

(RESEARCH ARTICLE)



## From sawdust to safety: Examining knowledge and practices of respiratory protective measures among sawmill workers in South-Eastern Nigeria

Festus Nnabuife Nwakpa <sup>1</sup>, Chioma Chetachukwu Ajator <sup>2</sup>, Ifeoma Bridget Udigwe <sup>2</sup>, Gabriel Chidera Edeh <sup>1</sup>, Onyeka Chukwudalu Ekwebene <sup>3, \*</sup>, Solomon Chukwuemeka Anulia <sup>1</sup>, Sharon Tare Ajuwa <sup>1</sup> and Pascal Chukwuebuka Ezerioha <sup>1</sup>

<sup>1</sup> Department of Medicine, Faculty of Medicine, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria.

<sup>2</sup> Department of Community Medicine, Nnamdi Azikiwe University University Teaching, Nnewi, Anambra State, Nigeria.

<sup>3</sup> Department of Epidemiology and Biostatistics, East Tennessee State University, Johnson City, TN, USA.

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### Abstract

The availability of timber products and the increase in demand for construction and export have made it a thriving business in Nigeria. . Chronic respiratory symptoms are common among sawmill workers because of their exposure to occupational-related sawdust hazards. This study aimed to assess the knowledge, self-reported respiratory symptoms, and protective measure in place by the sawmill workers. This was a cross-sectional study and it was carried out at Timber market, Nkwo-Nnewi, Anambra state, Nigeria with a sample size of 157. Structured interviewer-administered questionnaire was used for data collection. Data were analyzed with the statistical package for social sciences. The result of the study showed that nearly all the respondents were male (97.5%) and the majority were between 30-49 years of age. 45.9% of the respondents had worked at the sawmill for 10 years and above. The majority of the respondents were aware that the sawmill dust can affect their respiratory health 119(75.8%).Some of the respiratory problem reported include: Cough 97(61.8%), Cold 81(51.6%), Chest tightness 18(11.5%), Wheeze 17(10.5%), Shortness of breath 12(7.6%). The study indicated that majority of the respondents do not make use of personal protective device 100(63.7%) whilst only 57(36.3%) make use of personal protective equipment. Some of the common reasons cited for not using PPE were that it was not comfortable 44(43%) and that the PPE was not available 34(34%). A great percentage of the sawmill workers had poor knowledge of respiratory protective measures (37.0%). The sawmill workers had a high prevalence of respiratory symptoms probably because poor safety practices were evident. It is therefore essential to improve the level of knowledge among sawmill workers about occupational hazards and safety practices in order to mitigate its negative consequences. These can be achieved via periodic health awareness campaigns, and health policies by the government with the aim to enforce the sawmill workers to observe proper protective measures while working.

**Keywords:** Sawmill workers; Personal protective equipment; Respiratory protective measures; Knowledge

### 1. Introduction

Sawmilling is the process of breaking down timbers into further different sizes of boards after passing through various machines in the sawmill plant. Sawmill workers are grouped into machine operators, saw technicians, dust packers, overseers, wood loaders, machine off-loaders, and administrative staff with different duration of exposure to wood dust at the workplace<sup>1</sup>. Wood as the primary raw material in the sawmill has been used for ages for many purposes, primarily as a fuel or as a construction material in almost all countries because of its high tensile strength and durability<sup>2</sup>. Almost all sawmills generate wood dust, which is made as a by-product of wood processing during the cutting or shaping of wood materials. Its components have the property of sensitizing and irritating the mucous membrane<sup>3,4</sup>. In developing

\* Corresponding author: Onyeka Chukwudalu Ekwebene

countries, the demand for wood in construction, furniture, and fuel is on the increase and Nigeria is not an exception which has led to an increase in sawmill industries.

One of the major health challenges among sawmill workers is respiratory diseases. Respiratory disease comprises a broad spectrum of disorders as a result of inhalation or ingestion of noxious chemicals or dust particles and despite governmental safety standard regulations; it remains one of the most common work-related injuries worldwide.<sup>1,3</sup> Exposure to wood dust has been associated with varieties of respiratory disorders among sawmill workers, such as asthma, chronic bronchitis, chronic obstructive pulmonary disease (COPD), hypersensitivity pneumonitis or organic dust toxic syndrome, with atopic and non-atopic inflammation in the airways as predominate underlying pathological mechanism<sup>5</sup>. These hazards encountered here could be due to indecorous handling of sawmill machinery, lack of necessary prevention facilities, skill, and poor safety culture and practices. International Labor Organization (ILO) in 2016 declared that 2.02 million deaths occur each year from work-related incidents or injury and over 3.7 million people are being affected by work-related diseases, while an estimated 337 million fetal and non-fetal work-related accidents per year are all associated with occupational hazards<sup>6</sup>. The International Agency for Research on Cancer (IARC) has classified wood dust as carcinogenic, particularly for cancers of the nasal cavities and paranasal sinuses, mainly as a result of exposure to hardwoods, but there may also be a much smaller excess risk of sinonasal cancer associated with softwoods<sup>7</sup>. A study done in the United States revealed that use of PPE was poor, and this was attributed to lack of comfort, young age and lack of safety training<sup>8</sup>. A study in southwest Nigeria discovered the prevalence of cough and sneezing among sawmill workers as being 60% and 54% respectively and this was significantly higher than in the control group<sup>9</sup>. Research on occupational exposure in the wood industry has suggested those workers in sawmills, lumber mills, plywood and particle board factories are at high risk of developing lower respiratory tract diseases, allergenic disorders, cancer, and lung diseases<sup>4,10</sup>. Despite the potentially hazardous nature of the work, there has been little attention given to their state of health and safety in Nigeria by government health departments<sup>7</sup>. The respiratory health effects associated with wood dust come not only from the wood dust alone, but from other sources like biological organisms such as endotoxins, allergenic fungi and Mold which grows on the wood, as well as chemicals such as formaldehyde, copper naphthenate and pentachlorophenol used in the processing of some woods are also implicated<sup>11</sup>.

The sawmill business is a thriving business in Nigeria because of the availability of timber and high demand for timber products in both the local and export markets. Workers processing wood could be exposed to various allergenic, immune, toxic and carcinogenic substances originating from wood itself such as wood dust, bacteria and fungi growing on timber. The exposure may cause decline in lung function, bronchial hyper-responsiveness and various diseases such as allergic alveolitis, asthma, chronic bronchitis, rhinitis, mucous membrane irritation, contact dermatitis and nasal cancer. This study is essential in the estimation of the burden of respiratory problems among sawmill workers at the timber market. It will help create awareness and evaluate the knowledge of the workers about the risk of wood dust and other occupational hazards exposure and to ascertain the level of preventive measures in place by the sawmill workers. Also, there is scarcity of study on health challenges among sawmill workers in southeast Nigeria, hence this study intend to fill this gap.

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## 2. Material and methods

### 2.1. Study Area

This study was conducted in Nnewi, a city in Anambra state, South-eastern Nigeria. Nnewi is renowned for its vibrant commercial and industrial sectors and is the second largest and second most populated city in the state.<sup>12</sup> The city has a population of over 900,000 according to 2019 population projection<sup>12</sup>. Nnewi have about eight major markets: New motorcycle spare parts, New motor spare parts, Nwagbara market (mgbuka machine parts), Nnewi general market, Building material market, Electrical/Electronic market, Generator parts market and Timber dealers market(Ogbo osisi)<sup>13</sup>; however, this study specifically focused on the Timber dealers' market.

### 2.2. Study population

This included all the sawmill workers in the Timber dealers market (Ogbo osisi).

### 2.3. Research design

A cross-sectional study design was adopted for this study.

## 2.4. Inclusion Criteria

All the fully registered/identified workers present at the sawmill in Nkwo Nnewi Timber dealers' market and who gave informed consent.

## 2.5. Exclusion Criteria

Those not registered/identified as a worker in the sawmill, and those who met the inclusion criteria but didn't give consent to participate in the study.

## 2.6. Sample Size Determination

The sample size for this study was determined using the formula below:

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

Where,

n=Sample size.

Z=1.96(i.e.95% confidence interval)

d=0.05(acceptable margin of error)

p=69.8%=0.698(prevalence of sawmill workers with respiratory symptoms).<sup>14</sup>

q=1-p=1-0.698=0.302

Therefore,

$$= \frac{(1.96)^2 \times 0.698 \times 0.302}{(0.05)^2}$$

$$n=324$$

$$nf = \frac{n}{1 + (n/N)}$$

Where nf= Estimated population size.

N= 305, Population size of sawmill workers in Nkwo-Nnewi (from record gotten from chairman Ogbo-osisi group)

n= 324, sample size

Therefore

$$nf = \frac{324}{1 + (324/305)}$$

$$nf= 157.$$

## 2.7. Sampling Technique

The total population, one hundred and fifty respondents (305), was sampled from the Nkwo Nnewi Sawmill sites at Anambra state. A simple random sampling procedure that gives everyone an equal chance of being selected was adopted for this study. Enough number of research assistants were recruited for the data collection on a single day to prevent a particular subject from being sampled twice.

## 2.8. Research tools

The interviewer-administered questionnaire, sourced from previous work on the subject, was used to get the required data from the respondents.

## 2.9. Data analysis

Data collected were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive and inferential Statistics was applied where necessary. Numerical variables were reported as mean and standard deviation, while categorical data were reported using proportion and percentages. Chi-square test was used to assess the association between categorical variables. Variables with p-value  $\leq 0.05$  in the confidence interval of 95% was taken as being significant.

## 3. Results

Table 1 below shows the demographic data of the respondents. One hundred and fifty-seven participants were recruited for this study. A great number of the study participant (44.6%) were between 30-49 years, with mean age of  $46.54 \pm 10.7$  years. Most of the respondents were male (97.5%), completed primary education (63.1), married (72.0) and have been working at sawmills for more than 10 years (45.9%).

**Table 1** Socio-Demographics of the Respondents (n = 157)

Variables	Characteristics	Frequency ( N )	Percentage ( % )
Age range of respondents (yrs.)	10-29	32.0	20.4
	30-49	70.0	44.6
	50 and above	55.0	35.0
Mean $\pm$ SD	46.54 $\pm$ 10.7 years		
Educational status	Primary	99.0	63.1
	Secondary	40.0	25.5
	Tertiary	15.0	9.6
	None	3.0	1.8
Gender	Male	153.0	97.5
	Female	4.0	2.5
Marital status	Married	113.0	72.0
	Single	42.0	26.8
	Divorced	1.0	0.6
	Separated	1.0	0.6
Years of experience	Less than 10 years	85.0	54.1
	10 years and above	72.0	45.9

Table 2 below summarizes the respondents' knowledge of respiratory protection. Majority knew that sawdust can affect their respiratory system (75.8%). Majority works less than 10 hours/day (65.0%). Approximately half of the respondents believe that reducing working hour/day will help limit hazards (49.7%), of which majority intends to reduce their working hour/day to less than 8 hours. Majority of them had training before employment (59.2%), most of which were via apprenticeship (90.3%), with most spending less than 4 years in training (89.2%). Overall, there is at least fair knowledge of respiratory protection among the respondents (63.0%).

**Table 2** Knowledge of respiratory protective measures among sawmill workers

Variable	Characteristics	Frequency ( N )	Percentage (%)
Can dust affect your respiratory system?	Yes	119	75.8
	No	38	24.2
Maximum working hour/day	Less than 10 hours	102	65.0
	10 hours and above	20	12.7
Can reducing working hour/day limit hazards?	Yes	78	49.7
	No	79	50.3
What are you going to reduce your working hour/day to? (N=78)	<8 hours	61	78.2
	8 hours and above	17	21.8
Training before employment.	Yes	93	59.2
	No	64	40.8
Place of training (N=93)	Apprenticeship	84	90.3
	Technical school	9	9.7
Duration of training (N=93)	Less than 4 years	83	89.2
	Greater than 4 years	10	10.8
Overall Knowledge level	Good knowledge	44	28.0
	Fair knowledge	55	35.0
	Poor knowledge	58	37.0
	Total	157	100.0

**Table 3** Prevalence of Respiratory symptoms among Sawmill Workers at Nkwo Nnewi Market

Variable		Frequency (N=157)	Percentage (%)
Cold	Yes	81	51.6
	No	76	48.4
Cough	Yes	97	61.8
	No	60	38.2
Wheeze	Yes	17	10.8
	No	140	89.2
Shortness of breath	Yes	12	7.6
	No	145	92.4
Chest Tightness	Yes	18	11.5
	No	139	88.5

Table 3 illustrates the prevalence of various respiratory problem among the sawmill workers at the Timber Market. More than half of them had cold (51.6%) and cough (61.8%), however only 10.8%, 7.6% and 11.5% had wheezing, shortness of breath and chest tightness respectively.

**Table 4** Protective Measures in Place to Help Prevent Respiratory Problems Among the Sawmill Workers (n=157)

Variable		Frequency	Percentage
Use of PPE	Yes	57	36.3
	No	100	63.7
Types of PPE used	Facemask	40	70.2
	Handkerchief	7	12.3
	Hand glove	7	12.3
	Facemask and handkerchief	2	3.5
	Facemask and hand glove	1	1.8
Regularity of usage	Always	2	3.5
	Occasionally	55	96.5
Reason for not using PPE	Not comfortable	44	43.0
	Not available	34	34.0
	Can't afford it	1	1.0
	Others	21	22.0

Table 4 summarizes the protective measures adopted by the respondents to help prevent respiratory problems. Only 36.3% use personal protective equipment (PPE), and the commonest used PPE was facemask(70.2%); however most use this PPE occasionally (96.5%). Commonest reasons cited for not using PPE were that it was not comfortable (43.0%) and that it was not available (34.0%).

**Table 5** Association between socio-demographics and Knowledge of respiratory protective measures among the Respondents

	Variable	Knowledge			Chi square	p-Value
		Poor N (%)	Fair N (%)	Good N (%)		
Age	10-29	8(25.0)	14(43.8)	10(31.3)	2.479	0.907
	30-40	27(38.6)	24(34.3)	19(27.1)		
	50 and above	23(41.8)	17(30.9)	15(27.3)		
Gender	Male	58(37.9)	54(35.3)	41(26.8)	4.866	0.070
	Female	0(0.0)	1(25.0)	3(75.0)		
Educational status	None	1(33.3)	2(66.7)	0(0.00)	2.479	0.907
	Primary	24(34.8)	22(31.9)	23(33.3)		
	Secondary	27(38.6)	27(38.6)	16(22.9)		
	Tertiary	6(40.0)	4(26.7)	5(33.3)		
Marital status	Married	48(42.5)	36(31.9)	29(25.7)	8.398	0.210
	Single	10(23.8)	17(40.5)	15(35.7)		
	Divorced	0(0.00)	1(100.0)	0(0.00)		
	Separated	0(0.00)	1(100.0)	0(0.00)		
Duration of Employment	Less than 10 years	35(36.5)	35(41.2)	19(22.4)	2.549	0.280
	10 years and above	27(37.5)	20(27.8)	25(34.7)		

Table 5 shows the association between socio-demographics and Knowledge of Occupational Hazard among the Respondents at the bivariate level using chi-square test of statistical significance. No statistically significant association existed between level of knowledge of occupational hazard and socio-demographics features studied.

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#### 4. Discussion

The respondents in this study were majorly males (97.5%) which was similar to the study in Accra, Ghana by R. Health<sup>4</sup>, and Onowhakpor in Nigeria<sup>15</sup>, in which a high number of the respondents were male; however it contrasted the study done in Kumasi Ghana by Kwankye at Naja David wood industry Limited in which 31.3 % of the respondents were females. Working at a sawmill requires a lot of physical strength which makes it more advantageous for the male to be employed more than their female counterparts. Most of the respondents from this study were below 50 years of age, which could be attributed to the amount of energy required to carry out the strenuous activities in a sawmill such as cutting, lifting, and pushing. Only 9.6% had completed their tertiary education and about 54.6% have worked at the sawmill for less than 10 years.

The majority of the respondents were aware that sawdust can affect their respiratory system 119 (75.8%); which was similar to previous studies<sup>1,15,16</sup>. A great percentage of the sawmill workers had poor knowledge of sawdust-related occupational hazards: 58 (36.9%) and 44 (28.0%) had poor and good knowledge respectively which was consistent with similar studies; where the majority of the respondents had poor knowledge<sup>1,15,17</sup>. The poor knowledge observed in this study could be attributed to the fact that over half of the respondents attended only primary school as the highest level of education. This could have been because being educated increases access to information and communication materials and increased awareness of various workplace hazards. It was noticed from this study that those with higher level of education had better knowledge of respiratory protection to combating occupational hazards; and this could be because increasing level of education offers better access to information about the possible hazards they could encounter in the workplace. However the test statistics shows that there is no statistical association between knowledge and the socio-demographic variables tested.

More than half of them had cold (51.6%) and cough (61.8%), however only 10.8%, 7.6% and 11.5% had wheezing, shortness of breath and chest tightness respectively. These are like the findings from previous studies<sup>4, 9,14,18</sup>; however, it contradicted the findings by Adeoye et al which reported lower percentages of respiratory symptoms among sawmill workers.

Regarding the use of personal protective equipment (PPE), 63.7% of the respondents have never used any device at all while 36.3% use personal protective equipment while on duty. Commonest reasons cited for not using PPE were that it was not comfortable (43.0%) and that it was not available (34.0%). Among those that use PPE, facemask was the most common PPE used (70.2%); and only 3.5% make use of PPE regularly. A similar work done by Faremi et al, (2015) on occupational hazard awareness and safety practices among Nigeria sawmill workers in Southwest Nigeria also discovered that the use of PPE was very low, as about 72.3% never used the device at all while only 27.7% make used of the device while working<sup>19</sup>. He equally reported facemask (78.7%), protective goggle (40.4%) and hand gloves (18.1%) as the commonest PPE used by the sawmill workers; and they also reported that 34.0% used facemasks regularly, which is in contrast with the finding in this work where only 3.5% of the respondent use the PPE always<sup>19</sup>. This disparity in both studies could be attributed to the educational status of the respondents, where majority of their respondents had completed secondary and tertiary education as opposed to those in this study where majority only completed primary education.

The poor knowledge and the paucity of compliance with the use of personal protective equipment may contribute to the high percentage of respiratory symptoms among the sawmill workers as was discovered in this study.

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#### 5. Conclusion

This study showed that the sawmill workers had poor knowledge of respiratory protection against sawdust occupational hazards. There was a high prevalence of respiratory symptoms among the sawmill workers. This study equally showed that the majority of the respondents do not make use of personal protective device, of which the commonest reason cited were that it was not comfortable for them to use while working.

### *Recommendations*

The following recommendation is made based on the findings from this study, which if implemented will improve the health of the sawmill workers and hence boost their productivity:

- The government should ensure formal training of intending sawmill workers in a technical school to increase awareness and knowledge of health-related sawdust occupational hazards.
- Health awareness campaign should be organized to teach the workers how to identify some of the respiratory symptoms and to seek early medical care when such symptoms are noticed.
- The government at all levels in collaboration with the sawmill workers' association leaders and other concerned agencies should make policies to encourage and enforce proper use of personal protective devices.

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### **Compliance with ethical standards**

#### *Disclosure of conflict of interest*

The authors declare that they have no competing interests.

#### *Statement of ethical approval*

This research work was done with approval from the Nnamdi Azikiwe University Teaching Hospital Health Research Ethics Committee (NAUTHHREC) through the Head of Department of Community Medicine, Nnamdi Azikiwe University, with ethical approval number NAUTH/CS/66/VOL.15/VER.3/062/2022/041. Verbal permission was sought from the association of the sawmill workers for their approval before undertaking the data collection after the ethical approval form gotten from NAUTHHREC were presented to their leaders. Participants were well oriented on the objectives of the study; verbal consent were sought prior to administration of the questionnaire which emphasized the right to non-participation. Data confidentiality were preserved according to the Helsinki declaration of bioethics.

#### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

#### *Authors' Contributions*

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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### **References**

- [1] Agbana B, Joshua A, Daikwo M, Metiboba L. Knowledge of occupational hazards among sawmill workers in Kwara state, Nigeria. *Niger Postgrad Med J*. 2016, 23(1):25-32.
- [2] Bose AK, Kadam DD, C. P. A. An epidemiological study to evaluate morbidity patterns among wood workers belonging to unorganized sector. *Int J Community Med Public Heal*. 2019, 6(5):2246-2251.
- [3] Id DKH, Nejad VM, Sun H, Hanieh K. Prevalence of respiratory symptoms and spirometric changes among non-smoker male wood workers, U.S.A. *PLoS ONE*. 2020, 15(3):1-10
- [4] Health R. Respiratory Health Problems Among Sawmill Workers At the Timber Market, Accra . 2015, (1050779):1-49
- [5] Fentie D, Mariam TG, Mulat E, Demissie WR. Effect of occupational wood dust on pulmonary function among woodworkers in Jimma town, Southwest Ethiopia: A comparative cross sectional study. *EC Pulmonol Respir Med*. 2019, 8:587–593.
- [6] International Labour Standards on Occupational Safety and Health. [Accessed on 2022 Feb 3]. Available from: <https://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/occupational-safety-and-health/lang--en/index.htm>
- [7] Asgedom AA, Bråtveit M, Moen BE. Knowledge, attitude and practice related to chemical hazards and personal protective equipment among particleboard workers: A cross-sectional study. *Ethiopia: BMC Public Health*. 2019, 19(1):1-10



- [8] Asgedom AA, Bråtveit M, Moen BE. High Prevalence of Respiratory Symptoms among Particleboard Workers: A cross-sectional study. Ethiopia: International journal environment respiratory public health. 2019, 16(12):1-10.
- [9] Agu AP, Umeokonkwo CD, Nnabu RC, Odusanya OO. Health problems among sawmill workers in Abakaliki and workplace risk assessment. Abakaliki: Journal of community medicine and primary health care. 2017, 28(2):1-10.
- [10] Löfstedt H, Hagström K, Bryngelsson IL, Holmström M, Rask-Andersen A. Respiratory symptoms and lung function in relation to wood dust and monoterpene exposure in the wood pellet industry. Sweden: upsala journal of medical sciences. 2017, 122(2):78-84.
- [11] Adeoye OA, Adeomi AA, Olugbenga-Bello A., Bamidele JO, Abodunrin OL, Sabageh OA. Respiratory symptoms and peak expiratory flow among sawmill workers in South Western Nigeria. Southwest: Journal of environmental and occupational health. 2014, 3(3):141-146.
- [12] Nnewi - Wikipedia. [Accessed 2022 Feb 1]. Available from: <https://en.wikipedia.org/wiki/Nnewi>
- [13] Mega2biz. Nnewi markets and the nnewi misconception business. Nigeria: wikipedia, 2020 [Accessed 2022 Feb 1]. Available from: <https://www.nairaland.com/5704490/nnewi-markets-nkwo-nnewi-misconception>
- [14] Yitayew Awoke T, Kumie Takele A, Tefera Mekonnen W, Wakuma Abaya S, Tefera Zele Y, Alemseged EA, et al. Assessment of dust exposure and chronic respiratory symptoms among workers in medium scale woodwork factories: A cross sectional study. Ethiopia : BMC public health. 2021, 21:1-12
- [15] Onowhakpor A, Abusu G, Adebayo B, Esene H, Okojie O. Determinants of occupational health and safety: knowledge, attitude, and safety practices toward occupational hazards of sawmill workers in Egor Local Government Area, Edo State. African Journal of Medical and Health Sciences. 2017, 16(1):58-64
- [16] Bentum L, Brobbey LK, Adjei RO, Osei-Tutu P. Awareness of occupational hazards, and attitudes and practices towards the use of personal protective equipment among informal woodworkers: the case of the Sokoban Wood Village in Ghana. International journal of occupational safety and ergonomics. 2021, 0(0):1-9
- [17] Boston C, Kurup R, Zaman S. Perception of sawmill workers towards occupational health and safety at Linden/Soesdyke highway, Guyana. Asian Journal of advanced research and reports. 2020, 9(1):14-22.
- [18] EA T, TF E. Occupational exposure to wood dust and respiratory health status of sawmill workers in South-South Nigeria. Journal pollut effect control. 2015, 04(01):1-6
- [19] Faremi F, Ogunfowokan A, Mbada C, Olatubi M, Ogungbemi A. Occupational hazard awareness and safety practices among Nigerian sawmill workers. International Journal of Medical Science and Public Health. 2014, 3(10):1244-1254.