

Occupational Hazards, Safety and Hygienic Practices among Timber Workers in a South Eastern State, Nigeria

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Abstract

Background: Timber workers, especially in developing countries, are faced with challenges of prevention and control of work place hazards and illnesses. **Objective:** To determine the awareness of occupational hazards, effects, safety and hygienic practices among timber workers in a South Eastern State in Nigeria. **Methods:** A cross sectional descriptive design that used the total population of timber workers involved in the processing and marketing of wood in three major timber markets in a South Eastern State in Nigeria. Data was collected using a pretested semi-structured questionnaire. Descriptive analyses were done with frequencies and summary statistics. **Results:** The majority of the respondents were aware of the hazardous nature of wood dust (96%) and their main source of awareness was from personal experiences (55%). In spite of the fact that the predominant hazard effects in the majority were nose, throat irritation and cough (33%), the majority were of the opinion that the respirator was not important. Only 13% of the respondents that use personal protective equipment (PPE) always use them and the main reason for not using PPE is forgetfulness (38%). Proper hygiene and sanitation was poorly practiced, as all respondents indiscriminately disposed of waste wood (100%) and about one third (33%) did not have a bath after work each day. **Conclusion:** Timber workers in our environment are faced with increased risks of diseases, accidents and challenges of protection and safety. As a consequence, there is a need for proper education and enforcement of consistent use of the different protective devices.

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Keywords

Knowledge, Attitude, Practice, Occupational Hazard, Timber Worker, Imo, Nigeria

1. Introduction

Occupational hazard is a risk an individual is exposed to at the workplace, and during work periods, they may be exposed to biological agents, chemical and physical factors and ergonomic conditions, which predispose the individual to occupational diseases with a variety of health effects [1]-[3]. This appears to affect a considerable number of people in a variety of jobs and indirectly impact on the economy especially in developing countries where individuals take for granted the health and safety concerns associated with work due to lack of awareness and fundamental understanding of the interactions between work and health [3]-[5].

According to World Health Organization (WHO), there are about 250 million cases of occupational injuries and illnesses occurring annually worldwide, with prevalence studies from Botswana, Zimbabwe, Zambia, Ghana and Nigeria suggesting that there is a high occurrence of occupational disease in Africa [6]-[10]. Though in Nigeria, there appears to be an increase in work related injuries and illnesses, the records of occupational diseases with relevant Government agencies are poor due to inadequate reporting [11]-[13].

The timber workers are no exception to the occurrence of occupational injuries and illnesses. They operate in clusters of privately owned small scale ventures associated with apprenticeship training. Their work involves shaping, cutting, processing and marketing of wood and so has a high risk of wood-dust exposure with negative health effects [14]. It is a source of livelihood for many Nigerians, who are usually located around timber sheds with no form of organized occupational health and safety service. As a consequence, they are at an increased risk of occupational hazards and illnesses, and as such, preventing, reducing or keeping exposures within safe limits are important to the maintenance of a healthy work force.

The main material for timber workers is wood, which is classified as either hardwood or softwood depending on the type of trees they are cut from. A significant difference between the classes of wood exists with respect to the health effect of the dust created during handling, as high exposure to the dust of hardwoods has been reported to cause nasal cancer [14].

Wood dust, regulated as a nuisance dust by the United States Occupational Safety and Health Administration (OSHA), is recognized as a confirmed human carcinogen and as a result, the American Conference of Governmental Industrial Hygienists (ACGIH) recommends an exposure limit of 1 milligram per cubic meter for hardwoods and 5 milligram per cubic meter for softwoods. Furthermore, other adverse health effects associated with wood dust include dermatitis, allergic and non-allergic respiratory effects [14].

However, in terms of Government regulation, there is little or no attention given to the control of occupational hazards and its health effects which are potentially associated with the practices of timber workers in our environment and as such, it is important we determine the workers' awareness of the occupational hazards, effects and safety practices with the intention of highlighting their health education and training needs in order to empower them to take self action in the pursuit of good health and well-being.

2. Methodology

2.1. Study Area

The survey was conducted in three Local Government Areas (LGA); Owerri North, Orlu and Okigwe LGAs where the three major timber markets are located in Imo State. Imo State is located in the South Eastern part of Nigeria, within longitude 5°29'06"N and latitude 7°02'06"E occupying an area between the lower river Niger and the upper and middle Imo River. According to the 2006 census, Imo State had a population of 3.93 million (2.03 million males and 1.9 million females) occupying an area of 5183 square kilometers with Okigwe LGA having a population of 132,701 occupying 324 square kilometers, Orlu LGA having a population of 142,792 occupying 133 square kilometers and Owerri North LGA having a population of 176,334 occupying 220 square kilometers [15] [16].

2.2. Study Population/Study Design/Selection Criteria

The study population comprised all timber shed owners and their apprentices (timber workers) involved in the

processing and marketing of wood in the three major timber markets in Imo State. The study was a cross sectional descriptive design that involved the total population of 319 timber workers. Inclusion criteria were any individual in the market that owned a timber shed or was an apprentice aged 10 years and above. The exclusion criteria were any selected individual that had an acute illness at the time of the study.

2.3. Data Collection and Analysis

Three hundred and nineteen pretested semi structured questionnaires were interviewer administered and data was collected from all the participants.

The questionnaire comprised 4 sections, section one: sociodemographic characteristics; section two: awareness and effects of occupational hazards; section three: attitude towards safety practices and section four: safety and hygienic practices when handling wood. Medical students were recruited for the administration of the questionnaires. The returned questionnaires were checked for errors, cleaned, validated manually and analyzed. Descriptive statistics (frequency tables and summary indices) were generated.

2.4. Ethical Considerations

Permission was sought from the timber associations to conduct the survey and verbal consents were given by the respondents. Ethical approval was obtained from the Ethics Committee of Imo State University Teaching Hospital Orlu.

3. Results

Three hundred and nineteen questionnaires were administered and all were completed and returned.

3.1. Sociodemographic Characteristics

More than half of the respondents (65.3%) were between the ages of 20 and 39 years with the majority, male (95.9%), married (61.8%) and most of them (93.1%) with either a primary or secondary school level of education. Most of the respondents (89.3%) received apprenticeship training in wood processing and marketing and had been on the job for up to 20 years (87.5%) with less than one third (30.1%) still undergoing apprenticeship (**Table 1**).

3.2. Knowledge and Attitude of Respondents

Majority of the respondents who were aware of the hazardous nature of wood dust (95.9%) reported that their sources of awareness were mainly from personal experience (54.6%) and during training (34%) and least from health education programs (3.9%). The effects of the occupational hazards encountered were mainly nose, throat irritation and cough (32.9%) and eye irritation and itching (21.9%) and the least was skin infection (2.9%). Although the majority of respondents were of the opinion that it was necessary to always protect oneself while working (85.6%); and that the hand glove (38.2%) followed by the coat overall (24.8%) were the most important PPE to use, only about 3.8% of the respondents and none of the respondents mentioned face mask and respirators respectively as the most important PPE. While the majority of the respondents (40.4%) were of the opinion that sweeping dusty floors were associated with the occupational hazard effects encountered, only 9.7% and 8.8% were of the opinion that not using a particular PPE and scattering work tools respectively were also associated with the hazard effects encountered (**Table 2**).

3.3. Safety and Hygienic Practices of Respondents

The majority of the respondents reported the use of PPE (87.1%) with hand gloves being the most used form of PPE (69.4%) followed by coat overalls (27.3%). However, only 12.9% of those that have ever used PPE, and always use them; and the reasons for not using PPE were either due to forgetfulness (38%), affordability (34.3%), inconvenience (30.6%) and not being a necessity (28.9%). Close to half of the respondents (47%) did not sprinkle water on wood before sawing in order to reduce dust. In the event of fire or injury, none of the workshops had a fire extinguisher and most of them did not have or use first aid box (99.1%) but receive treatment when injured or ill from the chemist (70.2%). With respect to hygiene, all the respondents indiscriminately

Table 1. Sociodemographic characteristics.

Variable	Category	Frequency (%)
Age	10 - 19	18 (5.6)
	20 - 29	93 (29.2)
	30 - 39	115 (36.1)
	40 - 49	52 (16.3)
	50 and above	41 (12.9)
	Total	319 (100)
Gender	Male	306 (95.9)
	Female	13 (4.1)
	Total	319 (100)
Marital Status	Married	197 (61.8)
	Single	99 (31.0)
	Others	23 (7.2)
	Total	319 (100)
Educational Status	None	22 (6.9)
	Primary	195 (61.1)
	Secondary	102 (32.0)
	Total	319 (100)
Work Status	Master	223 (69.9)
	Apprentice	96 (30.1)
	Total	319 (100)
Duration on the job (yrs)	<1	24 (7.5)
	1 - 10	145 (45.5)
	11 - 20	110 (34.5)
	21 - 30	26 (8.2)
	>30	14 (4.4)
	Total	319 (100)
Received Training	Yes	285 (89.3)
	No	34 (10.7)
	Total	319 (100)
Residence	Owerri North	141 (44.2)
	Orlu	122 (38.2)
	Okigwe	56 (17.6)
	Total	319 (100)

disposed of wood waste and most of them (88.4%) ate inside the workshop while work was going on. Though a majority washed their hands before eating (75.6%), they did not use their hands to eat at work (82.8%). However, about one third of the respondents (33.2%) did not have a bath after work each day ([Table 3](#)).

4. Discussion

This study determined the awareness of occupational hazards, the effects, safety and hygienic practices of timber

Table 2. Knowledge and attitude of respondents.

Variable	Category	Frequency (%)
KNOWLEDGE		
Aware of the occupational hazard (n = 319)	Yes	306 (95.9)
	No	13 (4.1)
*Source of awareness of the occupational hazard (n = 306)	Personal experience	167 (54.6)
	During training	104 (34.0)
	Colleagues	36 (11.8)
	Health education	12 (3.9)
*Effects of the occupational hazards encountered (n = 306)	Nose/throat-irritation/cough	110 (35.9)
	Eye irritation/itching	67 (21.9)
	Bruises/cuts/injury	57 (18.6)
	Back/waist pain	37 (12.1)
	Fatigue/exhaustion	20 (6.5)
	Slips/falls	19 (6.2)
	Skin infections	9 (2.9)
ATTITUDE		
Do you feel the necessity to always protect yourself while working (n = 319)	Yes	273 (85.6)
	No	46 (14.4)
Single most important PPE you feel that is important (n = 319)	Hand gloves	122 (38.2)
	Coat overalls	79 (24.8)
	Eye goggles	48 (15.1)
	Helmets	24 (7.5)
	Boots	21 (6.6)
	Earplugs/muffs	13 (4.1)
	Face masks	12 (3.8)
	Respirators	0 (0)
	*What work behavior or action do you feel is associated with the effects encountered (n = 319)	Dry sweeping dusty floors
Working in bad postures		64 (20.1)
Emptying dust filter bags		37 (11.6)
Hand sanding		34 (10.7)
Not using PPE		31 (9.7)
Scattering work tools		28 (8.8)
Compressed air to dislodge dust		16 (5.0)

*multiple responses.

workers in Imo, a South Eastern State in Nigeria. In the present study, the timber workers were predominantly male within the age group of 20 - 49 years although a majority appeared to be below 40 years which is not unusual, as the work requires a high degree of physical manual labour more effectively carried out by younger adults; and this has been similarly observed in a study in Ghana and in other Nigerian studies [17]-[19]. In a study in Calabar, Nigeria by Osuchukwu *et al.*, it was observed, that the timber workers were predominantly male but the majority appeared to be above 40 years [20].

Table 3. Safety and hygienic practices of respondents.

Variable	Category	Frequency (%)
SAFETY PRACTICES		
Use of Personal Protective Equipment (n = 319)	Yes	278 (87.1)
	No	41 (12.9)
*Form of Personal Protective Equipment used (n = 278)	Hand gloves	193 (69.4)
	Coat overalls	76 (27.3)
	Eye goggles	39 (14.0)
	Helmets	31 (11.2)
	Face masks	22 (7.9)
	Boots	19 (6.8)
	Earplugs/muffs	9 (3.2)
	Respirators	0 (0)
Frequency of Personal Protective Equipment use (n = 278)	Always	36 (12.9)
	Sometimes	187 (67.3)
	Rarely	55 (19.8)
*Reasons why PPE are not always used (n = 242)	Forget to use	92 (38.0)
	Can't afford it	83 (34.3)
	Inconvenient	74 (30.6)
	Not a necessity	70 (28.9)
Sprinkle water before sawing wood (n = 319)	Yes	169 (53.0)
	No	150 (47.0)
Availability and use of first Aid box (n = 319)	Yes	3 (0.9)
	No	316 (99.1)
Source of treatment when sick or injured (n = 319)	Chemist	224 (70.2)
	Self medication	48 (15.1)
	Hospital	26 (8.2)
	Native treatment	21 (6.6)
Fire Extinguisher (n = 319)	Present	0 (0)
	Absent	319 (100)
HYGIENIC PRACTICES (n = 319)		
Eating inside workshop	Yes	282 (88.4)
	No	37 (11.6)
Use of hand to eat at work	Yes	55 (17.2)
	No	264 (82.8)
Wash hands before eating	Yes	241 (75.6)
	No	78 (24.4)
Bath after work each day	Yes	213 (66.8)
	No	106 (33.2)
Indiscriminate disposal of waste wood	Yes	319 (100)
	No	0 (0)

*multiple responses.

The timber workers in the present study, mostly had either a primary or secondary school level of education which was also observed in other studies [17] [19] and this could be explained by the fact that, some level of training and skill is required in the processing and marketing of wood as seen in the present study, where about 30% of the respondents were apprentices.

The level of awareness of occupational hazards observed in the present study could be explained to some degree by the level of education and also, the length of work experience observed in the majority of the respondents, where over 80% had been on the job for at least one year. A number of other studies [21]-[25] also observed this high level of awareness but Mitchual *et al.* [22] reported that the high level of awareness was irrespective of their educational background and probably due to the length of work experience. Also, Sabitu *et al.* [23], though among welders, reported other reasons for high awareness such as institutional training and institutional adaptation of safety regulatory measures. On the contrary, Osagbemi *et al.* [26], in the Northern part of Nigeria, reported a generally low level of awareness of occupational hazards except for electric shock, and that their source of information for safety measures were mainly from their employers; although, more than one third of the respondents had no source of information, there was still a majority of the respondents that were aware of the need for safety measures.

In the present study, their sources of information of occupational hazards and safety measures were mainly from personal experiences and training which was similar to the study by Osuchukwu *et al.* [20], where personal effort and on the job training were attributed as the main sources of awareness of occupational health and safety, and also Faremi *et al.* [19], attributed the main sources of information to seminars, friends and colleagues.

The effects of the hazards encountered by the respondents in the present study were mainly upper respiratory symptoms, eye symptoms, external injuries and body pain which are consistent with studies involving timber work [17]-[21] [25] [26]. These observed effects were mainly reported by the respondents as caused by their work behaviour and actions of dry sweeping dusty floors, working in bad postures, emptying dust filter bags and hand sanding. In spite of the fact that they knew inhalation of wood dust is hazardous, close to half of the respondents in the present study did not engage in dust reducing safety practices like sprinkling water on wood surfaces before sawing it. Also surprisingly, about 90% of the respondents did not know that not using a particular PPE was associated with the effects encountered, even when a majority felt the necessity to always protect self while working.

The respondents' knowledge of the effect of the hazards encountered, appeared not to have positively influenced either their safety practices or their opinion on the type of PPE they felt is the most important as the majority of the respondents felt that the hand gloves, coat overalls and eye goggles in that order, were the most singularly important PPE; the face masks and the respirators needed to protect against the commonly experienced upper respiratory symptoms by the respondents, were considered the least singularly most important PPE, as none of the respondents even reported the respirator as important.

Furthermore, though it was observed that a majority of the respondents reported that they use PPE, it was only 13% of them that always used PPE. Nevertheless, the PPE mainly used, was the hand gloves followed by coat overalls which was only used by 27% of the respondents. So it is obvious, that there were poor safety practices in the present study exemplified by the total absence of fire extinguishers, lack and non-use of first aid boxes by 99% of the respondents and the use of hospitals in the event of injuries and illnesses by only 8% of the respondents. This lack of safety practices compound the consequences of the low prevalence of correct and consistent use of PPE amongst the timber workers and this low prevalence especially in developing countries has consistently been reported in previous studies [17]-[19] [21] [22] [25] [26].

The reasons attributed for the non-consistent and correct use of PPE were essentially similar; though, varied slightly from study to study. Studies from Ghana by Ochire-Boadu *et al.* [17], reported inadequate supply and discomfort as reasons for the low use of PPE; and also, Mitchual *et al.* [22], reported on one hand, the unwillingness to wear face shields probably due to discomfort and on the other hand, a willingness to wear hand gloves and coat overalls probably influenced by their awareness of the need to wear them in order to protect themselves during wood processing. Studies from Nigeria by Faremi *et al.* [19] reported forgetfulness, inconvenience and not being a necessity as reasons for not using PPE; and also, Osagbemi *et al.* [26], reported non-availability, not being a necessity, forgetfulness and inconvenience as reasons for non-use of PPE. These observations were similar to that observed in the present study, where the lack of use was also attributed to forgetfulness, non-availability due to affordability, inconvenience and not being a necessity.

The hygienic practices of the timber workers appeared to be generally poor, where more than three quarters of

the respondents ate inside their workshops, about one quarter of the respondents did not wash hands before eating, about one third of the respondents did not take a bath after work each day and also, where all the respondents indiscriminately disposed of waste wood. These practices further increase the risk of diseases and accidents in the work place as occupational illnesses normally develop over a period of time because of the poor hygiene and sanitary conditions of the work environment.

The proper disposal of waste wood and the maintenance of proper hygienic and sanitary conditions remains a major challenge facing the timber industry, probably associated with cultural attitudes, as the existing guidelines for the proper disposal and treatment are not complied with; not because there are no laws or the timber workers are ignorant but due to the fact that the Sanitary and Environmental regulatory agencies charged with the responsibility of enforcing the laws are inactive [27].

5. Conclusion

Timber workers in our environment are faced with increased risks of diseases and accidents and also the challenges of protection and safety. Despite their high awareness of occupational hazards, the timber workers have not associated the effects of the hazards they generally experience to the specific lack of consistent use of the appropriate PPE and as such, they remain continuously exposed to the risk of accidents and diseases especially the upper respiratory illnesses which appear to be their predominant complaint. Consequently, there is need for proper education of the relevant hazards, their associated PPE, hygienic practices and consistent use of the different protective devices. Therefore, the introduction and enforcement of safety health measures through training and regular inspection by the relevant agencies will help to further promote the adoption of safety and hygienic practices among timber workers in order to safe-guard and maintain good health and wellbeing among the workers.

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Authors' Contributions

All the authors participated in the study.

Conflict of Interests

The authors hereby declare that there is no conflict of interests.

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