International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438

Occupational Exposure to Wood Dust in Calabar Municipality, Cross River State, Nigeria

Osuchukwu Nelson C.[1] Osuchukwu Easter C.[2] Eko Jimmy E.[3], Otareh Otareh O.[4]

[1, 3, 4] Department of Public Health, Faculty of Allied Medical Sciences, University of Calabar, Calabar, Nigeria

[2] Department of Nursing Sciences, Faculty of Allied Medical Sciences, University of Calabar, Calabar, Nigeria

Abstract: ***This study aimed at describing the occupational exposure of workers to wood dust in Calabar Municipality, Cross River State, Nigeria. A cross-sectional study design was adopted and a 36- itemed structured questionnaire was designed and used to generate data from 400 respondents. Multi-stage sampling technique was used to select 52 functional wood processing plants (i.e. 38 wood processing plants at Akim timber market and 14 wood processing plants at eight-miles timber markets). Data obtained from this study were analysed using descriptive statistics and presented in percentages, tables and charts. Results from this study showed that work activities of all the respondents generated wood dusts and 94% of the respondents had respiratory symptoms in the course of their work. Symptoms mostly experienced among the respondents were sneezing 44.8% and cough 19.2%. Seventy-four percent of respondents had no idea of on-site occupational health and safety services. The study also revealed that there was no pre-medical examination on any of the respondents, no standard functional first aid box at the work place, no medical center, no rest or recreation center, no staff canteen and no periodic medical examination on the workers and no separate lavatory facilities for males and females. In conclusion, there was generally poor awareness level on the risk factors associated with exposure to wood dust among respondents and no form of on-site occupational health and safety services in the study area. Increase awareness about risk exposure to wood dust and enforcement of safety standard among workers are pivotal to achieving occupational health and safety in wood processing plants.***

Keywords: Wood dust, occupational health and safety, wood processing plant, Calabar municipality

1. Background of the Study

Human activities, especially their occupations are associated with several forms of hazards that can cause injury and, or disease in an insidious manner. These activities often alter the nature of the environment and create hazards thereby causing health problems. The true extent of these problems may not be known because many occupational symptoms, injuries and diseases are neither notified nor registered (Becklake, 2003). Human exposure to hazard can occur at different stages of the life-cycle of an industrial product through occupational exposure during manufacture, use and disposal, consumer exposure, exposure to contaminated products or environmental exposure to toxic waste. Exposure can occur via pathways, including inhalation of contaminated air and dust, ingestion of contaminated water and food, dermal exposure to chemical or contaminated products (Quinlan et al., 2008).

Most exposures in the working environment are comprised of mixtures of potentially hazardous materials. For instance, exposure to wood dust can at the same time be exposure to harmful biological pathogens and chemicals used in preserving the wood, such as mould, fungi and formaldehydes. Notably, very little is known about the combined effects of exposure to multiple agents, even though the combined effects of some substances that act upon the same body organ are recognized (William, 2005). While inhalation is an important route of exposure for many occupational hazards, many industrial hazardous materials can also be absorbed directly through the skin and oral cavity such as dusts, gases, fumes, temperature, pressure, etc. Occupational exposure occurs during the performance of duties and may place a worker at risk of infection, disease, injury or accident. Many of these conditions can be caused by non-occupational factors, so deciding whether a particular type of disease should be considered as work-related is always to differentiate. In particular, there is often a problem in recognizing the work association for those conditions with long latent period between work exposure and development of the disease such as pneumoconiosis and those which tend to occur after a medium to long period of time of moderately high exposure such as asthma (Peta, 2005).

In developing countries, including Nigeria, workers may be exposed simultaneously to workplace hazards, an unsafe housing environment and a polluted general environment. This is compounded by insufficiently adequately trained occupational medical personnel, poor occupational history-taking and inadequate diagnostic equipments in primary and secondary level of health care services (Loewenson et al., 2002). Unfortunately, many large companies have their own medical services where corporate interests may influence the medical findings. In some cases, workers themselves under report as they ignore symptoms that are mild or short lived, or are unaware of the possible occupational causes of their symptoms. Further health impacts of occupational risk also arise when non-employed population is exposed to such risk. There are many examples of the spillover of occupational respiratory risks to people living within the vicinity of cement factories, flour mill factories, farms (poultry, etc.), wood processing factories, automobile spray painters and most industrial production through air pollution (Kahenya, 2004). In spite of these obvious health facts, there seem to be no comprehensive data in Nigeria as a reference for occupational exposure. Even with the vast number of respiratory conditions that can arise directly or indirectly from work, estimating exposures has often been difficult (Driscoll et al., 2004).

Some occupations with most likely higher risk of occupational exposure to inhalable hazards include but not limited to sawmill (wood) workers, cement factory workers, flour mill factory workers, quarry workers, miners, construction (road, building, crushed rock, metal works) workers, carpenters as well as transportation (road, water and rail) and chemical industry workers. Others include agricultural activities such as poultry farming, piggery, rice farming, sugarcane farming, cotton farming, etc, while artisans include welders, auto mechanics, spray painters, auto electricians, etc. There are some petrochemical refinery workers, coal tar workers, paint makers, pesticide makers, water works (treatment- handlers of chlorine, alum, etc) which may be exposed to work harzards. Other lesser occupation may include street sweeping, cleaners (domestic, office, hospital and industry) (National Institute for Occupational Safety and Health, 2003).

Principally, the major agents of respiratory hazard in all these occupations are dusts, fumes and smoke (carbon monoxide). Hazardous dusts that are generated in most of these occupations are simply categorized as organic or inorganic dust, depending on the nature of work. Dust does not only obstruct the tissue of the respiratory track but also causes irritation and may also carry germs with it. As rightly observed by Claxton and Barring (2005) the most serious hazard today in many industries is dust. It is obvious that trying to list the various occupations with high risk of respiratory hazards generally may seem to be endless. This study is therefore, confined to the possible identifiable exposure to organic dust common in wood (timber) factories or sawmills in Calabar Municipality.

2. Statement of the Problem

Occupational exposure to inhalable harmful wood dust in the workplace has a broad spectrum of adverse effect on workers' health which may include; respiratory irritation, allergic respiratory problems (asthma and hay fever-ike symptoms), nasal and lung cancer (Ige and Onadeko, 2000). Other health problems linked to exposure to wood dust are eye irritation, skin rash (dermatitis) and possibly some types of cancer (Feron et al., 2001). These health effects can arise in a wide range of occupational settings and range from wild, reversible conditions to progressive fatal disorders and can be linked to short-term or long term exposure with tremendous implications on workers health. These health effects are either due to chemicals in the wood or infectious substances in the wood created by bacteria, fungi or moulds. Coughing and sneezing are caused by the wood dust itself (Fokkens and Scheeren, 2000).

It is estimated that deaths from work-related respiratory disease account for about 70% of all occupational disease deaths (WHO, 2002). In Nigeria, particularly in Calabar Municipality, Cross River State, there is no comprehensive statistics on occupational exposure to wood dust in sawmills. Published studies have concentrated on the most prevalent symptoms and disease causing admission to hospital in most urban centers and records of occupational respiratory diseases have remained poor (Akanbi et al., 2009). This makes it difficult for workers to be aware of their health status in terms of work related morbidity and mortality (Ezeonu et al., 2005). Considering the health burden constituted by exposure to wood dust in terms of morbidity and mortality and the paucity of data on occupational exposure to wood dusts in Calabar Municipality, Cross River State-Nigeria, it was imperative to carry out this research work.

3. Objectives of the Study

The general objective of this study is to describe the occupational exposure to wood dust in Calabar Municipality, Cross River State, Nigeria.
The specific objectives of this study are to;

1. examine the nature of dust generated in the work environment in the study area.
2. determine workers' awareness level of the risk factors associated with exposure to wood dusts in their work environment.
3. determine the duration of exposure of workers to wood dusts in the workplace
4. describe the on-site occupational health and safety services in each workplace

3.1 Research Questions

1. Which nature of dust are workers exposed to in the study area?
2. What is the awareness level of the risk factors associated with exposure to wood dusts among workers in the study area?
3. What is the duration of exposure of workers to wood dusts generated in their workplace?
4. Are there available on-site occupational health and safety services in the study area?

3.2 Significance of the study

Occupational dusts are an important group of hazards which cannot be overlooked. Identifying a workplace-related hazard, symptom and cause of disease is imperative because it can lead to proper management, treatment and prevention for other workers. This study would therefore serve as a baseline survey for future research on occupational exposure to wood dust. Recommendations from this study would guide health planners and policy makers to formulate policies that would ensure compliance to safety standards among employers and employees in the study area. Data generated from this study would help in planning, implementation and strategizing intervention programmes that would curb occupational hazard at workplace outlets.

4. Methodology

4.1 Study Setting

The study was carried out in Calabar Municipality. Essentially, Calabar is the capital of Cross River State, within the rainforest belt of Nigeria. Calabar is located on latitude $04^0.57^0$ West and longitude $08^0.20^0$ East. The city is bounded westward by the Calabar River, to the North by Odukpani Local Government Area, to the near east stretches the Great Qua River and Akpabuyo Local Government Area and to the South by Calabar South Local Government Area.

Calabar Municipality has an area of 142km^2 with an estimated population of 179,392 and 10 political wards (NPC, 2006). Most occupants of the area are civil servants, small, medium and large scale entrepreneurs and fishermen. Christianity is the predominant religion with few Muslims and traditionalists. The languages widely spoken are English, Efik/ibibio and Quas. Calabar Municipality is a cosmopolitan city that embraces virtually all the major ethnic groups in Nigeria.

4.2 Study Design

A descriptive cross-sectional study design was employed to describe the occupational exposure to wood dust in Calabar Municipality, Cross River State.

4.3 Study Population

The study population comprised all workers who are at risk of occupational exposure to wood dust, especially those directly involved in all wood milling processes in the study area. The workers comprised of 363 males and 37 females with different age groups ranging from 15 to 60 years and above.

4.4 Sample size determination

The sample size for this study was determined using Daniel's (1979) equation which is given as follows;

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

Where:

n = desired sample size
Z = confidence interval at 95% (1.96)
p = Proportion of workers exposed to wood dust (0.5)
q = (1-p) Proportion of workers not exposed to wood dust (1-0.5 = 0.5)
d = precision or absolute sample error (0.05)

$$n = \frac{(1.96)^2 \times 0.5 \times 0.5}{0.05^2} = 384.16$$

To account for attrition problem, the sample size was increased to 400 which became the actual sample size for the study.

4.5 Sampling Procedure

Multi-stage random sampling technique was used and the procedure is described as follows;

Stage 1: Simple random sampling technique was employed to select two functional timber markets (that is, Akim and Eight miles timber markets) out of the three in the study area using the lottery method.

Stage 2: After a preliminary survey of the two functional timber markets, a total of 52 functional wood processing plants were identified (38 wood processing plants in Akim timber market and 14 wood processing plants in eight-miles timber markets).

Stage 3: Simple random sampling was used to select 292 workers from Akim timber market and 108 workers in Eight-miles timber market. Only workers who were at workplace and gave their consent to participate in the study were interviewed.

4.6 Instrument for Data Collection

A structured questionnaire consisting of 36 items was administered to 400 respondents in the study area. The questionnaire comprised five sections (A to E) on socio-demographic data, occupational exposure to wood dusts among sawmill workers, workers' awareness level of risk factors associated with exposure to dust in their work environment, duration of exposure to dusts hazard among the workers and availability of on-site occupational health and safety services respectively. Pre-testing of the questionnaire was conducted among 20 wood workers at Okomita in Akamkpa Local Government Area. The pre-test was to confirm the viability, correctness and possible amendment of the questionnaire.

4.7 Data Collection Procedure

Four hundred copies of the questionnaires were interviewer-administered to respondents in the study area by four trained field assistants. The field assistants were trained for two days on handling, distribution, consistency in interpretation and collection of the questionnaires. The questionnaire administration was carried out within three days. Respondents were properly guided and assisted by the interviewer on how to fill in their responses on the questionnaires administered to them.

4.8 Method of Data Analysis

Data generated were collated and analysed using statistical packages for social sciences (SPSS version 20.0). Results were calculated in percentages and presented in tables.

4.9 Ethical Considerations

A letter of introduction was obtained from the department of Public health, University of Calabar, Calabar. This letter facilitated the issuance of ethical approval from Ethics Committee Calabar Municipal Council. Verbal consent was duly sought and obtained from the respondents and anonymity and confidentiality of information was maintained through the study.

5. Results

The result of this study showed that most respondents were within the age range of 45-49 years 111 (27.8%) followed by those between 40-44 years 102 (25.5%), then 50-54 years 48 (12.0%) and 35-39 years 43 (10.8%). Predominantly, males 363 (90.7%) participated more than females 37 (9.3%). Majority of the respondents were those who had attained primary level of education (47%), were married 261 (65.2%) and were Christians (99.2%) (Table 1).

In table 2, virtually all respondents 400 (100%) indicated that their workplace generated wood dust; which mean that

they are all exposed to wood dust. A larger proportion of the respondents 378 (94.0%) reported to have experienced some respiratory symptoms during work whereas the remaining 22 (6%) stated otherwise. Among the 94.0% respondents who had respiratory symptoms during work, 114 (19.2%) had cough, 266 (44.8%) sneezing, 13 (2.2%) wheezing, 38 (6.4%) shortness of breath, 92 (15.5%) difficulty in breathing and 71 (12.0%) experienced phlegm production. While most respondents 249(65.9%) reported that the symptom(s) persisted between four to seven days, 95(25.1%) said they experience the symptom(s) for less than three days, 21(5.6%) experienced it for one to two weeks while 13(3.4%) said symptoms(s) persisted for more than three weeks. Based on frequency at which respondents experienced the symptom(s) within one month, most respondents 273(72.2%) had symptoms only once, whereas about 37(9.8%) had the symptom(s) twice, 11(2.9%) experienced symptom(s) three times and 16(4.2%) of the respondents experience symptom(s) more than three times. About 41(10.9%) gave no response (Table 2).

Table 1: Socio-demographic characteristics of respondents (n=400)

Variables	*Number Of Respondents*	*Percentage (%)*
Ages (in years)		
15-19	14	3.5
20-24	17	4.3
25-29	22	5.5
30-34	27	6.8
35-39	43	10.8
40-44	102	25.5
45-49	111	27.8
50-54	48	12.0
55-59	12	3.0
60 and above	4	1.0
Total	**400**	**100**
Sex		
Male	363	90.7
Female	37	9.3
Total	**400**	**100**
Educational level		
No formal education	20	5.0
Primary education	188	47.0
Secondary education	152	38.0
Tertiary education	40	10.0
Total	**400**	**100**
Marital status		
Married	261	56.2
Single	127	31.8
Divorced/separated	9	2.2
widower	3	0.8
Total	**400**	**100**
Religion		
Christianity	397	99.2
Muslim	0	0.0
Traditional religion	3	0.8
Total	**400**	**100**

Table 2: Occupational exposure to wood dust amongst workers, type of symptoms during work, duration and frequency of symptom(s) (n=400)

Variables	*Number Of Respondents*	*Percentage (%)*
Workplace generate dusts		
Yes	400	100
No	0	0.0
Total	**400**	**100**
Ever had respiratory symptoms during work		
Yes	378	94.0
No	22	6.0
Total	**400**	**100**
Respiratory symptoms indicated by the respondents during work ****Multiple responses*		
Cough	114	19.2
Sneezing	266	44.8
Wheezing	13	2.2
Shortness of breath	38	6.4
Difficulty in breathing	92	15.5
Phlegm production	71	12.0
Total	**594**	**100**
Duration of respiratory symptom(s) within a month		
Less than 3 days	95	25.1
4-7 days	249	65.9
1-2 weeks	21	5.5
3 weeks and more	13	3.5
Total	**378**	**100**
Frequency of symptom(s) within a month		
Once	273	72.2
Twice	37	9.8
Three times	11	2.9
More than three times	16	4.2
No response	41	10.9
Total	**378**	**100**

Data in table 3 showed that less than half of the respondents claimed to be aware of the risk factors associated with exposure to wood dust, whereas, about 202 (51.0%) stated otherwise. Their major sources of information were from print/electronic media 65 (16.0%), workplace seminar and training 37 (9.0%) and others sources 96 (24.0%). About 186 respondents identified wood dusts 127 (31.7%), exhaust 33 (8.2%), cold 7 (1.8%) and other risks 19 (4.8%) as respiratory risk factors found at workplace. While a larger proportion of the respondents 387 (86.4%) identified wood dust as the inhalable particle or hazard they always come in contact with during working hours, others identified chemical vapour 11 (2.5%), exhaust 38 (8.5%) and excessive heat 12(2.7%) as inhalable particles or hazards they always come in contact with during working hours. Consequently, most respondents reported to have had respiratory symptom(s) in the course of duty while only 23 (5.8%) did not have any respiratory symptom(s) in the course of their duty (Table 3).

In table 4, available data indicates that most respondents 214 (53.5%) reported to have been exposed to wood dust for 11 years and above, while about 131 (32.8%) respondents said they have been exposed to wood dust between 6-10 years. Others said they have been exposed to wood dust between 1-5 years 47(11.7%), while 8 (2.0%) reported to be exposed to wood dust for less than a year. Based on daily working hours exposure to wood dust, most respondents 303(75.8%) reported to be working for 8-12 hours per day which accounts for their duration of exposure to wood dust on daily basis, whereas 97 (24.2%) said they usually work for less than 8 hours per day. No respondent agreed to have worked for more than 12 hours per day.

In terms of on-site occupational health and safety services, a lesser proportion of the respondents 103 (25.8%) had

knowledge while most respondents 297 (74.2%) did not have any idea about occupational health and safety services. Sources of information about occupational health and safety services among respondents were through on-job training 14 (13.6%) while 89(86.4%) had the knowledge from personal efforts (Table 5). Out of the 400 (100%) respondents, none of the respondents had undergone pre-employment or periodic medical examination in the course of their work. All the 400 (100%) respondents indicated that there is no functional first aid box and medical center in their workplace (Table 5).

Table 3: Respondents' awareness level of risk factors associated with exposure to wood dust (n=400)

Variables	*Number Of Respondents*	*Percentage (%)*
Aware of risk factors associated with wood dusts		
Yes	198	49.0
No	202	51.0
Total	**400**	**100**
Source(s) of information		
Workplace seminar/training	37	9.0
Print/electronic media	65	16.0
Others	96	24.0
No response	202	51.0
Total	**400**	**100**
Risk factor(s) for respiratory symptoms in the workplace		
Wood dust	127	31.7
Exhaust	33	8.2
Cold	7	1.8
Fumes	0	0.0
Others	19	4.8
No response	214	53.5
Total	**400**	**100**
Particles in contact with during working hours		
Dust	387	86.4
Fumes	0	0
Chemical vapour	11	2.5
Exhaust	38	8.5
Excessive heat	12	2.6
Total	**448**	**100**
Ever had respiratory symptoms in the course of duty		
Yes	377	94.2
No	23	5.8
Total	**400**	**100**

Table 4: Duration of exposure to wood dusts in years and on daily work hours (n=400)

Variables	*Numbers Of Respondents*	*Percentage (%)*
Respondents' working duration		
Less than one year	8	2.0
1-5 years	47	11.7
6-10 years	131	32.8
11years and above	214	53.5
Total	**400**	**100**
Daily working hours		
Less than 8 hours per day	97	24.2
8-12 hours per day	303	75.8
More than 12 hours per day	0	0.0
Total	**400**	**100**

Table 5: Awareness of on-site occupational health and safety services at workplace (n=400)

Variables	*Number of Respondents*	*Percentage (%)*
Aware of any occupational health and safety services		
Yes	103	25.8
No	297	74.2
Total	400	100
Sources of information		
On-the-job training	14	13.6
Personal effort	89	86.4
Total	103	100
Ever undergone Pre-employment medical examination		
Yes	0	0.0
No	400	100
Total	400	100
Ever undergone Periodic medical examination		
Yes	0	0.0
No	400	100
Total	400	100
Availability of first aid box at workplace		
Yes	0	0.0
No	400	100
Total	400	100
Presence of medical center		
Yes	0	0.0
No	400	100
Total	400	100
Presence of staff canteen		
Yes	0	0.0
No	400	100
Total	400	100
Presence of rest area or recreational center		
Yes	0	0.0
No	400	100
Total	400	100
Presence of separate toilets for males and females		
Yes	88	22.0
No	312	78.0
Total	400	100

Also, virtually all respondents 400 (100%) indicated the absence of staff canteen, rest or recreational center for workers and most respondents 312 (78.0%) reported that there were no separate toilet facilities for males and females. only 88 (22.0%) respondents said there were separate toilet facilities for males and females (Table 5).

6. Discussion

In this study, 400 wood factory workers at Akim timber market and eightmiles timber market both in Calabar Municipality were interviewed on occupation exposure to wood dust. Both timber markets are clusters of small scale timber processing plants. The workers comprised 90.7% males and 9.3% females. These small-scale wood industries employed people of different age groups ranging from 15-60 years and above with the age group 45-49 years (27.8%) dominating the study. The pertinent issues here are the male dominance in wood working processes and a relatively young workforce showing great gender disparity in the wood processing factory.

Studies have reported that workers in wood processing industries are exposed to relatively high level of dust in their

working environment. In this study, all the respondents (100%) were directly involved in wood processing activities that generate wood dust. Ninety-four percent of the respondents have had respiratory symptom(s) at one time or the other in the course of working in the wood processing factory with sneezing (44.8%) and cough (19.2%) as predominant respiratory problems reported. This may be attributed to the fact that the air the workers inhale at work contained excessive amount of wood dust and also poor ventilation and closed-in-working areas. This finding corroborates that of Ugheoke et al (2009), Honless et al (2005) and Ige & Onadekon (2000) where cough, sputum production, sneezing, wheezing and difficult breathing were mostly some of the respiratory symptoms common among workers in wood processing industries during work. This finding also agrees with that of Okwari et al (2005) which reported high respiratory symptoms such as cough, chest pain and nasal irritation among timber market workers in Calabar.

Among the 94.0% respondents who had respiratory symptoms due to their wood handling or working activities, 65.9% had persisted symptoms up to 4 to 7 days, while 72% experienced symptoms(s) once in a month. This study found out that most of the symptom(s) experienced by respondents were mostly at early stages of their employment. This suggests that the respiratory system had to adjust to the new environment because of first direct exposure to higher intensity of a particular dust hazard. This observation supports that of Pukkala et al (2005) which stated that for a given hazard, the greater the exposure the greater the risk of an adverse effect on health due to exposure-response relationship.

Nearly half of the respondents (49.0%) were aware of the fact that inhalation of wood dust could be hazardous and respondents knew at least one respiratory problem which could result from inhalation of wood dust. This however, suggest that awareness of various occupational hazards among sawmill workers in the study area was low, given that a higher proportion of the respondents (51.0%) were not aware of the health risk associated with inhaling wood dusts. The high level of ignorance shown by workers in identifying potential hazards in their workplace may be attributed to inability to differentiate between the respiratory symptoms associated with the inhalation of wood dusts and symptoms caused by other non-occupational exposure, deciding whether a particular symptom is work-related. This observation agrees with that Peta (2005) which explained that there is always a problem in recognizing the work-related health conditions common in non-occupational community. Awareness level on the effect of exposure to wood dust among respondents were majorly through the media 65(32.8%) and seminar/training 37(18.7%) while 96(48.5%) had other sources of information. This result clearly indicated that the electronic media had played a better role in creating awareness on the risk associated with inhaling wood dust among respondents.

In terms of duration of exposure to dust hazard among workers, a larger percentage of the workers spent more than eight hours at work which is against the normal eight hour workday standard term exposure limit. Ugheoke et al (2006) argued that sawmill workers who spent more than 8 hours per day may experience more stress at the end of the day and this can also increase the risk of injury and more exposure to inhalable wood dusts at workplace. It was found in this study that majority of the respondents (86.4%) were always in contact with wood dust during work and 94.2% have had respiratory symptoms in the course of duty with excessive sneezing (44.8%) dominating. This finding is consistent with that of Rongo et al (2004) who reported that persistent cough, nasal discharge, nasal obstruction, excessive sneezing, chest pain, allergies to some specific types of wood and excessive formation of phlegm in the morning are most of the symptoms often cited before manifestations of acute or chronic respiratory ailments emanating from exposure to wood dust. The respiratory symptoms mentioned may generally be regarded as an indicator of a pathological condition in the respiratory system.

About two-third of the respondents (74.2%) had no knowledge about occupational health and safety. This result showed that very little is done by employers to train their workers on the basic occupational health and safety services at the workplace. The lack of an organized occupational health services in the study area and ignorance on the part of both employers and employees (woodworkers) might have resulted in their being exposed to wood dust hazards that have adverse consequences on their health. This results conforms to that of Ewuzie and Ibhafidon (2007) who found out that ignorance of workers management to industrial safety could be a hindrance to efforts that might be made at safeguarding or protecting the workers from harm. United Nations (2000) equally identified ignorance as a primary factor why many employers may be less knowledgeable about the importance of occupational health and safety control measures. In this study, it was also reported that employers of labour had no knowledge of the importance of pre-employment medical examination as virtually all respondents (100%) had no pre-employment medical examination at their workplace. Low educational status and absent exposure to workshop/training or seminar of most employers may significantly influence their lack of knowledge of considering pre-employment medical examination as a requirement for recruiting workers. This study also recorded complete absence of first aid box, health clinic, recreation centers and staff canteen at workplace. Also, most respondents reported that they were no separate toilet facilities for males and females at work place.

7. Conclusion and Recommendation

This study showed that all 400 study participants were exposed to wood dust and 94% experienced production respiratory symptoms such as cough, sneezing and phlegm production in the course of working in the wood processing factories. There was no pre-employment medical examination, periodic medical examinations, no standard functional first aid box, no health clinic, no staff canteen, and no rest or recreational center for staff among others. Hence, the government and relevant agencies should impose higher restrictions and enforcement guidelines for establishing wood processing factories with proper provision for occupational health and safety services before granting licenses to wood processing factory operators. Awareness on

the importance of occupational health and safety control measures among employers of labour should be intensified in all wood processing outlets.

References

[1] Aknabi M. O., Ukoli C. O., Erhabor G. E., Aknabi F. O., Gordon S. B. (2009): The burden of respiratory disease in Nigeria. *African Journal of Respiratory Medicine*; 39(1):10-16
[2] Becklake M. R. (2003): Ocuupational exposures: Evidence for a casual association with chronic obstructive pulmonary disease. *American Review of Respiratory Disease*; 140(2):S85-S91
[3] Claxton L. D., Barring A. (2005): Chemical mutagens: An emerging issue for public health. *American Journal of Public Health*; 67(2):1037-1041
[4] Driscoll T., Nelson D., Steenland K., Leigh J., Concha-Barrientors M., Fingerhut M., and Puss-Ustus A. (2004): Occupationally related respiratory disease: Respiratory tract infections. *Industrial Occupational and Environment Medicine*; 38(2): 56-62
[5] Ewuzie M. A., Ibhafidon A. (2007): Occupational health hazards in Nigerian industries: implication for increased health education. *International Journal of Occupational and Environment Health* 12(2):101-120
[6] Ezeonu E., Ezeonu J., Edeogu O. C. (2005): Occupational health hazards in the Nigerian cement industry-workers' awareness and perception. *African Newsletter on Occupational health and Safety* 15(2):75-76
[7] Feron V. J., Arts J. H., Kuper C. F., Slootweg P. J. Woutersen R. A. (2001): Health risks associated with inhaled nasal toxicants. *Critical Review of Toxicology*; 31(2):313-347
[8] Fokkens W. J., Scheeren R. A. (2000): Upper airway defecne mechanism. *Paediatric Respiratory Review*; 1(1):336-341
[9] Holness D. L., Sass-Kortsak A. M., Pilger C. W., Nethercott J. R. (2005): Respiratory function and exposure-effect relationships in wood dust-exposed and control workers. *Journal of Occupational Medicine;* 27(13):501-506
[10] Ige O. M., Onadeko O. B. (2000): Respiratory symptoms and ventilator functions of the sawmillers in Ibadan, Nigeria. *African Journal of Medical Science*; 29(4):101-104
[11] Kahenya P. A. (2004): Review of studies on occupational disease in Kenya. *African Newsletter on Occupational Health Safety*; 6(2):46-49
[12] Loewenson R., Laurel A., Hogstedt C. (2002): Participatory approaches to occupational health research. *Arbete Och Halsa, Sweden*; 38(2):17-31
[13] National Institute of Occupational Safety and Health (NIOSH) (2003): The work-related lung disease surveillance report. Cincinnati: U.S. Department of Health and Human Services; 88(4):1-55.
[14] National Population Commission (2006): Nigeria demographic and health survey, Abuja: National Bureau of Statistics, Abuja.
[15] Okwari O. O., Antai A. B., Owu D. U., Peters E. J., Osim E. E. (2005): Lung function status of workers exposed to wood dust in timber markets in Calabar. Nigeria. *African Journal of Medical Sciences*; 34(2):141-578
[16] Peta M. (2005): Occupational respiratory disease: SWORD surveillance of work-related and occupational respiratory disease in the UK. *Occupational Medicine*; 86: 104-128
[17] Pukkala E., Guo J., Kyyronen P. (2005): National Job-exposure matrix in analyses of census-based estimates of occupational cancer risk. *Scandinavian Journal of Work Environment and Health*; 13(2):3197-3207
[18] Quinlan P. J., Earnest G., Eisner M. D. (2008): Performance of self-reported occupational exposure compared to a job exposure matrix approach in asthma and chronic rhinitis. *Occupational and Environment Medicine*; 18(9):805-810
[19] Rongo L. M., Barten F., Msamanga G. I., Heederik D., Dolmans W. M. (2004): Occupational exposure and health problems in small-scale industry workers in Dar es Salaam, Tanzania: A situation analysis. *Occupational Medicine* 54(1):42-46
[20] Ugheoke A. J., Ebiomoyi M. I., Iyawe V. I. (2009): Influence of smoking on respiratory symptoms and lung functions indices in sawmill workers in Benin City, Nigeria. *Nigerian Journal of Physiological Sciences;* 21(3):49-54
[21] United Nations (2000): *International Standard Industrial Classification of all Economic Activites (*ISIC) (3rd ed.) York: United Nations ;112-151
[22] Williams P. B. (2005): Wood technology: Critical analysis of studies concerning reports of respiratory sensitization to certain wood dusts. Allergy and Asthma Proceedings; 26(4): 262-267
[23] WHO (2002): Health promotion for working populations: Technical report series no. 765 Geneva: World Health Organisation; 22-56.