

## Sleep Disorders among Employees in the Evening Shift in the Hospital: A Systematic Review

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### Abstract

**Introduction:** Sleep disturbances are prevalent among nurses, so they are exposed to adverse negative consequences, affecting their health, and subsequently affecting the quality of the provided nursing care, and overall, the performance and productivity.

**Methods:** An electronic search in PubMed and Embrace was conducted to identify eligible articles. After exclusion of ineligible and duplicated articles, 52 articles were included in this review.

**Results:** The findings of this review revealed that working in night shifts, physiological status of nurses, and demographic variables, such as age, sex, nutritional habits, and Energy Drinks of hospital nurses, and the period of the COVID-19 pandemic are influencing factors affecting the quality of nurses' sleep. The negative consequences of poor sleep include disturbance in cognitive and

behavioral functions, the risk for injuries and infections, low quality of nursing care, errors, and mistakes.

**Conclusions:** There are several solutions that could be implemented to manage the situation, instrumental, or on self-adjustment, avoidant, task oriented and emotion oriented. The nurses should be provided with coping mechanisms to engage in quality of sleep and minimize the negative consequences of poor sleep associated with the nature of their work. The approved interventions used to enhance sleepiness among nurses include bright lighting exposure, napping, rescheduling of shift work and behavioural changes.

**Keywords:** Sleep, Disturbances, Problems, Nurses, Occupational Health

## Introduction

Nurses represent a large section of healthcare workers in healthcare settings, and they have a significant, continuous, direct patient care. They are also working in the front-line contact with patients in the healthcare settings and are therefore at the situations exposing to different physical and psychological stressors [1]. According to WHO, nurses represent approximately half or more of the healthcare workers in the healthcare sectors globally [2].

Nurses spend most of their working hours providing direct patients care which mandate them to be fully oriented and focused at all times regardless for any emergencies or urgent situations [3]. The previous studies have showed that working shifts is directly affecting on sleep patterns and leads to adverse health consequences, and nurses are the most affected sector in the healthcare setting [4]. In one of the scoping reviews on the ways to improve fatigue risk management in healthcare conducted on nurses and midwives, it was shown that they are half of the workforce working shifts, which certainly leads to disturbance in sleep and causing fatigue and indirectly affects quality of proved patient care [5].

The health care systems are organizations that are established to meet people's health needs. Work in the health sector is often associated with night shifts and long duty hours in order to provide round the clock services [6]. Due to nature of their work, nurses working with alternative shift work including night shifts, and also extended shift hours up to twelve and twenty-four working hours instead of the regular eight hours shift [5]. The previous reports approved that working longer shifts is associated with sleep disturbances, and long run adverse negative health effects [4, 7-9]. Furthermore, large number of nurses working night shifts suffer from sleep problems and long-term health related issues [5].

## Methods

A web-based search was conducted in PubMed and Embrace using the following search strategy "sleeping disturbances", "sleeping problems ", "working shift", "nurses" and "work overload". The search resulted in 122 studies. The reference lists of the articles and reviews were screened for relevant articles. After exclusion of irrelevant, duplicated and review studies, 52 studies were included in the review as they met the inclusion criteria.

## Results and Discussion

Many previous studies have investigated the sleep patterns and its consequences among nurses and other healthcare providers, one previous study, conducted in Thailand, have documented that 76% of nurses have less than seven hours of daily sleep [10], similar findings were reported from another study, conducted in the United States, which have reflected that the hours of sleep among nurses is in average of less than seven hours a day [11], and the same level was reported by another study conducted in India where the rate of sleep deprivation was among two thirds of nurses working in the hospitals [12]. Furthermore, studies conducted in Saudi Arabia have showed that most of nurses on night shifts experienced sleep problems with

physical or physiological consequences [13, 14]. The aim of this literature review is to highlight what is already known about sleep disturbance among hospital nurses and to identify strategies and interventions to solve the problem. In addition, this literature review will identify the influencing factors of sleep disturbance with demographic characteristics of working nurses. Factors influencing sleep patterns among hospital nurses:

Sleep disturbance is a state of lowered alertness and impaired productivity associated with prolonged alertness caused by inadequate quantity or quality of sleeping hours [15]. There are several reported influencing factors that could affect the quality of nurses' sleep patterns. It is obvious that nurses working in morning shifts have better sleep patterns compared to those working in night shifts [16, 17]. Furthermore, nurses working in night shifts suffer from lack of sleep and long term negative consequences such as increase body weight, high blood pressure, and psychological issues [18]. Working night shifts in the health sector is a challenging condition but it is sometimes rewarding endeavour. Additionally, it is becoming a standard for healthcare workers to work morning, nights, and weekends or even extended long hours. The American Academy for Sleeping Disorders has reported that nurses who work night, early morning, and rotating shifts for their jobs are at higher risks for shift work sleep disorder [19]. This situation could influence nurses to be sleep deprived and/or excessively sleepy while at work because of the disorder. The negative consequences associated with lack of sleep such as circadian rhythmicity, physiological changes affecting sleep and wake cycles, hormone secretions body temperature and blood pressure [20]. In particular, for Saudi Arabian context, the total of nurses was about two thirds of the total healthcare professionals working in the health sectors [21]. At the local level in Saudi Arabia, there are studies that investigating poor sleep among nurses, one of these studies was conducted by Alsharari, 2019 which showed most of hospital nurses have psychological issues

related to night shifts [13]. Another study in the country concluded that nurses working night shifts have patient safety issues and other physiological problems [14]. Another factor affecting sleep patterns of nurses is physiological aspect of the body; these include body temperature, blood pressure, heart rate [22-24]. These factors could interfere with work status lead to mistakes, errors, lack of sleep, or insufficient nursing care. As a result sleep disturbance could be a recurrent problem among nurses [24]. These factors could also lead to negative outcomes among hospital nurses and low productively.

The third influencing factor on sleep pattern among nurses is demographic characteristics of nurses [22, 23]. These include age, gender, eating patterns, intake of tea or coffee, social patterns, Energy Drink , and several other factors associated with lack of nurses' sleep. However, some previous studies on Australian healthcare worker not ascertain the association between these factors and sleeping problems [25, 26], other studies have linked these factors with lack of sleep and other negative consequences [16, 18, 27, 28]. It was also reported that Energy Drink negatively affect sleep quality of hospital nurses, it was reported from a study conducted on factors influencing sleep patterns of hospital nurses that the Energy Drink consumption is an influencing factor on nurses' sleep quality if taken before bed time [29]. Furthermore, one previous study reported that the nurses work in night shifts, or having bad nutritional habits were highly exposed to shorter sleeping times [30].

The last recent influencing factors in the COVID-19 pandemic and other infectious diseases. As nurses working in the frontline to confront the pandemic they exposed to psychological stress, fatigue, and physiological changes as a response to the stressful situation. It was reported that Omani nurses have experienced lack of sleep during the pandemic [31]. Another study conducted in the United States of America has shown nurses working during the COVID-19 pandemic was reported poor sleep patterns [32].

Effect of sleep disturbance on hospital nurses: It is approved that the negative effects of sleep disturbance on nurses' behavioural and cognitive functions [33-35]. Lack of sleep among nurses lead them to make errors, mistakes, injuries, and lowering patient safety [5, 10] several previous studies have linked the medications administration errors with lack of sleep among working nurses [36].

Additionally, they become more at risk for needle stick injuries, highly risk for blood-borne diseases [37] other reports highlighted that the nurses will make more human errors and injuries due to lack of sleep which certainly decreases quality of provided nursing care [38].

Another negative consequence of lack of sleep includes unsafe behaviour [39]. Based on the National Sleep Foundation, lack of sleep leads to producing more cortisol in relation to drowsiness and fatigue, irritability, tiredness and possibly even delusion behaviours' [40]. The third effect is that fewer sleeping hours is the main cause for nurses' burnout, because working as a nurse is the most stressful job compared to other healthcare professions [41]. It was reported in one study on nurses burnout and quality of sleep during COVID-19 that burnout levels are associated with nurses' insomnia [42].

### **Coping Strategies with Sleep Disturbance among Nurses:**

Sleep disturbance is prevalent among hospital nurses with negative consequences on nurses' physical and psychological health [43]. There are different approved coping strategies used by working nurses to decrease the effect of poor sleep, these include instrumental, self-adjustment, avoidant, task oriented and emotion oriented [44-46].

The strategies of coping with stress among hospital nurses is one of the main components of the stress management process. Several studies have documented that appropriate coping strategies decrease the negative adverse effect of sleep deprivation based on several theories [47]. It was approved that coping is mainly

applied by two strategies of stress coping including instrumental, or on selfadjustment. The instrumental approach was directed to solve the problem by changing behaviour or modifying environment. The self-adjustment process includes control and appropriate modification [44]. Endear and Parker mentioned other three coping strategies include avoidant, task oriented and emotion oriented [45, 46].

There is lack of evidence for appropriate coping strategies used by hospital nurses for lack of sleep, but there are some studies which explored the used coping styles for sleep disturbances by nurses and nursing students. It was noticed that they used emotion oriented strategies for short sleeping hours compared to those with longer sleeping hours [48]. Avoidant is another coping strategies reported by Sadeh and Gruber, who recommended this approach to get enough sleeping hours for shift nurses [49]. The emotion oriented coping strategies for poor sleep is another recommended strategies to bring more physiological arousal and get in sleep faster [50].

## Conclusions

The sleeping problems among hospital nurses need appropriate interventions to control and mitigate its consequences. Several interventions have been recommended to manage hospital nurses' sleep problems, these may include bright lighting technique, napping, staffing and shift rescheduling, or behavioural based interventions.

The first intervention is the bright lighting which is the most common intervention used to improve nurses' alertness during shift work and to ensure sleep quality after work. It works by suppressing the production of melatonin after exposure for bright lighting so nurse could have adequate sleeping hours. The second intervention is the brief nap which is approved to be useful for reducing the sleepiness and enhancing sleep needs. The third common intervention for enhancing nurses sleeping patterns

is rescheduling of the shifts which was approved technique, which plays a significant role in nurses sleep with distribution of working days and rest days. The last intervention is the behavioural based approach which was approved as one of the effective interventions to minimize insomnia among working nurses because nurses exposed to several stressor in working environment. These interventions need further investigation to ensure it consider individual differences among hospital nurses and to be applicable to manage sleeping problems.

### **Conflict of interests**

The authors declared no conflict of interests.

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