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Auditory Clinical Profile of Nightclub Employees in the City of Parakou in 2021

Ibrahim Mama Cissé[1*], Ahoya Christophe Fabien Gounongbé[1], Ménonli Adjobimey[2], Carmen Abatti[2], Fatiou Ibouraima[1], Khadidjatou Saké[1], Marius Flatin[1]

[1]Department of Occupational Health Research Unit, University of Parakou, Parakou, The Republic of Benin
[2]Department of Medicine and Medical Specialties, University of Abomey-Calavi, Abomey-Calavi, The Republic of Benin
Email: *onjourna@gmail.com

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Abstract

Introduction: Hearing impairments are common among nightclub workers. The present work aims to study the hearing clinical profile of these employees in the city of Parakou in 2021. **Methods:** This was a cross-sectional, descriptive analytical study from March 14 to June 15, 2021. It focused on employees of 13 nightclubs in the city of Parakou. Were included in the study, employees with at least 03 months of practice and aged at least 18 to 50 years at most on the date of the survey and who had given their informed consent to participate in the study. Each employee received a questionnaire, an otoscopy and an acoumetry in tune. Noise pollution was measured at each workstation using a sound level meter. **Results:** A total of 114 employees were collected. The mean age was 26.38 years ± 4.81 and the sex ratio 0.87. The server position was occupied by 65 employees (57%) followed by managers, 19 or 16.70%- and 17-disc jockeys, 14.90%. Among the employees 31.60% exercised between 03 and 09 months. 76.32% were exposed to noise for more than 8 hours per day and 81.58% were exposed to noise for more than 40 hours per week. The sound level at the workstation was for 59 employees (51.75%) between 90 and 100 dB. Tinnitus was the most expressed complaint, respectively 21 (18.40%) on the right and 22 (19.30%) on the left. Rinne's test was positive in 85.10% of employees. Weber's test was indifferent to all frequencies in the majority of respondents. **Conclusion:** Hearing damage among nightclub employees in the city of Parakou is a reality. It is important to put preventive measures in place.

Keywords

Hearing Impairment, Noise, Nightclubs, Parakou Benin 2021

1. Introduction

Worldwide, noise is the second cause of early hearing loss in adults after presbycusis and 16% of hearing loss is linked to occupational exposure to noise [1]. In the workplace, noise is one of the most common nuisance factors along with temperature (heat) and light (visual disturbance). It can be responsible for various nuisances, including hearing disorders [2] [3]. It therefore remains the most harmful occupational risk factor for hearing. Prolonged and repeated exposure to high sound levels is responsible for impairment of the auditory system that can range from tinnitus to irreversible sensorineural hearing loss due to damage to the inner ear [4]. Over the past decades, most of the research done globally and in Africa on noise-induced hearing loss (NIHA) and preventive strategies, has focused primarily on workers in traditional industries. With the recent shift of the economy from a manufacturing base to a service base, there is growing concern that PAIB will affect not only traditional noisy trades, but also many employees in non-manufacturing industries [5]. Nightclub workers whose jobs expose them to loud sounds can also develop hearing impairment. However, few studies published in the city of Parakou address this subject, which is of great importance given the status of this city which is the regional capital of northern Benin with countless nightclubs. This is what justifies the choice of this subject.

2. Framework and Methods

The study was carried out in the city of Parakou. It is a cross-sectional, descriptive analytical study with prospective data collection. Data collection took place from March 14 to June 15, 2021. It involved the employees of the 13 nightclubs in this city. Were included in the study, employees with at least 03 months of exercise and aged at least 18 to 50 years at most on the date of the survey and who had given their informed consent to participate in the study. An exhaustive census of all employees working in a soundproofed room was carried out with the exception of those with at least one of the following medical histories: chronic otological condition (chronic otitis, etc.), an otological malformation, a history of otological surgery, a notion of hearing loss before exercise in a nightclub, a recent intake of medication.

The dependent variable was hearing impairment. These disorders evolve in four stages: 1st stage = mild deafness; the subject does not realize his hearing loss because the speech frequencies are affected. 2nd stage = moderate deafness; conversational frequencies are affected; the subject becomes hard of hearing. 3rd stage = severe deafness. 4th stage = profound deafness or cophosis; irreversible. At this stage the worker is sensory handicapped. The independent variables were socio-demographic characteristics (age, gender); professional characteristics (position held in the nightclub, seniority in the profession), characteristics of exposure to noise (duration of exposure to noise per day and per week, noise level at the workstation, wearing personal protective equipment.) and the clinical characteristics (functional signs, otoscopic examination, tuning fork acoumetry).

Data collection was done through face-to-face interview. A data collection sheet was used. Each employee received an otoscopic examination, acoumetry, a Rinne and Weber test. A METERK Version MK09-EN-00 digital sound level meter was used to measure the sound level at each workstation.

3. Data Processing and Analysis

At the end of the survey, data was entered into Epi Data version 3.1 software. The processing of texts, the production of tables and graphs were done using Microsoft Word and Excel application software. The data entered was then analyzed using Epi Info version 7 software. The central tendency parameters (Mode, Mean, Standard Deviation) were used for the description of the quantitative variables and the proportions for the qualitative variables. The Chi-square test was used for the comparison of proportions. Thus, an association between the different independent variables and the dependent variable is sought in univariate analysis. Values of $p < 0.05$ were considered statistically significant. The authorization of the local ethics committee for biomedical research of the University of Parakou (Reference 0395/CLERB-UP/P/SP/R/SA of March 12, 2021), as well as the authorization of the Mayor of the city of Parakou, were obtained before any field data collection. Respondents freely joined the study. The information collected on the respondents was treated confidentially and the survey forms were filled in anonymously.

4. Results

Socio-demographic and professional characteristics: A total of 114 nightclub employees were surveyed. The average age of the respondents was 26.38 years ± 4.81; with extremes of 18 and 45 years. The study population consisted of 53.50% women and 46.50% men for a sex ratio of 0.87. Overall, 57.00% were servers, followed by 16.70% managers and 14.90%-disc jockeys. Among the employees surveyed, 31.60% (36) worked for a period of between 03 and 09 months against 27.20% (31) for 10 to 16 months, and 28.10% for 17 to 23 months. Employees were exposed to noise for more than 8 hours a day and more than 40 hours a week; *i.e.*, 76.32% and 81.58% respectively. The noise level at the workstation was between 90 and 100 dB for 51.75% of respondents; with extremes of 75 and 114 dB; and an average of 94.76 dB. 100% of respondents had a sound level above 70 dB. Of the employees working more than 40 hours/week, 52 or 45.61% were exposed to a sound level ≥ 85 dB (Table 1).

Characteristics related to occupational noise exposure and clinical characteristics of the population: Employees did not wear PPE during work in 97.40% of cases (Figure 1). The main reason cited was ignorance of the existence of PPE or its importance (62.20%). Tinnitus was the complaint most expressed by nightclub workers, in both the right and left ears; *i.e.*, 18.40% and 19.30% respectively (Table 2).

Otoscopic examination was normal in all nightclub workers with free external acoustic meatus (EAM) and normal eardrums. The acoumetric profile was eva-

luated using the Rinne test and the Weber test. Rinne's test was positive in 85.10% of employees and Weber's test was indifferent to all frequencies in the majority of respondents (Table 3).

Table 1. Sociodemographic and professional characteristics of the population.

Religion	Number	Percentage
Christian	**86**	**75.40**
Islamic	26	22.80
Endogenous	2	1.80
Total	114	100.00
Workplace	Number	Percentage
Servers (its)	**65**	**57.00**
Managers	19	16.70
Disc jockey	17	14.90
Bartender	11	9.60
Bouncers	2	1.80
Total	114	100.00
Workstation sound level	Number	Percentage
<80 dB	5	4.39
[80 dB - 90 dB[	26	22.81
[90 dB - 100 dB[	**59**	**51.75**
≥100 dB	24	21.05
Total	114	100.00
Duration exposure to noise	Number	Percentage
Exposure time per day		
≤08 hours/day	27	23.68
>08 hours/day	**87**	**76.32**
Exposure time per week		
≤40 hours/week	21	18.42
>40 hours/week	**93**	**81.58**
Total	114	100.00

Table 2. Distribution according to functional auditory signs, employees of Parakou nightclubs in 2021; N = 114.

	Right ear		Left ear	
	N	%	N	%
None	87	76.30	86	75.40
Tinnitus	**21**	**18.40**	**22**	**19.30**
Hypoacusis	6	5.30	6	5.30
Total	114	100.00	114	100.00

Table 3. Distribution according to the Weber test, of employees of Parakou nightclubs in 2021; N = 114.

WEBER test	256 Hz		512 Hz		1024 Hz		2048 Hz		4096 Hz		8192 Hz	
	N	%	N	%	N	%	N	%	N	%	N	%
Sick ear	1	0.90	2	1.80	0	0.00	0	0.00	1	0.90	0	0.00
healthy ear	11	9.60	11	9.60	9	7.90	15	13.20	10	8.80	19	16.70
Indifferent	102	89.50	101	88.60	105	92.10	99	86.80	103	90.40	95	83.30
Total	114	100.00	114	100.00	114	100.00	114	100.00	114	100.00	114	100.00

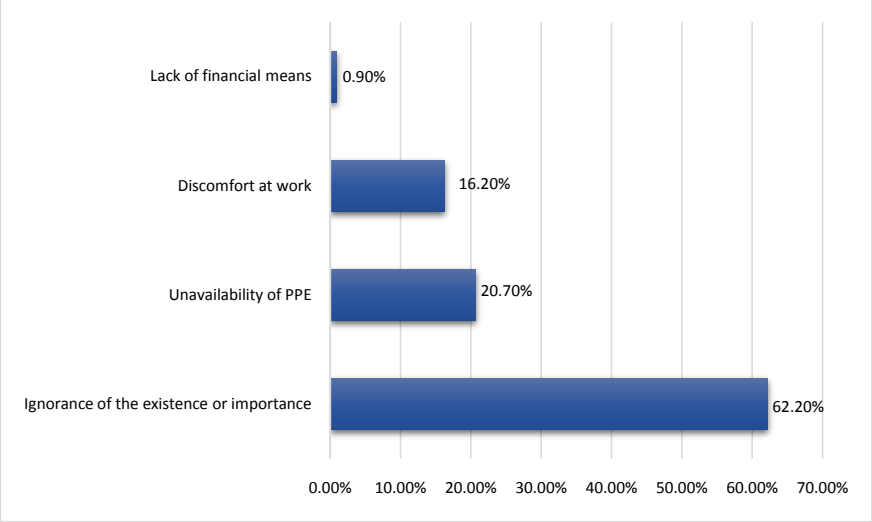

Figure 1. Distribution of nightclub employees by reason for not wearing PPE at work (Parakou, 2021); (N = 114).

5. Discussion

The average age was 26.38 ± 4.81 years; with extremes of 18 and 45 years. The study population was mainly made up of women, *i.e.*, 53.50%, for a sex ratio of 0.87. Tinnitus was the most common complaint that nightclub workers related to noise, in both the right and left ears; *i.e.*, 18.40% and 19.30% respectively. Otoscopic examination was normal in all nightclub employees. The average age of nightclub employees was 26.38 ± 4.81. The age group of 18 - 25 was the most represented with a proportion of 54.40%. These results corroborate the literature data. In Brazil in 2007, in a study carried out on the musical exposure and the audiological results of 30-disc jockeys, Santos *et al.* [6] found a mean age of 27 ± 5.9 years. In 2004, Bray *et al.* [7] found an average age of 29 years in a study carried out in the United Kingdom on a group of disc jockeys. An analysis of exposure shows that the sound level in nightclubs in the city of Parakou was between 90 and 100 dB with an average of 94.76 dB for just over half of the employees; *i.e.*, 51.75%.

Most of them, 31.60%, had been working in the profession for a period of between 03 and 09 months. These measurements revealed that the sound levels measured are above the tolerable threshold for their daily exposure time, since

for a maximum daily exposure time of 8 hours, the weighted equivalent sound level should be 85 dB (A) [8] [9] [10]. Other authors have reported similar sound levels and durations of exposure: Lalut *et al.* [11] in a study carried out in nightclubs in Île de France in 2010 reported average sound levels between 91.5 and 106.2 dB. Wannou [12] found high sound pressure levels that varied on average between 89.1 dB and 116.4 dB among military musicians. In a study on the risk of amplified music for disc jockeys working in three discotheques in France in 2009, Potier *et al.* [13] found sound levels between 92.3 and 102.1 dB with an average of 98.7 dB. Nyarubeli *et al.* [14] in Tanzania, found a sound exposure of 92 dB for an average duration of exposure of 05 years. The vast majority of nightclub employees in the city of Parakou, *i.e.*, 97.40%, did not wear PPE in the workplace. The main reason cited was ignorance of the existence of PPE or its importance; *i.e.* 62.20%. These results are similar to data from the literature. Indeed, Kitcher *et al.* [15] found in Ghana in 2014 among factory workers, a proportion of non-wearing PPE equal to 95%. El Dib *et al.* [16] also found that 85.40% of employees did not use PPE to protect themselves in the workplace.

The main otological symptoms found in nightclub employees in the city of Parakou were tinnitus, both in the right ear and in the left ear; *i.e.* 18.40% and 19.30% respectively. They were followed by bilateral hearing loss (5.30%). Santos *et al.* [6] found that the most frequent complaints immediately after exposure to intense music were bilateral tinnitus (66.70%). On the other hand, in 2013, Chakroun *et al.* [17], in a study carried out in a department of southern Tunisia on occupational deafness, found among employees, hypoacusis (70%) and tinnitus (26.50%), all bilateral. Wannou [12] found among military musicians a predominance of hearing loss (34.50%) followed by tinnitus (20%) and headaches (7.30%). It appears that tinnitus and hearing loss are the most common functional signs in the event of noise exposure among workers. They are often bilateral, confirming the symmetrical nature of noise-related hearing loss.

6. Conclusion

Hearing damage, caused by noise pollution in nightclubs in the city of Parakou, is a reality. They negatively influence the lives of users. To reduce these attacks, it is necessary to educate employers about taking preventive measures including periodic medical visits on the one hand, and employees about wearing PPE and respecting safety measures in nightclubs on the other. go.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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