

# PULMONARY PROBLEMS AMONG SAWMILL WORKERS IN A RURAL COMMUNITY IN SOUTH-SOUTH NIGERIA

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## ABSTRACT

**Aim:** This study was carried out to determine the knowledge, prevalence of respiratory symptoms and preventive measures put in place by saw-millers towards wood dust exposure.

**Methods:** The study was carried out in a rural community in south-south Nigeria. All sawmills in the community were utilized for the study and a total population of 36 workers in the sawmills who met the inclusion criteria were recruited for this study. Interviewer-administered questionnaire was used to obtain data from respondents. Data collected were entered into spread sheet and analyzed using IBM-SPSS version 20.0

**Results:** Most of the respondents had good knowledge of pulmonary problems associated with wood dust. Majority of them (80.6%) had respiratory symptoms in the course of their work and the symptoms mostly experienced were sneezing 86.2%, catarrh 82.8% and cough 65.5%. Majority of them (72.2%) used personal protective equipment and all respondent were aware of preventive measures towards wood dust.

**Conclusion:** Most of the respondents had good knowledge of symptoms of dust inhalation and majority had respiratory symptoms including sneezing, catarrh, and cough. Majority also used personal protective equipment.

**Key words:** Sawmill workers, Knowledge, Respiratory symptoms, pulmonary problems, Preventive Measures.

## INTRODUCTION

Wood dust which is a byproduct of wood processing is a major cause of occupational hazards among sawmills workers<sup>1</sup>. Sawmilling operation usually involves a lot of manual handling which make workers susceptible to higher level of risk. One of the major problems of saw mill workers is pulmonary problems which result from inhalation of organic and inorganic dust generated from wood processing. This occur because the respiratory system is the most important system affected by dust particles and chronic exposure to these dust particles causes irritation of the respiratory tract with development of the respiratory symptoms,

damaging the lung tissue, decreasing pulmonary function and subsequently increasing the risk of developing lung cancer which is a significant cause of morbidity and mortality.

When dust particles are inhaled, immune cells like macrophages engulf the particles and dissolve it. However, in chronic dust exposure the phagocytic activity of the alveolar macrophages are impaired leading to overwhelming of the immune mechanism. The dust particles then lodge and stimulate inflammation in the small airway of the lungs which result in respiratory symptoms such as cough, running nose, irritation of the eyes, phlegm, sneezing, wheezing, dyspnoea, chronic bronchitis, chest pain, chest tightness, decrease lung function and asthma. Worked related asthma is the commonest cause of occupational respiratory disorder in industrialized society<sup>2</sup>. Chronic wood dust exposure tend to deteriorates pulmonary function, increase the prevalence of developing pulmonary disease, exacerbate both acute and

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chronic respiratory illnesses and increase the risk of developing lung cancer.

In addition many factors such as use of ageing machine, poor maintenance of the local exhaust ventilation system, leakage of dust from the joint of the central exhaust ventilation system into the working environment increases the risk of exposure to dust<sup>2</sup>. The increase prevalence of pulmonary problems among saw mill workers is due to lack of knowledge on health hazards of wood dust and the possible potential hazards from chronic wood dust exposure. This low awareness on health risk of dust exposure is associated with grievous consequences on the health status of saw mill workers. Sawmill workers are exposed to high level of wood dust, which can significantly lower their lung function; hence, they are more likely to wheeze or run out of breath<sup>1</sup>. Previous comparative study among sawmill workers and other workers (control) showed the sawmill workers to have significantly high prevalence of regular cough, regular phlegm, regular runny nose and nasal secretion, frequent headaches and irritation of the eyes<sup>1</sup>. Other effect of wood dust in addition to impairment on pulmonary function includes its irritating effect on the eyes, nose and throat<sup>3</sup>. 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.<sup>4</sup> Dust does not only obstruct the tissue of the respiratory track but also causes irritation and may also carry germs with it.

### MATERIALS AND METHODS

This study was conducted among 36 sawmill workers in a rural community in South-South Nigeria. The community has an area of 253km<sup>2</sup> and a population of 105,310 at the 2006 census and 2017 projected population of one hundred and thirty seven thousand, four hundred and fifty nine (137,459). It lies between latitudes 6° 44' North and 6° 11' North of the equator and longitudes 6° 13' East and 6° 7' East of the Greenwich Meridian. A descriptive cross sectional study design was utilized for the study and a total

population of all saw millers in the community was studied. Data collected were analyzed using IBM- SPSS version 20.0. Results were presented in frequency tables, charts and graphs. All the questions on knowledge were awarded a total of 13 points. Each wrong response to the questions on knowledge were awarded 0 point and each correct response was awarded 1 point each making a total of 13 points. Respondents with 7-13 points were regarded as having good knowledge while respondents with 0-6 points were regarded as having poor knowledge.

### RESULTS

The respondents were all males. A greater proportion of the respondents were within the age group of 31-40 years 14(38.9%). More of the respondents 25(69.4%), had secondary level of education while majority of them were Christians 30 (83.3%), and Esan by tribe 28(77.8). More of the respondent have worked for less than 10years in wood industry 25(69.4%), only 3(8.3%) have worked for greater than 20years. Majority of them, 31(86.1%) had good knowledge of pulmonary problems while 5(13.9%) had poor knowledge of pulmonary problems.

Also, majority of the respondents 29(80.6%) had respiratory symptoms which include cough 19(65.5%), catarrh 24(82.8%), difficulty in breathing 13(44.8%), chest pain 14(48.3%), sneezing 25(86.2%), wheeze 12(41.4%), phlegm production 15(51.7%), chest tightness 14 (48.3%) while only few of them 7(19.4%) did not experience respiratory symptoms. Majority of them 26(72.2%) have use preventive measures such as face mask 26(72.2%), goggles 3(8.3%), protective apron 2(5.6%), hand gloves 5(13.9%), safety boot 3(8.3%).

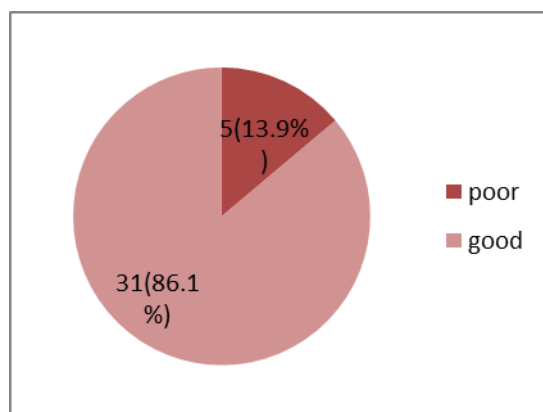
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**Table 1: Sociodemographic characteristics of respondents**

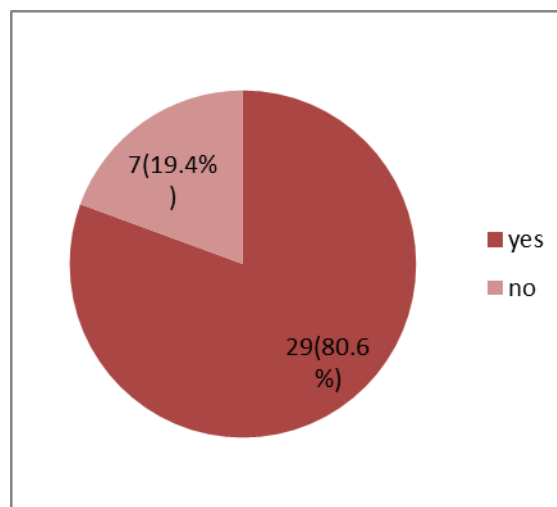
Variables	Frequency n=36	Percent
<b>Age</b>		
21-30	10	27.8
31-40	14	38.9
41-50	7	19.4
51-60	5	13.9
<b>Level of Education</b>		
Primary	11	30.6
Secondary	25	69.4
<b>Religion</b>		
Christian	30	83.3
Muslim	4	11.3
ATR*	2	5.6
<b>Ethnicity</b>		
Bini	2	5.6
Esan	28	77.8
Etsako	3	8.3
Others**	3	8.3
<b>Marital Status</b>		
Married	19	52.8
Singles	17	47.2
<b>Years Worked In A Sawmill</b>		
<10 years	25	69.4
10-19 years	8	22.2
20-29 years	3	8.3

Mean age  $\pm$  sd: 36.9  $\pm$  10.5; \*ATR- African Traditional Religion

\*\*Others: Ibos =2(5.6%), Urhobo =1(2.7%)



**FIGURE 1: Respondents knowledge of pulmonary problems associated with wood dust.**



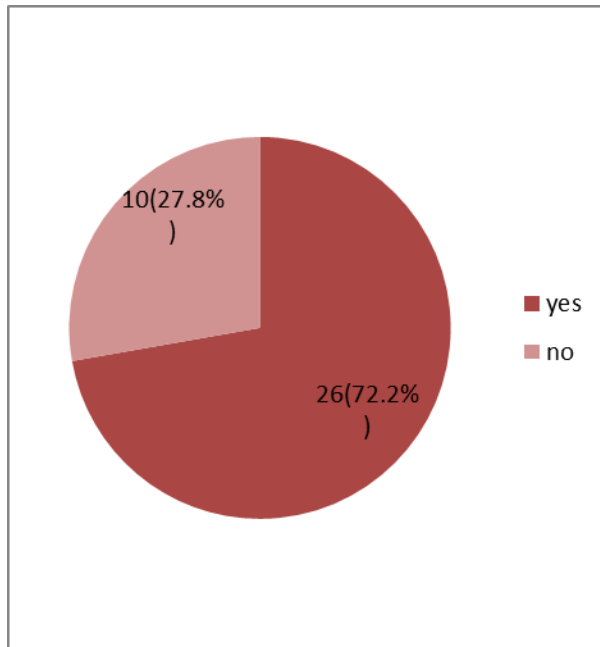
**Figure 2: Respondents who had respiratory symptoms**

**TABLE 2: Symptoms experienced by respondents**

*SYMPTOMS	FREQUENCY n=29	PERCENT
Catarrh	24	82.8
Sneezing	25	86.2
Cough	19	65.5
Phlegm production	15	51.7
Chest tightness	14	48.3
Chest pain	14	48.3
Difficulty in breathing	13	44.8
Wheeze	12	41.4

\*Multiple responses

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**Figure 3: Respondents who used preventive measures**

**TABLE 3: Personal protective equipment used by respondents**

PPE used*	Frequency n=26	Percent
Face mask	26	100.0
Hand gloves	5	19.2
Goggles	3	11.5
Safety boot	3	11.5
Protective apron	2	7.7

\*Multiple responses

### DISCUSSION

All the participants in this study were males, which shows that sawmilling is a male dominated occupation. This is similar to a study carried out in cross river<sup>4</sup> where all respondents were male This is also similar to the study carried out in Osun State<sup>3</sup>, and Kwara State<sup>5</sup> Nigeria where majority of the workers were males. But in contrast to studies carried out in Jos,<sup>6</sup> and south-western Nigeria<sup>7</sup> where females made up 2.5% and 30 % of the respondents respectively. This male dominance in the sawmill industry could be as a result of the strenuous nature of sawmill work.

The highest level of educational qualification of respondents was secondary school. This is similar

to the study done in Kwara State<sup>5</sup> where secondary school was the major qualification among sawmill workers studied. In this study larger percentage of the workers have spent less than 10 years at work place, 22.2% have spent 10-19 years while some (8.3%) have spent more than 20 years. The longer the length of exposure to dust inhalation, the more likely the impairment of lung function and development of respiratory symptoms. This fact was demonstrated in a study carried out in Sulaimani<sup>2</sup> where long-term exposure to wood dust impairs pulmonary function and duration of this exposure mostly determines the extent of the pulmonary problems. Also, data from previous studies showed that the decrease in pulmonary function was correlated with the time spent working in sawmill industry<sup>2</sup>. More than half of the respondents in this study worked for more than 8hours per day. This is similar to the study carried out in South-Western Nigeria where over 90% of sawmill workers worked for more than 8hours per day. The finding also compliment the work done in Calabar<sup>4</sup> where a large number of workers spent more than 8 hours at work which is against the normal 8hours work day standard term exposure limit<sup>4</sup>. Workers who spent more than 8hours 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 dust at work place.

In addition, this study showed that most respondents (86.1%) had good knowledge of respiratory symptoms caused by wood dust and inhalation was the major route of entrance of dust into the alveolar space causing respiratory symptoms. This is similar to the study done in Osun<sup>3</sup> in which respondents acknowledged that wood dust is hazardous and knew that it inhalation could cause cough, phlegm production, wheeze, dyspnoea, sneezing and catarrh. This is also similar to work done in Ghana<sup>11</sup> where respondents have very high awareness of occupational health and safety issues related to their work. This however contradicts the work done in Kwara State<sup>5</sup> and Cross River State<sup>4</sup> as Majority of respondents in the study groups had a poor knowledge of the danger of sawmill dust and

health effects of the dust. This was probably due to the fact that most of the respondents received their training through apprenticeship and thereby rely on their masters for information on the job especially knowledge of hazards associated with wood dust of which the master too probably have insufficient knowledge. This lack of formal training for the job might not allow the workers to learn about the hazards associated with their occupation as well as possible precautions to be taken in the practice of their vocation. The poor knowledge could explain hazards and probably health problems associated with sawmill workers due to their poor knowledge hence exposure of workers to wood dust and subsequent development of respiratory symptoms<sup>5</sup>. Workers in the wood industries are exposed to relatively high level of dust in their working environment and subsequently dust inhalation if proper and adequate measures is not put in place to minimize dust inhalation<sup>8</sup>.

Findings from this study also showed that respiratory symptoms among sawmill workers were significantly high. 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 working area. In this study, all the respondents (100%) were directly involved in wood processing activities that generate wood dust, 80.6% of the respondents have respiratory problem at one time or the other in the course of working in the wood processing factory. Symptoms experienced by respondents were sneezing (69.4%), catarrh (66.7%), cough (52.8%), phlegm production (41.7%), chest pain (38.9), chest tightness (38.7%), difficulty in breathing (36.1%), and wheeze (33.3%) with sneezing, catarrh and cough being the most predominant respiratory problem reported. This was in agreement with the study carried out in south western Nigeria<sup>1</sup>, Osun State<sup>3</sup> and Cross River state<sup>4</sup> where high prevalence of respiratory symptoms among respondents studied were high. While the prevalence of cough (52.8%) among sawmill workers in this study is comparable to the 53.0% reported in Osun state Nigeria<sup>3</sup>, it is lower than the 60% reported in south western Nigeria<sup>1</sup> and higher than 19.2%

reported in cross river state<sup>4</sup>. Similarly while the prevalence rate of sneezing among sawmill workers in this study was found to be 69.4%, 54.0% was reported in south western Nigeria<sup>1</sup>, Osun state reported 54%<sup>3</sup> while cross river states reported 44.8%.<sup>4</sup>Also in this study, among the 80.6% respondents who had respiratory symptoms due to their wood dust handling or working activities, 48.3% had persisted symptom up to 4-7 days, 37.9% had symptoms less than 3 days and 13.8% had symptoms lasting more than a week. This observation supports the study done in Cross River State Nigeria<sup>4</sup>. All the respondents were aware of preventive measures against wood dust exposure. This observation was similar to that done in Ghana<sup>9</sup> were the result indicated that the respondents rated very high their awareness of occupational health and safety issues related to their work. This however contradicts the study done in Osun State<sup>3</sup> were respondents had poor knowledge about occupational health safety practices. A greater percentage (72.2%) of respondents uses personal protective equipment. This contrast study done in North Central Nigeria<sup>10</sup> were majority of the workers did not make use of the available protective gadgets.

In conclusion, most of the saw-millers had good knowledge of wood dust and a higher proportion of them had respiratory symptoms such as cough, catarrh, sneezing, phlegm production, difficulty with breathing, chest pain and chest tightness. Majority of the respondent used preventive measures such as face mask but the appropriate nose mask may not have been used. Based on the findings from this study, the following recommendations are made: The employers of saw-millers should provide all needed personal protective equipment in the saw mill factories. They should also train and encourage the workers on the effective use of the provided personal protective equipment. The employer of saw-millers should also make the work environment conducive for its employee by minimizing dust generation, provision of protective equipment and training of its work.

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