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# Perception of work teams about the noise at emergency room

## Percepção de equipes de trabalho sobre o ruído em pronto-socorro

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### ABSTRACT

**Purpose:** Compare the perception of professionals in the nursing and administrative areas regarding noise in the emergency room. **Methods:** Descriptive study with quantitative analysis. The noise perception was evaluated by means of an Adapted Questionnaire, in the form of an interview. A total of 59 professionals participated in the study, 38 from the nursing area and 21 from the administrative area. The statistical survey considered the level of significance of 0.05 (5%), through Chi-square test. **Results:** The perception of noise by emergency room nursing and administration staff was considered noisy and most intense in the afternoon shift. Nursing professionals identified more the equipment noise (60.53%) and administrative workers the people noise (85.71%). The most frequently extra-auditory complaints were fatigue, stress, anxiety, nervousness and irritability. Nursing professionals are the most annoyed by noise, but administrative employees report more difficulties in performing their tasks in the face of noise. **Conclusion:** There was a difference between perception of nursing and administrative area, but for both the most annoying noise is people. Implement educational prevention and awareness programs to reduce noise aimed at Emergency Room professionals.

**Keywords:** Perception of noise; Occupational risks; Effects of noise; Noise; Hearing

### RESUMO

**Objetivo:** Comparar a percepção dos profissionais das áreas de enfermagem e administrativa frente ao ruído no pronto-socorro. **Métodos:** Estudo descritivo, com análise quantitativa. A percepção do ruído foi avaliada por meio de questionário, em forma de entrevista. Participaram do estudo 59 profissionais, 38 da área de enfermagem e 21 da área administrativa. O levantamento estatístico levou em conta o nível de significância de 0,05 (5%), através do teste Qui-quadrado. **Resultados:** A percepção do ruído pelos profissionais de enfermagem e administração, no pronto-socorro, foi considerada como ruidosa e mais intensa no turno da tarde. Profissionais da enfermagem identificaram mais os ruídos dos equipamentos (60,53%) e os da área administrativa, os ruídos de pessoas (85,71%). As queixas extra-auditivas mais citadas foram cansaço, estresse, ansiedade, nervosismo e irritabilidade. Os profissionais da enfermagem demonstraram ser os mais incomodados com o ruído, porém, os administrativos referiram dificuldades em desempenhar suas tarefas. **Conclusão:** Houve diferença na percepção do ruído entre os profissionais das áreas de enfermagem e administrativa, mas para ambas as áreas, o ruído de maior incômodo é aquele produzido por pessoas, mostrando a necessidade de programas educativos de prevenção e conscientização para redução de ruído, direcionados aos profissionais do pronto-socorro.

**Palavras-chave:** Percepção do ruído; Riscos ocupacionais; Efeitos do ruído; Ruído; Audição

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## INTRODUCTION

The Emergency Room (ER) is one of the hospital units with high health care complexity, flow of professionals and users. It has specificities which distinguishes it from the other health care services, once it demands immediate, efficient and integrated care, besides broad technical knowledge, professional expertise and the use of technological resources<sup>(1)</sup>.

Noise exposure at workplace has been pointed as a factor for concentration reduction, irritability and stress on the part of professionals who work at hospital units<sup>(2)</sup>. The increase in noise levels in those places has been associated with people's flow, voice tone among the professional team, presence of several devices with loud alarms, work behavior such as closing doors, drawers, lockers carelessly, among others<sup>(3-6)</sup>.

Professionals performing similar functions have different conceptions on the risks they are exposed to, and regarding noise exposure, differences in opinion are still higher on the way they are affected<sup>(7)</sup>. Research assessing sound pressure levels also analyzed those professionals' perception on the outcomes due to loud noise and its related symptoms. Results showed that they were above the recommended by the regulations of acoustic comfort, besides evidencing significant statistical associations between a noisy place and professionals' health complaints. The most reported symptoms were: headache and disturbance in face of loud sounds. Noise may affect professional performance and even affect oral communication among workers<sup>(8)</sup>.

Being subjective, people react differently to the same noise: a person may not perceive certain noise, while another may get disturbed. Even in situations where noise level is not loud but audible, an individual may, or not, object to it<sup>(9)</sup>.

Environmental noise exposure for a long period not only causes physical, mental and social impairments, but may also contribute to human errors due to miscommunication, work accidents, procedure errors, occupational diseases and other hazards to nursing professionals' health, that is, work conditions may pose risks to people's safety, not only professionals', but also patients'<sup>(10,11)</sup>.

According to the United States Environmental Protection Agency<sup>(12)</sup>, noise levels in hospital settings should not exceed 45 dB(A), during the day, and 35 dB(A), during the night. The World Health Organization (WHO) recommends 30 to 40 dB(A) for internal hospital settings. Brazilian regulation 10152 from the Brazilian Association of Technical Regulations (Associação Brasileira de Normas técnicas – ABNT) refers to noise levels regarding acoustic comfort, aiming at community welfare<sup>(13)</sup>. Sound pressure levels measured above the recommended by the responsible agencies may affect concentration demanded in the professional nursing practice, during task performance, due to its complexity<sup>(14)</sup>.

The study relevance is justified by several studies in different hospital settings, featuring noise as the currently main problem<sup>(3-6)</sup>. In this context, the ER<sup>(1)</sup> is an environment to focus attention on because it comprises several medical and hospital devices, a large professional team, accident victims, family members and rescue vehicles, increasing noise in the environment, health hazards and risk for professional team

performance. Such data are important for the implementation of measures and actions to reduce noise in the place<sup>(15,16)</sup>.

Therefore, this study aimed to compare noise perception of nursing and administrative professionals in the emergency room.

## METHODS

It is a descriptive quantitative study, held at an urgency and emergency unit of a public hospital in Paraná State. The project was approved by the Ethics Board of the hospital under number 167/2010. All participants signed the Free Informed Consent Form, complying with Resolution 466/12, Brazilian Health Council. Only professionals out on vacation or leave, and those who refused to participate were excluded.

ER physical structure comprises areas to admit patients, which can be the lobby or the entrance for urgency and emergency for those brought by rescue vehicles, ambulances or helicopters. The floor plan displays a lobby with waiting room, Advanced Life Support Room, which was designed to care for three emergency patients, a hall opposite the Advanced Life Support Room, with restrooms and a patient stretcher area for the Integrated Trauma Service (SIATE, in Portuguese), and the Mobile Emergency Service (SAMU, in Portuguese); a nurse station, where medications are prepared, where shift transfers by the nursing team are held, and where doctors stay to fill out prescriptions and discuss procedures.

There is a large transit area opposite the nursing station, for stretchers with patients waiting for screening or admission when other areas are crowded. There is also a central corridor, with chairs for clients and their companions waiting for medical appointments, to undergo X-ray and other kind of screening.

There is still an observation room, plaster room, service booth, suture room, forms and X-ray and CAT scan room, satellite pharmacy, staff area, among others. X-ray and CAT scan sector rooms are located close to the emergency room. The heliport is located in the central area of the hospital, and accesses the ER by an elevator. Since it started, more than one patient may arrive at the hospital by helicopter on certain days, and on other days, no patients are transported.

Noise levels in the ER, assessed according to NHO - 01 regulation (Occupational Hygiene Regulation), Fundação Jorge Duprat Figueiredo de Segurança e Medicina do Trabalho – FUNDACENTRO (Jorge Duprat Figueiredo Foundation of Occupational Safety and Medicine)<sup>(17)</sup>, ranged from 56.6 dB (A) to 119 dB (A). The lowest noise level was measured in the suture room (56.6 dBA), in the morning, and the highest level was the helicopter at the moment of its landing and stay (119 dBA). Among the equipment, the highest noise was the plaster saw at work (90.0 dBA), and the lowest noise was the oximeter at work (61.0 dBA)<sup>(16,18)</sup>. Measurements were held in ten internal sites in the emergency room every two minutes and thirty seconds in each site, repeated for over three times, thus four measurements were carried out in each site, maximum, minimum and equivalent continuous noise (Leq), in the morning, afternoon and evening/night<sup>(16,18)</sup>.

In the nursing area, nurses perform care planning, and also deliver care tasks, along with nursing technicians and assistants under their guidance and supervision. They move around all the

emergency area, and some professionals are allowed to assist patients at the heliport.

The nursing team in this unit consists of 46 professionals: nurses, nursing technicians and assistants, and the administrative staff (30 professionals). These teams are distributed in a 12/36-hour schedule or 40 hours a week. Therefore, some professionals work for six, eight or 12 hours, scheduled day or night shifts, as follows: morning, from 7:00 AM to 1:00 PM; afternoon, from 1:00 PM to 7:00 PM, and evening/night, from 7:00 PM to 7:00 AM.

The administrative staff comprises technicians and assistants who work at the reception and admission room. Their tasks entail patient servicing, fill out the clinical record of the patients, taking their personal data and the reason why they searched for the ER.

59 professionals participated in the study: 38 from the nursing area (NA) and 21 from the administrative staff (AD). Professionals who were out on vacation ( $n=7$ ), on leave ( $n=6$ ), three nurses who knew about the research, and one nursing assistant who had refused to participate, were excluded from the study.

Data collection was carried out between January and February/2011. A questionnaire was used in order to assess professional team's perception, knowledge and attitudes towards occupational noise (Annex 1). The questionnaire was based on a study which assessed the perception of environmental noise<sup>(19)</sup>, adapted to the current study with open and closed questions related to noise and work conditions<sup>(16)</sup>. At the beginning of the interview, it was avoided mentioning "noise perception", to prevent interference in the data collection, once the intention was to verify whether noise would be spontaneously mentioned along the accounts. During the interviews, a broad range of information was gathered, however, only noise-related information was used. Subsequently, questions were clustered, typed in spreadsheets and statistically treated.

Statistical analysis was held by means of descriptive methods (relative frequency distribution) and inferential methods (Chi-square test, Spearman's correlation coefficient). The tests were applied at a significance level of 0.05 (5%), correlating health conditions to length of time working at the ER, health conditions to noise perception and perception of disturbances among the work teams.

## RESULTS

The studied population comprised 59 professionals, that is, 38 from the nursing area (NA), and 21 from the administrative area (AD). Females prevailed with 68.42% (NA), and 76.19% (AD), respectively. Regarding age, a total of 50% (10) AE professionals, and 42.86% (9) AD professionals within prevalent age range between 30 and 39 years, mean of 34.1 (standard deviation 7.0) for the NA, and mean of 32.6 (standard deviation 9.7) for the AD. Regarding the work hours, prevalence of 36 work hours in 68.42% (26) of the NA, and 40 work hours in 57.14% (12) of the AD. Almost half of the NA professionals (47.36%), and AD professionals (71.43%) worked for less than two years at the emergency room. As for the length of stay at the ER, NA professionals (60.53%) stayed 6 work hours daily at the ER, while AD staff (90.48%) stayed 12 work hours every other day at the ER. Regarding noise perception at the ER, most of them considered it very loud (NA/52.63%), followed by normal or

average (28.57%). Participants' information related to gender, age range, weekly work hours, and length of work in hours are described in Table 1.

The noisiest hours at the ER, reported by the teams, were as follows: morning: from 7:01 AM to 1:00 PM; afternoon: from 1:01 PM to 7:00 PM; night: from 7:01 PM to 1:00 AM, and early morning: from 1:01 AM to 7:00 AM. They correspond, during the day, to the shift change of the studied population. The evening period was divided in two parts, the beginning of the evening shift and early morning shift, ending with the professionals' change of shift (Table 2).

Answers were classified as a study variable when the respondents stated that there was no certain time for noise. Likewise, when respondents mentioned noisy hours corresponding to more than one shift, more than one answer was classified.

Participants rated noise sources as disturbing: among the NA, 60.53% of the professionals identified the equipment as noise sources, and among the AD, 85.71% of the professionals reported noise produced by people. The noise mentioned as the most disturbing for the NA (31.58%), as well as for the AD (38.10%) was the one evolving from people. Among the NA, noise produced by the work team (18.42%), and among the AD, noise caused by patients was mentioned (33.33%). (Table 3).

As for the perception of disturbances caused by noise in the ER, assessed by means of the Chi-square test, difference was evidenced ( $p=0.0432$ ), in the proportion of disturbances between NA and AD professionals, being significantly higher for NA professionals.

NA professionals (7.89%) reported difficulties caused by noise while performing their tasks, but they did not report which one(s). Among the AD, almost half of them (42.86%) reported difficulties, being 33.33% related to concentration, 11.11% concerning communication, and 55.55% could not report the type of difficulties. (Table 4).

Extra-auditory problems were reported with greater occurrence, being fatigue the most mentioned one by the NA (71.05%) as well as by the AD (57.14%), also being mentioned stress by the NA (60.53%), and AD (47.62%), anxiety by the NA (47.37%), anxiety and nervousness by the AD (42.86%), and irritability by the NA (44.74%) and AD (52.38%) (Table 5).

By correlating health conditions to professionals' length of time working at the ER, Spearman R's correlation test was applied, thus verifying the difference between the results of both teams: less than 2 years ( $R=0.654$  and  $p=0.0041$ ), 2 years to less than 5 years ( $R=0.7948$  and  $p=0.0022$ ); 5 years or more ( $R=0.2055$  and  $p=0.44452$ ), prevailing greater number of complaints among the NA.

By correlating health problems to noise perception, Spearman's correlation test showed significant correlation between the results of both groups, for those who considered noise in the ER moderate ( $R=0.7053$  and  $p=0.00023$ ), or not noisy ( $R=0.6606$  and  $p=0.0053$ ). This means that both groups showed similar behavior on health conditions. In case of the participants who considered noise as very loud ( $R=0$  and  $p=0.0640$ ) and normal/average ( $R=0$  and  $p=0.2548$ ), correlation was not significant, unveiling that both groups were different, with greater number of health conditions among the NA.

**Table 1.** Distribution of participants according to gender, weekly work hours, time length of work in years, length of stay at workplace in hours and perception of noise levels at the emergency room

PARTICIPANTS' PROFILE	NURSING (n=38)		ADMINISTRATIVE (n=21)	
	n	%	n	%
<b>Gender</b>				
Female	26	68.42	16	76.19
Male	12	31.58	5	23.81
<b>Age</b>				
Under 30 years	11	28.95	8	38.10
30 to 39 years	19	50.00	9	42.86
40 or over	8	21.05	4	19.04
<b>Weekly work hours at the ER</b>				
36 hours	26	68.42	9	42.86
40 hours	12	31.57	12	57.14
<b>Time length of work at the ER in years</b>				
Less than 2 years	18	47.36	15	71.43
2 to 4 years	10	26.32	4	19.05
5 years or longer	10	26.32	2	9.52
<b>Length of stay at the ER in hours</b>				
6 hours	23	60.53	2	9.52
8 hours	02	5.26		
12hours	13	34.21	19	90.48
<b>Perception of noise level in the ER</b>				
Very loud	20	52.63	6	28.57
Normal/ average	11	28.95	6	28.57
Little noisy	5	13.16	6	28.57
Not noisy	1	2.63	3	14.29
Indifferent	1	2.63		

Subtitle: ER = emergency room; n = number of subjects

**Table 2.** The noisiest shift at the emergency room, according to the teams

SHIFT	NURSING (n=38)		ADMINISTRATIVE (n=21)	
	n.	%	n.	%
Variable	18	47.37	7	33.33
Morning	8	21.05	1	4.76
Afternoon	9	23.68	14	66.67
Evening/Night	8	21.05	3	14.29

Subtitle: n = number of subjects

Obs: Some professionals reported more than one shift as the noisiest, and no participants reported any disturbance during early morning

**Table 3.** Distribution of the participants according to the noise sources and the ones considered disturbing in the emergency room

NOISE SOURCES AND THE ONES CONSIDERED DISTURBINGS	NURSING (n=38)				ADMINISTRATIVE (n=21)			
	Source		Disturbing		Source		Disturbing	
	n	%	n	%	n	%	n	%
<b>1-Equipament</b>	23	60.53	10	26.32	6	28.57	-	0.00
Respirators	12	31.58	2	5.26	-	0.00	-	0.00
Monitors/oximeters	9	23.63	3	7.89	-	0.00	-	0.00
Internal bell	9	23.68	1	2.63	4	19.05	-	0.00
Infusion pump	8	21.05	2	5.26	-	0.00	-	0.00
Rolling cart	4	10.53	2	5.26	-	0.00	-	0.00
Stretchers	4	10.53	1	2.63	-	0.00	-	0.00
Telephone	3	7.89	-	0.00	2	9.52	-	0.00
Air conditioners	1	2.63	-	0.00	-	-	-	0.00
Computers	-	-	1	2.63	-	-	-	0.00
<b>2-People</b>	21	55.26	12	31.58	18	85.71	8	38.10
Work team	11	28.95	7	18.42	-	0.00	4	19.05
Patient	9	23.68	4	10.53	7	33.33	7	33.33
Crowding	5	13.16	1	2.63	11	52.38	-	0.00
<b>3-External noise</b>	16	42.11	11	28.94	10	47.62	4	19.05
Ambulance	8	21.05	2	5.26	3	14.29	-	0.00
Helicopter	7	18.42	6	15.79	3	14.29	1	4.76
Construction works	5	13.16	3	7.89	4	19.05	1	4.76
Doors	-	0.00	-	-	1	4.76	-	0.00
<b>4- Does not disturb</b>	-	-	2	5.26	-	-	9	42.86
<b>5- Could not inform</b>	-	-	7	18.42	-	-	-	0.00

Subtitle: n = number of subjects

Obs: Some professionals reported more than one noise source, and NA group was more disturbed. This situation can be understood by the tasks delivered by the nursing team at the emergency room, developed within a unit with unpredictable features, with a demand requiring ability and emergency resolutions. However, the AD group reported to feel disturbed by noise produced by people



**Table 4.** Distribution of participants according to difficulty in carrying out some tasks in the presence of noise and type of difficulties

Variable	NURSING (n=38)		ADMINISTRATIVE (n=21)	
	n	%	n	%
<b>Affects task performance</b>				
No	35	92.11	12	57.12
Yes	3	7.89	9	42.86
<b>Type of difficulty</b>				
Focus	-	0.00	3	33.33
Communication	-	0.00	1	11.11
Could not inform	3	100.0	5	55.55

Subtitle: n = number of subjects

**Table 5.** Distribution of participants according to the reported health conditions

HEALTH CONDITIONS	NURSING (n=38)		ADMINISTRATIVE (n=21)	
	n	%	n	%
Fatigue	27	71.05	12	57.14
Stresse	23	60.53	10	47.62
Anxiety	18	47.37	9	42.86
Irritability	17	44.74	11	52.38
Gastrointestinal disorders	13	34.21	3	14.29
Nervousness	11	18.95	9	42.86
Sleep disorders	10	26.32	8	38.10
Eye disorders	6	15.79	4	19.05
Circulatory disorders	6	15.79	1	4.76
Headache	5	13.16	6	28.57
Disturbance	4	10.53	5	23.81
Hearing loss	4	10.53	1	4.76
No answers	4	10.53	2	9.52
Tinnitus	3	7.89	1	4.76
Dif. Speech Underst.	2	5.26	1	4.76
Cardiac problems	2	5.26	1	4.76

Subtitle: n= number of subjects

Obs: Some professionals reported more than one complaint

## DISCUSSION

This study aimed to assess nursing and administrative teams' perception on noise at the ER. While searching for references, few studies were found which addressed noise levels at the ER, with the greatest part of studies investigating it at intensive care units (ICU)<sup>(20)</sup>. Therefore, in this discussion, there was prevalence of mentioned studies which addressed themes in an ICU, as it is a quite similar environment to an emergency room, such as critical patients, several devices and a great number of professionals at work.

In this study, female workforce prevailed in the nursing area (68.42) as well as in the administrative area (76.19%) (Table 1). Historically, nursing is a female profession. Authors<sup>(21)</sup>, by analyzing the work capacity among nursing professionals at an ER of a university hospital, also obtained similar population data, that is, 74.1% of female workers, also evidenced in other studies<sup>(22-24)</sup>.

Regarding age range, these were young professional teams in the NA (78.95%) as well as in the AD (80.96%), less than 40 years of age, corroborating other studies<sup>(23,25)</sup> (Table 1).

It was observed that 68.42% and 42.86% of the NA and AD professionals, respectively, worked an average of 36 hours a

week, and 31.57% of the NA and 57.14% of the AD worked 40 hours a week. A study<sup>(25)</sup> evidenced that 57.1% of the researched nurses worked an average of 36 hours a week, averaging 6 hours a day.

It was evidenced turnover among the work teams, therefore, NA (47.36%) as well as AD (71.43%) were less than two years working in the ER. Study results<sup>(14)</sup> showed a great number of nurses working in the unit for less than three years, but considering all the studied sample, average time at work in this unit was five years and eight months.

As for the noise perception in the ER, NA, with 52.63%, reported to be very loud. However, among the AD, a percentage of 28.57% considered it to be loud, average and moderate. The fact that calls attention is that only 2.63% of the NA and 14.29% among the AD considered the environment as not noisy (Table 1). These answers matched noise levels assessed at an ER, which ranged from 56.6 to 119 dB(A)<sup>(16,18)</sup>. Importantly, the comfort levels recommended for hospitals, according to the NBR 101522<sup>(13)</sup>, are from 35 dB (A) to 45 dB (A).

Study<sup>(26)</sup> held at an ICU evidenced that only 2.7% of the professionals perceived the environment as little noisy, with noise level ranging from 61.35 to 62.,31dB(A). In another study<sup>(27)</sup>, which analyzed the perception of the acoustic features

in an ICU, data were also found where only 10.2% considered the environment as little noisy.

By analyzing the noise levels during the different work shifts, it was verified that among the NA professionals, 41.9% considered the noise as variable, while among the AD, 56.0% reported higher noise levels in the afternoon shift, corroborating authors' findings<sup>(28)</sup>. When comparing the results of the perception measurement of health professionals, it was evidenced greater agreement among health professionals from the afternoon shift, once 80% of them considered the existence of loud noise in the neonatal intensive care unit (NICU), while the perception of those who worked in the other shifts was between moderate and loud (Table 2).

As for other noise-generating sources (Table 3), nursing professionals reported more equipment noise (60.53%), while the administrative staff reported people-evolving noise (85.71%). NA carries out tasks with greater number of equipment, as well as people's health care, while AD carries out more service rendering and bureaucratic tasks. Therefore, it is expected that the teams identify noise sources around them. In other studies, authors found similar data<sup>(2-6,29,30)</sup>, and they also evidenced, as noise-generating sources, equipment alarms, talks, laughter and people's coming and going.

Regarding the difficulty in task performance due to noise (Table 4), NA group reported difficulty (42.86%), being difficulty in focusing for 33.33%, and in communicating for 11.11%. According to a study<sup>(2)</sup>, professionals also reported some outcomes in their work routine, such as focus reduction, irritability and stress, distraction, relentlessness and hearing disorders, in an answer frequency ordering. It is pointed out that the AD staff worked in an environment without divisions, delivering on the counter service. Meanwhile, such professionals answered the phone, filled out forms with printers on, which facilitated noise spreading, affecting focus and communication.

In both groups (NA and AD), extra-auditory health conditions were reported (Table 5), being fatigue the most mentioned, followed by others, such as stress, anxiety, nervousness and irritability. A study<sup>(5)</sup> showed that professionals feel discomfort in face of loud noises (74.4%), followed by unease and fatigue (35.5%), due to stress from noise produced by several devices combined with alarms, construction works, visiting hours and conversations among hospital employees. According to an author<sup>(14)</sup>, one of the most relevant of the harmful extra-auditory outcomes, found among nursing professionals at a public teaching hospital, irritability (45.63%) was the most recurring.

There was correlation between health conditions among the teams to length of time at work and noise perception at the ER. According to an author<sup>(7)</sup>, professionals that carry out the same jobs have different conceptions on the risks that they are exposed to and, regarding noise exposure, differences are still greater concerning the way it affects them.

Study<sup>(28)</sup> held at a university hospital in the city of Santa Maria - Rio Grande do Sul State, Brazil, aimed to apprehend professionals' perception from a NICU, as well as parents' on noise in the unit, in addition to measuring these levels for further comparison between both researched groups. The mentioned study reported that 97.7% of the interviewed professionals claimed that noise may cause alterations in individuals, pointing out irritability and stress as the greatest harmful outcomes for professionals, stating that they are aware of the harm caused at their workplace and out of it.

The study on workers' risk perception<sup>(15)</sup> consists of trying to understand how such perceptions may influence their behaviors, their attitudes and ways to perform their job, as these factors make them likely to suffer work accidents or develop occupational diseases. Those factors can be reduced, for example, by means of preventive policies and strategies.

A study<sup>(27)</sup> showed the importance of applying a low-cost measure, such as work team's ongoing education on environmental noise prevention, so that behavioral change is achieved.

Concluding, and based on the results of the current study, implementation of measures are suggested, such as professionals should get closer to each other and speak softly, avoiding talks beside the patients, and creation of sites for clinical discussion, away from patients' units. Efficient strategies are also turning off alarms fast, carefully opening and closing drawers, maintenance of noise-generating equipment or interventions for noise reduction at the ER, taking health care teams' perceptions into consideration, aiming at a positive influence for changes in behavior, attitudes and ways to deliver their jobs in order to minimize health damages, work accidents or difficulties regarding teams' professional performance.

## CONCLUSION

There was difference in the perception of nursing area professionals and administrative professionals regarding noise in the ER, however, for both areas, the most disturbing noise is produced by people.

In light of the identified health problems, which can be used for further reflections and interventions, it is suggested to develop a program of noise reduction in the ER settings, with the effective participation of the professionals in order to foster the development of actions at individual and collective level. Thus, routine noise assessment should be kept with feedback to the collaborators. Further studies in ER settings are recommended.

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## Annex 1. Interview guide

Nº.....

Date of the interview ...../...../2011. Starting time \_\_\_\_\_ and end \_\_\_\_\_

### I- IDENTIFICATION DATA

1- Name. \_\_\_\_\_

2- Age- \_\_\_\_\_ 3- Gender ( ) Male ( ) female

### II- OCCUPATIONAL DATA

Employee: FUNPAR( ) SESA( )

4- What is your job in the facility?

( ) nurse ( ) nursing technician. ( ) nursing assistant ( )

( ) administrative technician..( ) administrative assistant.

5- How long have you been in this position (in months)? .....

6- Is it your only job? ( ) yes ( ) no. If not, where else do you work? .....

7- Where did you use to work before coming to the ER? .....

8- What are your weekly work hours? .....

9- What are your weekly work hours at the ER? .....

10- How long have you worked in this unit (in months)? .....

11- How long do you stay here daily (in hours/day)? .....

12- Mention the positive points perceived in this unit .....

13- Mention the negative points in this unit. ....

14- Do you perform any actions to minimize the negative points formerly reported? .....

15- Have the negative points ever affected your health? ( ) yes ( ) no

16- Could you list which occupational hazards you are exposed to at your workplace? .....

### III- HEALTH DATA

17- Do you suffer from any health conditions? ( ) yes ( ) no.

18- If the answer is affirmative, which ones? .....

19- Have you had any health problems in the past fifteen days? ( ) yes ( ) no

20- In case of an affirmative answer, what has been the problem? .....

21- When was the last time you went to a doctor? .....

22- Why did you see the doctor? .....

23- What did you treat with the doctor? .....

24- Do you take any medications? ( ) yes ( ) no. If so, why? .....

25- I'm going to describe a set of health problems, and you should say if you have any of them:

a- ( ) hearing loss; b- ( ) sleep disturbances; c- ( ) stress; d- ( ) irritability

e- ( ) fatigue; f- ( ) frequent headaches

g- ( ) nervousness; h- ( ) difficulties in understanding speech

i- ( ) tinnitus; j- ( ) anxiety

l- ( ) disturbance; m- ( ) eye disorders

n- ( ) cardiac problems; o- ( ) circulatory disorders

p- ( ) gastrointestinal problems

Only answer it if a problem was listed.

26- Could you say the cause of your health problem? ( ) yes ( ) no

If the answer is affirmative, mention the cause .....

27- Have you already seen a doctor due to the formerly mentioned conditions?

( ) yes ( ) no ( ) could not inform

#### IV- DATA ON LEISURE ACTIVITIES

- 28- Do you have any leisure activities? ( ) yes ( ) no  
 29- If the answer is affirmative, mention which one: .....  
 30- What kind of environment do you enjoy going to? .....  
 31- Do you spend time away from your job ? ( ) yes ( ) no  
 32- If the answer is affirmative, where?  
 33- Whenever you want to rest or enjoy yourself, what kind of activities do you try to do? .....  
 34- Do the reported health symptoms disappear or get reduced when you're on vacation?

#### V) DATA ON ENVIRONMENTAL SOUND PERCEPTION

- 35- What do you think of the sounds in the ER? .....  
 36- Is there any kind of noise that disturbs you at the ER? ( ) yes ( ) no. If affirmative, which one? .....  
 37- What moment/time of the day is the noisiest in the ER? .....  
 38- When you're working here, does noise prevent you from performing any tasks? ( ) yes ( ) no. If affirmative, can you list which tasks? .....  
 39- Can you identify the noise sources here in the ER?  
 ( ) yes ( ) no  
 40- What are, in decreasing order, the noisiest sites that you identify here in the ER? .....  
 41- Do you go to any other noisy places? Which ones? .....  
 42- Can you compare this environment with other less noisy ones? .....  
 43- Do you make any noise that may disturb others here in the ER?  
 ( ) yes ( ) no ( ) I don't know.  
 44- What do you do to avoid noise in the ER?  
 45- Would you quit your job in the ER due to the noise? ( ) yes ( ) no  
 If the answer is affirmative, why?  
 46- What was environmental noise like when you started working here?  
 47- In your opinion, what is the cause of the noise currently existing in this job?  
 48- Do the other professionals from the ER take any preventive measures in relation to the noise? .....  
 49- Have you ever felt any disorders due to the noise in the ER? .....  
 50- Have you ever seen a doctor due to the noise in the ER? .....  
 51- Do you like to go to noisy places? .....  
 52- Do you know any noise-related hazards? .....  
 53- Do you prevent your hearing from the noise hazards? .....  
 54- Have you ever had any contact with any prevention campaigns against noise? .....  
 55- Have you noticed any movements towards noise reduction in the ER? .....  
 56- Define, in one word, noise perceived in the ER. ....