

Factors Related to The Perception of Hospital Noise in A Neuroscience Unit

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Abstract

Noise has doubled in recent decades; technological advance being its main cause. This means that the figures are well above the recommendations stipulated by the World Health Organization (WHO), which are 35 dB during the day, and 30 dB at night

Keywords: neurological patients; hearing problems; sleep disorders.

Introduction

In general terms we can define noise as an unpleasant and annoying sound, with excessively high levels of decibels that are potentially harmful to hearing¹, “as a variation in air pressure that can be detected by the human ear, and can be described by certain physical parameters, mainly intensity and frequency” [2] or as “inarticulate, usually unpleasant sound”³. Noise is one of the triggers of sleep deprivation, patients have described it as a stressor that It increases when they are unable to communicate or move and this triggers a decrease in the duration, time distribution and fragmentation of sleep, with a predominance of stages 1 and 2 and a reduction in the 9 stages 3 and 4 and REM⁴.

Noise has doubled in recent decades; technological advance being its main cause. This means that the figures are well above the recommendations stipulated by the World Health Organization (WHO), which are 35 dB during the day, and 30 dB at night[5]

The WHO has estimated that approximately 500 million people in the world are exposed to high levels of noise. Similarly, the Organization for Economic Co-operation and Development (OECD) considers that 130 million people are exposed to a sound environment higher than 65 dB⁶. Estimates from these organizations show that 300 million people throughout the world world feel acoustic discomfort, that is, they are exposed to sound levels between 55 and 65 dB[7]

In hospitals, there is a constant flow of noise from alarms, medical equipment, ventilation systems, audible conversations in the hallways, noises from stretchers, cart [8] which influences the patient's recovery. It is estimated that the average noise levels reached in patient rooms exceed double that recommended by the WHO, so it is vitally important that health organizations apply noise measurement devices to control levels. of stridency and implement noise reduction strategies [8]

Noise and light pollution are a cause for concern due to the serious discomfort they cause and their effects on health, both physiological and psychological in hospitalized people[10]

According to the results of a study published in the journal *Annals of Internal Medicine*¹¹, recovery can be compromised in the hospital environment due to noise, which interrupts sleep phases and, consequently, alters brain activity and cardiovascular function. Neurological patients have altered perception of these two stimuli, and for this reason, they are more vulnerable to these stimuli. It has been described that the presence of insomnia associated with excess noise and light is directly related to worse control in chronic diseases [12]

A recent pilot project [13] carried out at the Gregorio Marañón General University Hospital has made it possible to understand how the implementation of an intervention on factors such as noise, temperature, interference from the activity of health personnel at night and pain control can improve the quality of rest perceived by hospitalized patients by up to 10%.

Another study[14] carried out at the Belén de Lambayeque Provincial Teaching Hospital in 2018, through repeated measurements of noise levels in healthcare areas, determined the presence of noise pollution in the vast majority of areas.

The study carried out by the Catalan Institute of Health, [15] which analyzes different areas of several hospitals considered the noisiest, aims to propose interventions to help patients rest. The measurements determined a minimum of 58.6 decibels and a maximum of 69 decibels, both data much higher than the WHO recommendations. We found references in services such as ICU and Emergency Service[17]

In 2017 at the Hospital Clínic of Barcelona, a quasi-experimental trial was carried out in the emergency area, whose intervention consisted of structural changes to reduce light and environmental noise, as well as the establishment of a standardized work procedure to modify the plans. night care. The results determined that factors such as pain, nursing interventions or daytime sleep did not impact sleep quality; however, light and environmental noise influence nighttime rest more than other known variables[18]

The Hospital Universitario de la Princesa, through the Commission on Perceived Quality and Humanization, carried out an analysis in 2015 on the perception of patients in relation to noise during their hospitalization process. The need to propose specific interventions to reduce environmental noise and thus help improve the recovery process was analyzed and observed. It was concluded that around 20% of patients and/or family members consider that the noise in the hospital is loud or very loud, which is why they proposed taking intervention measures. relation to the age factor, improving the quality of rest was included as one of the strategies of the 2016-2019 Humanization Plan of the Ministry of Health of the Community of Madrid¹⁶ with the aim of reducing the negative effects that noise and other factors have in rest, considered a public health problem, especially in elderly people.

Due to the above, the purpose of this project is to know if the factors related to the perception of noise by patients and how this affects the rest and comfort of patients admitted to the Neurosciences Unit of the center, since as previously justified, neurological patients often have altered noise perception. It is interesting to study the results of this study in this group of patients in relation to the results of the study about the noises that were most annoying for the patient.

In addition, the Princess University Hospital is a member of the international movement of Hippocratic Hospitals as a Humanist center with the collaboration of the Humans Foundation. This movement responds to the need to raise awareness among current health professionals¹⁹.

Main objective:

Describe the related factors in relation to the perception of noise of people hospitalized in the Neurosciences Unit of the Hospital Universitario de la Princesa and the impact on the rest and comfort of patients.

Specific objectives:

1. Know the factors related to patients' perception of hospital noise in the Neurosciences Unit.
2. Know the tolerability of patients regarding the noise level in a hospitalization unit.
3. Know how patients perceive the impact of hospital noise on their rest and comfort.
4. Know the decibel level of noise in the Neurosciences Hospitalization Unit through measurement using a sound level meter.

Methodology

Prospective descriptive observational study in which it is proposed to describe the factors related to noise perception in the Neurosciences Unit of the Hospital University of La Princesa, considering the perception of patients and/or family members participants in the study, also in objective terms, the measurement of noise environment of the unit. To collect the patients' perception, two surveys are proposed: one regarding perceived quality of sleep and rest, validated by the Quality Commission Perceived and humanization of the hospital center itself and another of noise perception, called "noise pollution" validated by the Madrid Health Service.

To collect noise intensity level data measured in decibels, uses a portable sound level meter as a tool. The measurement is planned in three days different and at different times.

To evaluate the cognitive capacity of the participating subject who responds to the survey, the use of the T@M test (Memory Impairment Test) is required.

Sample size

Patients hospitalized in the Neurosciences Unit of the University Hospital of the Princess who meet the proposed inclusion criteria within a period of time limited to 60 days. Estimating the number of patients who have been discharged in the unit studied in the previous 3 months as a universal sample, a calculation is made sample size of 35 patients, considering 8% losses.

Inclusion criteria:

- Over 18 years old.
- Signed informed consent to participate in the study.
- Sufficient cognitive capacity, evaluated through an assessment test neurological T@M (Memory Impairment Test) (18) (Annex 1).

Exclusion criteria:

- Revocation of informed consent.
- Patients diagnosed with sleep disorders.
- Patients diagnosed with hearing problems.

Variables

- Descriptive: Age, Sex, Cognitive ability.
- Noise perception: very high, high, acceptable, low, very low.
- Perception of sleep quality.
- Quantification in decibels of the sound level.

Instruments

To obtain data on the neurological status of the patients, the T@M test (Memory Impairment Test) is used. It consists of five sections: immediate memory, temporal orientation, semantic remote, free evocation, evocation with cues; It is used in the assessment of cognitive ability on a regular basis.

To obtain data regarding the patient's perception of Quality of Life in relation to noise, the survey of perceived quality of sleep and rest was used, validated by the Commission on Perceived Quality and humanization of the hospital center.

To obtain data regarding the patient's perception of noise, the so-called "noise pollution" survey validated by the Madrid Health Service was used.

To quantify the noise level in decibels, objective measurements were taken with a portable sound level meter as follows: 3 daily measurements for 21 days, including the three work shifts on each measurement day. The measurement is carried out at the two existing nursing controls in the unit and at the entrance door to the patient rooms.

Data Collection And Analysis

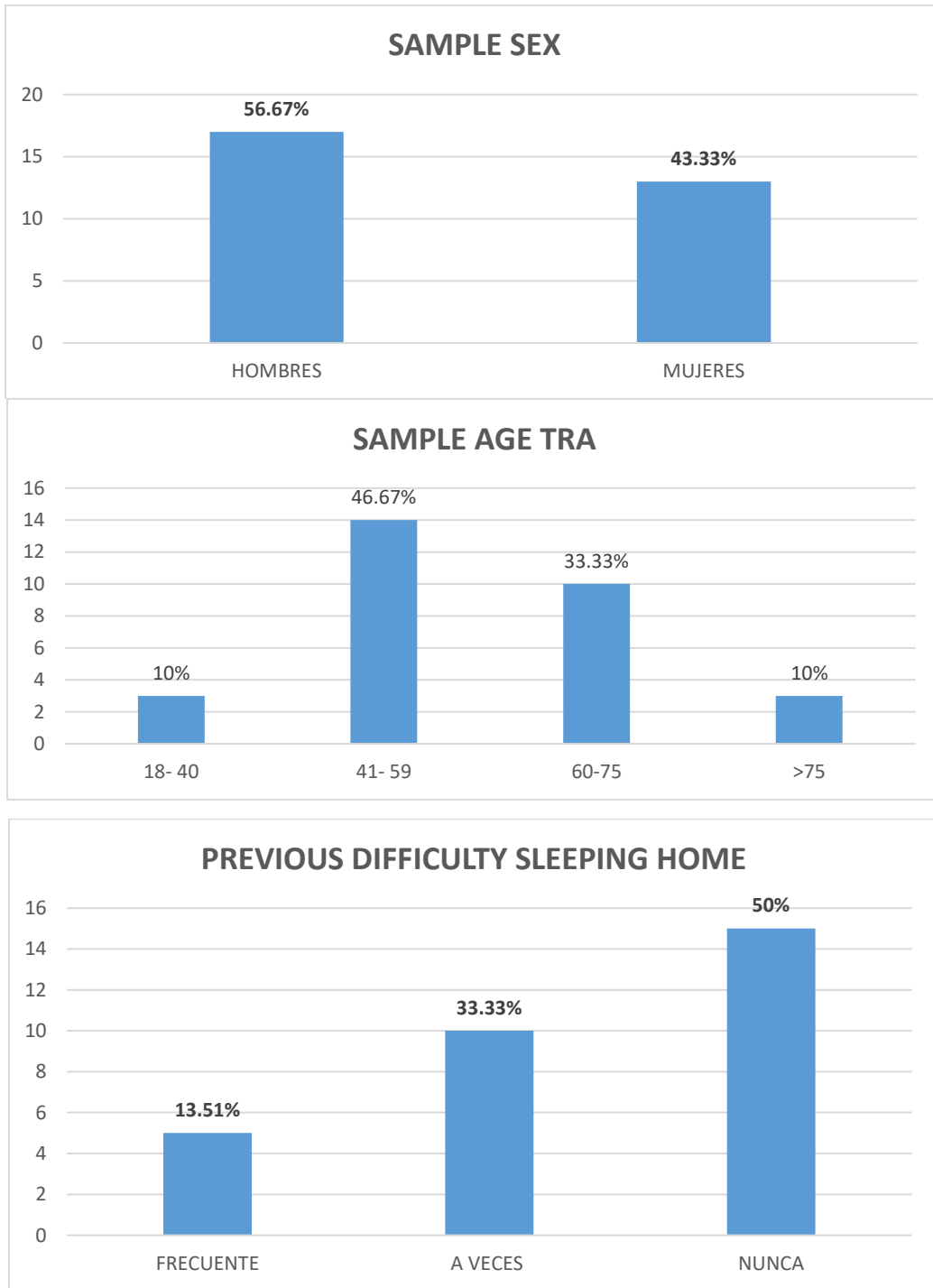
Data Collection Notebook (CDR) for each of the participants, identified with a participant number.

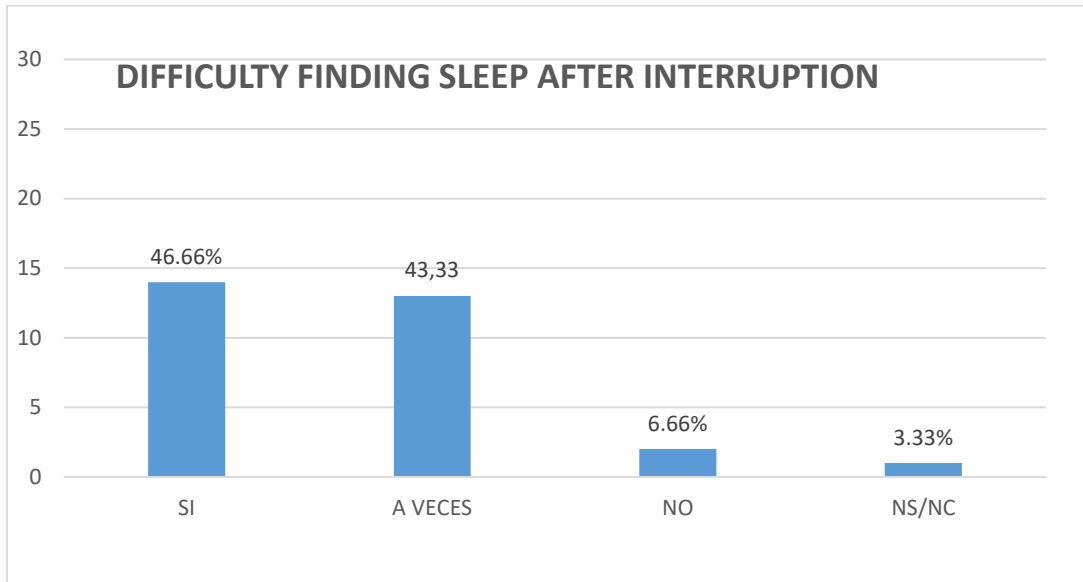
To exploit the data, the CDR data were incorporated into a SPSS v.21 database, verifying the information before and during inclusion in it, in

order to detect possible errors. Subsequently, descriptive statistical techniques were applied.

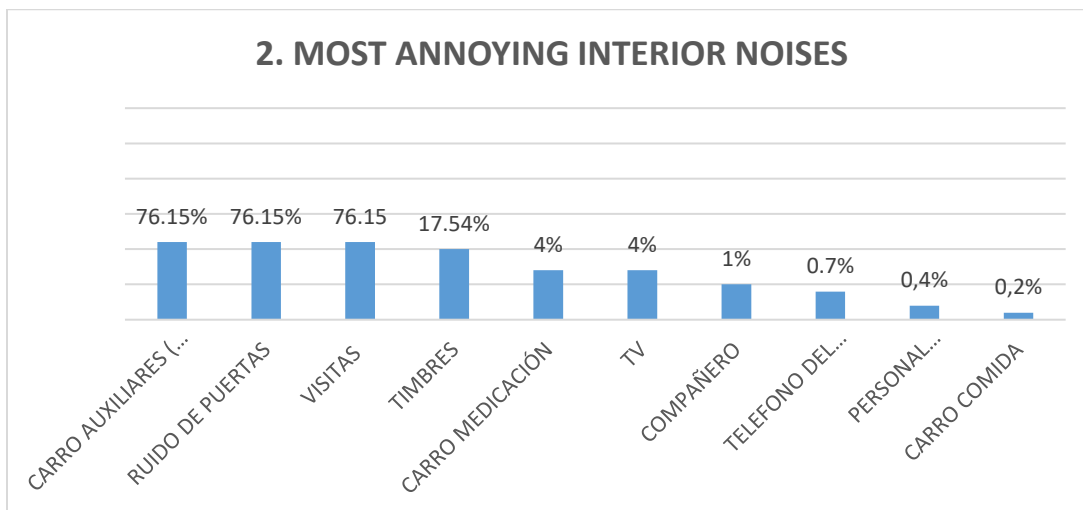
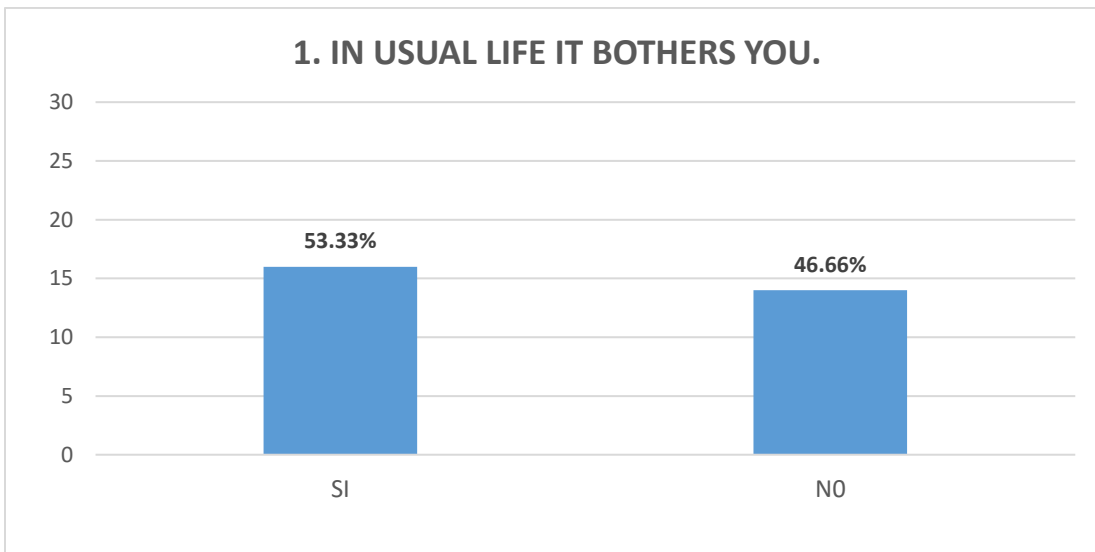
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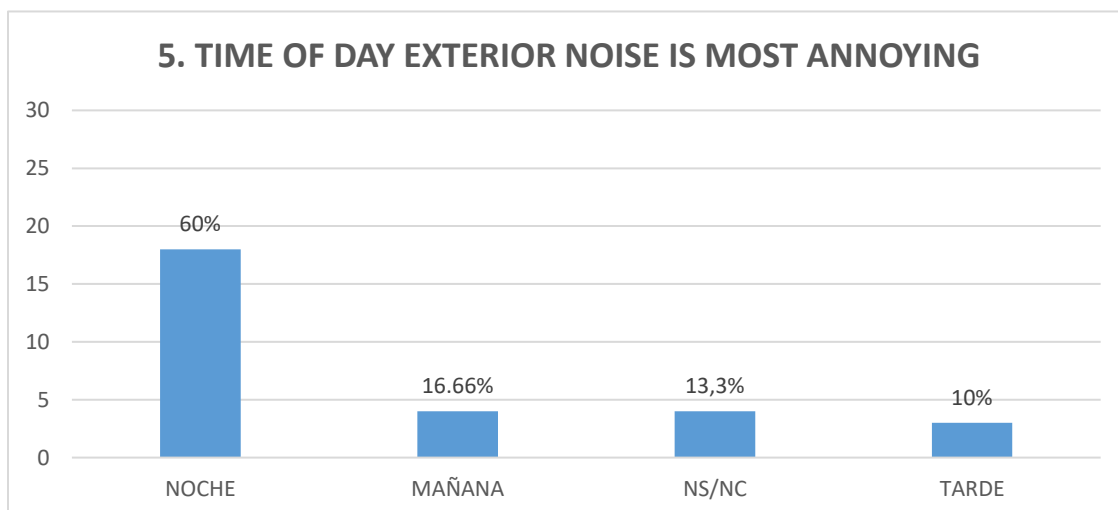
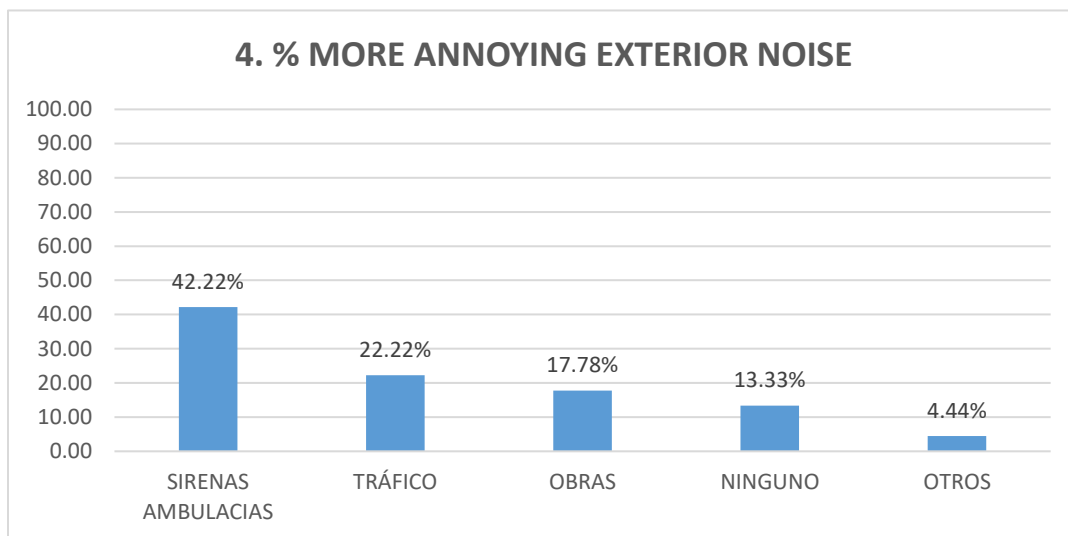
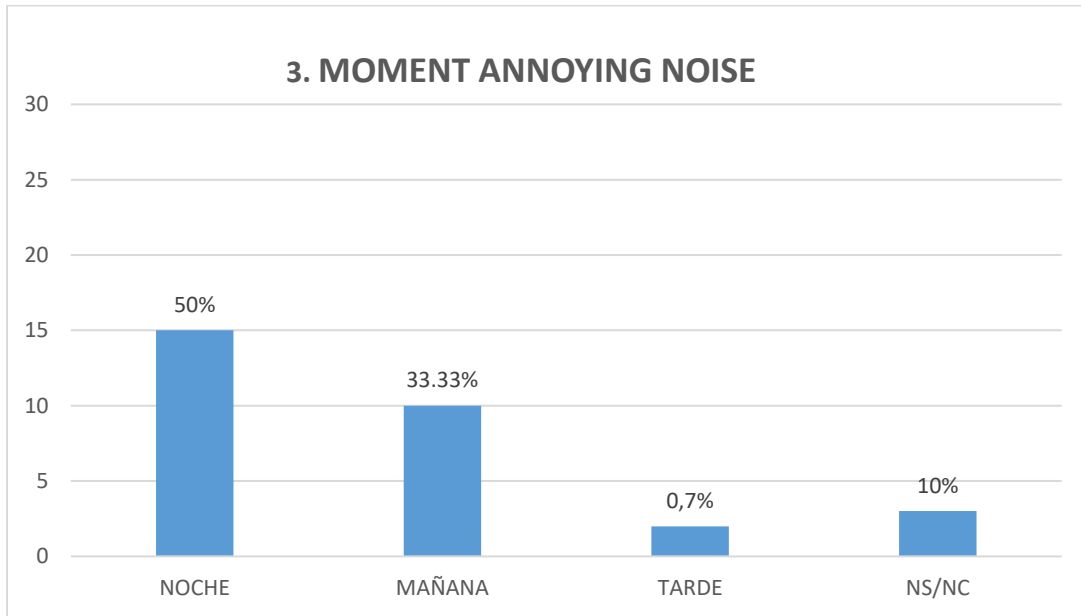
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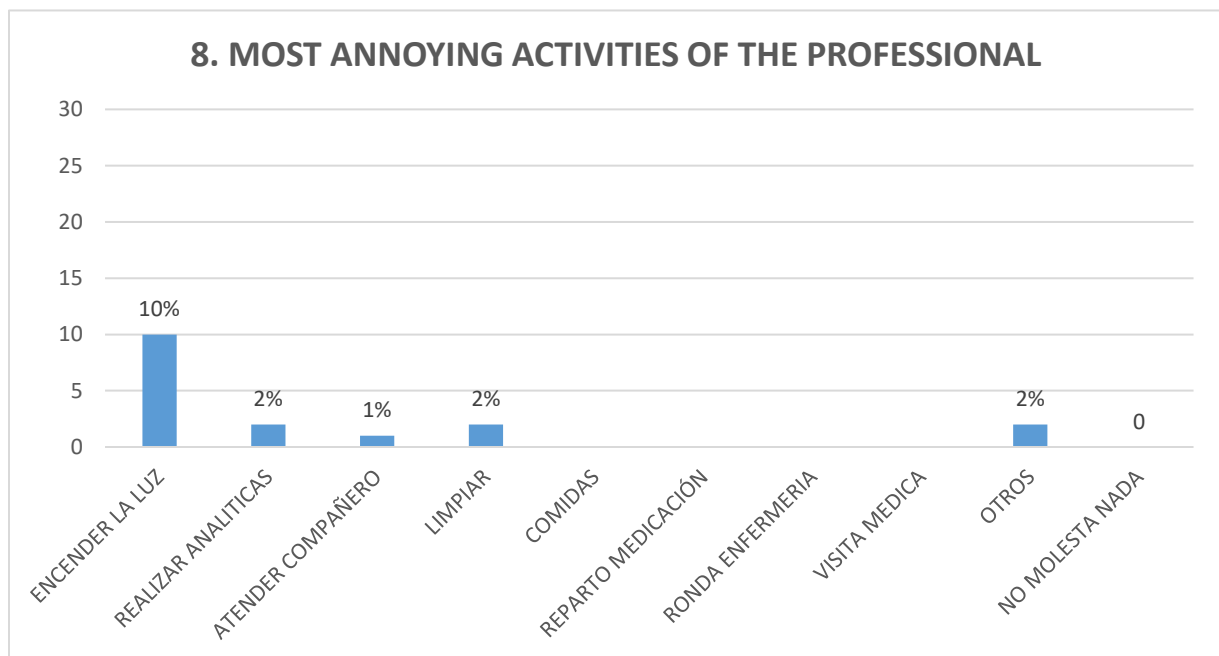
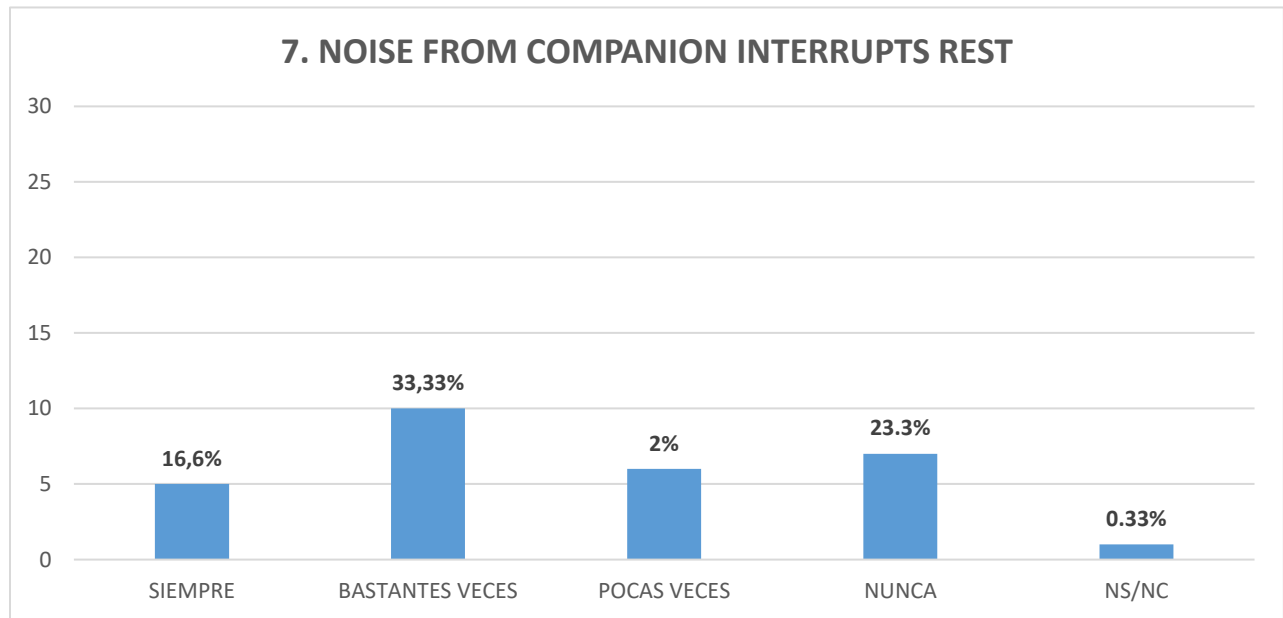
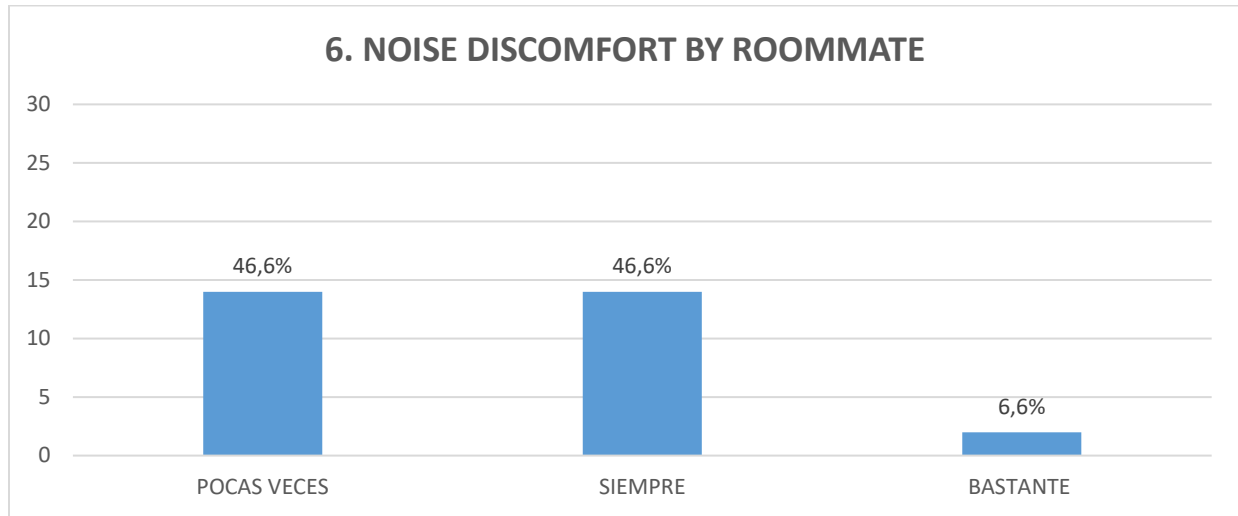


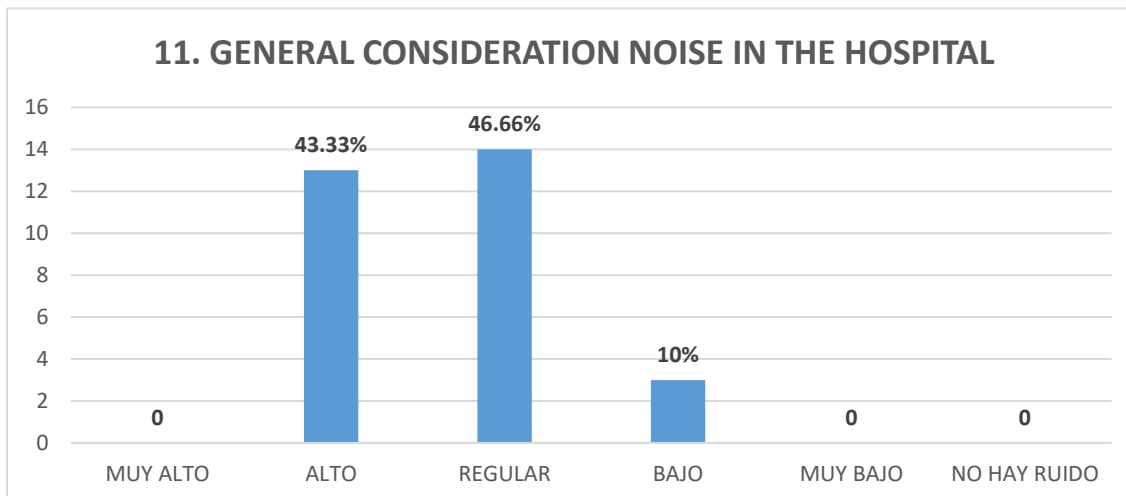
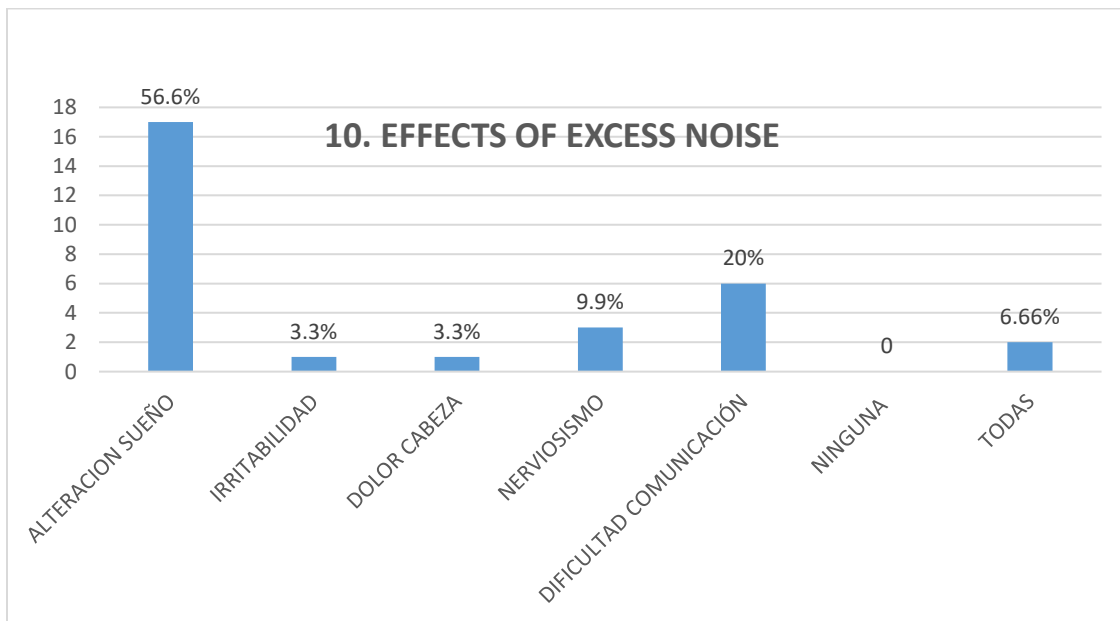
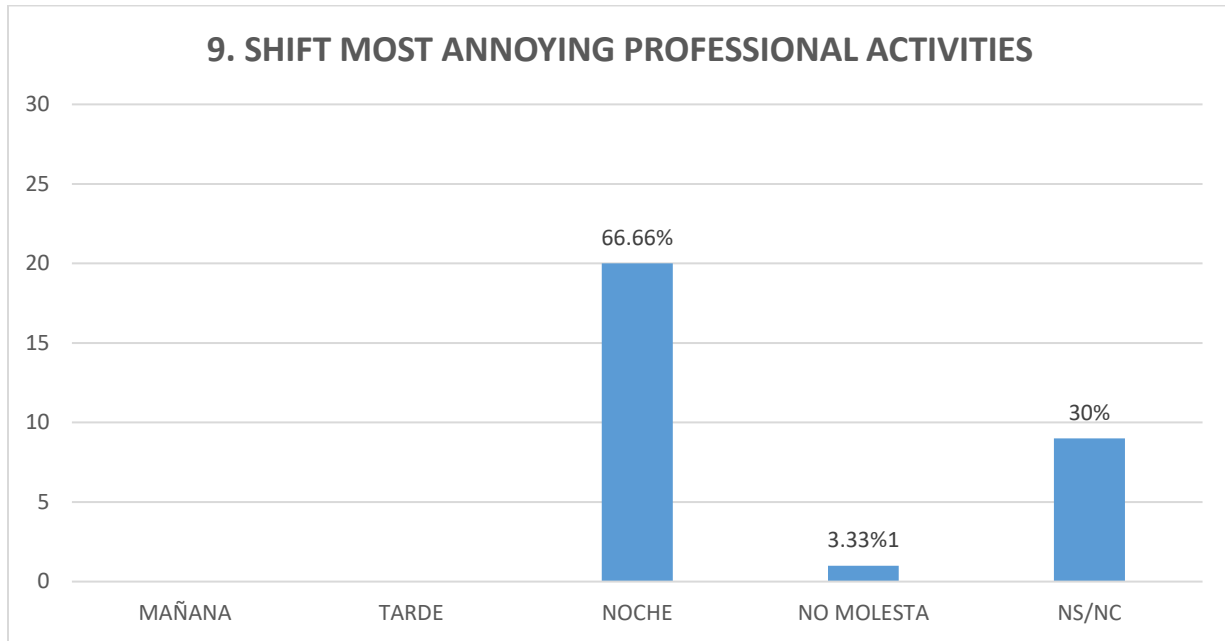


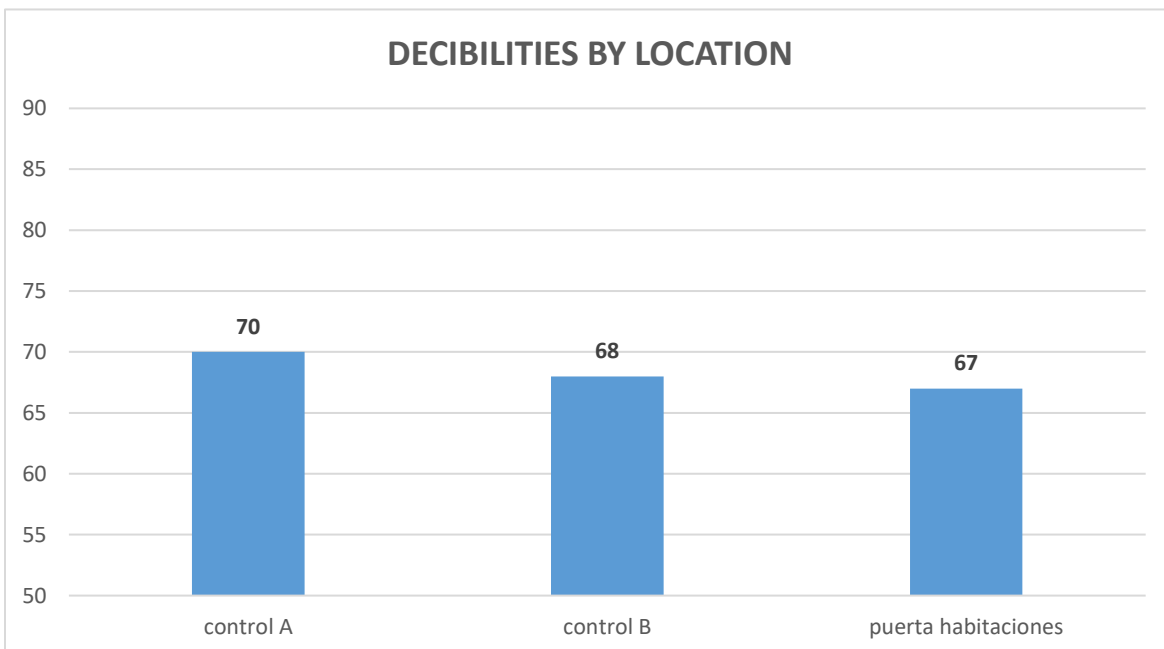
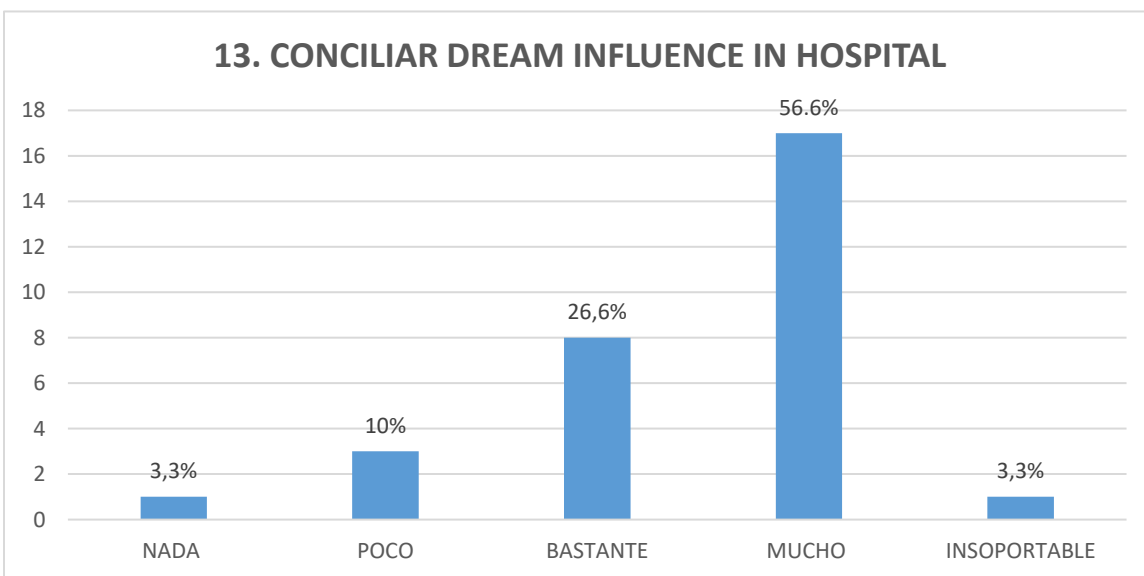
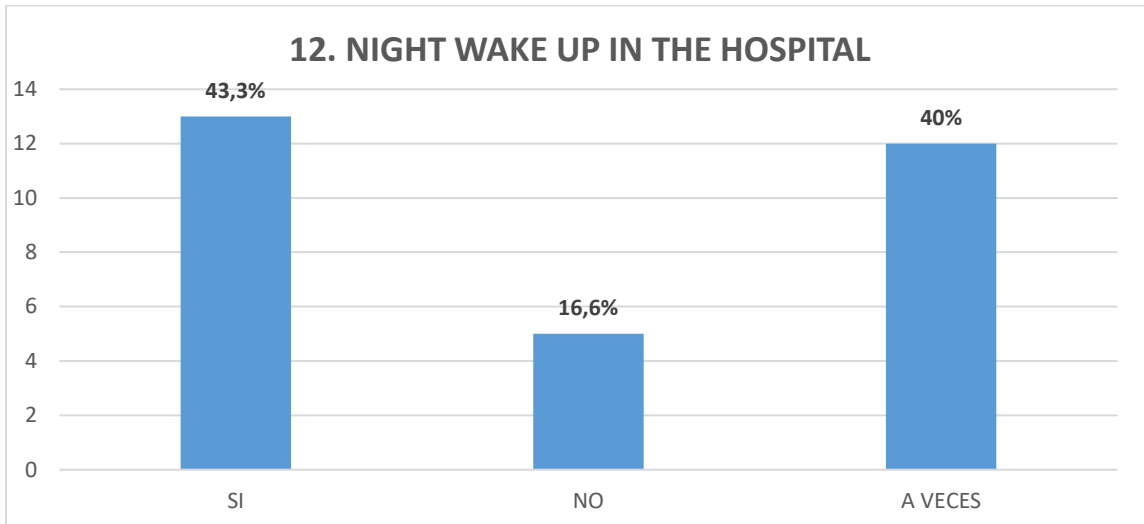
Regarding the dependent variables:

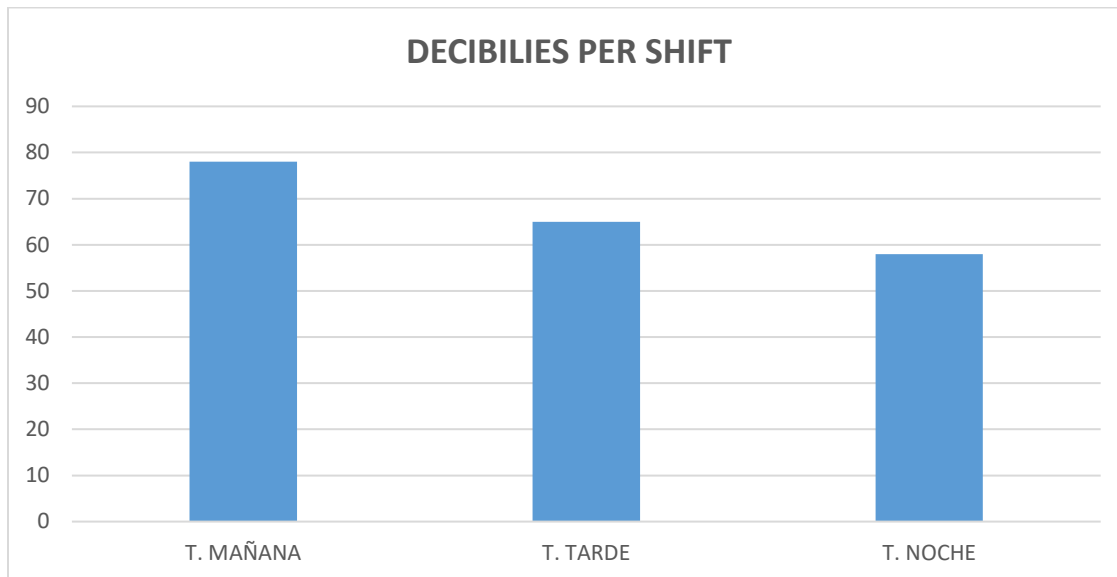












Ethical Aspects:

This study was carried out respecting the ethical principles of the Declaration of Helsinki and its subsequent modifications (latest Fortaleza 2013), the recommendations relating to Good Clinical Practice.

The guidelines of the General Data Protection Regulation (RGPD) 2016/679 and Organic Law 3/2018, Protection of Personal Data and guarantee of digital rights, were followed.

Patients will participate in this study only after having been informed of the nature of the study, its objectives, confidentiality and legislation, in order to protect their integrity. No analysis related to this study will be carried out before signing the informed consent (IC).

Regarding the conservation of the CRD, they will be collected and guarded by the researchers.

The project has been approved by the Clinical Research Ethics Committee of the La Princesa University Hospital.

Personal information of patients will not be revealed in any case and patient data will be encrypted to protect their identity. Only data relevant to the study will be used after prior authorization by the patient.

The project respects the four ethical principles of bioethics. The patient at all times has the full right to decide about himself, whether or not he may participate in the study, or after having decided to participate in it, he may deny its continuity at any time he considers appropriate. So that the patient can make the necessary decisions, he or she will be properly informed and explained about the entire process.

Likewise, the reason is the improvement in the quality of patient care; whose maximum is not to cause harm to the participants, not posing any risk to the patient.

This study will allow other patients to benefit from the knowledge obtained in the future; as well as carry out specific intervention programs. It is important to know the patient's perception and the impact on their rest and well-being, in order to plan improvement actions, both educational and furniture, that can provide the patient with a quiet stay, focused on rest and well-being. Better rest ultimately means better recovery.

Conclusions:

Regarding the description of the sample under study:

- The age range is between 41 and 75 years and practically equal between men and women.

- Half of the patients claim to have sleep problems and more than half consider that noise, in general, bothers them.

- More than 90% of patients consider that once they have been woken up by a noise they find it difficult to fall asleep.

Regarding the dependent variables:

- Almost half of the patients consider that the noise in the hospital is loud, although the rest consider it acceptable.

- More than 80% consider that the noise in the hospital does not allow them to rest as they would at home.

- More than 40% consider that nighttime noise in the hospital wakes them up at night.

- Three thirds of patients consider that during the night shift, noise becomes more annoying.

- Half consider that the morning shift is the noisiest.

- Most patients tolerate the noise produced by the activities of hospital professionals.

- A small percentage of those surveyed consider that the activities involved in turning on the light in the room are more annoying than the noise itself.

- A group of patients states that professionals could do something to reduce noise while carrying out their activity.

- The majority of patients believe that professional activities on patients during the night should be brought forward or delayed to respect rest.

- Almost three-quarters of patients consider that their roommate at some point interrupted their sleep and more than half consider their roommate to be annoying.

- More than half consider that noise causes sleep disturbances and even some difficulty in communicating. A small percentage reports feeling irritable.

- More than half consider that cars and doors are the main cause of noise.

- A small percentage consider that the visits are annoying because of the noise they generate and also the repair works in the hospital.
- Almost half say that the most annoying outside noise is the sound of ambulance sirens.
- The noise levels in decibels are slightly higher than recommended.

Discussion:

In the future, this study will allow other patients to benefit from the knowledge obtained, since specific interventions can be carried out aimed at establishing a calm stay, focused on rest and well-being. Incorporating the patient's point of view allows planning improvement actions, both educational and furniture. Better rest ultimately means better recovery.

It should be noted that the healthcare professional must be aware of the importance of reducing annoying noise for the patient. In addition, proper maintenance of the furniture in hospitalization units is necessary, such as work carts, hinges and gears on doors and windows.

The use of a double room generates, in itself, sharing physical space with another unknown person. It is necessary, therefore, to adapt each person's habits, and for there to be a situation of mutual respect. The visits generated by each of the cohabitants during the hospitalization time must be adjusted taking into account the rest and meal times of the other patient.

The perception of noise is highly subjective data. This may be influenced by other aspects other than those taken into account, such as light pollution or the discomfort caused by the professional interventions on the patient, which would be a bias.

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