SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

The objective of this study was to gather the following information on sound in acute patient care areas: (a) sources of sound, (b) levels of sound, (c) patient perception of sound and its effect on them, and (d) types of sound that can be modified or controlled.

Noise in acute patient care areas

Hilton, B.A., 1985 | *Research in Nursing & Health*. Volume 8, Issue 3, Pages 283-291

Key Concepts/Context

The paper begins by defining noise (as sound higher than that recommended for hospitals and considered undesirable or intolerable by patients) and questioning noise levels in hospitals and how patients are affected by it. The author cites studies between 1961 and 1981 that showed that ill people had a lower tolerance for sound than healthier people, sounds in hospitals were higher than recommended levels and tended to be a stress factor for patients, and that when sound was considered to be noise, it led to stress, which in turn could delay healing. In this study noise has been studied in acute patient care areas through recordings, observations, and patient interviews. The study was carried out in three different hospitals (three ICUs, a recovery room, a pre- and post-operative ward, and a medical ward). Results indicated that sound levels are higher in the ICU and recovery rooms of the larger hospital. Further, sounds were louder in multi-bed rooms versus single-patient rooms and were perceived similarly by patients.

Methods

Using an exploratory, descriptive design this study was carried out in three hospitals in a large metropolitan area of northwest Canada – a large general hospital, a small teaching hospital, and a small community hospital. In all, six units were studied – a pre- and post-operative ward, a recovery room and an ICU in the general hospital, two medical wards and an ICU in the teaching hospital, and an ICU in the community hospital. The sample consisted of 25 patients – four to five from each unit. The following factors were considered while selecting the patients – wide range of sound levels, different distances from the nurse station, room type (single- and multi-bed), and different time intervals following surgery (hence, varying staff and equipment presence). A microphone suspended on a cable was placed at the head of the patient bed to measure the decibel level of sound continuously for 24 hours. A small sound meter was placed at the headboard to record LEQs at intervals of 1 minute, 15 minutes, 1 hour, and 24 hours. A researcher sat near the patient for three hours to identify and record sources of sound. Patients, except those in ICU,

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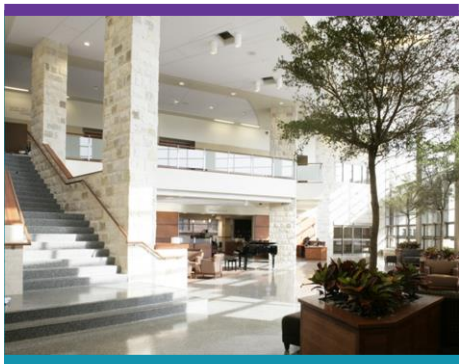

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were also asked to complete a small survey on noise levels, whether they were affected by noise or specific noises, and whether their sleep was affected.

Findings

In connection with sound levels, the study found that both critical and non-critical patient areas in the two smaller hospitals were quieter than in the large general hospital. Although sound levels in the ICUs of the two small hospitals ranged between 32.5-57 dB(A) LEQ and between 34.25-62.5 dB(A) LEQ in the ward, sound levels were less than 50dB(A) LEQ for 90% of the observed time. In the ICU of the community hospital, despite quiet periods, sound levels did not go below 36.5 dB(A) LEQ. In the recovery room and ICU of the large hospital, the sound levels stayed over 50 dB(A) LEQ for 24 hours and went up to 68.5 dB(A) LEQ. Sound levels were higher than 60 dB(A) LEQ for 50% of the time in the recovery room and for 25% of the time in the ICU. The pre- and post-operative ward, by comparison was quieter, with sound levels ranging between 48 and 53.5 dB(A) LEQ (but mostly staying below 50). During the night the two small hospitals and in the pre- and post-operative ward of the large hospital had reduced sound levels as compared to the latter's recovery room and ICU. Intermittent sound levels of 50 dB(A) or higher were recorded 500 times in the pre- and post-operative ward of the large hospital, 448 times (67% of the time between 5.30 and 6.30 a.m.) in the ICU, and 32 times in the medical wards of the teaching hospital.

The sources of sounds were more identifiable in the smaller hospitals than in the large hospital. These sources were categorized as steady (oxygen, chest-tube bubbling, and ventilator functioning), quasi-steady (mainly people talking, computers, suctioning, water running, and toilets flushing), and impulse sounds (equipment being bumped, alarms, phones, doors, and message tubes).

The sound from steady sources was constant for hours, whereas the sound from impulse sources usually lasted for one second. Quasi-steady sources, especially of people talking, ranged from zero to as high as 166 minutes (for patients) – the former in the ICU of the general hospital and the latter in the ICU of the teaching hospital; nurses talking was the highest in the recovery room and ICU of the general hospital.

With regard to patient perception about sounds, patients mostly expressed satisfaction with the sound levels in four of the six units – the pre- and post-operative ward of the large hospital, the ICU and medical wards of the teaching hospital, and the ICU of the community hospital. Some patients did report being bothered by nurses talking, the groans and moans of another patient, and telephones ringing. Patients in the recovery room of the large hospital reported strong negative feelings about the sound levels and reported being affected by small sounds even after leaving the recovery room.

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Some of the efforts made in these units to reduce sounds and noises – closing the door to the patient room (in the teaching hospital), pulling heavy clear plastic curtains across doorways in the community hospitals, turning down the volume on the phones (in all units), personnel practices (dimming lights to encourage talking in soft voices, and informing patient family in the mornings so as to reduce number of incoming phone calls (in the community hospital)).

Limitations

The authors identified the following limitations for this study: (a) identifying sources of sound when they occurred simultaneously, when the ambient sound levels were high (b) equipment failure that led to loss of data (c) continuous sound levels could not be recorded in the community hospital.

Design Implications

The author recommends single-patient rooms in ICUs with optimum space to accommodate staff and equipment and hence control sound levels. Equipment and furniture selection should also be done taking into consideration the amount of sound produced while, for instance, lowering and raising bed rails or chart binders that do not snap.

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