SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

This study sought to describe nighttime patterns of environmental factors at the bedside of children with cancer receiving inpatient chemotherapy, including sound, light, and temperature levels.

DESIGN IMPLICATIONS

Efforts are needed to identify modifiable sources of nighttime sound and develop interventions to reduce nighttime sound. Collaborative efforts to organize clinical care to minimize nighttime disruptions may lead to reduced bedside sound levels, coupled with design interventions.

Characteristics of the Nighttime Hospital Bedside Care Environment (Sound, Light, and Temperature) for Children With Cancer

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Key Concepts/Context

Children with cancer have a lot to cope with aside from their disease and its treatment. Often, they are in unfamiliar healthcare environments that may be too noisy or bright to facilitate uninterrupted sleep. However, not much is known about the sound and light levels in either pediatric or adult inpatient oncology units.

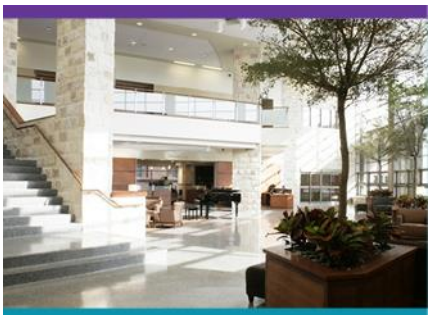
Methods

This study included 15 school-aged children receiving chemotherapy on an inpatient pediatric oncology unit. Over 3 days, researchers continuously measured their rooms' sound, light, and temperature using a digital-sound pressure-level meter and an external channel data logger.

They took measurements at 30-second intervals, resulting in 1,440 individual measurements for sound, light, and temperature each 12-hour night shift. The investigators calculated means of each variable for each 2-hour time interval (e.g., 7:00 to 8:59 p.m., 9:00 to 10:59 p.m.) within each 12-hour night shift. This article presents a descriptive summary of sound, light, and temperature within each 2-hour time interval for each of the three study nights.

Findings

The study found that the hospital rooms had persistently elevated sound levels throughout the night often exceeding the 35 dB recommended by the World Health Organization for a healthy sleep environment during each 2-hour time interval of the night shift. The researchers found sound levels similar to those in



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pediatric critical-care settings and that were greater than 10 times that of a healthy sleep environment, even very late at night. These noise levels are associated with disrupted sleep. Each 2-hour time interval also saw abrupt increases in sound intensity of greater than 70 dB. All children experienced nighttime sound-level spikes comparable to moderate traffic or loud conversation.

In summary, the nighttime environment for children receiving inpatient chemotherapy includes excessive sound levels and spikes of sound intensity throughout the night. Such a noisy environment is not compatible with restful sleep and may also add physiological and psychological stress that could impact the health, response to chemotherapy, and recovery of children with cancer.

Limitations

The authors state that the study's limitations include a small sample size and a cross-sectional design. However, because they organized the data into 2-hour intervals within each of the three study nights, they were able to use a mixed linear model for within-night analyses. Another limitation is that this study focused on the environment of hospitalized children receiving inpatient chemotherapy; therefore, their findings cannot necessarily be generalized to other subgroups of hospitalized children with cancer, such as children with fever and neutropenia or children undergoing hematopoietic stem cell transplantation. Finally, the study did not identify sources of increased sound or light intensity that could have come from nursing care, parents or visitors, or the child's activity in the room.