

Noise Pollution: Knowledge, Attitudes and Practice of Sawmill Workers in Osun State, Nigeria

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Abstract

Background: Literature on awareness of the harmful effect of noise on the health, hearing, and the quality of life of Nigerians engaged in noisy occupation is scarce. **Objective:** The objective was to assess the knowledge, attitudes, and practice of sawmill workers and owners to noise pollution; and the need for prevention with the use of hearing protection devices. **Subjects and Methods:** This was a purposive sampling of sawmills in 6 local government areas in Osun state. The respondents were studied using interviewer-administered questionnaires. The workplace noise levels were assessed. **Results:** A total of 412 male respondents, consisting of 400 sawmill workers and 12 sawmill owners were studied. The mean age of the respondents was 32 years. Average time of exposure to noise was 10 h/day. The average level of noise at the sawmills was 108 ± 9 dB. 140 (35.0%) sawmill workers could not identify the sources of noise correctly. 140 (85.0%) would endure noise exposure, and 376 (94.0%) did not know that hearing loss could be due to noise exposure. 176 (44.0%) of the workers believed that noise had no impact on health, while 373 (93.3%) did not believe that noise was associated with a change in productivity. None of the sawmill owners was familiar with policy on noise control and none of them provided earmuffs or plugs for their workers. **Conclusion:** Sawmill workers and their employers in the present study were not aware of the harmful effects of noise on their health. Hearing protection devices were therefore not available or worn by most sawmill workers. The sawmill workers were thus at risk of developing noise-induced hearing loss.

Key words: Hearing loss, Nigeria, noise, pollution, sawmills

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INTRODUCTION

It has been established that noise has a negative impact on hearing, health, and quality of life.¹ The risk of noise pollution can be widespread since there are exposure to noise at home, at work, in the outdoor environment, and during social or recreational activities.^{2,3} Due to the fact that the associated health effects of noise are not visible and are not as life-threatening as those of air, water, and hazardous wastes, emphasis on noise has been at the bottom of most environmental priority lists worldwide.^{3,4}

Sustained stress reactions to noise can result in annoyance, cardiovascular diseases, ulcers, and insomnia among others.⁵⁻⁹ Moreover, these extra-auditory effects of excessive noise appear to occur at levels far below those required to damage hearing.¹⁰ Noise should therefore not be accepted any longer as

a natural by-product of industrialization because of its harmful effects on health and quality of life.² There is therefore a need to improve the level of awareness among Nigerians about the harmful effect of noise on their health and the need to encourage responsible behavior that will help in noise reduction in their day-to-day life experience.

The present study was designed to assess the knowledge, attitude, and practice of Nigerians sawmill workers on noise and its harmful effects, and determine the average noise level at the sawmills and the measures available for protection of workers against harmful effects of noise.

SUBJECTS AND METHODS

Two groups of respondents were enrolled for the study. The

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first group comprised sawmill workers in six local government areas (LGAs) in Osun state. The LGAs were Irewole, Ife South, Ife Central, Ife East, Ayedaade, and Ilesha West. The LGAs were selected for because they had the highest concentrations of sawmills in the state. Purposive sampling was used to include workers whose jobs entail operating or staying close to the sawmill machines for various processing activities. The second group comprised two sawmill owners from each of the 6 LGAs.

A questionnaire, eliciting information on demographic data, identification of sources of noise, knowledge about the health hazards of noise exposure, how to react to noisy neighbors and the use of hearing protective devices (HPDs) was administered on each worker. The second questionnaire, in addition to the above also sought information about the level of awareness of sawmill owners on policies on noise and the measures put in place by them to make the sawmills free of noise pollution and safe.

The noise level of each machine during each visit was measured with a sound pressure meter (EXTEC instruments, US model 407735) placed at a distance of one meter from the machine. The averaged sound level, which was the average of all frequency components obtained at each visit, was used. The data from the questionnaires were coded, and analysis of data was done using the Statistical Package for Social Sciences (SPSS) [SPSS Inc., Chicago, IL, USA (233 South Wacker Drive, 11th Floor, Chicago, IL 606066-6412)] for Windows version 16. The results were presented using simple frequency tables, percentages, and bar charts.

RESULTS

A total of 412 respondents, comprising 400 sawmill workers and 12 sawmill owners, two from each of the LGAs were recruited into the study.

Sociodemographic data

The age range of the 400 workers was 10–67 years. The age distribution of the 400 sawmill workers is shown in Table I. 311 (77.8%) of the workers were between the age range of 10 and 40 years while 16.3% (65) were below 18 years. All the workers were males and the duration of exposure to noise per day was about 10 h (7 am to 5 pm).

The means of noise levels in each of the LGAs are presented in Table II. The overall mean of the noise levels at the machine point where the workers were found was 108 ± 9 dB. All the sawmill workers violated the recommended duration of exposure to loud noise. The standard for the duration of exposure to loud noise at different levels is shown in Table III.

Knowledge of harmful effect of noise

A total of 140 (35.0%) of the workers could not identify the sources of noise correctly. They did not believe that the noises at home, during leisure or at parties constitute danger since one could get used to them. They only expressed concerns about occupational noise. They, however, did not believe their own occupation was noisy because that was where they were

Table I: The age distribution of the 400 sawmill workers

Age in years	n (%)
10-20	117 (29.3)
21-30	101 (25.2)
31-40	93 (23.3)
41 and above	89 (22.2)
Total	400 (100.0)

Table II: Summary of the noise levels obtained from the sawmill environment in each local government

Local government	Noise level in dB
Ife-South	107.2
Ife-East	110.4
Ife-Central	109.7
Ayedaade	117.0
Irewole	99.8
Ilesha-West	98.9

NB: The noise level for the less noisy environment is 65 dB (A) on the average

Table III: Noise Exposure Limits for Industrial Workers in Nigeria (FEPA 1991)

Exposure time (h/day)	Permissible exposure limit dB (A)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

FEPA: Federal Environmental protection agency

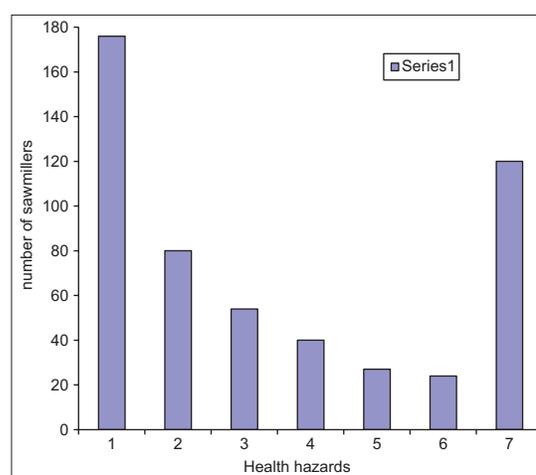


Figure 1: Awareness of sawmillers about the harmful effect of noise. 1: No impact on health, 2: Inabilities to sleep, 3: Inabilities to concentrate, 4: Annoyances, 5: Low productivity, 6: Loss of hearing, 7: Tinnitus.

earning their income. Figure 1 shows the level of awareness of sawmill workers about some harmful effects of noise on

health. A total of 340 (85.0%) of the workers would endure exposure to noise without doing anything about it because in their own words “We are used to it.” Of the 400 workers, 376 (94.0%) never thought that noise could cause damage to their hearing though they agreed that it was likely that noise could cause hearing damage. Only 120 (30.0%) believed that noise could be associated with tinnitus. None of the subjects thought that noise could cause hypertension, insomnia, and peptic ulcer disease.

Attitude and practice

Only 60 (15.0%) of the workers used one form of improvised HPDs or the other. They improvised by using cotton wool, foam or tissue paper as an earplug and did not use these on a regular basis. None of the sawmill owners provided their staff with ear protective devices due to lack of awareness of the existence of such devices. None of the sawmill owners was aware of any governmental policy on the control of noise pollution in a noisy factory and the right of the workers concerning noise pollution. A total of 396 (99.0) of the employees and 11 (91.7%) of the sawmill owners admitted never to have ever seen an ear muff/plug. 360 (90.0%) of the employees would use the hearing protection devices if they had access after listening to health talk.

DISCUSSION

Sawmill operations are usually noisy.¹¹ The workers who are exposed to noise suffer from the danger of ill health including noise-induced hearing loss (NIHL).¹² Over 90% of sawmill workers never attributed hearing loss to loud noise exposure and about 45% did not believe that noise could cause any health problem showing that there was a gross lack of knowledge about the harmful effect of noise on health, hearing, and the quality of life by most of the employees and their employers. Kahan and Ross also reported respondents were poorly informed regarding the fact that noise was a health hazard in South African miners.¹³ On the contrary, Minja *et al.* reported that over 80% respondents of industrial workers in Tanzania had the knowledge that hearing loss and NIHL due to noise could be prevented by appropriate ear protection. Ologe *et al.* also reported that 92–93% of workers in steel rolling mill in Nigeria had knowledge about the hazards of noise pollution and knowledge about methods of protection, respectively.^{14,15}

Only about 15% of the respondents in the present study used improvised and inadequate ear protectors, and none had a proper HPD. Ologe *et al.* reported that 27% of respondents in a steel rolling mill possessed ear protectors, but only 28% of such owners of the devices used them all the time.¹⁵ While 93% of respondents in Rashaad Hansia and Dickinson study reported using HPDs but only 50% were observed to be doing so, and consistent and continuous use was reported by only 24% and 31%, respectively.^{15,16} This revelation was alarming as these employees may not have taken any active measures to protect themselves even if they had been provided with protective devices. This corroborated the findings in other

works done in developing countries that established a relatively low level of awareness about the harmful effects of noise on health and the noise abatement strategies, despite the fact that noise pollution is on the increase.^{12,17-20}

Over 70% of the respondents were within the second-fourth decades of life and were all males. This age bracket represents the working force of any country, and chronic ill health or disability if not actively prevented may have a negative impact on the productivity of the nation. Exposure to loud noise has been established to be associated with an increased risk of NIHL and stress related illness such as high blood pressure, peptic ulcer, and impaired cognitive function and attentiveness.²¹⁻²⁴

It was found in the present study that the sawmill owners did not provide ear protection for their employees nor had a plan to embark on hearing conservation program. This attitude was found to be due to ignorance about the existence of any hearing protection devices, and the legal rights of their employee. They were, however, not willing to spend money on noise prevention devices, because they considered this was an additional operational cost that may unnecessarily lower the profit margin.

The only available law under which an employee might sue the employer in Nigeria is under the common law of nuisance. In this case, it has to be proven to the court that the noise made had infringed on the sufferers fundamental human rights and that the individual had suffered a considerable injury as a result. The majority of the workers did not have a pre-employment hearing test, were illiterates with meager resources and could not afford legal costs. Hence, they usually resign to fate.

CONCLUSION

The present study has shown that there is a gap in hearing protection of sawmill workers majorly due to lack of knowledge about the harmful effect of noise on health and lack of access to protective hearing devices despite daily exposure to excessively loud noise (108 dB) for unacceptably long hours. They were, however, willing to use hearing protection devices if this could be provided at a subsidized rate. There is, therefore, a need for public enlightenment, well-coordinated educational programs, and sensitization on the harmful effect of noise and the use of hearing protection whenever workers are exposed to noise.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Babisch W, Dutilleul G, Paviotti M, Backman A, Gergely B, McManus B, *et al.* Good practice guide on noise exposure and potential health effects. In: Babisch W, Van den Berg M, editors. European Environment Agency Technical Report. Vol. 11. Copenhagen, Denmark: EEA; 2010. p. 1-40.
2. Stansfeld SA, Matheson MP. Noise pollution: Non-auditory effects on health. *Br Med Bull* 2003;68:243-57.

3. King RP, Davis JR. Community noise: Health effects and management. *Int J Hyg Environ Health* 2003;206:123-31.
4. Carvalho A, Rodriguez RB. Expeditions Noise Mapping at a Municipal Level. Proceedings of the 29th Internoise Exhibition on Noise Control Engineering; 2000. p. 27-30.
5. Mirzaei R, Ansari-Mogaddam A, Mohammadi M, Rakhshani F, Salmanpor M. Noise pollution in Zahedan and residents' knowledge about noise pollution. *J Health Scope* 2012;1:3-6.
6. Agarwal S, Swami BL. Noise annoyance under interrupted traffic flow condition for Jaipur city. *Int J Appl Sci Eng* 2009;7:159-68.
7. Anomohanran O. Evaluation of environmental noise pollution in Abuja, the capital city of Nigeria. *IJRRAS* 2013;14:470-6.
8. van Kempen E, Babisch W. The quantitative relationship between road traffic noise and hypertension: A meta-analysis. *J Hypertens* 2012;30:1075-86.
9. Sørensen M, Andersen ZJ, Nordsborg RB, Jensen SS, Lillelund KG, Beelen R, *et al.* Road traffic noise and incident myocardial infarction: A prospective cohort study. *PLoS One* 2012;7:e39283.
10. Pulford C. *Air Madness: Road's Mistakes Repeated*. 3rd ed. Woodford Halse, Northants (Northampton shire) UK: Ituri Publications; 2008. p. 135.
11. EEA. Europe's Environment. The Third Assessment: European Environment Agency. In: Cavanaugh W, Tocci G, editors. *Environment Noise*. Copenhagen, Denmark. Cavanaugh Tocci Associates Inc.; 2003.
12. Satterthwaite D. The impact on health of urban environments. *Environ Urban* 1993;5:87-111.
13. Kahan E, Ross E. Knowledge and attitudes of a group of South African mine workers towards noise induced hearing loss and the use of hearing protective devices. *S Afr J Commun Disord* 1994;41:37-47.
14. Minja BM, Moshi NH, Riwa P. Noise induced hearing loss among industrial workers in Dar es Salaam. *East Afr Med J* 2003;80:298-302.
15. Ologe FE, Akande TM, Olajide TG. Noise exposure, awareness, attitudes and use of hearing protection in a steel rolling mill in Nigeria. *Occup Med (Lond)* 2005;55:487-9.
16. Rashaad Hansia M, Dickinson D. Hearing protection device usage at a South African gold mine. *Occup Med (Lond)* 2010;60:72-4.
17. Smith AW. The World Health Organisation and the prevention of deafness and hearing impairment caused by noise. *Noise Health* 1998;1:6-12.
18. Chi CC. Growth with pollution: Unsustainable development in Taiwan and its consequences. *Stud Comp Int Dev* 1994;29:23-47.
19. Ahasan MR, Partanen T. Occupational health and safety in the least developed countries – A simple case of neglect. *J Epidemiol* 2001;11:74-80.
20. Joyce S. Growing pains in South America. *Environ Health Perspect* 1997;105:794-9.
21. Balfour JL, Kaplan GA. Neighborhood environment and loss of physical function in older adults: Evidence from the Alameda county study. *Am J Epidemiol* 2002;155:507-15.
22. Meyer-Bisch C. Epidemiological evaluation of hearing damage related to strongly amplified music (personal cassette players, discotheques, rock concerts) – High-definition audiometric survey on 1364 subjects. *Audiology* 1996;35:121-42.
23. Basner M, Babisch W, Davis A, Brink M, Clark C, Janssen S, *et al.* Auditory and non-auditory effects of noise on health. *Lancet* 2014;383:1325-32.
24. Berglund B. Community noise in public health perspective. In: Goodwin VC, Stervenson DC, editors. *Sound and Silence: Setting the Balance*. Vol. 1. Auckland, New Zealand: New Zealand Acoustical Society; 1998. p. 19-24.