SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

The primary objective of this study was to construct a "noise map" within and around a 15-story, acute care hospital by systematically measuring and subjectively characterizing noise levels, areas, sources, and reactions.

Noise Levels in an Urban Hospital and Workers' Subjective Responses

Bayo, M. V., Garcia, A. M., Armando, G.
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Key Concepts/Context

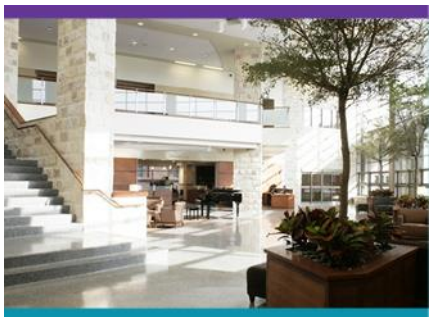
Noise has become a major environmental problem as well as a public health concern, resulting in a wide range of negative consequences. Despite healthcare facilities' attempts to foster favorable environments to assist in patient recovery and staff working conditions, noise levels are often higher than desirable in and around hospitals. There is a need to identify the main noisy areas and noise sources and evaluate the hospital staff's reactions to noise.

Methods

In this study, a set of noise measurements and interviews of health workers were conducted in a 15-floor medical/surgical building of a major urban hospital in Valencia, Spain, to identify the main noisy areas and noise sources and evaluate the hospital staff's reaction to noise. This hospital serves a population of approximately 500,000 and employs approximately 5,700, of whom 70% are healthcare workers. No specific sampling technique was applied. Data analysis was carried out with the SPSS/PC+ statistical package.

Findings

To minimize interference with sleep and recovery, recommended maximum noise levels are 45 dBA and 35 dBA, respectively. During both of the time periods (9:00 a.m. to 1:00 p.m. and 4:00 p.m. to 8:00 p.m.), the majority of the internal noise equivalent levels (230 and 226, respectively) exceeded 55 dBA, while external noise equivalent levels ranged from 52-75 dBA. Highest noise levels were found in nonmedical care and transit areas with subjective sources being: hospital workers (32%), visitors (31%), patients (17%), and hospital devices (15%). The noise produced in the ward areas was primarily produced by visitors (52%), hospital workers (30%), patients (26%), care devices (13%), radio/television (13%), and



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external noise (13%). Workers perceived that noise effected patients' comfort and recovery; negative effects on the workers themselves were perceived less frequently.

Limitations

Measurements were not based on continuous recordings or measurement and characterization at peak noise levels. Interviews were voluntary, which may affect the ratings of subjective measurements. It was not possible to estimate the proportion of no response. Inference statistical tests could not be calculated because random sampling was not assumed.

Design Implications

A high proportion of workers thought it would be possible to reduce noise levels by: general improvement of working conditions; control noise at the source (e.g., less noisy devices, adequate maintenance, substitution of acoustic signals by visual ones when possible); better acoustic insulation; and education of patients, visitors, and workers regarding avoidance of unnecessary noisy behaviors. Additional measures may include nonauditory personal pagers and other technology-based innovations, the addition of white-noise elements, and spatial layouts/properties (floor plan, adjacencies, materials, fixtures, furnishings, equipment, etc.).