

Occupational Exposure of Workers to Wood Dust in Ibesikpo Timber Market, Calabar South Local Government Area, Nigeria

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Abstract

The purpose of this study was to determine the occupational exposure of workers in Ibesikpo timber market, Calabar South Local Government Area, Cross River State, Nigeria to wood dust; specifically, the health effects experienced by workers, general knowledge of the risk factors associated with exposure to wood dust, availability of occupational health services and the use of personal protective equipment. The study was a cross-sectional descriptive study. The study population comprised all workers in the timber market. A semi-structured questionnaire which was interviewer-administered was used for data collection and data collected were analysed using Statistical Package for Social Sciences (SPSS) version 20 and presented in percentages and tables. Greater number of workers were exposed to wood dust and other occupational hazards (94.41%). The health effects experienced by the respondents were eye problem, skin infection and respiratory symptoms such as wheezing (13.41%), shortness of breath (6.10%), sputum production (9.76%) and cough (70.73%), which has the highest percentage. Majority of the respondents were less knowledgeable about the hazards associated with exposure to wood dust (74.13%). There was no provision for occupational health services in the timber market. Utilisation of personal protection equipment among the respondents was low (34.27%). Steps to protect the health of the workers in Ibesikpo timber market are recommended.

Introduction

Human activities especially their occupations are associated with several forms of hazards. Workers exposure to hazards can occur at different stages in the life cycle of an industrial process. Occupational exposure is a measure of the intensity and or extent to which human body experience a particular hazard.

Occupational exposure may place a worker at risk of infection, disease, injury, accident and disability (Peta, 2005).

An estimate of exposure may be obtained in various ways and include, a detailed history taking, work place visit, the use of background personnel monitoring devices etc. (Okesola, 2007).

Exposure to wood dust occurs in many industries including logging and sawmills operations, furniture and paper manufacturing, construction of buildings etc. Wood dust is produced from processes such as sanding, cutting, sawing, carving, planing, drilling etc. Wood dust is a potential health risk when it becomes airborne.

Exposure to wood dust may cause respiratory symptoms including farmers' lung, organic dust toxic syndrome, occupational asthma, non-asthmatic airflow obstruction, chronic bronchitis etc. Others are dry cough, shortness of breath, chest pain, conjunctivitis, dermatitis etc.

The World Health organization estimates that death from work-related diseases accounts for about 70% of all occupational diseases (WHO, 2002). The International Labour Organization (ILO) states that about 2.3million workers die annually due to work-related accidents (ILO, 2010). In Nigeria, an increased risk rate of 88 per 100 sawmill workers has been reported by Ugheoke, *et al* (2006).

The general objective of this study was to determine the occupational exposure of workers to wood dust in Ibesikpo timber market, Calabar. The specific objectives were to determine the workers knowledge of the risk factors associated with exposure to wood dust, identify the health effects experienced by the workers and determine the availability of occupational health services as well as utilization of personal protective equipment by workers in Ibesikpo timber market.

Materials and Methods

Study Area

The study was conducted in Ibesikpo timber market, Calabar. The timber market consisted of clusters of small-scale wood industries. Most of the industries were on temporary structures commonly referred to as shelters/shades. Those on permanent structures contained sawing machines.

Study population

The study population comprised all workers at Ibesikpo timber market, Calabar, that were directly or indirectly exposed to wood dust. These consisted of 45 machine operators, 60 sales personnel and 40 employees.

Study design and sampling procedure

A cross-sectional descriptive study was used for the study. The sample size for the study was determined using Bluman (2004).

$$n = \frac{z^2 pq}{d^2}$$

The determined sample size was 148. Since the population of the workers was closed to the desired sample size, the whole population of the workers was studied.

Instrument for data collection

A pre-tested semi-structured questionnaire was used for data collection. This comprised 30-items divided into 6 sections.

Section A had questions on socio-demographic variables of the respondents, Section B had questions on occupational exposure to wood dust, Section C, on knowledge of risk factors associated with wood dust, Section D, duration of exposure to wood dust in the workplace, Section E, was on availability of occupational health services and section F, on the use of personal protective equipment.

The questionnaire was interviewer-administered. Data collected were analysed using SPSS version 20 and presented in percentages and tables.

Results

Table 1, shows the respondents socio-demographic data by sex, age, marital status, educational level and religion. About 58% of the respondents were male, 31.47% of the respondents were between the age of 21-30years, 55.24% were single and 53.85% of the respondents had secondary education. All respondents were Christians.

Table 2 shows the distribution of respondents, according to level of knowledge of risk factors associated with exposure to wood dust. About 74% of the respondents were not knowledgeable of the risk factors associated with wood dust.

Table 3 is distribution of workers according to the health effects experienced. About 57% the respondents had respiratory problems/symptoms. These were cough 70.73%, wheezing 13.41%, sputum production 9.76% and shortness of breath 6.1%. About 21% of the respondents also suffered from eye problems.

Table 4 shows availability of occupational health services at the work place. The result showed that there was no occupational health

services provided in the timber market studied. Sources of treatment identified in the study were patent medicine shop (69.7%), private clinic/hospital 4.04% and others 26.26%. None of the respondents had ever had pre-employment and or periodic medical examination since employment.

Table 5 shows proportion of workers using personal protective equipment. About 66% of the respondents had never used personal protective equipment. For those that used, about 92% provided for themselves.

Table 6 shows the exposure of workers to wood dust/duration of exposure in years. About 94% of the workers were exposed to wood dust.

Table 1: Distribution of Respondents by Socio-demographic data. (n=143)

Variables	No. of respondents	Percentage(%)
(a) Sex:		
Male	83	54.04
Female	60	41.96
Total	143	100
(b) Age in (years):		
15-20	35	24.48
21-30	45	31.47
31-40	37	25.87
41-50	25	17.48
51-60	1	0.70
Total	143	100
(c) Marital status:		
Single	79	55.24
Married	53	37.06
Divorced	5	3.50
Widowed	6	4.20
Total	143	100
(d) Educational level:		
Primary education	54	37.76
Secondary education	77	53.85
Tertiary education	2	1.40
Non-formal	10	6.99
Total	143	100
(e) Religion		
Christianity	143	100
Islam	0	0
Traditional	0	0
Others	0	0
Total	143	100

Table 2: Distribution of Respondents According to Level of Acknowledge of Risk Factors associated with Exposure of Wood dust (n=143)

Variables	No. of respondents	Percentage
(a) No. of respondents who had knowledge of the risk factors associated with exposure to wood dust.	37	25.87
No. of respondents who did not have knowledge of risk factors associated with exposure to wood dust.	106	74.13
Total	143	100
(b) Respondents source(s) of information:	11	29.73
Work place	9	24.32
Electronic media	4	10.81
Medical Personnel	11	29.73
Friends	2	5.41
Print media	37	100
Total	143	100

Table 3: Distribution of Respondents According to the Health Effects Experienced/ Occurrence (n=143)

Variables	No. of respondents	Percentage
(a) No. of respondents who had respiratory symptoms.	82	57.34
No. of respondents who never had respiratory symptoms.	41	28.67
No. of respondents who were not sure they had respiratory symptom,	20	13.99
Total	143	100
(b) No. of respondents who had:		
Cough	58	70.73
Wheezing	11	13.41
Sputum production	8	9.76
Shortness of breath	5	6.10
Total	82	100
(c) No. of respondents whose symptoms were regular	5	6.10
No. of respondents whose symptoms were not regular.	59	71.95
No. of respondents who had no specific pattern of symptom	18	21.95
Total	82	100
(d) Respondent with eye problems	30	20.97
Respondents without eye problems	92	64.34
Respondents not sure whether or not they have problems	21	14.69
Total	143	100

Table 4: Availability of occupational health services at work place. (n= 143)

Variables	No. of respondents	Percentage
(a) Present of first aid box/medical services work place?		
Yes	0	0
No	143	100
Total	143	
(b) Have you ever been sick/injured at workplace		100
Yes	99	69.23
No	44	30.77
Total	143	100
(c) Source(s) of treatment when sick/injured at work place.		
Patent medical store	69	69.70
Clinic / Hospital	4	4.04
Others	26	26.26
Total	99	100
(d) Sources of payment during treatment		
Employer	10	10.10
Self	89	89.90
Total	99	100
(e) Have you ever undergone pre-employment/ periodic medical examination since employment?		
Yes	0	0
No	143	100
Total	143	100

Table 5: Proportion of workers using personal protective equipment (n = 143)

Variables	No. of respondents	Percentage
(a) No. of respondents whoever used Personal Protective Equipment	49	34.27
No. of respondents who had never used Personal Protective Equipment	94	65.73
Total	143	100
(b) Types of Personal Protective Equipment used:		
Face-mask	3	6.12
Hand gloves	26	53.06
Respirator/nose mask	15	30.60
Eye goggle	2	4.10
Coverall	3	6.12
Total	49	100
(c) Source of Personal Protective Equipment used		
Employer	4	8.16
Self purchase	45	91.84
Total	49	100
(d) Respondents reasons for non-usage of personal protective equipment		
Not provided	45	47.90
Not necessary	8	8.50
Not comfortable	19	20.20
Not affordable	12	12.76
Only for operations	10	10.64
Total	94	100

Table 6: Exposure of workers to wood dust / duration of exposure in years (n=143)

Variables	No. of respondents	Percentage
(a) Does your work generate dust?		
Yes	135	94.41
No	8	5.59
Total	143	100
Are you affected by the wood dust		
Yes	95	70.37
No	19	14.07
Not sure	21	15.56
Total	135	100
(b) No. of years spent at workplace		
Less than 1 year	35	24.48
1-5 years	56	39.16
6-10 years	42	29.37
11 years and above	10	6.99
Total	143	100
Daily working hours		
Less than 8 hours	0	0
8 hours and above	143	100
Total	143	100
Do you observe off/work free day(s)?		
Yes	0	0
No	143	100
Total	143	100

Discussion

The respondents studied comprised 58.04% male and 41.96% female. Majority of the respondents were ignorant of the potential hazards or risk factors associated with wood dust. Although about 94% of the workers studied agreed to the fact that their job generated wood dust only about 26% were knowledgeable of the risk factors associated with exposure to wood dust.

About 70% of the respondents were affected by wood dust generated in their work place and majority of them (75.52%) had exposure to wood dust for duration greater than one year and beyond. The workers spent more than 8 working hours daily. The findings of this study collaborated Ugheoke (2006), that workers in wood processing industries are often exposed to high level of wood dust in their work environment.

The use of personal protective equipment in the study was not encouraging. About 66% of the workers had never used PPE, considering the various hazards associated with wood dust. The commonly used PPE was hand glove (53.06%). Others were nose mask/respirator (30.6%), face mask and coverall (6.12%) each goggle (4.10%).

With about 31% of the respondent using nose mask, it is obvious, they were exposed to inhalable wood dust in the work place. About 57% of the respondents had various respiratory symptoms such as cough, wheezing, sputum production and short breath. These findings agreed with Rongo, *et al.* (2004) who reported persistent cough, nasal discharge, nasal obstruction, excessive sneezing, chest pain, allergies to specific types of wood, among small-scale industry workers in Tanzania.

The study also supported Oppliger *et al.* (2005), on exposure of workers to wood dust in Swiss

saw mills. They identified poor compliance and non-use of PPE as contributing factors to high cause of disability, mortality and fatality among workers during occupational activities.

There was no provision for occupational health services in Ibesikpo timber market and the workers never had pre-employment or periodic medical examination since employment. Since occupational health services were not provided, most workers sought for treatment in patent medicine shops (69.70%) and other sources (26.26%). United Nations identified ignorance as a primary factor why employer may be uninformed about available health and safety control, and their importance in the work environment (UN 2010).

Conclusion

Although majority of the respondents studied agreed to the fact that their work generated large volume of wood dust, most of them had no knowledge of the potential health hazards associated with wood dust. Hence they could not protect themselves against such exposure. This resulted in majority of them experiencing the various respiratory symptoms. There is need for further studies to determine the extent or magnitude of exposure of the workers to wood dust.

The paper recommends need for proper health education/promotion of the workers on the importance of personal protective equipment. The plant operators should be mandated to use personal protective equipment. The workers in Ibesikpo timber market should be made to undergo periodic

medical examination as many of them are experiencing various respiratory symptoms.

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