SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

This study examined patient characteristics to learn whether they were associated with noise that limited nighttime sleep. Factors that caused sleep disturbances were identified.

Nighttime Noise Issues That Interrupt Sleep After Cardiac Surgery

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Key Concepts/Context

Hospital unit environments have excessive environmental ambient sound levels. In cardiac-surgical, general, and neonatal intensive care units, sound levels were commonly more than 50 dB and spiked to 80 dB and 100.9 dB. Common sounds associated with routine care in a postsurgical intermediate care unit have a decibel level in the range of heavy truck traffic (about 80 dB). Noise influences the physiological state of sleep. It is important to reduce nurse-generated and environmental noise when patients are trying to sleep.

Methods

This study was a cross-sectional, descriptive study using survey and registry data.

A convenience sample of 148 patients recovering from coronary artery bypass graft (CABG), cardiac valve surgery, or other cardiac operative procedures was recruited from a 1,400-bed, tertiary care, teaching, medical center in northeast Ohio. Thirty-seven patient characteristics were identified and studied using a cardiac surgery registry containing data required by the Society of Thoracic Surgeons.

Three nights were chosen to allow patients to become familiar with the postoperative environment prior to enrollment. In addition, by the fourth postoperative day, patients were less likely to have nighttime sleep disturbed by pain and routine external factors such as radiology or intravenous procedures or treatments.

Noises that prevented or interrupted nighttime sleep and relaxation/sleep promotion variables were measured using an investigator-developed survey (Nighttime Noise Events and Sleep Survey) of 15 noise events and 10 relaxation and sleep promotion variables. A Likert scale was used to rate frequency of occurrence.

DESIGN IMPLICATIONS

This study found that most patient characteristics were not associated with nighttime noise. Other than surgery type and diagnoses, factors preventing or interrupting sleep are modifiable through behavioral and nursing processes and structural changes.

Reviewer note: Designers should note the normally high decibel levels found in most acute healthcare settings. Many noise offenders can be mitigated with design.

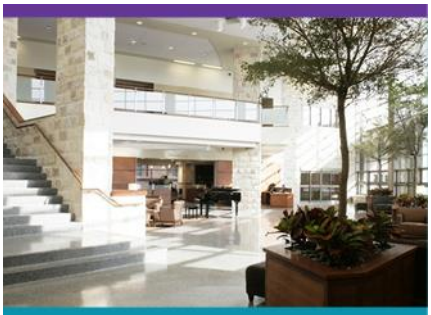
The use of a list of 10 nighttime relaxation and sleep promotion variables was assessed using yes/no responses.

Descriptive statistics were computed to describe the group by demographics, medical background, and surgical type/procedures. Descriptive statistics were also used to determine noise events that prevented or interrupted nighttime sleep while recovering after cardiac surgery. Chi-square test, Fisher exact test, or Wilcoxon signed rank test were used to compare differences in noise events by patient characteristics and by relaxation and sleep promotion variables used, depending on the level of data, sample size, and distribution of the data. The correlation structure of significant factors in the univariate phase was examined, and those factors that were independent of one another were used in the multivariate analysis. In multivariate analyses, stepwise logistic regression was used to create odds ratio estimates of significant patient characteristic (demographics, medical history, and surgical type/procedures) predictors for the top three nighttime noise events that prevented or interrupted sleep. Ninety-five percent confidence intervals for the odds ratio were calculated, and a significance level of .05 was considered statistically significant for all tests. SAS version 9.1 (SAS Institute, Cary, North Carolina) was used to conduct analyses.

Findings

Most participants (n = 136, 92%) identified at least 1 noise event that prevented or interrupted nighttime sleep, and 12 (8%) participants identified all 15 noise events as preventing or interrupting sleep at some point in the previous two nights. Of 15 noise events, 6 (40%) were rated by more than half of participants as preventing or interrupting sleep at night: overhead paging (75.3%); alarms on equipment (68.7%); people talking in the hallway (68.2%); call light alarms (58.0%); equipment moving in the hallway (56.0%); and doors opening, closing, or slamming (52.7%). Noise from overhead paging was the most frequently cited noise event that prevented or interrupted nighttime sleep, and it also ranked as the noise that occurred with the highest repetitive frequency during the night, was the most severe, and created the greatest difficulty in getting or staying asleep. Of 10 relaxation and sleep promotion aids provided, the most frequently used were pain medication (75.5%) and nurses using soft voices (whisper tone, 62.1%).

Many noise events prevented or interrupted nighttime sleep for the majority of participants. Frequent noises that were the most troubling were those generated by people and the environment of care: overhead paging, noise from alarms on equipment, and noise from people talking in the hallway. While considered normal experiences on a hospital unit, the top three noise events are foreign to patients.



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Limitations

Study limitations were that definitive cause-and-effect relationships cannot be established. A convenience sample was used to collect data. While confidentiality was ensured, patient response bias could have accentuated noise responses.