

**HEALTH PROBLEMS OF NOISE POLLUTION AS PERCEIVED BY
WORKERS IN DANGOTE CEMENT FACTORY OBAJANA, KOGI
STATE**

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ABSTRACT

Noise pollution is one of the major environmental pollutions that have direct effects on human performance. Thus, the survival and healthy existence of man depend largely on the enabling environment where he resides and works. This study, therefore, investigates Health Problems of Noise Pollution as Perceived by Workers in Dangote Cement Factory Obajana Kogi State. The objectives of the study were to investigate: if noise pollution could lead to (i) hearing loss and; (ii) abnormal sleeping patterns as perceived by workers in the Dangote Cement factory in Obajana Kogi State. A descriptive research design of the survey type was used for the study. Population for the study comprised all Dangote cement factory workers, Obajana, Kogi State. The convenience sampling technique was used to select 520 respondents. A researcher designed a questionnaire that was validated and tested for reliability which yielded a coefficient of $r = .78$ through a test re-test method using Pearson Product Moment Correlation. Questionnaire forms were administered and collected by the researcher with two trained Research Assistants. The inferential statistics of Chi-square (χ^2) were used to analyze the null hypotheses at a 0.05 alpha level of significance. The findings of the study revealed that: hearing loss with (calculated χ^2 value= 513.66 > critical χ^2 value = 16.92 degree of freedom =9); abnormal sleeping pattern with (calculated χ^2 value= 439.22 > critical χ^2 value = 16.92 degree of freedom =9). It was concluded from the study that hearing loss and abnormal sleeping patterns are significant perceived health problems of noise pollution by workers in Dangote Cement Factory Obajana, Kogi State. Based on the conclusion, the following recommendations were made: Health talks would enlighten the factory workers on how to use hearing aids to prevent hearing loss among the factory workers and those already suffering from hearing loss are to be referred for proper medical care and factory workers should be given adequate health information on sleeping earlier after daily task/work so as to ensure proper rest and sound sleep.

Keywords: Hearing Loss, Abnormal Sleeping Pattern, and Factory Workers

1.0 INTRODUCTION

Noise pollution has been one of the challenging current health issues in the world today in which an average individual is being exposed to either high, low or medium noises source every day. This health problem affects the well-being and health status of those exposed and poses them at risk of hearing loss. Noise pollution is one of the major environmental pollutions that has direct effects on human performance (Debasish & Debasish, 2012). Thus, the survival and healthy existence of man depend largely on the enabling environment where he/she resides, as disruption in the conducive environment may lead to dysfunction in his health status. Noise is derived from the Latin word "nausea" implying 'unwanted sound' or 'sound that is loud, unpleasant or unexpected and it is considered as pollution because of the noxious and unwanted sound it emits into the environment (Singh & Davar, 2004). Noise originates from human activities especially the urbanization and the development of transport and industry. Consequently, pollution according to Yilmaz and Ozer (2005), is the introduction of contaminants into the natural environment that cause adverse change. They submitted that pollution can take the form of chemical substances or energy such as noise, heat or light.

Noise pollution in Nigerian cities is relatively high when compared to recommended levels by World Health Organization (WHO, 2012). Geetha and Ambika (2015) define noise pollution as a series or more noise that may damage activity or human life. They observed that construction equipment, jet planes, road traffic, garbage trucks, and manufacturing processes are some of the major sources of noise pollution. They opined that noise pollution is of two types, the first being noise hazards which lead to permanent hearing loss and neural stress while the second type of noise pollution is noise nuisance, which encompasses mental stress, irritability, sleep interference, and hearing loss and loss of concentration. Meanwhile, noise-induced hearing loss is seen as the major source of concern for factory workers' well-being due largely to its health implication. Noise-induced hearing loss is defined as an injury to the inner ear caused by prolonged exposure to loud noise. Occupational noise-induced hearing loss develops slowly in response to frequent exposure to excessive noise and affects a considerable number of factory workers (Concha-Barrientos, Campbell-Lendrum & Steenland, 2004). Nigerian cities are environmentally noise polluted. Road traffic, industrial types of machinery, and generators are the major sources of noise pollution in the country (Oyedepo, 2012) Therefore, Hakeem (2014) affirmed that there is a need for proper implementation of rules and regulations, public enlightenment, education and sensitization on the hazards, dangers and human health problems associated with noise pollution. Consequently, emphasized that the non-auditory effects of noise on humans are viewed as being generally stress-related, following observations that noise exposures endanger physiological reactions typical to those of stress. Noise seems to have a negative effect on performance and it appears that the longer the exposure, the greater the effect (Goines & Hagler, 2007). It can be safely concluded that the effect of noise pollution can affect both the physical, mental and social health of the individual exposed to incessant noise and the fact that people may not know the detrimental effect of noise on their health according to Nichol森 and Smitherman (2006) may worsen the problem of noise generation and exposure.

Perpetual hearing loss, muscle tension, high blood pressure, increased aggression, headaches, migraine, irritability, insomnia, and psychological disorder are the health hazards caused by noise pollution. The effects of noise on conscious subjects are insidious and result in increased psychosocial stress that may influence subsequent stress among factory workers (Babisch, Pershagen, Selander, Houthuijs, Breugelmans & Cadum, 2013). In Nigeria, the problem of noise pollution is widespread. Several studies report that noise level in metropolitan cities exceeds the standard limits (Miller, Chen & Zhou, 2011). The equivalent environmental noise level of 70 dB(A) Laeq, 24h has been recommended by WHO for industrial, commercial, shopping, and traffic areas, indoors, and outdoor areas to prevent impairments. Defining wellbeing is especially challenging because of the different ways in which the concept is understood in different contexts and by different people. However, rather than being driven by a definition, researchers have focused on dimensions and descriptions (Dodge, Daly, Huyton, & Sanders, 2012).

The basic working definition of well-being proposed by White (2010) includes: doing well, a material dimension referring to standards of living; feeling good, the subjective perception; as well as a dimension of doing good and feeling well, incorporating the idea of living a good life which emphasizes the importance of people's relationships with others. The framework also considers three interdependent dimensions of wellbeing: material; relational; and subjective. High-level noise will result in hearing loss. Evidence abounds that constant noise exposure can damage sensitive structures in the ear. Noise-induced hearing loss, the second to age-induced hearing loss results from damage to the hair cells of the cochlea in the inner ear arising from continuous exposure to recreational and occupational noise (Rabinowitz, 2010). Blasts and other intense or explosive sounds can rupture the eardrum or cause immediate damage to the structures of the middle and inner ear, while, hearing loss due to prolonged noise exposure is generally associated with the destruction of the hair cells of the inner ear (Olaosun et al. 2009).

Noise may potentially disrupt normal sleep by either disrupting its continuity, changing its structure (prevalence of various sleep stages) or reducing the absolute amount of time spent asleep or otherwise diminishing its restorative value by creating an excited condition without visible change in sleep structure (such as in autonomic arousal, a transient increase in sympathetic tone the activity level in the sympathetic nervous system (Griefahn, Brode, Marks & Basner, 2008) or by producing stress in an organism as it expands additional resources to maintain the sleep condition (Basner, 2008). Though noise pollution is a slow and subtle killer, yet little or no effort has been made to ameliorate the surge. Noise pollution has become worrisome and a very serious concern because of its effects on workers' health and its potential to create a public health problem that may lead to hearing impairment and low quality of life. Interaction with some of the factory workers reveals that noise pollution has negative effects on their health which has resulted to hearing loss and poor sleeping patterns among others. Industrial employees are exposed to noises from a variety of sources, such as traffic noise from busy roadways, stationary vehicles and street noise, compressors and pneumatic tools in garages, workshops and maintenance areas, handheld power tools, heavy machinery and other equipment, ventilation systems operating at substandard levels, human sources such as Children and co-workers (Ahmed, Dennis, Badran, Ismail, Ballal, Ashoor & Jerwood 2015). The aforementioned problems are what prompted the researchers to investigate health problems of noise pollution as perceived by workers in Dangote Cement

Factory Obajana, Kogi State. The purpose of the study is to investigate Health Problems of Noise Pollution as Perceived by Workers in Dangote Cement Factory Obajana Kogi State. The objectives of this study are to Investigate if hearing loss is a perceived health problem of noise pollution by workers in Dangote Cement Factory Obajana, Kogi State. It will also examine if the abnormal sleeping pattern is a perceived health problem of noise pollution by workers in Dangote Cement Factory Obajana Kogi State.

Research Hypotheses

The following hypotheses were tested in the study:

1. Hearing loss is not a perceived significant health problem of noise pollution by workers in Dangote Cement Factory Obajana, Kogi State.
2. Abnormal sleeping pattern is not a perceived significant health problem of noise pollution by workers in Dangote Cement Factory Obajana, Kogi State.

2.0 METHODS AND MATERIALS

A descriptive research design of survey type was adopted for the study. The population for this study comprised all workers in Dangote Cement Factory Obajana, Kogi State. The sample of the study was five hundred and twenty (520) workers selected through the convenience sampling technique as only factory workers met on duty after ethical approval to carry out the research were given copies of the questionnaires to fill. The research instrument adopted for this study was a researcher-developed structured questionnaire that was validated and the reliability of the instruments was carried out by adopting a test-retest method to determine the internal consistency, by which the questionnaire was pretested among thirty respondents who shared similar characteristics with the participants of this study. The result of the administration was analyzed using Pearson Product Moment Correlation and a correlation coefficient of 0.78 was obtained this shows that the research instrument was reliable enough for the study.

The instrument was administered with the help of two trained research assistants. The training covered sampling procedures, contents of the questionnaire, how to interpret the items in the questionnaire, and how to get participants' informed consent. Ethical principles guiding the use of human participants in research were upheld throughout the conduct of this study. Participation in the study was made voluntary and informed consent was obtained from each participant in the study. The researcher kept confidential all the information supplied by the research participants, while also ensuring the privacy of the participants. The researcher ensures where possible that completed copies of the questionnaire were collected back immediately to avoid loss of the instrument. Inferential statistics of chi-square were used to analyze the hypotheses at a 0.05 level of significance using Statistical Package for Social Sciences Version 23.0.

3.0 RESULTS

Test of Hypotheses

Ho1: Hearing loss is not a perceived significant health problem of noise pollution by workers in Dangote Cement Factory Obajana, Kogi State.

Table 1: Chi-square (x2) Analysis of hearing loss as a perceived health problem of noise pollution.

Variable	N	Df	Calculated x^2 value	Critical/Table x^2 value	Remark
Noise Pollution and Hearing Loss.	520	9	513.66	16.92	Ho rejected

@ 0.05 alpha level

Table 1 revealed the calculated Chi-square (x2) value is 513.66 and the table (x2) value is 16.92 with the degree of freedom 9 at 0.05 alpha level. Since the calculated (x2) value of 513.66 is greater than the table (x2) value of 16.92 at 9 degrees of freedom. Therefore, the null hypothesis was rejected. This implies that hearing loss is a perceived significant health problem of noise pollution by workers in Dangote Cement Factory Obajana, Kogi State.

Ho2: Abnormal Sleeping patterns will not significantly be a perceived health problem of noise pollution among Workers in Dangote Flour Mill Ilorin, Kwara State, Nigeria.

Table 2: Chi-square (x2) Analysis of health problems of Noise Pollution on Abnormal Sleep Pattern.

Variable	N	Df	Calculated x^2 value	Critical/Table x^2 value	Remark
Noise Pollution and Abnormal Sleep pattern.	520	9	439.22	16.92	Ho rejected

@ 0.05 alpha level

Table 2 revealed the calculated Chi-square (x2) value is 439.22 and the table (x2) value is 16.92 with the degree of freedom 9 at 0.05 alpha level. Since the calculated (x2) value of 439.22 is greater than the table (x2) value of 16.92 at 9 degrees of freedom. Therefore, the null hypothesis was rejected. This implies that abnormal sleep pattern is a perceived significant health problem of noise pollution by workers in Dangote Cement Factory Obajana, Kogi State.

4.0 DISCUSSION OF FINDINGS

The finding in hypothesis 1; revealed that hearing loss is a perceived significant health problem of noise pollution by workers in Dangote Cement Factory Obajana, Kogi State. This finding is in line with Shargorodsky, Curban, and Farwell (2010) who reported that subjective hearing loss following noise-induced hearing loss is the most common form of chronic hearing loss. Exposure to noise has been observed to have a deleterious impact on the health status of individuals working within the ravaging environment. Continuous exposure

to this high and unwarranted sound remains one major cause of hearing loss and hearing disorders all over the world. To this end, The World Health Organization Programme for the Prevention of Deafness and Hearing Impairment in 1997 reported that exposure to excessive noise is the major avoidable cause of hearing loss/impairment worldwide, just as Noise-Induced Hearing Loss is the most prevalent irreversible industrial disease, and suggest compensatable occupational hazard (WHO, 1997). The researcher agreed with the findings that excessive noise pollution can cause hearing loss among factory workers.

The finding in Hypothesis 2; also revealed that abnormal sleeping pattern is a perceived significant health problem of noise pollution by workers in Dangote Cement Factory Obajana, Kogi State. This finding is in line with Prematunga, (2012) who suggested that for most people, sound is an important and meaningful contributor to their environment and their daily activities. However, unwanted sounds may interrupt sleep pattern where quiet is desirable, distraction, reduce the quality of communication and contribute to the stress of individuals (Berglund, 2010). Although blood pressure normally drops during sleep, people experiencing sleep fragmentation from noise have difficulty achieving a nadir for any length of time because blood pressure rises with noise transients, and heart rate increases with noise level (Haralabidis, 2008). Decreased quality and quantity of sleep elevates cardiovascular strain, which manifests as increased blood pressure and disruptions in sleep and cardiovascular circadian rhythms (Sforza, 2004). The opinion of the researcher here is that noise pollution in the environment can cause abnormal sleep patterns among residents living around construction sites.

5.0 CONCLUSIONS

Based on the finding of the study the following conclusions were drawn:

1. Hearing loss is a perceived significant health problem of noise pollution by workers in Dangote Cement Factory Obajana, Kogi State.
2. Abnormal sleeping pattern is a perceived significant health problem of noise pollution by workers in Dangote Cement Factory Obajana, Kogi State.

6.0 RECOMMENDATIONS

Based on the conclusion drawn the following recommendations were drawn:

1. Health talks would enlighten the factory workers on how to use hearing aids to prevent hearing loss among the factory workers and those already suffering from hearing loss are to be referred for proper medical care.
2. Factory workers should be given adequate health information on sleeping earlier after daily task/work so as to ensure proper rest and sound sleep.

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