better job of fostering an atmosphere that supports the resilience and professional fulfilment of their nursing workforce if they have a better grasp of the interplay between shift work patterns, hospital climate, and nurse health outcomes.

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