Published in final edited form as:

Heart Lung. 2015 ; 44(2): 95–99. doi:10.1016/j.hrtlng.2015.01.011.

Health care worker attitudes and identified barriers to patient sleep in the medical intensive care unit

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Abstract

Objective—To identify barriers to sleep for intensive care unit (ICU) patients.

Design—A qualitative study using semi-structured interviews.

Subjects—Nurses and physicians who had experience working the night shift.

Interventions—None.

Measurements and main results—Multiple environmental barriers to sleep in the ICU were identified when participants were directly asked about factors affecting sleep. Responses highlighted healthcare system-based barriers related to hospital/ICU policy and workflow. Implicit barriers to sleep were found when participants responded to open-ended questions. These included attitudinal barriers such as the uncertainty about the significance of sleep, the tension between providing protocol-driven ICU care and allowing uninterrupted patient sleep, and lack of consensus regarding interventions to promote sleep.

Conclusions—This qualitative study suggests that health care worker attitudes, methods of sleep promotion, hospital institutional policies and workflow may contribute to sleep disruption in the ICU. These barriers provide additional targets for intervention in studies designed to improve sleep in the ICU.

Keywords

Sleep; Intensive care unit; Qualitative research; Critical care; Health care providers; Attitude of health personnel

Background

Studies of critically ill patients demonstrate poor sleep in the intensive care unit (ICU).¹ Those who have survived to hospital discharge from the ICU recall insomnia and

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fragmented sleep during their stay, promoting fatigue and heightening fear and anxiety.² Studies of stressors affecting patients during ICU stays consistently identify difficulty sleeping as a common cause of distress for ICU patients.^{3,4} Patients attribute their poor sleep quality and quantity to the potentially modifiable factors of environmental noise, light, and difficulty in distinguishing night from day.⁵⁻⁷

Objective data using both polysomnography to measure sleep and patient and nursing questionnaires support that patients sleep poorly in the ICU. Twenty-four hour polysomnographic studies reveal that critically ill patients have fragmented sleep, with multiple arousals, a lack of or absence of phases of restorative sleep, and loss of circadian rhythm.⁸⁻¹⁰ Studies of environmental causes of sleep deprivation in the ICU find that high levels of noise, frequent interruptions by staff, light, mechanical ventilation, medications, and the patient's underlying disease contribute to this problem.¹¹

In what has been called a "cultural shift" in the care of the critically ill patient, interest in long-term outcomes of ICU survivors and in improving the quality of life of patients recovering in the ICU is increasing.¹² Many investigators have identified patient sleep in the ICU as a priority for clinical research in ICU survivor outcomes.^{11,13} Efforts to improve patient sleep in the ICU require identification of all modifiable barriers. The experiences of nurses and physicians working night shifts in the ICU may be an important source of information regarding barriers to sleep beyond the environmental ones identified in prior studies, but little is known about the views of these clinicians. This qualitative study of health care providers who have worked night shifts in the ICU sought to ascertain the perspectives of ICU health care workers regarding sleep in the ICU, in order to identify potentially modifiable barriers to patients' sleep.

Methods

We used qualitative methodology in order to identify barriers to sleep in the ICU that may not have been previously described in the literature. By asking participants to speak generally about their experiences with patient sleep in the ICU, we were able to examine their responses for attitudes and practices that may serve as barriers even if not recognized directly as such by participants.

Participants and setting

Nurses, advanced practice nurses, physician assistants, and physicians who worked in the medical intensive care unit (MICU) at Yale-New Haven Hospital (YNHH) were recruited for participation in this study. The MICU at YNHH has 36 beds and close to 3000 admissions per year. YNHH has separate intensive care units for coronary care, surgical care, neurointensive care, and cardiothoracic surgery. Interviews were not conducted in these intensive care units. The MICU at YHHH is designed in a racetrack format with all the rooms having windows which face outward. All data were collected over a two-month time period in 2009 and no medical ICU sleep protocols or trials were ongoing at the time of the study. Out of 21 clinicians approached, 19 agreed to participate in the study. We used purposive sampling, in order to identify knowledgeable participants who would provide the

greatest insight into the research question.¹⁴ We targeted nurses who had current or past experience working night shifts in the intensive care unit. All intern and resident physicians recruited into the study had an interest in critical care, as they were most likely to have reflected on the patient experience in the ICU at night. In addition, we aimed for sufficient representation of perspectives of both genders, different roles in the ICU, and level of experience working in the ICU.

Potential participants were approached for recruitment on an individual basis, often after change of shift, when the health care workers had time for an interview. The Yale Human Investigation Committee approved this research protocol.

Data collection

A single interviewer (KH) conducted the interviews. One-on-one in depth interviews were performed using a standardized discussion guide. The interview guide was designed to obtain health care workers' perceptions of and attitudes regarding patient sleep in the ICU. The guide began with open-ended questions, followed by probes to elicit detailed responses. Participants were initially asked to describe a typical night in the ICU, the environment of the ICU at night, and how they thought the environment of the ICU impacted patients during the night shift. Participants were then asked about what factors (other than the patient's primary illness) may prevent patients from clinically improving in the ICU. They were asked open-ended questions about patient sleep in the ICU and hospital, allowing the opportunity to bring up factors affecting sleep and attitudes toward patient sleep. Participants were then asked about specific barriers to patient sleep that exist in the ICU.

Each interview was recorded on an electronic audio recorder and transcribed by an experienced transcriptionist. There was no time limit to the interview and it continued until all the questions were answered and the participant was had finished expressing their thoughts. The interviewer continued to recruit new participants until thematic saturation of the data was reached, when additional interviews did not generate new information.

Analysis

All of the text derived from the interviews was analyzed. Content analysis was performed on sections of text in which participants provided responses to direct questions about barriers to sleep in the ICU in order to develop a taxonomy of explicitly recognized barriers to patient sleep in the ICU. The study authors independently read three transcripts and identified, or coded, specific barriers to patient sleep found within the text. We then refined the coding guide by reviewing and discussing additional transcripts until we reached consensus and formed a uniform coding schema. The rest of the interviews were then coded according to the coding guide.

Grounded theory analysis was performed to analyze the sections of text where participants answered open-ended questions about sleep. This was done in order to identify attitudes or practices that represented barriers to sleep but were not explicitly recognized as such by participants. In grounded theory, investigators also identify key concepts, or codes, in the textual data but compare and categorize these codes across the data to form larger abstract

themes. This is done in an iterative process, as subsequent interview data is compared and contrasted with previous data.¹⁴ We identified recurring concepts related to sleep in the ICU, not isolated to barriers to sleep, and met together to categorize these concepts. We then met again to discuss and reach consensus on broad themes related to patient sleep in the ICU. An audit trail of the coded data and the coding process was maintained. The quality of this qualitative work was heightened by the use of systematic data collection and analysis.¹⁵

Based on the above methodology we separated our results into “explicit” barriers to sleep in the ICU, which were expressed by the participants without any vagueness or implication and “implicit” barriers to sleep, which were inferred but not directly stated. Barriers to sleep were also defined as “extrinsic”, or factors external to the patient or “intrinsic”, which were factors related to the patient or their illness.

Results

Our study population was a convenience sample of ICU practitioners. Participant characteristics are shown in Table 1. Experience level of the participants ranged from interns who were one-year out of medical school to nurses who had 20 years of ICU experience. Participants provided multiple responses to the direct question asking them about barriers to patient sleep in the ICU. The explicitly identified barriers were generally due to extrinsic characteristics of ICU care or intrinsic patient characteristics and are listed in Table 2 as well as summarized in the text below. Participants’ responses to open ended questions that allowed participants to express their perception and opinions about patient sleep revealed additional implicit barriers to sleep in the ICU that were not explicitly identified as such by our participants. These implicit barriers were related to health care worker attitudes and knowledge about sleep and the use of sedative/hypnotics in the ICU.

Explicitly identified barriers to patient sleep in the ICU – extrinsic

Many barriers cited by participants were related to the ICU environment. Nearly all participants noted that noise due to monitors, other patients, and medical personnel was a barrier to patient sleep. Nursing procedures, such as bathing, turning, performing vital signs, and administering medications to patients were frequently mentioned. Physician procedures were also identified as barriers, as well as staff and family presence in the patient’s room.

Several participants spoke of health care system-based barriers to patient sleep in the ICU. These barriers were related to hospital or ICU policy and work-flow. Some participants stated that non-urgent diagnostic imaging for hospitalized patients was often delayed until the evening or at night. One nurse, in speaking about these diagnostic imaging studies, said, “... they do outpatients during the day, so inpatients get put off until evenings or nights.”

Several participants spoke of delays in transfer from the emergency department to the ICU due to lack of available beds. One nurse said, “... getting 5 admissions between 7 pm and 4 am. Sometimes we have no control over that – but sometimes we have patients in the ED at noon waiting for an ICU bed and they don’t come up until 7 pm.” The noise and hubbub associated with caring for a new admission affected not only the admitted patient, but patients in adjacent rooms as well. The same nurse added, “Admissions are noisy, they come

in, they take a lot of staff, it's a lot of things going on. So those patients next to the empty room that got the admission, they're hearing all that."

Due to the interdependent nature of hospital workflow, if patients were discharged from general medical floors at a later time, transfers out of the ICU were delayed, and transfers into the ICU from the emergency department arrived late in the day. Participants noted that these delays in patient discharges or transfers contributed to poor patient sleep.

Explicitly identified barriers to patient sleep in the ICU – intrinsic

Explicitly identified barriers to sleep that were intrinsic to the patient included the anxiety patients experienced while being critically ill, contributed to by their physical symptoms including dyspnea and pain. Participants frequently noted the alteration in circadian rhythm with patients being awake all night and sleeping during the day. In addition they noted that delirium tended to occur more frequently at night causing interruptions to sleep. The severity of a patient's illness was also cited as a reason for sleep disturbance as the ICU staff reported needing to be in the room more frequently for the sicker patients.

Implicitly identified barriers toward patient sleep in the ICU

Uncertainty about the clinical impact of patient sleep in the setting of critical illness—Though nearly all providers agreed that sleep was important, they were uncertain about the clinical impact of sleeplessness in the ICU. Some physicians cited lack of evidence proving that patient sleep affects ICU outcomes. When asked if improving patient sleep could improve patient outcomes in the ICU, one nocturnist physician said, "... Would it improve mortality benefit? I don't know... these patients are really sick. I don't know if a nap would help. ... I think it's going to be very tough to show benefit, somehow, empirically." When asked the same question, an attending physician said, "You know, I think we don't really know a whole lot about sleep. I know we need it. It's an overlooked part of the healing process."

The responses we obtained about the clinical importance of sleep in ICU patients varied by the participant's level of training. Attending physicians and experienced night shift ICU nurses often spontaneously brought up the importance of patient sleep, while physicians in training and nurses with less experience often did not. More experienced providers noted that inexperienced providers who have not been taught to consider the importance of sleep in their critically ill patients might be less mindful of promoting a quiet sleep environment. A seasoned night shift ICU nurse referred to this when speaking of the challenge of giving patients uninterrupted periods of time to sleep in the ICU, "I think a lot of nurses don't pick up on that. So again, that falls along with experience. I've been doing nights for probably 8 years, so I kind of know the routine. But new nurses won't do that. They won't pick that up."

Patient sleep amidst competing demands of ICU care—Participants recognized the competing priorities of providing care per ICU protocols and giving an ICU patient uninterrupted time for sleep. An ICU nurse stated, "I think people tend to forget that people need to sleep. Because we are giving this higher level of care, they sometimes forget that sleep is a necessity." Some providers spoke about the heterogeneity of patients admitted to

the ICU, and how some patients may not require as frequent vital signs or monitoring as other patients. ICU protocols, such as frequent vital sign monitoring, were noted to interfere with sleep, even if the patient was not high acuity and was recovering from critical illness. One attending reflecting on patients admitted to the ICU for initiation of non-invasive positive pressure ventilation, asked, “Does he really need his blood pressure measured every 15 min? Does he really need his finger stick checked every hour?”

Lack of consensus regarding effective interventions for sleep in the ICU—We discovered among participants that there was a lack of consensus about which if any pharmacologic or nonpharmacologic interventions were effective for sleep promotion in the ICU as detailed below.

Variability in perceptions of available treatment options—A few participants spoke of non-pharmacologic interventions to promote patient sleep in the ICU, but no participant discussed sleep hygiene protocols. Non-pharmacologic interventions that were mentioned included diminishing noise and decreasing light in the ICU at night.

Uncertainty about administration of sedative/hypnotics—All participants raised the issue of sedative/hypnotic administration to promote patient sleep in the ICU at night but there was uncertainty about their role as sedatives versus sleep promotion in ICU patients. Participants frequently spoke about sedative/hypnotics in terms of their ability to provide sedation to patients, and it was not clear if they were equating sedation with sleep. One nurse said, “In this unit, patients tend to get more sedation like benzos (benzodiazepines) and narcotics during the late evening, night time shift in order to help them rest better. I’m not sure that always works well, but I know we tend to do that.” Another nurse stated, “Most of the times, we don’t give them enough medications. Because... you know all this machinery and all this stuff has to be quite uncomfortable, so the medications knock them out so they are not aware that all this is going on and they are probably much better off.”

Providers had differences in opinion about the benefits and harms of sedative/hypnotics when used to promote patient sleep in the ICU. A nocturnist physician spoke about the underuse of mild sedative/hypnotics for patient sleep in the ICU, saying, “I know some physicians don’t like to use trazodone in the ICU. I think that’s crazy... you know you’re not going to over sedate somebody with trazodone.” Other providers thought that sedatives may have deleterious effects on patient sleep. One nurse stated, “... You may perceive them as sleeping and they are not ... it may be a drug induced sleep. And that has been proven to not always be the most restful sleep because it is the drugs facilitating the sleep and so it is not proper REM sleep.” A daytime attending noted, “... if you’re not sleeping the first thing you get is a sedative or hypnotic and we come in the morning and everyone’s sleeping and they sleep all day. You know, you treat one symptom and create another symptom.”

There are differing opinions among ICU caregivers regarding the need for sedation. An experienced night shift nurse spoke of this difference in opinion, and how it may affect patients, stating, “I know the house staff like to stay away from sedating patients, which, and nursing understands that. ... so you try and get an order to sedate the patient ... they’re up all night. ... their clock is reversed.” An attending physician spoke about this dynamic

between nursing and medical staff, "... most of the time sedation is a huge issue at night and normally what I do is end up treating nurses and not so much patients. What ends up happening is that you end up negotiating care with the nurses about sedation. What are they comfortable with, what are you comfortable with – you come to a common ground."

Discussion

Sleep has been demonstrated to impact immune and respiratory function and circadian rhythm has shown to be disrupted in ICU patients. This study was conducted in order to determine what the perceived barriers to patient sleep in the ICU are by the caregivers. We identified multiple barriers to patient sleep in this qualitative study of MICU healthcare workers who had experience working night shifts in the ICU.

When asked directly about barriers to patient sleep, participants explicitly recognized previously identified environmental barriers related to the ICU itself, but also highlighted institutional barriers related to hospital/ICU policy and workflow, such as the timing of patient tests and ICU transfers. Identification of these hospital and ICU policies and workflow highlight the importance of gaining interdisciplinary involvement when designing interventions to improve sleep in critically ill patients.

Implicit barriers to patient sleep in the MICU when participants responded to open-ended questions about patient sleep; included clinician attitudes about the importance of promoting sleep in the ICU. Specifically there was uncertainty about the clinical significance of poor patient sleep in the setting of critical illness, the tension between providing protocol-driven ICU care and allowing uninterrupted patient sleep, and a lack of consensus regarding interventions to promote patient sleep in the ICU. These identified areas can be used to develop an educational program for nursing and physician staff to increase knowledge of the literature on the importance of sleep, maintaining circadian rhythm and sleep promotion.

While there exists much data regarding factors such as noise and light that can disrupt ICU patient's sleep, there is a paucity of data on outcomes associated with poor patient sleep in the ICU. Data does exist about the effect of sleep deprivation on healthy subjects but it is unclear if this can be extrapolated to critical illness.^{16–19} This scarcity in primary outcome data and the resulting knowledge gap may underlay the attitudes that clinicians have toward patient sleep in the ICU, as uncertainty about its benefit may prevent clinicians from prioritizing patient sleep. A recent study by Kamdar et al demonstrated that delirium and coma were significantly decreased after implementation of a multi-faceted intervention to promote patient sleep in a medical intensive care unit, though improvement in patient's sleep quality as measured by the Richards-Campbell Sleep Questionnaire did not reach statistical significance.^{11,20} Our data suggests that it may be particularly important to ensure the buy-in of health care workers involved in studies of patient sleep in the ICU by providing education about the effect of sleep deprivation in healthy subjects and the results of trials such as this. Our findings suggest that inexperienced health care workers may benefit from education about the impact of sleep deprivation and techniques to provide uninterrupted periods for nocturnal sleep.

For some of the participants in our study, lower prioritization of patient sleep was a trade off of current standard of care. ICU protocols, such as ventilator weaning and sepsis algorithms, save lives.²¹ The medical ICU often has a heterogeneous patient population, however, with some patients in the throes of acute critical illness, some chronically critically ill, and others recovering from the acute phase of their illness. Sleep promotion efforts in the ICU could involve a sleep protocol that first identifies where the patient lies on the spectrum of critical care, with greater uninterrupted time for sleep given to patients in recovery from or in a plateau phase of their illness.

A potentially important implicit barrier to patient sleep in the ICU identified in this study was lack of consensus regarding effective measures for sleep promotion in ICU patients. Though there is data supporting the institution of sleep hygiene protocols for patients hospitalized in acute care floors, the data for sleep protocols in the ICU is sparse.²² The data from our study suggests that researchers studying sleep in the ICU must be mindful that health care workers in the ICU may have a variety of opinions regarding the use of sedative/hypnotic medication and patient sleep. Future studies examining the benefit of standardized administration of sedative/hypnotics and sleep as well as the education of ICU staff about their use are needed.

Study participants identified system-based barriers to patient sleep in the ICU that have not been a focus of prior research. Specific barriers related to hospital/ICU policy and workflow may be unique to each health care system and/or ICU. In our institution, nonurgent diagnostic imaging studies in ICU or other hospital patients could be performed during the day to promote patient sleep. Outpatients, who often take time off of work for diagnostic imaging appointments, could have their studies performed in the late afternoon or early evening hours. The noise related to delayed emergency room admissions to the ICU could be ameliorated by early discharges from the hospital, so that hospital beds are open early in the day for patients who are ready to be transferred out of the ICU. Health care system-based barriers provide another target for intervention in studies controlling for factors that affect patient sleep in the ICU.

Limitations

This study was performed in a single medical intensive care unit. The results may not be generalizable, but the goal of qualitative research is to provide in depth perspectives of a small number of subjects.

Conclusions

Interest in and research about patient sleep in the intensive care unit is growing. In order for high quality clinical trials to be performed, all modifiable barriers to patient sleep in the ICU must be ascertained. This qualitative study suggests that health care worker attitudes, methods of sleep promotion, and hospital institutional policies and workflow may contribute to patient sleep disruption in the ICU. These barriers provide additional targets for interventions designed to improve patient sleep in the ICU.

Acknowledgments

This work was supported in part by the NIH/NHHR (R21 NR011066-01A1), Clinical Epidemiology Research Center, VA Connecticut Healthcare System (K24AG028443 NIH/NIA) and the Pepper Center: Claude D. Pepper Older Americans Independence Center at Yale University School of Medicine (#P30AG21342 NIH/ NIA). This work was also supported by the Training Grant in Geriatric Clinical Epidemiology from the National Institute on Aging (T32 AG019134), and the Hartford Foundation.

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Table 1

Subject characteristics.

Subject characteristics	Number (N = 19)
Gender	
Male	9
Female	10
Role in ICU	
Nurse	6
Advanced practice nurse	1
Intern physician	3
Resident physician	3
Fellow physician	3
Attending physician	3

Table 2

Explicit and implicit identified barriers to patient sleep in the intensive care unit.

Explicit and extrinsic barriers to patient sleep in the MICU

Noise: Staff, monitors, other patients
Nursing duties: Bathing, turning, medication administration
Medical staff procedures: Arterial lines, central lines
Monitoring/Vital signs
Staff presence in room
Family presence in room
Travel for imaging
Late admissions to the ICU
Mechanical ventilation

Explicit and intrinsic barriers to patient sleep in the MICU

Emotional state
Circadian rhythm alteration
Delirium
Severity of underlying illness

Implicit barriers to patient sleep in the MICU

Uncertainty about the clinical impact of patient sleep in the setting of critical illness
Patient sleep amidst the competing demands of ICU care
Lack of consensus regarding effective interventions for sleep in the ICU
Variability in perceptions of available treatment options
Uncertainty about administration of sedative/hypnotics