



NIGHT SHIFT NURSES' PERCEPTION OF SLEEP QUALITY

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Abstract

Night shift nurses account for approximately 7.6% of over 2.8 million nurses working in the United States as of 2016. Many other professions within the medical field, as well as countless other professions, have similar working hours. Working overnight requires sleep during the day, which can lead to altered sleep patterns and mental and physical disability. This work sleep pattern is not conducive to a safe patient care environment. The current literature shows that night shift can cause symptoms of anxiety and depression, fatigue, and altered sleep patterns. However, due to the inaccuracies in data collection, low sample sizes, and gender bias, the extent of the problem remains underestimated. The purpose of this study is to compare the day shift and night shift nurse's perception of sleep quality using The Pittsburgh Sleep Quality Index (PSQI). The goal is to illuminate the problem, if one exists, and develop new and novel ways to improve sleep quality among health care providers.

Night Shift Nurses' Perception of Sleep Quality

Working night shift is very common in healthcare; doctors, nurses, and nurse's aides often work overnight when they would normally be sleeping. As of 2016, night shift nurses accounted for 7.6% of the over 2.8 million nurses working in the United States (Bureau of Labor and Statistics, 2016). Working night shift has been shown to alter the body's biological mechanisms, leading to altered sleep patterns and mental health issues (Akerstedt & Wright, 2009). This work schedule forces the nurse to sleep during the day, disrupting the body's natural chemical processes for the regulation of sleep and interrupts the body's ability to heal (Fischer, Griep, Rotenberg, & Silva-Costa, 2015). Sleep during the day is often shorter, lighter, and more fragmented, which leaves the nurse feeling unrested (Kunert, King, and Kolkhorst, 2007). Furthermore, social and environmental factors can affect quality of sleep further deteriorating the body's natural defense mechanisms (Fischer et al., 2015). This continuous cycle wears down the body's defense mechanisms and can manifest as sleep disturbances, anxiety, depression, and physical and mental disability. Additionally, physical symptoms, such as increased blood pressure, increased appetite, weight gain, and blood glucose intolerance can also surface (Lauriello, 2017). The physical and mental health effects of shift work on the nurse can have enormous patient care implications. The compromised nurse is at risk of making medication errors and compromising the safety of both the staff and patients (Adhami et al., 2014).

Purpose of the Study

Nursing is already a stressful and physically demanding career; add to it fatigue and a lack of quality sleep caused by night shift, and it can place unwanted stress and strain on the nurse's mind, body, and spirit (Lauriello, 2017). Yet, there remains a discrepancy in the literature. Researchers struggle to elucidate the true relationship between shift work and health long term. The purpose of this study is to compare the day shift and night shift nurse's perception of sleep quality using The Pittsburgh Sleep Quality Index (PSQI). The goal is to illuminate the problem, if one exists, and develop new and novel ways to improve sleep quality. I hypothesize that night shift nurses will have a greater perception of poor sleep quality when compared with day shift nurses.

Relationship to MRT

The Middle Range Theory (MRT) of the Negative Health Impact of Shift Work on Nurses explored how the concepts of shift work and health are related (Butts & Rich, 2018). It can be applied to other professionals whom work night shift: Police, emergency medical technician (EMT), doctors, and casino workers are all required to work over night; therefore, would be at risk for physical and mental health deterioration (Lauriello, 2017). The literature review revealed a lack of evidence to support the claim that working night shift has a negative impact on health. Data collection remains a limiting factor to accurately capture the true detrimental effects of working night shift. It's unknown how long it takes to realize the ill effects of working night shift; therefore, it makes developing a research design difficult. The information garnered from the development of this MRT will help further examine how night shift and sleep quality are related. This information may be helpful to develop new and novel ways that improve the health and well-being of those subjected to night shift schedules.

Significance to Nursing

Sleep is vital to life. Without a good night's sleep, the body loses its ability to regenerate (Smyth, 2007). Fischer, Griep, Rotenberg, and Silva-Costa (2015) stated, trying to sleep during the day disrupts the body's natural biological clock causing an imbalance in important hormones like cortisol and melatonin, which leads to a decrease in sleep quality (p. 34). A lack of sleep can lead to fatigue and poor performance, which, in the case of nursing, could affect patient safety (Kunert, King, and Kolkhorst, 2007). Furthermore, fatigue is an important issue for nurses because it can lead to bad outcomes, such as medication errors, diminished mental acuity, and job dissatisfaction (p. 31). It's important to examine the relationship between working night shift and health. Recruiting nurses to work night shift is as important as recruiting nurses for day shift. If working night shift causes a degradation in physical and mental health and researchers don't fully understand how or why, then it will become increasingly hard to develop solutions adequate enough to recruit and retain future nurses.

Research Question

Does working night shift lead to a decrease in the quality of sleep?

Ethical Concerns

This research study will be using human subjects; therefore, it will be submitted to the Institutional Review Board (IRB) for approval. There is minimal risk to study participants during this research study. Informed consent will be obtained for the safety of study participants. The PSQI will be administered anonymously to protect the privacy of

study participants and will hopefully increase the likelihood of honest responses (Polit & Beck, 2012). Demographics will be collected but all identifiers will be removed.

Review of Literature

A review of the literature revealed several studies examining the relationship between working night shift, health, and sleep. However, women and critical care nurses represent the majority of study populations currently available making the results less generalizable. Researchers do not fully understand how the two concepts are related, nor do they know the temporal relationship, if one exists. Bjorvatn and colleagues (2014), conducted a two year long longitudinal study examining night shift and symptoms of anxiety and depression. They found that the final sample of participants had better mental health than those who dropped out indicating a healthy worker effect or that there was a selection process that occurred. The final participants were there by choice; therefore, were able to develop better coping mechanisms to combat the ill effects of night shift (Bjorvatn, Magerov, Moen, Pallesen, Thun, and Torsheim, 2014). Furthermore, because the nurses most affected by working night shift dropped out of the study, the effects of working night shift may be underestimated (Bjorvatn et al., 2014). However, Bjorvatn and colleagues (2014) found that when the nurses working night shift switched to day shift, they observed an overall decrease in anxiety and depressive symptoms over time compared to the control group. Ultimately, no real correlation was found between shift work and mental illness (Bjorvatn et al., 2014).

Fatigue, like anxiety and depression, can result from a lack of sleep, both in quality and quantity. Fatigue has been identified by nurses as a primary cause of medication errors (Kunert et al., 2007) Kunert et al. (2007) conducted a study examining the differences in perceptions of fatigue between night and day shift nurses. The authors used the Brief Fatigue Inventory (BFI) to measure perceptions of fatigue and the Pittsburg Sleep Quality Index (PSQI) to measure the perceived quality of sleep. In this study the authors found a significant correlation between fatigue and quality sleep: The night shift nurse's perception of fatigue was greater, and their quality of sleep was poorer than that of the day shift nurse's (Kunert et al., 2007). In addition, day shift nurses also reported fatigue and poor sleep quality and both groups reported using medications to fall asleep (p. 35). Nursing is a physically and mentally demanding occupation; therefore, it's unclear to what extent day shift or night shift contributed to the poor sleep quality and perceived fatigue. Further studies are needed to compare day shift nurses with other healthcare personnel working day shift to elucidate a stronger relationship among the variables (Kunert et al., 2007). Notwithstanding, these findings indicate that poor sleep quality and greater feelings of fatigue can lead to increased mistakes that can compromise patient safety in both day shift and night shift nurses (p. 35).

Sleep patterns are another aspect that can have an effect on fatigue and health. Silva, Martino, Viana, Beverra, and Miranda (2017) conducted a cross-sectional, descriptive and observational study that analyzed the sleep patterns of nurses who work day and/or night shift and how they relate to sleep quality. The authors collected sociodemographic population data, had participants complete a sleep log diary, and administered the Visual Analogue Scale and the PSQI questionnaire for data collection (Silva et al., 2017). In addition, the sample size (n=104) was predominately female (n=94) and between the ages of 24 and 45 (p. 59). Silva et al. (2017) concluded that dayshift nurses had longer, more quality sleep when compared with night shift nurses. Furthermore, when patterns of sleep between day and night were compared, the difference was evident; night shift nurses had a harder

time falling asleep and staying asleep (p. 61). Again, due to the small sample size and the predominately female population, this study has may not be generalizable to all of nursing.

A study conducted by Sveinsdottir (2006) aimed to describe and compare their self-assessed quality of sleep, occupation, working environment, illnesses, and job satisfaction among Icelandic females working varying shifts. A cross-sectional approach was utilized using 348 nurses selected from the Icelandic Nurses' Association which represents 17% of their nursing workforce (Sveinsdottir, 2006). Furthermore, a self-administered questionnaire measuring the variables quality of sleep, occupation, working environment, illnesses, and job satisfaction was used in data collection (p. 229). The study concluded there was no difference found between participants based on the shift worked and the above variables. However, nurses working rotating days/evening shifts had more gastrointestinal and musculoskeletal symptoms than other participants (Sveinsdottir, 2006). This is in contrast to other studies reviewed that showed a disruption in sleep quality and fatigue among night shift workers.

Lastly, Johnson et al. (2014) conducted a cross-sectional correlational study that evaluated the relationship between sleep deprivation, occupational errors (needle sticks, etc.), and patient care errors among nurses working night shift. The study used a comprehensive tool developed by the investigator that collected data on multiple variables, such as age, gender, children, shifts worked, and hours slept, as well as many others (Johnson et al., 2014). More than half the study population was sleep deprived and three quarters of the sleep deprived nurses slept for 4.7 hours or less over a 24-hour period (Johnson et al., 2014). Interestingly, sleep deprived, and non-sleep deprived nurses had similar odds of making an occupational error; however, there was a significant inverse relationship between hours slept and patient care errors (Johnson et al., 2014). Sleep hygiene isn't a subject taught in nursing school but may be helpful in reducing occupational and patient safety errors (Johnson et al., 2014).

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Theoretical Framework

Roy's (2009 as cited in Butts and Rich, 2018) Model of Adaptation is a holistic view of the patient and focuses on how the patient is able to cope and adapt to different internal and external stimuli (p. 458). This study, with an emphasis on sleep quality, will examine how working night shift affects the perception of sleep quality. Roy (2009) defines a stimulus as, "That which provokes a response, or more generally, the point of interaction of the human system and environment" (p. 27). The stimuli can be either internal, external, or both. A nurse working night shift has both an internal stimulus (the body's circadian rhythm) and an external stimulus (sleeping during the daylight hours).

Sleeping during the day disrupts the body's natural chemical processes for the regulation of sleep and interrupts the body's ability to heal (Fischer, Griep, Rotenberg, & Silva-Costa, 2015). Roy (2009) classifies the adaptive processes into two major subsystems, the regulator and cognator (p. 41). The regulator mechanisms of the body try to correct the chemical imbalance caused by a lack of sleep, while the cognator mechanisms try to get more sleep because of drowsiness and lethargy (as cited in Lauriello, 2017). It is not possible to observe directly the

functioning of the regulator-cognator systems; however, the responses generated as a result are observable (Roy, 2009). Roy (2009) made this possible by developing four adaptive modes termed “the physiological-physical, self-concept-group identity, role function, and interdependence modes” (Roy, 2009, p. 43). Activity and rest, contained in the physiological mode, would be compromised as a result of working night shift because of the lack of sleep quality and fatigue (Roy 2009, as cited in Butts & Rich, 2018). Each system works dynamically together, as a first line of defense, to adapt to a stimulus (Roy, 2009).

“Like the physiological mode, the self-concept mode also needs to be satisfied in order for healthy coping and adaptation to take place” (as cited in Lauriello, 2017). Working night shift can manifest itself both mentally and emotionally. The Self-Concept Mode focuses on the integrity of the mind and how it relates to the body (Roy 2009, as cited in Butts & Rich, 2018). Poor sleep quality can compromise the nurse and lead to a break down in the four adaptive modes.

Research Methods and Design

This study will be utilizing human subjects; therefore, a proposal will be submitted to the Internal Review Board (IRB) for approval. The study methods utilized in this research fall into the minimal risk category, which may help expedite the process. A descriptive, nonexperimental, longitudinal study design will be deployed to observe, describe, and document sleep quality and how it relates to working night shift.

Sampling Plan

A convenience sample from a local South Jersey hospital will be utilized to obtain participants from both night and day shift. All members of the nursing staff who are willing to participate will be included. Night shift will be defined as working from the hours of 7:00 p.m. to 7:00 a.m. Day shift will be defined as working from 7:00 a.m. to 7:00 p.m. Sleep quality will be operationalized by utilizing the Pittsburg Sleep Quality Index (PSQI).

The PSQI questionnaire is possibly the most commonly used sleep assessment tool in clinical and nonclinical settings (Manzar et al., 2018). The PSQI consists of 24 questions rated 0-3, 19 are self-report and 5 are taken from a roommate, spouse, or bed partner; however, only the self-report questions are used for quantitative data analysis (Manzar et al., 2018). It can differentiate good sleep from poor sleep using seven components: “sleep latency, sleep duration, sleep quality, sleep efficiency, sleep disturbances, use of sleeping medications, and day time dysfunction” (Kunert, King, and Kolkhorst, 2007, p. 33). Moreover, these seven components are then tallied revealing a global sleep quality score: A score greater than five indicates poor sleep quality (Kunert, King, and Kolkhorst, 2007). Reliability and validity have been extensively substantiated in the literature (Manzar et al., 2018). Questionnaires, such as the PSQI, are cost effective, easy to administer, and have high subject compliance, which makes it a good fit for the current study (Manzar et al., 2018).

Data Collection

A packet will be distributed into the work mailbox of perspective subjects. The packets will contain a letter explaining the purpose of the study, consent to participate, a form to collect demographic data, the PSQI questionnaire, and a return envelope. Identifying data will not be collected during this study to ensure anonymity.

Participants will use a Likert scale ranging from 0 (zero times in the past month) to 3 (more than three times per week) to self-rate each of the seven components of the PSQI scale over one month (Kunert, King, and Kolkhorst, 2007). The PSQI will only be completed once during the study.

Data Analysis

Inferential and descriptive statistics will be used to analyze participant responses. The difference in mean scores on the PSQI will be evaluated using univariate analysis. The difference in mean component scores between the two groups will be evaluated using a multivariate analysis. Demographics will be analyzed for similarities and differences. A statistician will be hired for data analysis.

Limitations

Convenience sampling will be used in the study; therefore, it may not be representative of the nursing population. Furthermore, convenience sampling may make it difficult to determine differences between the different specialty areas. The sample size will most likely be very small, because the study's site is small in comparison to other major university hospitals. A small sample size affects statistical power, which helps to detect true relationships among variables (Polit & Beck, 2012).

Conclusion

Sleep is a vital part of life and, as such, helps the body rejuvenate after a long day. More importantly, the quality and quantity of sleep, when insufficient, can disrupt the body's natural biological processes. This can result from working night shift because it forces the person to sleep at hours not natural for the human body. This study will attempt to illuminate a relationship between working night shift and quality sleep. In doing so, it may help future researchers develop new ideas that improve the sleep patterns of night shift workers.