

Sleep Deprivation

Am I at Risk for Patient Harm?

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Introduction

The work of the North Carolina Board of Nursing (NCBON) is guided by the Nursing Practice Act (NPA), which contains laws enacted by the legislature to regulate the practice of nursing. Under § 90-171.37(a), the NCBON has the authority to initiate an investigation upon receipt of information about any practice that may violate any provision of this article. This authority may include a nurse unable to practice nursing with reasonable skill and safety to patients because of any physical or mental abnormality. The Board may also investigate any nurse who is unfit or incompetent to practice nursing because of deliberate or negligent acts or omissions, regardless of whether actual injury to the patient is established.

The NCBON often receives inquiries regarding the maximum hours a Registered Nurse (RN) or Licensed Practical Nurse (LPN) may work within 24 hours while maintaining patient safety. It is essential to understand that the NCBON has no authority over employee/employer issues such as worked hours but focuses on its mission to protect the public by regulating nursing practice.

The NCBON does, however, provide guidance in addressing concerns related to extended work hours through interpretation of the laws and rules used to regulate nursing practice. The NCBON Staff and Patient/Client Safety Position Statement provides valuable information on the nurse's responsibilities in accepting a patient assignment. Additionally, the statement offers guidance to nursing leadership by emphasizing the importance of caution when assignments are expected to exceed 12 hours in 24 hours or 60 hours in seven days.

For more information, please visit

<https://www.ncbon.com/sites/default/files/documents/2024-03/ps-staffing-and-client-patient-safety.pdf>.

Working long hours may lead to sleep deprivation, which can impact mental alertness and interfere with decision-making. Nurses who experience a compromised ability to make decisions may be at risk for patient harm. Sleep deprivation can induce mental and physiological effects that may compromise the ability to think clearly and react appropriately during unforeseen circumstances.



Objectives

To prevent patient harm due to sleep deprivation, the nurse must understand the practice issue that could be associated with working extended hours and becoming accustomed to unhealthy sleep patterns. This article aims to discuss sleep deprivation and its contributing factors. You will learn the definition of sleep deprivation, including stages and mental and physiological effects. Most importantly, this article aims to explore how sleep deprivation may lead to an act of patient neglect. The importance of adequate sleep, and tips on recognizing and minimizing episodes of sleep deprivation will be reviewed. Discussion questions using case scenarios will be answered to reinforce the content provided. Reflection questions will encourage nurses to evaluate their current sleep patterns while identifying strategies to improve their sleep hygiene.

Background

The North Carolina Administrative Code (NCAC) 21 36.0217 (a) provides behaviors and activities that may result in disciplinary action, including accepting responsibility for client care while impaired by sleep deprivation. It is important to remember that nurses are responsible for ensuring they are mentally and physically capable of delivering safe, competent care. Falling asleep during an assigned shift could have negative implications, such as patient harm.

Prior cases involving sleep deprivation were discussed with Angie Matthes, Director of Investigations. Based on review of the complaints from January 1, 2019, through December 31, 2023, the NC BON received 68 complaints of neglect involving sleeping on duty. Possible outcomes for such cases range from no further action to suspension. Of the 68 cases investigated by the Board, 14 cases resulted in action being taken. Specifically, the Board obtained clear, convincing evidence to support a violation of the NPA. Resolutions of these 14 cases ranged from remedial education to suspension of licensure. Becoming familiar with sleep deprivation and its impact on one's ability to think clearly will help one better understand how it may adversely affect patient safety.

What Defines Sleep Deprivation?

The Cleveland Clinic (2022) defines sleep deprivation as simply "when you are not getting enough, or you are not getting good, quality sleep". As a result, problems may arise, including forgetfulness, being less able to fight off infections, mood swings, and depression. John Hopkins Medicine (2024) provides causes of sleep deprivation to include other factors such as stress and changes in the work schedule. Nurses who work in facilities that require patient care 24 hours a day may be required to work fluctuating hours and are more likely to be predisposed to strenuous demands working under such conditions



becomes a barrier to developing a healthy sleep routine.

Sleep is a physiologic function that can control feelings of tiredness. From my nursing experience as a previous Nurse Manager, I've learned that feelings of tiredness, known as fatigue, can be induced by work intensity or extended work hours. Since the start of the COVID-19 Pandemic, various types of facilities have experienced staffing challenges. As a result of these staffing challenges, nurses often have the choice of picking up extra shifts, resulting in extended work hours. Nurses who do not allow time for adequate sleep in between shifts put themselves at risk of experiencing sleep deprivation. Nurses are accountable for ensuring they are mentally and physically able to deliver individualized care based on provider orders and patient care needs. Nurses must consistently demonstrate the ability to apply critical thinking and prioritization within the healthcare environment in which they work.

The drive to sleep and cycles of wakefulness are two components that regulate human sleep. Time awake impacts the physiological drive to sleep (Sun & Debanto, 2023). Therefore, long work hours could make the drive to sleep more powerful increasing the risk of experiencing moments of microsleep. Can you recall driving home from work and vaguely remember passing specific landmarks you knew you had to pass to reach your destination? If you answered yes, you may have experienced an episode of microsleep.

The definition of microsleep is when you fall asleep for seconds. This brief sleep period occurs so quickly that you may not realize you have fallen asleep. Microsleep can happen anytime and is not exclusive to those who work the night shift. You may be awake with your eyes open, but your brain does not process the information (Summer & Rehman, 2023). Sound scary? Think of this happening while caring for an assigned patient or driving home after a long workday. Microsleep can be dangerous and can be the precursor to an unfavorable outcome.

Sleep deprivation may increase the risk of experiencing episodes of microsleep. The best way to prevent microsleep is to get the right amount of sleep, which will make you feel physiologically replenished and your mind more receptive to information (Cleveland Clinic, 2022).

Some symptoms to determine if you are sleep deprived include but are not limited to:

- Drowsiness
- Inability to concentrate
- Impaired memory
- Reduced physical strength
- Slowed reaction times (Cleveland Clinic, 2022).

More severe symptoms of sleep deprivation include microsleeps, uncontrollable eye movements, trouble speaking, drooping eyelids, hand tremors, visual and tactile hallucinations, impaired judgment, and impulsive behavior (Cleveland Clinic, 2022).



The symptoms listed are congruent with an individual who may be under the influence of a controlled substance or alcohol. Such symptoms may not only impact the ability to deliver safe patient care, but they could also affect one's overall health and ability to manage family and personal matters, resulting in an unhealthy sleep routine (Pacheco & Rehman, 2023). Therefore, it is essential to understand how sleep deprivation may impact cognitive performance.

Stages of Sleep Deprivation

Becoming familiar with the stages of sleep deprivation will help nurses better understand the importance of taking the required steps to manage and prevent its occurrence. The Cleveland Clinic (2022; Table 1) outlines the four stages to include stage definition and characteristics.

Stages of Sleep Deprivation		
Sleep Deprivation Stages	Stage Definition	Stage Characteristics
Stage 1	24 hrs without sleeping	The effects are like being under the influence of alcohol
Stage 2	Common symptoms of sleep deprivation intensify	Most people start to experience microsleeps and have trouble thinking or focusing
Stage 3	Individual starts to show severe symptoms	The individual may begin to hallucinate and may struggle to communicate with others
Stage 4	Symptoms are at their most extreme	Hallucinations are common and the individual struggles to tell what's real and what isn't

Table 1. Stages of Sleep Deprivation.

Familiarity with the stages of sleep deprivation can assist with early detection and possibly prevent progression to advanced stages. Taking the initiative to establish a healthy sleep pattern could possibly be the first step towards minimizing episodes of sleep deprivation.

Causes of Sleep Deprivation

Sleep Deprivation can happen for many reasons. "Reasons involving life circumstances may include shift work (especially shifts that happen partly or wholly during nighttime hours, alcohol use (especially misuse), using stimulants like Caffeine later in the day, bad sleep-related habits (known as sleep hygiene), high-stress levels, and sleeping in a new or unfamiliar place, such as in a hotel while traveling" (Cleveland Clinic, 2022). Please refer to (<https://my.clevelandclinic.org/health/diseases/23970-sleep-deprivation>) for additional



information on sleep deprivation causes. The inability to sleep or periods of poor sleep quality can cause feelings of tiredness, resulting in fatigue.

Fatigue

Understanding the definition of fatigue may help with early recognition. “Fatigue can be described as an overwhelming sense of tiredness, lack of energy, and feelings of exhaustion associated with impaired physical and cognitive function” (AANA, 2015, p. 2). Individuals who experience fatigue may feel tired and have decreased energy, which results from inadequate sleep or poor quality of sleep. Soomi Lee, an Assistant Professor of Aging Studies at the University of South Florida, stated “insufficient sleep duration, poor sleep quality, and untreated insomnia may be associated with medical errors” (Lee, 2021). Fatigue resulting from inadequate sleep or poor quality of sleep over an extended period can induce the following:

- Lack of alertness
- Fatigue and lack of energy
- Memory problems
- Moodiness and agitation
- Inability or unwillingness to participate in normal daily activities
- Poor reaction time
- Weight gain
- Poor balance and coordination
- Changes in appearance
- A weakened immune system
- Greater chance of car accidents
- Increased risk of cardiovascular disease and other health issues (Cleveland Clinic, 2024).

According to research, drowsiness caused by sleep deprivation can mimic the effects of alcohol consumption. “After about 24 hours of being awake, the level of impairment is equivalent to a blood alcohol content (BAC) of 0.1%” (Pacheco and Rehman, 2023). This level of impairment can be detrimental to nursing practice.

The Effects of Sleep Deprivation

The Agency for Healthcare Research and Quality (AHRQ) reported sleep deprivation can cause impairment of various cognitive functions such as mood, motivation, response time, and initiative (AHRQ, 2019). In September 2023, the World Health Organization (WHO) provided key facts on patient safety, which stated that around one in every ten patients is harmed in health care, and more than 3 million deaths occur annually due to unsafe care. Over 50% of reported harm (one in every twenty patients) is preventable (WHO, 2023).

Sleep prepares the brain for the next day by performing new pathways to assist with learning and remembering new information. Individuals who become sleep deprived may



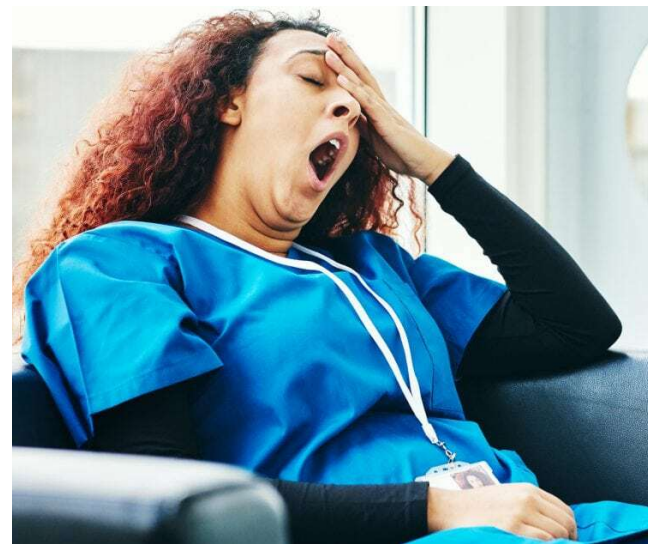
have trouble making decisions, controlling emotions and behavior, and coping with change (National Heart, Lung and Blood Institute, 2022). Potential short-term cognitive impacts of poor sleep can lead to excessive sleeping, poor attention span, reduced ability to adapt to the environment, reduced emotional capacity, and impaired judgement. Long-term implications of sleep deprivation may lead to impaired memory and may cause and can predispose individuals to increased risk of developing Alzheimer's disease.

Cognitive impairment interferes with thinking clearly and utilizing good judgment, which can impact the decision-making process. Nurses who work long hours, alternating shifts, and successive days in a row are at risk for sleep deprivation and may become predisposed to experiencing cognitive impairment.

The American Association of Nurse Anesthesiology (AANA, 2015) points out numerous studies have shown that prolonged sleep deprivation decreases reaction times and diminishes reasoning skills and performance. The AANA (2015) further explains that fatigued individuals have impaired language and impairment in the retention of information, short-term memory, and motor skills. Similarly to Lee (2021), the AANA estimates that 18 hours or more of wakefulness equals a BAC of 0.05%. Additionally, the AANA provides a long list of symptoms of fatigue to include but not limited to:

- Conducting multiple rechecks of completed tasks
- Tiredness during the day
- Nodding off while awake
- Impaired concentration or memory
- Diminished reflexes
- Impaired decision-making
- Unawareness of surroundings
- Indecisiveness
- Decreased situational awareness
- Microsleep

(<https://www.aana.com/wp-content/uploads/2023/01/patient-safety-fatigue-sleep-and-work-schedule-effects-011523.pdf>)



Cognitive impairment sets the foundation for medical error and can lead to patient harm. Fatigued nurses may need more time to complete necessary tasks, address patient care needs, provide appropriate documentation, communicate effectively, and recognize subtle changes in the patient's condition. Nurses are held accountable for knowing if they are safe and competent to accept a patient assignment as explained in 21 NCAC 36.0217 (a)(7) which refers to an individual accepting and performing professional responsibility that the Licensee knows or has reason to know that they are not competent to perform. Therefore, it is crucial to have self-awareness of when it is unsafe to accept patient care responsibilities.



Accepting a patient assignment while sleep-deprived is risky behavior that can lead to patient harm. This can result in an investigation to determine a nurse's competence.

Preventing Patient Harm

The World Health Organization (WHO) defines patient safety as “the absence of preventable harm to a patient and reduction of risk of unnecessary harm associated with health care to an acceptable minimum” (WHO, 2023). While physicians prescribe treatment and order necessary diagnostic test, time spent with the patient can be minimal impacting their ability see a decline in the patient's status over time (Phillips, Malliaris, & Bakerjian, 2021). Nurses typically spend most of their time providing patient care and therefore, must be able to recognize subtle changes that may impact patient outcomes. “From a patient safety perspective, a nurse's role includes monitoring patients for clinical deterioration, detecting errors and near misses, understanding care process and weaknesses inherent in some systems, identifying and communicating changes in patient condition” (Phillips et al., 2021). Nurses have many responsibilities and at times, are the last line of defense before a task or procedure reaches the patient.

A nurse who does not have the mental capacity to deliver safe, competent care is at risk for multiple violations. Becoming familiar with the NPA can clarify how the NCBON may use specific laws to govern nursing practice. The NCBON NPA includes §90-171.37 (a)(3), which states the NCBON may initiate an investigation if an individual is unable to practice nursing with reasonable skill and safety to patients by reason of illness, excessive use of alcohol, drugs, chemicals, or any other type of material or by reason of any physical abnormality. You can learn more about the NPA by accessing [Chapter 90 - Article 9A \(ncleg.net\)](#).

The Effects of Sleep Deprivation

Based on National Sleep Foundation (NSF) requirements, most adults require about 7-9 hours of sleep each night. Less than seven hours of sleep or poor sleep quality could be associated with adverse health outcomes. The NSF provides tips on how to improve sleep quality. You can learn about these tips by clicking on the following link. [National Sleep Foundation Releases Recommendations to Be Your Best Slept Self® This Summer - National Sleep Foundation \(thensf.org\)](#). Consistently getting less sleep than the NSF recommends can pose the risk of becoming sleep deprived. (Pacheco & Rehman, 2023).

Taking time to ensure you are getting enough sleep is extremely important. With various healthcare facilities experiencing staffing shortages, nurses must listen to their bodies and know their limitations. Although working varied shifts may interfere with adhering to a consistent sleep schedule, it would be beneficial to take the appropriate steps toward developing a consistent plan to improve sleep quality. The Cleveland Clinic has provided the following tips on managing sleep deprivation to include actions to consider and actions to avoid (Cleveland Clinic, 2022; Table 2).



Managing Sleep Deprivation	
Consider	Try to avoid
Creating a relaxing bedtime routine with a consistent sleep schedule	Consuming Caffeine and substances that contain nicotine or alcohol within 4-5 hours
Keeping the room at a reasonable temperature	Using electronics right before bedtime
Exercising 20-30 minutes each day; 5-6 hours before going to bed	A room that is either too hot or too cold
Getting at least 30 minutes exposure to sunlight	Any activity that may cause increased anxiety before bed

Table 2. Managing Sleep Deprivation

Normal Sleep Cycle

A regular sleep cycle includes four sleep stages determined based on an analysis of brain activity during sleep. These cycles can vary among individuals and from night to night and are based on age, recent sleep patterns, and alcohol consumption. Progressing smoothly multiple times through the sleep cycle is crucial to getting high-quality rest, as each stage allows the mind and body to wake up refreshed (Sunj & Singh, 2023).

According to Sunj & Singh (2023), the four sleep stages include one for rapid eye movement (REM) sleep and three for non-REM (NREM) sleep. The first three stages represent NREM sleep. The total average time spent in the NREM sleep stages is thirty-one to one hundred thirty-two minutes. The average stage four (REM) time is ten to 60 minutes. REM sleep is essential to cognitive functions like memory, learning, and creativity.

Sleep stages are critical because they allow the brain and body to recuperate and develop. Failure to obtain enough of both deep sleep and REM sleep may explain the profound consequences of insufficient sleep on thinking, emotions, and physical health (Sunj & Singh, 2023). Factors such as age, recent sleep patterns, alcohol, and sleep disorders may affect the ability to progress smoothly through the sleep cycle. Individuals who get irregular or insufficient sleep over several days or more may experience an abnormal sleep cycle. Consistent abnormal sleep cycles can put one at risk for developing sleep deprivation (Sunj & Singh, 2023).

A Healthier Sleep Cycle

Many healthcare facilities, require nurses to work 12-hour shifts. In addition, nurses may be required to work alternating shifts. Working alternating 12-hour shifts may interfere with required steps toward developing a healthier sleep cycle. Despite the challenge, nurses must focus on improving their sleep hygiene, which refers to the sleep environment and sleep-related habits. According to the NSF, achieving a more consistent sleep schedule, getting natural daylight exposure, avoiding alcohol before bedtime, and eliminating noise



and light disruptions can help you get uninterrupted sleep. Remember that your mattress, pillows, and sheets can also contribute to how comfortable your sleep environment is.



Additional tips for a healthier sleep cycle include:

- Get a healthy amount of exposure to bright light during the day.
- Exercise regularly for a deeper sleep.
- Eat meals at consistent times.
- Avoid heavy meals, nicotine, caffeine, and alcohol before bedtime.
- Use a consistent wind-down routine in the evening to get the sleep you need.
- Make a sleep-friendly environment—put devices away an hour before bed and sleep in a quiet, cool, dark place.

News National Sleep Foundation, June 14, 2022, "Releases Recommendations to be your best-slept self this summer," (retrieved April 05, 2024).

Nursing Implications

Nurses are responsible for ensuring they are competent and physically able to provide care to their assigned patients. Nurses who accept a patient care assignment while they are sleep-deprived may be cognitively impaired, putting themselves at risk of causing patient harm.

Nurses who are in leadership roles such as charge nurse, nurse supervisor, team leader, and nurse manager are often responsible for assigning patients. As stated in 21 NCAC 36.0217 (a)(20), when performing such roles, it is essential to know the competency of assigned staff. If the licensee assigning or delegating knows or has reason to believe the competency of an individual may be altered due to impairment from sleep deprivation, physical or psychological conditions, or alcohol agents prescribed or not, could violate the NPA. Therefore, nurse leaders responsible for patient care should know the signs, symptoms, causes and effects of sleep deprivation. This will support decisions regarding the assessment of an individual's competency status before care is assigned.

The following case studies will discuss what the NCBON may consider after receiving a complaint involving a nurse accused of sleeping on duty.



Scenario #1

Sally, an RN staff nurse assigned to care for six (6) patients, was seen at the nurse's station wrapped in a blanket with eyes closed. Other staff members observed Sally's behavior twice throughout the shift. What would you do next as the staff member who observed Sally's behavior? **(Select all that apply)**

- a) Do nothing. Sally is working a double shift, and her help is appreciated. It's best to allow Sally time to rest.
- b) Wake Sally up. Suggest that she move into the break room to sleep in private with less noise.
- c) Wake Sally up and remind her that sleeping during a scheduled shift is inappropriate.
- d) Notify the nurse supervisor or nurse manager of Sally's behavior.

Discussion: The answer is (c), (d)

Sally should be awakened and reminded that sleeping during a scheduled shift is inappropriate. The individuals who observed the incident should inform the nurse supervisor or manager. Doing so will allow the leadership team to investigate Sally's behavior further and determine how it may have impacted patient care.

Scenario #2

Rachel, an LPN working as a home care nurse, was found lying on the floor sleeping. The client's family discovered Rachel sleeping and asked her to go home. The clients' sheets were soiled, and the client was on tube feedings. Rachel had yet to feed the client, had not administered medications, and there was no documentation of vital signs or assessments.

True or false?

Rachel's episode of sleeping on duty has created a scenario for risk of patient harm and multiple violations of the NPA.

Discussion: The answer is True. Patient care was neglected, and documentation was lacking. In this case, sleeping on duty led to an act of neglect, there was failure to maintain an accurate medical record, and the care provided was below the standard of care.



Scenario #3

Nancy, a private duty nurse, was caught on camera sleeping while the client was choking and vomiting. Nancy admitted to being tired due to lack of sleep and personal life issues. Nancy reports not sleeping at all the night before. What steps should Nancy have taken to avoid this situation?

- a) Nothing. Nancy did the right thing by catching up on her sleep and finishing the shift.
- b) Nancy should have contacted her agency when she could not keep her eyes open and requested to be relieved from her shift.
- c) Nancy should have informed the client's family that she would need to rest a few hours during her shift.
- d) Nancy should have contacted her agency before the start of the shift to report that she had not slept and that it was unsafe for her to provide patient care.

Discussion: The answer is (d). Nancy should have contacted her agency before the start of the shift to report she had not slept. Nancy's actions did not align with the 21 NCAC 36.0217 (a) (21) - accepting responsibility for client care while impaired by sleep deprivation, physical or psychological conditions, or by alcohol or other agents prescribed or not. Nurse Nancy also violated #7 - accepting and performing professional responsibilities that the Licensee knows or has reason to know they are not competent to perform. In this case, Nancy admitted to not sleeping at all the night before a scheduled shift. Therefore, Nancy should not have accepted the assignment.

Nursing Implications

It is important to remember that the NCBON focuses on its mission to protect the public through regulation of nursing practice. Working alternating shifts and extended work hours can lead to sleep deprivation caused by exhaustion and fatigue. Individuals who experience fatigue may experience a feeling of tiredness and decreased energy resulting from inadequate sleep time or poor quality of sleep. Sleep deprivation impairs memory, decreases cognitive function, and results in poor decision-making. Accepting responsibility for client care while impaired by sleep deprivation could lead to patient harm. Nurses must strive to accomplish good sleep hygiene by following the tips offered by the NSF. Although the NCBON has no authority over worked hours, nurse leaders should be cautious when assignments are expected to exceed 12 hours in 24 hours or 60 hours in seven days to prevent sleep deprivation, fatigue, and patient harm.

Reflection Questions

- Who is responsible for ensuring the nurse can deliver safe, competent care?
- If you are experiencing symptoms of sleep deprivation before an assigned shift, what should you do?



- How many hours of sleep are required for the brain to recharge?
- What are some symptoms of sleep deprivation, and what impact would these symptoms have on patient safety?
- What steps can you take to promote good sleep hygiene?
- What part of the sleep cycle is essential to cognitive functions like memory, learning, and creativity?
- What happens if a nurse accepts and performs professional responsibilities that the nurse knows or has reason to know, they are incompetent to perform?
- Name some steps you might take to avoid sleep deprivation.

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