Effects of Sleep Hygiene in the Hospital

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Background

Just like eating and drinking, sleep is required for the human body to function normally. Sleep is a condition of body and mind that occurs for several hours every night. The nervous system is relatively inactive—the eyes closed, the postural muscles relaxed—and consciousness practically suspended. Sleep hygiene is defined as a variety of different practices that are necessary to have normal, quality nighttime sleep. Sleep deprivation adversely affects health and personal well-being. All individuals (healthy or ill) require adequate sleep. Sleep architecture refers to the basic structural organization of normal sleep. There are two types of sleep, non-rapid eye movement (NREM) sleep and rapid eye movement (REM) sleep. NREM sleep is divided into stages 1, 2, 3, and 4, representing a continuum of relative depth.

NOISE:

The Environmental Protection Agency (EPA) and World Health Organization (WHO) recommend a maximum noise level of 30-35 dB during day and 35 dB at night. However, nocturnal noise levels range from 50 to 70 dB in a general unit up to 70-80 dB during the day. Both of which are almost two times or more the recommended levels. Quieter noise levels would promote better sleep hygiene. Healthcare providers coming in and out throughout the day can make it difficult to sleep at the same times each day.

Many patients experience a lack of social cues for the induction of sleep. Lack of cues, such as meal times, leads to alterations in circadian rhythms and leads to sleep deprivation. Anxiety and stress can be caused by an unfamiliar environment. As with other disruptions of sleep architecture, patients with anxiety and stress spend less in the restorative stages of sleep (stage 3 and REM). Difficulty/inability to speak, or new diagnosis of illness cause disruptions in sleep architecture due to things like mechanical ventilation or placement of a tracheostomy tube.

PHYSICAL EFFECTS:

Sleep deprivation can induce a stress response and result in increased secretion of inflammatory markers. Stress response activates the Hypothalamus Pituitary Adrenal Cortex (HPA) axis and negatively affects immune function leading to the release of cortisol. The HPA axis is responsible for human’s stress response. This response is characterized by hypothalamic release of corticotropin-releasing factor (CRF) CRF is also known as CRH or corticotropin-releasing hormone. When CRF binds to CRF receptors on the anterior pituitary gland, the adrenocorticotropic hormone (ACTH) is released. ACTH binds to receptors on the adrenal cortex, and stimulates adrenal release of cortisol. This disruption of the normal cell distribution causes an increase in susceptibility to opportunistic infections and an impaired ability to fight acquired infections. The immune system experiences a decrease in helper and natural killer cell function coupled with an increase in the number of lymphocytes and monocytes. The ability to get continuous and consolidated sleep may also become more difficult as we age.

LIGHT:

Excessive amounts of light and the absence of natural light can cause sleep disruption. Light is the basic unit of measurement for light. Not only does the WHO determine that 180 lux is required to awaken a person, but it is also the level required to suppress melatonin secretion. Melatonin secretion is important for sleep induction and aids in circadian rhythms. However, in the hospital, nocturnal light level range reaches up to 3445 lux, preventing patients from falling and staying asleep. The amount of light a patient is exposed to causes a disruption in circadian rhythms. Within the hospital, bright light is often required to complete adequate patient assessment and the performance of patient care activities and procedures, making it difficult for healthcare personnel to limit lighting.

MEDICATION:

Benzodiazepines are used to treat anxiety and aid with sleep, but limit the amount of REM sleep. Opioids promote sleep onset, but limit REM sleep and cause nocturnal awakenings. In addition to disrupting the sleep cycle, benzodiazepines and opioids are associated with delirium.

PAIN:

Many researchers link sleep deprivation in the hospital to the various cycle between pain and sleep. As patients become more sleep deprived, they experience more pain. When patients experience more pain, it prevents them from obtaining a full night of uninterrupted sleep. Poor sleep is also linked to higher pain levels throughout the next day. Unintended and uncontrolled pain contribute to patients’ sleep deprivation. In order to re-establish the restorative stages of sleep, stage N3 and REM, patients must complete the 10-15 minute sleep cycle. This cycle limits patients from obtaining a normal sleep cycle.

ICU:

In an ICU setting, focused nursing assessments are required as often as every hour. Vital sign adjustments, medications, and equipment administration and wound care are examples of the necessary assessments that need to be completed around the clock in the hospital. Bed-bound patients need to be repositioned at least every two hours to prevent pressure sores, causing severe limitations to sleep. In fact, ICU patients experience between 40-40 interruptions per night, with 75% of ICU patients reporting “poor” or “very poor” sleep. This is disruptive to sleep as reaching N3 and REM sleep, the restorative stages of sleep. The graph above illustrates sleep cycles of ICU patients in comparison to the normal adult.

References


St. Mary’s Hospital Sleep Questionnaire

ASSESSMENTS:

St. Mary’s Hospital Sleep Questionnaire:

• A brief 5-Item questionnaire used to evaluate perceived sleep depth, sleep latency
• Scores calculated by mean score of these 5 items, with higher scores representing better sleep
• Approximately 2 minutes to complete by patient or care provider
• Demonstrated strong correlation with measurements of deep sleep and REM sleep

Interventions to Promote OT/PT Participation

Sleep deprivation is directly related to how patients perform in therapy. Poor sleep hygiene can negatively affect how the person functions during the day, which relates to how we engage in occupations. Sleep promotion interventions are designed to minimize sleep disruptions and maintain the normal sleep-wake cycle. Interventions are tailored to counteract the common causes of sleep disruption. Requesting that patients limit their intake of stimulants, avoid intake of stimulants 4-6 hours prior to bedtime, limit intake of caffeine, avoid foods high in sodium, and customize alarm settings for each patient can decrease the noise level throughout the hospital.

Healthcare providers can also offer ear buds or eye masks if controlling the noise or lighting in the hospital is not realistic. Research has showed improved results in sleep hygiene in the ICU with the implementation of these interventions. The maintenance of social cues such as meal times can ensure that patients eat prior to falling asleep. Other social cues, including awareness of time, will aid in maintaining circadian rhythms. Keeping a clock within view or having a phone or watch on hand is an easy fix to this problem. As an interdisciplinary team, it is important to ensure that the patient is comfortable in bed, has their pain under control, and has their emotional needs addressed prior to sleeping.

Sleep deprivation in the hospital is a significant problem for healthcare providers. The sleep environment can have a substantial impact on the patient's ability to sleep. Nurses play a crucial role in improving sleep hygiene and promoting better sleep for patients in the hospital. This includes controlling environmental factors such as noise, light, and interruptions to help patients achieve uninterrupted sleep.