SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

To investigate whether or not improving an ICU environment enhances the quality of sleep for critically ill patients receiving treatment through mechanical ventilators.

DESIGN IMPLICATIONS

This study took place in an ICU that had already undertaken steps to reduce noise levels around critically ill patients. Reduced noise levels may have contributed to the abnormal levels of "normal sleep" levels attained by more than half of the participants in this study.

Sleep in Intensive Care Unit: The Role of Environment

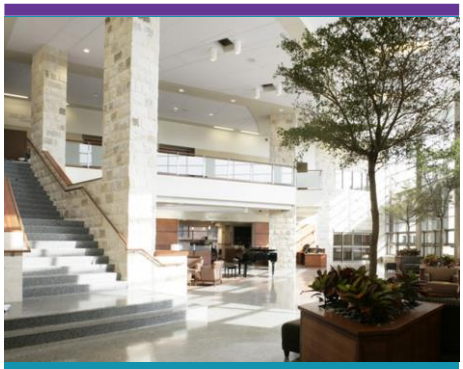
Yuliya, B., Jennum, P., Nikolic, M., Holst, R., Oerding, H., Tof, P., 2017 | *Journal of Critical Care, Volume 37, Pages 99-105*

Key Concepts/Context

Several previous studies have linked abnormal, often-disrupted patient sleep patterns to impaired immune system function and various detriments to cognitive performance. Patients receiving treatment in an intensive care unit (ICU) are often subjected to several variables that can easily disrupt their sleep patterns, such as light, noise, frequent therapeutic procedures, and the patient's illness or injury itself. Previous studies concerning ICU patient sleep quality largely involved qualitative data from patient-answered questionnaires and typically did not involve populations of severely ill ICU patients. Polysomnography (PSG) is a method for assessing several biological indicators of sleep quality; the authors of this study suggest that PSG has not been previously used to study sleep patterns in severely ill ICU patients, due to the complex nature of the method and the ICU environment itself. PSG could help designers better understand the environmental factors most affecting the sleep patterns of ICU patients and inform beneficial changes within the physical environment.

Methods

This study took place over 48 hours in an eight-bed ICU. Participants included 17 adult patients undergoing mechanical ventilation treatment for at least 48 hours. A "quiet routine" protocol was created where ICU alarm and lighting levels were decreased and visits were prohibited after 10 p.m. Participants were randomized to receive the "quiet routine" intervention during either the first or second night of the study. Throughout the experiment, researchers gathered data concerning both ICU noise levels and participant PSG measurements to gauge changes in both the sonic environment and patient conditions over time.



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Findings

Noise level measurements indicated that the ICU already had low levels of noise without the "quiet routine" intervention. Subsequently, no significant difference in ICU noise levels was detected during the intervention, and no significant changes in patient PSG data were found. Normal patient sleep patterns, which were detected in 53% of participants, were not affected by the intervention. The results suggest that the ICU's previous efforts in reducing overall noise levels were effective enough to render this study's intervention moot.

Limitations

This study involved a relatively small sample size of patients (17 participants) and used data from a relatively short period of time (48 hours). The authors note that their metrics for scoring PSG measurements were based off a previous study that did not involve critically ill ICU patients. The authors also note that sound peaks were not documented during audio recording, and the ICU featured two-patient rooms, which may not be a common design in other ICUs.