



Occupational hazard awareness and safety practices among cement factory workers at obajana, Kogi state, Nigeria

Omotosh Musa¹, James Bamidele² Adekunle Salaudeen¹ Hauwa Saromi¹ and Ade Omi AA³

¹Department of Epidemiology & Community Health, Faculty of Clinical Sciences, University of Ilorin, Ilorin, Nigeria.

²Department of Community Medicine, Faculty of Clinical Sciences, Ladoke Akintola University of Technology, Ogbomosho, Nigeria.

³Department of Community Medicine, Ladoke Akintola University Teaching Hospital, Osogbo, Nigeria.

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ABSTRACT

Most of the world's population spend about one-third of their adult life at work, and with work-place injuries and fatalities remaining at unacceptably high levels. This study was carry out to determining occupational hazard awareness and safety practices among cement factory workers in community in Nigeria.

A descriptive cross-sectional study was carried out and data were collected using pre-tested semi-structured questionnaires. Using multi-stage sampling technique, 283 questionnaires were administered to workers who consented to the study. Two hundred and seventy-one questionnaires were fully completed and used for analysis.

Most of the respondents were males, 265(97.8%), between 31-35 years in age, 88(32.5%) and had tertiary education, 181(66.8%). Majority of the respondents, 266(98.2%) were aware of hazards associated with their jobs. Two hundred and sixty two (96.7%) of the respondents accepted that their occupation was hazardous. The most commonly known hazard by the respondents was dust, 206(77.4%), followed by noise 83(31.2%). Most of the respondents, 263(97.0%) had pre-employment medical examination done before starting work while only 106(39.1%) had ever done periodic medical examination. Most of the respondents, 265(97.8%) used protective equipments and nearly all the respondents 268(98.9%) were interested in updating their knowledge about hazards prevention. In the last 1 year preceding the study, 53(19.6%) of the respondents had suffered injuries while at work and forty six (17%) had been absent from work due to work related injuries.

In conclusion, the level of awareness about occupational hazards and compliance with safety measures was very high, but the rate of periodic medical examination was low among respondents. It is recommended that periodic medical examination policy be adopted by management.

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Introduction

Since the dawn of civilization, industries have been established to meet various human needs. Over the course of time, some of these industries where found to exert untoward effect on the health of man¹⁻⁴. Most of the world's population spend one third of their adult life at work contributing actively to the development and well being of themselves, their families and of the society. The right to health and safety at work is therefore a part of basic human rights⁵.

According to WHO and ILO estimate for the year 2000, there are 2 million work-related deaths per year worldwide⁶. The ILO estimated that well over 250 million non-fatal accidents cause absence from work⁷. In Nigeria the real incidence of occupational accidents, fatalities, as well as deformities is not well recorded. The factory inspectorate department in their annual report said it is not easy to obtain an accurate number of accidents because of non-reporting of many reportable accidents by factory occupiers^{7,8}. A Nigerian-based study showed that between 1987 and 1991 there were 2,012 reported cases of industrial injuries in workers in Nigerian factories with an annual average of 402.4 accidents⁹. Studies carried out among cement industry workers in Nigeria revealed an inventory of

hazards including respiratory problems, irritation and contact dermatitis, organ-system perturbations particularly of the lungs and liver, physical injuries like burns, headache, fatigue and musculoskeletal disorders¹⁰⁻¹³.

With an increase in occupational related diseases, there is need for a greater focus on preventive activities¹¹. A study among cement workers in Nigeria reported that there were no specific training programmes for safety education, protective measures or accident prevention for workers. Also, the workers were reported to be reluctant to wear the proper protective uniforms for their job¹⁰. Various studies have also shown that workers are unaware of the occupational hazards to which they are exposed^{1,10,14}. It is therefore important that a study of this nature be carried out to determine the occupational hazards awareness and safety practices by workers in the cement industry with a view to making necessary recommendations to achieve work safety.

Materials and methods

The study was carried out among the workers in Obajana cement factory, located at Obajana in Lokoja local government area of Kogi State, Nigeria with a total staff population of 1,200.

This was a descriptive cross-sectional study. A sample size of 216 was arrived at using Fischer's formula for population less than 10,000¹⁵ and taking prevalence to be 78%¹⁶. However, to make up for non-response, 283 respondents were selected using the multi-stage sampling technique.

Permission to conduct the study was obtained from the management of the cement factory and informed consent was verbally obtained from the respondents before the questionnaires were administered.

The data were gathered with the aid of pre-tested semi-structured questionnaires administered by trained research assistants. The questionnaires were manually sorted out and the data analysed using Epi-info software and p-value was set at $p < 0.05$.

Results

Two hundred and eight three questionnaires were distributed and returned, however only 271 were properly filled and were used for the analysis.

The age range was from 21 to 48 years with a mean age of 33.91 and the modal age was 35 years. Eighty-eight (32.5%) were aged 31-35 years and 46-50 years had the lowest percentage (1.5%). Most of the respondents, 265(97.8%) were males, females constituted only 2.2%. One hundred and seventy three (63.8%) were married, while 98(36.2%) of the respondents were single. About two-thirds of the respondents, 181(66.8%) had tertiary education, while those with primary education were 15(5.5%). Ninety-two (34.0%) had worked for between 25-36 months in the factory, while 16(5.9%) had worked for over forty-eight months.

Most of the respondents, 212(78.2%) had not worked in a cement factory before but 59(21.8%) had worked in a cement factory before their present employment. Majority of the respondents, 266(98.2%) were aware of hazards associated with their jobs. Two hundred and sixty two (96.7%) of the respondents accepted that their occupation was hazardous, 9(3.3%) said their occupation was not hazardous. Training on safety at work, 248(93.2%) was the main source of awareness about occupational hazards among respondents, while the internet, 13(4.9%) was the least source of awareness. The most commonly known hazard by the respondents was cement dust 206(77.4%), followed by noise 83(31.2%), with the least being explosives 19(7.1%).

Two hundred and sixty-five (97.8%) of the respondents were aware of a clinic in the factory, while 6(2.2%) were not aware of a clinic in the factory. Most of the respondents, 263(97.0%) had pre-employment medical examination done before starting work while 8(3.0%) did not. One hundred and sixty-five respondents (60.9%) had never had periodic medical examination, only 106(39.1%) had ever done periodic medical examination. On the reasons given by the 7 respondents who did not undergo pre-employment medical examination; 3(42.8%) did not because they were fit and well, another 3(42.8%) said it was due to lack of awareness, the remaining 1(14.3%) said it was not required. Two hundred and thirty-three (86.0%) of the respondents had attended training on industrial safety or hazards prevention while 38(14.0%) had not attended any training on industrial safety or hazards prevention. Two hundred and sixteen (92.7%) of respondents said training was held in Obajana cement factory and 8(3.0%) attended training in Lagos, while 2(0.9%) said they attended the training in higher institutions. Thirty five (92.1%) of the respondents who had not attended any

training on industrial safety said it was because they were not nominated, 3(7.9%) were newly employed.

Most of the respondents 261(96.3%) were aware of protective measures while 10(3.7%) of them were not aware of these measures. One hundred and sixty (60.1%) understood prevention of occupational hazards to mean reducing hazards to the minimum, while 122(45.0%) said it is making sure hazards do not occur. The major preventive measures known by the respondents were the use of safety devices 268(98.9%), maintenance of workplace hygiene 255(94.1%), and provision of adequate ventilation in the factory 253(93.4%). The least known was elimination/substitution of hazardous agent 143(52.8%). All the respondents claimed they abided by the factory's safety measures and instructions. Most of the respondents, 265(97.8%) used protective equipments and only 6(2.2%) of them did not. Most of the respondents (72.3%) said they complied with safety instructions for their personal safety, 40(14.8%) complied because it is compulsory and 35(12.9%) of them complied for both reasons. Four (66.7%) out of the 6 non-users of protective equipments felt it was not necessary in their section, while 2(33.3%) said they were not directly involved in production. Two hundred and thirty-five respondents (88.7%) used personal protective equipment regularly, 4(1.5%) of them used protective equipment when they remembered and 17(6.4%) of them said they used them when they felt it was necessary. Helmets 266(98.2%) and boots 252(93.0%), had the highest frequency of safety gadgets normally used by the respondents, 227(83.8%) used face/dust masks, while eye protector 105(38.7%) had the lowest frequency.

In the last one year prior to the study, fifty-three (19.6%) of the respondents had suffered injuries while at work and 218(80.4%) had not suffered any injury while at work. Of the 53 respondents that had suffered an injury, 48(90.6%) of them felt the injury could have been prevented while 5(9.4%) felt the injury could not be prevented. Forty-two (79.2%) reported the injury while 11(20.8%) did not. Forty six (17%) of the respondents had been absent from work due to work related injuries in the last 1 year preceding the study.

Most of the respondents 192(70.8%) had never seen government agents coming to inspect the factory, while 79(29.2%) of them had seen government agents in the factory for the purpose of inspection.

Discussion

Almost all the respondents were aware of hazards in the workplace and believed their occupation was hazardous (98.2% and 96.7% respectively), and on-the-job training was the main source of this awareness (91.5%). This is a good development and it is likely to minimise workplace injuries as similarly reported by Mwaiselage et al who carried out a similar study in Tanzania¹⁷. The most commonly known hazard by respondents was cement dust which was known by almost 8 out of 10 respondents followed by noise (31.2%). This is also similar to what was reported in a study among workers in a cement factory in United Arab Emirates¹⁸.

Pre-employment medical examination is a very important medical examination that a worker needs to undergo even before being introduced to work^{8,19}, and in this study most of the respondents(97.0%) had undergone the medical examination. It is however still of concern that 8(3.0%) of the respondents were working in this potentially hazardous factory without a pre-employment medical examination for such reasons as they were not aware or that they felt they were fit and well. It is also

surprising that less than 4 out of 10 respondents had ever had periodic medical examination and even these (medical examinations) were done at the respondents' instances. This attitude to medical examinations will not help the early detection of diseases²⁰ and it is different from what was reported in a study on occupational health services in manufacturing industries in Nigeria where all(100%) of the workers studied had undergone the pre-employment medical examination and most had had periodic medical examination done²¹.

Most of the respondents (96.3%) were aware of protective measures and the commonest preventive measure was safety devices. The devices listed under this included caution tapes, warning signs, safety slogans and notices, warning alarm and gas or smoke detectors. This is important as it has been documented that these safety devices helps to create safety awareness among workers¹⁹. All the respondents abided by the factory's safety measures and instructions and about three-quarters of them said they complied because of their personal safety. This shows that the workers have a high value for personal safety and this is likely to reduce the incidence of work-related injuries and diseases. Most of the respondents (97.8%) used protective equipments and about 9 out of 10 respondents used the protective equipment regularly and the few that did not use protective gadgets were those not directly involved with production. This is contrary to what was reported by different studies in Egypt and Nigeria (Sokoto) where workers were reluctant to use protective clothing^{10,12}.

Nearly all the respondents (98.9%) expressed willingness in updating their knowledge about hazards and hazards prevention. This is probably due to the high level of awareness of occupational hazards among the respondents. Many of the respondents (86%) had attended training on industrial safety or hazards prevention and this contributed to the high level of awareness among them as many of them learnt about the occupational hazards from these training sessions. About 90% of these respondents attended training sessions within the factory which shows commitment on the part of the management to the safety of the workers and this is necessary because an unsafe work place indicates that something is wrong within the management system^{22,23}.

About 20% of the respondents had suffered injuries while at work and 17% had been absent from work on account of work-related injuries in the last 1 year preceding the study. Most of the respondents (90.6%) who had suffered a form of work-related injury agreed that the injury could have been prevented. This implies that with more attention to preventive practices, most of these accidents could have been prevented. Seven out of 10 respondents had never seen government agents coming to inspect the factory. The government may need to review her stand on this issue as it will be necessary for regulatory agencies to keep a closer watch on potentially hazardous factories so as to ensure the optimum health of workers. Also absence of effective factory inspection has been documented as one of the reasons for worsening work-related injuries¹⁰.

Conclusion and recommendation

The level of awareness about occupational hazards was very high among respondents and the major source of awareness was on-the-job training on safety at work. There was a high level of compliance with safety measures with a modest prevalence of work-related injury, but the rate of periodic medical examination was low among respondents. It is recommended that periodic medical examination policy be adopted by management and that

staff training on hazards prevention and industrial safety should be sustained and frequency of training should be increased.

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Table 1: Socio-demographic Characteristics of Respondents
n=271

Variables	Frequency(Percentage)
Age group (in years)	
21-25	12(4.4)
26-30	73(26.9)
31-35	88(32.5)
36-40	67(24.7)
41-45	27(10.0)
46-50	4(1.5)
Gender	
Male	265(97.8)
Female	6(2.2)
Marital status	
Single	98(36.2)
Married	173(63.8)
Educational status	
Primary education	15(5.5)
Secondary education	75(27.7)
Tertiary education	181(66.8)
Duration on present job(in months)	
Less than 12	38(14.0)
12-24	77(28.4)
25-36	92(34.0)
37-48	48(17.7)
More than 48	16(5.9)

Table 2: Awareness of Hazards among Respondents

Variables	Frequency(Percentage)
Respondents believe that job is hazardous(n=271)	
Yes	262(98.2)
No	9(3.3)
Awareness of occupational hazards (n=271)	
Yes	266(98.2)
No	5(1.8)
Sources of awareness (multiple response; n=266)	
Training on safety at work	248(93.2)
Colleagues at work	132(49.6)
Health workers	94(35.3)
School	81(30.5)
Books	72(27.1)
Friends	48(18.0)
Television	44(16.5)
Newspaper	32(12.0)
Radio	24(9.0)
Family members	21(7.9)
Internet	13(4.9)
Types of hazards in the cement factory (multiple response; n=266)	
Cement dust	206(77.4)
Noise	83(31.2)
Falls from height	52(19.5)
Injuries from machines	50(18.8)
Inhalation of gases, chemicals or smoke	50(18.8)
Heat	46(17.3)
Electrocution	45(16.9)
Falling or moving object	35(14.7)
Fire	21(7.8)
Explosives	19(7.1)
Others	55(20.7)

Table 3: Occupational Health Service available to Respondents

Variables	Frequency(Percentage)
Awareness of clinic in the factory (n=271)	
Yes	265(97.8)
No	6(2.2)
Pre-employment medical examination(PEME) (n=271)	
Yes	263(97.0)
No	8(3.0)
Reasons for doing PEME (n=263)	
Physical fitness	112(42.6)
Health status	110(41.8)
Physical fitness and health status	30(11.4)
Placement and documentation	11(4.2)
Reasons for not doing PEME (n=7)	
Fit and well	3(42.8)
Lack of awareness	3(42.8)
It was not required	1(14.4)
Periodic medical examination (n=271)	
Yes	106(39.1)
No	165(60.9)
Training on Hazard prevention (n=271)	
Yes	233(86.0)
No	38(14.0)
Reasons for non-attendance in training(n=38)	
Not nominated	35(92.1)
New staff	3(7.9)

Table 4: Safety Practices among Respondents

Variables	Frequency(Percentage)
Awareness about preventive measures (n=271)	
Yes	261(96.3)
No	10(3.7)
Perception about hazard prevention (multiple response; n=271)	
Hazards do not occur at all	122(45.0)
Reducing hazards to the minimum	160(60.1)
Types of preventive measures (multiple response; n=271)	
Use of safety devices	268(98.9)
Hygiene of work place	255(94.1)
Provision of adequate ventilation	253(93.4)
Personal hygiene	218(80.4)
Periodic medical examination	211(77.9)
Segregation of hazardous process	157(57.9)
Elimination/substitution of hazardous agents	143(52.8)
Compliance with safety measures(n=271)	
Yes	271(100.0)
No	0(0.0)
Reason for compliance with safety measures(n=271)	
Personal safety	196(72.3)
It is compulsory	40(14.8)
Both reasons above	35(12.9)
Use of available protective equipments(n=271)	
Yes	265(97.8)
No	6(2.2)
Regularity in using protective equipment(n=265)	
Regularly	235(88.7)
When felt necessary	17(6.4)
Occasionally	9(3.4)
When it is remembered	4(1.5)
Reason for non-use of protective equipment(n=6)	
Not necessary in my section	4(66.7)
Not directly involved in production	2(33.3)
Availability of measures to prevent accidents(n=271)	
Yes	252(93.0)
No	19(7.0)
Safety gadgets used by respondents(multiple Response: n=271)	
Helmets	266(98.2)
Boots	252(93.0)
Reflective jacket	239(88.2)
Protective clothing/overall	235(86.7)
Dust masks	227(83.8)
Protective gloves	201(74.2)
Ear plugs/muffs	115(42.4)
Eye protector	105(38.7)

**Table 5: Prevalence of Work-Related Accidents/Injuries
n=271**

Variables	Frequency(Percentage)
Work related injury in the last 1 year	
Yes	53(19.6)
No	218(80.4)
If injury could have been prevented	
Yes	48(90.6)
No	5(9.4)
Reporting of injury by injured staff	
Yes	42(79.2)
No	11(20.8)
Absence from work in the last 1 year	
Yes	46(17.0)
No	225(83.0)