



OCCUPATIONAL HAZARDS ASSOCIATED WITH TIMBER WORKERS IN ANAMBRA SOUTH SENATORIAL DISTRICT OF SOUTH-EASTERN NIGERIA

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Abstract

This study examined the occupational hazards associated with timber workers in Anambra South Senatorial District. The study adopted a descriptive cross-sectional design with a population of 1280 timber workers. A multi-stage sampling procedure was utilized to select the 510 samples for the study. The instrument for data collection was a self-structured validated questionnaire tagged "Occupational Hazards among Timber Workers Questionnaire (OHTWQ)" with a reliability coefficient of 0.74. The Mean and Standard Deviation were used to answer the research questions through Statistical Product and Service Solutions (SPSS), version 23.0. The findings, among others, illustrated that timber workers are exposed to biological hazards (mean = 3.06), psychosocial hazards (mean = 3.00) and ergonomic hazards (mean 2.99). Although the findings of the study showed that timber works are less exposed to physical hazards (mean = 2.44), It was concluded that timber workers are exposed to different forms of occupational hazards in their workplace, including biological, psychosocial, and ergonomic. The study recommended that government should organize quarterly occupational safety training for workers, especially those who work in timber industries as an effective intervention to reduce the health outcomes associated with occupational hazards to improve health and safety well-being

Keywords: Occupational Hazards, Timber Workers, Anambra South Senatorial District

Introduction

The timber industry is one of the most hazardous in the construction of firms that results in injury, deformity, and even death. The environment in which industrial workers work is regarded as one of the riskiest work environments. Industrial workers experience a variety of hazards as a result of their work-related activities, according to Odibo et al. (2018) on typical workplace-related exposure. Following their passage through various machines in the timber plant, timbers are broken down into additional boards of various sizes through a process known as "timbering." Machine operators, saw technicians, dust packets, overseer's wood loaders, machine off-loaders, and administrative staff are the groups of timber workers with varying levels of exposure to wood dust at work (Agbara et al., 2016). The timber industry is a place where unprocessed logs are transformed into wood. In nations with abundant forest resources, nearly equal numbers of people are indirectly employed in other industries that either further process the wood into other products or use processed wood globally. Nigeria is blessed with sizable tracts of rainforest, which are characterized by the development of valuable trees that are cut down and used as lumber. Numerous timber companies across the nation employ hundreds of thousands of people, making the timber industry a significant contributor to the nation's economy (Sambre et al., 2016).

Physical hazards such as vibration from sawing machines, exposure to noise from sawing machines and generator sets, exposure to flying and falling objects like sharp wood, and exposure to heat from the machine at the workplace can put the workers at risk of hearing impairment, while biological hazards such as fungi and mould, exposure to parasitic organisms, exposure to general waste, airborne pathogens, and insects in the timber industry put the workers at risk of contracting an infection. Airborne microflora from secondary infection of the wood with moulds is also implicated as part of the risk factor for the respiratory system (Dutkiewicz et al., 2001). Industrial workers face ergonomic risks such as being cut in or struck by operating machinery; repetitive motions; heavy lifting and pulling of logs; and poor body positioning or awkward body positions that increase the risk of injury and cause slipping and falling while carrying heavy logs of wood. The risk of being cut or rolled over by a machine as a result of stress or fatigue increases with psycho-social hazards like occupational stress, long working hours,

loss of wood due to high emotional demand, persistent fatigue or tiredness due to work-related activity, and workplace violence. This can result in instant death (Amadi, 2011). A structure where logs are processed into lumber is known as a timber or lumber mill. To create long pieces and cross-cut logs according to standard or bespoke sizes, modern timbers employ a motorised saw (dimension lumber). If the user is careless, the motorized saw might accidentally cut off a portion of his body, which could result in serious bleeding or even death (Ritti et al., 2007).

The most basic kinds of timber equipment consist of a chain saw, a customized jig, saw spindle moulders, pressing machines, surface planers, and morticers, which are used for the production of square holds and tenons with the slot produced from overlapping the square holes. The workpiece should not be moved during cutting as this can break the cutter. Therefore, the cutter should be withdrawn before the workpiece is moved. Another danger that the morticer causes is accidental contact with the cutters, so it is also important to switch off the machine when changing the workplace. Inadequate space surrounding the machine might result in the operator being pushed by a passerby into the moving element (the cutter), which may lead to the cutting of the operator's body parts. However, even incidental contact with the cutters while the machine is off can still cause hands to seize. The inability to notice potential dangers or hazards that may have been foreseen is one of the main causes of workplace injuries, illnesses, and accidents. A proactive, ongoing procedure to identify and evaluate such dangers is a crucial component of any successful safety and health program. Employers and employees should gather and review information about workplace hazards that are present or likely to be present; conduct initial and periodic workplace inspections to identify new or recurring hazards; investigate injuries, illnesses, incidents, and close calls/near misses to determine the underlying hazards, their causes, and safety and health program weaknesses; group similar incidents and identify trends in Determine the severity and likelihood of incidents that could result from each identified hazard, taking into account the hazards associated with emergency or non-routine situations, and use this information to prioritise corrective actions. Some hazards, like tripping hazards and housekeeping hazards, can and should be fixed as they arise or are discovered. Fixing problems right away highlights how crucial health and safety are. The physical environment, which is a component of the workplace, has an immediate effect on human perception, has the potential to alter interpersonal relationships, and may lower productivity. This is true because the qualities of a workplace or gathering location for a group have an impact on productivity and the degree of satisfaction (Peple et al., 2017).

Various measures for the prevention and control of hazards and diseases may be grouped under three headings: medical, engineering, and statutory or legislative (Park, 2009). Medical measures include pre-pleasing examination, periodic examination, medical and healthcare services, health educator and counselling, notification, supervision of the working environment; maintenance and analysis of records. Such measures as building design, good housekeeping, and use of protective devices, among others, are engineering measures. Legislative measures, on the other hand, include laws, rules, and regulations that safeguard a worker's health, safety, and welfare. The National Institute for Occupational Safety and Health (NIOSH) (2014) also suggested that, to reduce risks for Timbers employees, established exposure levels to hazardous chemicals should be followed via preventative measures including engineering controls and administrative controls. According to reports, there has been an increase in complexity and variety in Nigeria, but it has been difficult to ensure and maintain the best standards and equipment needed to undertake high-risk operations (Oluwagbeni, 2011). Protecting the employees' health and wellness is challenging, however. Timber workers are exposed to risks that have a major negative impact on their health and quality of life, with a cascading effect on their close relatives and other family members who are less equipped to deal with environmental risks. Timber workers are prone to diverse environmental hazards ranging from biological, chemical, ergonomic, physical, and psychosocial. Biological infectious diseases; pesticides; ecological interaction among organisms; chemical, synthetic, and natural chemicals; physical hazards that occur naturally and pose health hazards, such as hearing impairment, ultraviolet radiation from sunlight, etc. Most timber workers in Anambra State have many health challenges ranging from amputations, scars all over the body, respiratory infections, and various deformities such as sight and hearing impairments, to incapacitation due to irredeemable damage to their physical health and chronic diseases. The researchers, being very close to many workers from this type of industry, have noticed that these workers have the wrong perception that any person who works in timber can never be free from injury or other health risks associated with the job.

Aim and Objectives of the Study

The study is aimed at determining the occupational hazards associated with timber workers in the Anambra South Senatorial District of Anambra State. In specific terms, the study sought to:

Occupational hazards associated with timber workers in Anambra South Senatorial District of South-Eastern Nigeria

1. Find out the biological hazards among timber workers in the Anambra South Senatorial District of Anambra State.
2. Ascertain the chemical hazards among timber workers in the Anambra Senatorial District of Anambra State.
3. Identify the physical hazards among timber workers in the Anambra South Senatorial District of Anambra State.
4. Determine the ergonomic hazards among timber workers in the Anambra South Senatorial District of Anambra State.
5. Determine the psycho-social hazards among timber workers in the Anambra Senatorial District, in Anambra State.

Research Questions

The following research questions were asked to guide the study:

1. What are the biological hazards among timber workers in the Anambra South Senatorial District of Anambra State?
2. What are the chemical hazards for timber workers in the Anambra South Senatorial District of Anambra State?
3. What are the physical hazards for timber workers in the Anambra South Senatorial District of Anambra State?
4. What are the ergonomic hazards among timber workers in the Anambra South Senatorial District of Anambra State?
5. What are the psychosocial hazards among timber workers in the Anambra South Senatorial District of Anambra State?

Materials and Methods

This study adopted a cross-sectional survey design to explain and describe the occupational hazards as they affect timber workers in the Anambra South Senatorial District. The population of the study consisted of 1280 timber workers in Anambra South Senatorial District. The sample size for this study was 510 timber workers. A multi-stage sampling procedure was adopted for this study, which was done in three stages. The instrument for data collection was a self-structured questionnaire tagged "Occupational Hazards among Timber Workers Questionnaire (OHTWQ). The instrument consists of two sections: Section A is made up of the socio-demographic characteristics of the respondents, while Section B indicates the respondents' views on occupational hazards among timber workers. The reliability coefficient (0.74) of the instrument was obtained by correlating the two results using the Pearson Product Moment Correlation Coefficient. Hence, the instrument was appropriate and reliable for the study. The data collected was analyzed using Statistical Product and Service Solutions version 23.0.

Results

What are the biological hazards among timber workers in the Anambra South Senatorial District of Anambra State?

Table 1: Biological hazards among timber workers in Anambra South Senatorial District

| SN | Biological hazards | Mean | Std Dev. | Decision |
|----|---|-------------|-------------|-------------|
| 1 | General wastes constitute dangerous airborne | 3.18 | 40 | High |
| 2 | There are airborne pathogens that may cause disease | 2.95 | 57 | High |
| 3 | Parasitic organisms are common | 3.18 | 56 | High |
| 4 | Fungi/moulds are the most common disease-causing agents | 2.95 | 28 | High |
| | Grand mean | 3.06 | 0.45 | High |

Table 1 showed the biological hazards among timber workers in Anambra South Senatorial District. The result showed that the biological hazards included general wastes (3.18+0.45), airborne pathogens (2.95+0.57), parasitic organisms (3.18+0.56), and fungi/molds (2.95+0.28).

Research question 2: what are the chemical hazards among timber workers in the Anambra South Senatorial District of Anambra State?

Table 2: Chemical hazards among timber workers in Anambra south Senatorial District

| SN | Chemical hazards | Mean | Std Dev. | Decision |
|----|--|-------------|-------------|----------|
| 1. | Snipers used to kill insects on woods constitute a Hazard | 2.82 | 0.42 | High |
| 2. | Perfect killers are often used which may affect Human health | 2.28 | 1.17 | Low |
| 3. | Noka wood constitutes a harmful chemical hazard | 2.26 | 1.18 | Low |
| 4. | Smoke from burning dust and wood piece is always the problem which may affect the respiratory organs | 2.15 | 1.03 | Low |
| | Grand mean | 2.37 | 0.95 | Low |

Table 2 showed the chemical hazards among timber workers in Anambra South Senatorial District. The result showed that the chemical hazards included snipers used to kill insects in wood (2.82+0.82), use of perfect killers (2.28+1.17), noka wood (2.26+1.18), and smoke from burning dust and wood pieces (2.15+1.03).

Research question 3: What are the physical hazards among timber workers in the Anambra South Senatorial District of Anambra State?

Table 3: Physical hazards among timber workers in Anambra South Senatorial District

| SN | Physical hazards | Mean | Std Dev. | Decision |
|----|---|-------------|------------|----------|
| 1. | Heat from machine may increase the human body temperature. | 2.10 | .98 | Low |
| 2. | There are flying and falling objects like sharp pieces of woods that are harmful to the eyes. | 2.20 | .98 | Low |
| 3. | Vibration of sawing machines also causes body vibration. | 2.25 | .94 | Low |
| 4. | Noise from the generator set and sewing machine causes partial deafness when the decibel is high. | 3.09 | .31 | High |
| | Grand mean | 2.41 | .80 | Low |

Table 3 showed the physical hazards among timber workers in Anambra South Senatorial District. The result showed that the physical hazards include heat from the machine (2.10+0.98), flying and falling objects like sharp pieces of wood (2.20+0.98), vibration (2.25+0.94), and noise from the generator set (2.41+0.80).

Research question 4: What are the ergonomic hazards among timber workers in the Anambra South Senatorial District of Anambra State?

Table 4: Ergonomic hazards among timber workers in Anambra South Senatorial District

| SN. | Ergonomic hazards | Mean | Std Dev. | Decision |
|-----|--|-------------|------------|----------|
| 1. | Cut or struck by operating machine is common | 2.90 | .39 | High |
| 2. | Uncomfortable workstation leads to low-output | 3.04 | .30 | High |
| 3. | Poor body position or awkward position are often experienced which may constitute industrial hazard. | 3.02 | .26 | High |
| 4. | Heavy lifting and pulling movement of logs may lead to incapacitation. | 3.02 | .26 | High |
| | Grand mean | 2.99 | .30 | High |

Table 4 showed the ergonomic hazards among timber workers in Anambra South Senatorial District. The result showed that the ergonomic hazards included cut or struck by an operating machine (2.90+0.39), uncomfortable workstation (3.04+0.30), poor body position or awkward position (3.02+0.26), and heavy lifting and pulling movement of logs (3.02+0.26).

Research question 5: What are the psycho-social hazards among timber workers in the Anambra South District of Anambra State?

Table 5: Psycho-social hazards among timber workers in Anambra South Senatorial District

| SN | Psycho-social hazards | Mean | Std Dev. | Decision |
|----|--|-------------|-------------|----------|
| 1. | Occupational stress cause strain or deformation | 3.17 | .60 | High |
| 2. | Workplace violence constitute suffering, Widespread fighting and in most cases, it leads to Death. | 3.17 | .60 | High |
| 3. | There are persistent fatigue or tiredness due to work Related activities that may cause harm. | 3.00 | .23 | High |
| 4. | Loss of sleep due to high emotional demands may affect the entire body system. | 2.68 | .52 | High |
| | Grand mean | 3.00 | 0.48 | High |

Table 5 showed the psycho-social hazards among timber workers in Anambra South Senatorial District. The result showed that the psycho-social hazards included occupational stress (3.17+0.60), workplace violence (3.19+0.60), persistent fatigue (3.00+0.23), and loss of sleep due to high emotional demands (2.68+0.52).

Discussion of findings

The result of the study showed that timber workers are exposed to biological hazards in their workplaces. The result illustrated that the grand mean score of 3.06 was greater than the criterion mean score of 2.50 depicting that timber workers are exposed to a biological form of hazards. This means there is a high level of exposure to biological factors that may cause health challenges to timber workers. In light of this, the result of this study is in line with studies of Kemei and Nyerere (2016) that exposure to fluid creates the tendency for an accident to occur in the workplace, especially among workers. Studies by Yusuf et al (2014) buttressed that biological health hazards and disorders associated with timber workers with a resultant effect on health outcomes. The result also is credence with studies by Faremi et al. (2014) that over 75.5% of timber workers are highly exposed to occupational hazards while a good proportion of them suffer from different health problems. Rawlance et al. (2017) reported that workers experience biological hazards from wood and timbers that could lead to microbial infection. Osagbemi et al. (2010) added that workers in the timber industries are at risk of fungi and mould-related diseases as a result of exposure to microorganisms. Pintakham and Siritwong (2015) affirmed that workers are significantly exposed to biological hazards because of the site of the location of the industry. However, there is no previous studies that are contrary with the present findings but the difference in the result of the study was due to the location of the study and the sample of the study.

The result of the study showed that the grand mean score of 2.37 was relatively less than the criterion mean of 2.50 indicating that there was low exposure to chemical hazards except when using sniper to disinfect the woods in the industry. This means that timber workers hardly utilize chemical during sawing of woods which in turn reduce their level of exposure to the different chemical that may affect them. The result of this study is in line with the studies of Raymond (2005) stated that some chemical agents constitute health problems and challenges. On the contrary, this study is contradictory to numerous studies by Warnakulasuriya et al. (2012) and Tumwesigye et al. (2016) among others that workers are at high risk of chemical hazards. The difference between the previous study and current findings was because the method of the study and most workers may not see the use of chemicals in the industry as anything that may be risky.

The result of the study showed that timber workers are relatively exposed to physical hazards in the workplace. The result of the study illustrated that the grand mean of 2.44 was relatively less than the criterion mean of 2.50 depicting that perceived physical hazards among timber workers. This means that physical hazards are likely to be controlled in the workplace during operation due to familiarity with the hazards associated with the job. The result of this study is in line with the studies of Warnakulasuriya et al. (2012) that the highest prevalence of health problems due to physical hazards was 23% among workers. Over 61% of employees are severely exposed to health issues as a consequence of risks, according to Ahmed-Refat et al. (2008). Hazard rate ratios for neck/shoulder diseases demonstrated a preventive benefit of arm boards, according to Rempel et al. (2006). Physical hazards are a frequent cause of accidents in many different businesses, including the lumber industry, and they may be inevitable in other industries, like construction. There is no contrary previous study against the current findings.

The result of this study showed that the grand mean score of 2.99 was greater than the criterion mean score of 2.50 depicting that timber workers are exposed to ergonomic hazards. This means that timber workers experience a mismatch with their work in terms of physical factors such as work position, height, manual handling of tools, and uncomfortable work station among others. The findings of this study are consistent with those of studies by Hamid, et al. (2018), who found that ergonomic hazards, muscle aches/sprains (76.5%), elbow/wrist/neck pain (56.0%), body posture issues (56.0%), excessive muscle stretching (67.5%), and bending/twisting at work (55.5%) were frequent occurrences. The findings of this study are consistent with those of Segun et al. (2010), who found that high levels of human (manual handling) involvement in timber operations expose workers to higher levels of risks from log handling and machine operation, environmental hazards, work-related bodily injuries, and in the worst cases, death. The level of noise, a wood employee's daily personal noise exposure to all types of occupational risks, including ergonomic hazards, was supported by Qutubuddin et al. (2012). According to Faremi et al. (2014), a significant percentage of woodworkers have hearing problems, and 45.7% of them report having persistent back discomfort after each day's work. After adjusting for pre-intervention regional mean pain score, present and prior physical exertion, and ergonomic workstation design, Krause et al. (2010) discovered a significant link between high average ERI ratios and one-year increases in right upper-extremity pain. Ganiyu et al. (2015) observed a statistically significant link between all regions of WMSDs and ergonomic risks detected ($p < 0.05$), and they concurred that extended sitting and standing as well as working in an uncomfortable posture were the most frequent ergonomic hazards among participants. Ahmed-Refat et al. (2008) reported that the prevalence of musculoskeletal pains is 49.2% as a result of awkward posture and working duration. It is plausible that timber workers in the workplace are highly exposed to ergonomic hazards because of the nature of the timber operation which requires high physicality and good positioning of workers. When there is poor positioning and log handling of the machine, vibrations, and a high volume of sawing machines might cause health challenges to the workers. There are no previous studies that contraindicate the outcome of the current findings the difference in the result was based on the awareness of certain control measures.

The result of the study revealed that the grand mean score of 3.00 was greater than the criterion mean score of 2.50 indicating that timber workers are to a large extent exposed to psychosocial hazards in the workplace. This means that timber workers encounter social and psychological problems that may be perceived as psychosocial hazards including occupational stress, workplace violence, persistent fatigue, loss of sleep due to high emotional demands, and poor communication. The result of this study is in line with the studies of Hamid et al (2018) that there was a significant percentage of workers who experienced psychosocial or physical abuse (68.5%). The result of this study is credence to the studies of Aguwa et al. (2014) that a good proportion of workers experience psychological burnout after daily activities. The outcome was also consistent with the work of Nkporbu et al. (2016) which found that the workload accounted for 548 (98.2%) of the risk factors for psychosocial hazards. This was followed by homework interface (82.0%), a lack of opportunities for advancement at 392 (70.1%), a lack of career development (58.7%), and work content (60%) while a constant state of alertness (CSA) accounted for the least amount of risk factors (17.6%). Malinska, et al. (2010) reported frequent complaints among operators were headaches and tiredness. Rempel et al. (2006) added that psychological and social problems are hazardous to workers in the industry. It is plausible that psychological and social problems are hazardous to workers including timber operators. The nature of timber operations and activities result in communication lacuna and interpersonal relationships. There is no previous study that is against the findings of the current study but the difference was due to the methods of the study and the population of the study.

Conclusion

In this study, it was concluded that timber workers are exposed to different forms of occupational hazards exposure in their workplace including physical, ergonomic, and psychosocial with low exposure to chemical hazards. The study suggested that occupational hazards intervention should be implemented to create awareness to reduce the rate of exposure to occupational risk.

Recommendations

Regarding this study the following recommendations were made;

1. Government should organize quarterly occupational training for workers especially those who work in the timber industry as an effective intervention to reduce the health outcome associated with occupational hazards to improve health and safety well-being.
2. Managers of the timber industry should be stringent about occupational safety and health intervention for workers who are recommended in the workplace.

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3. Timber workers should cooperate or associate to oversee the welfare of workers in the industry through safety monitoring and inspection.
 4. The government and managers of the timber industry should implement basic health and safety training with special emphasis on new workers on the nature of the job and safety regulations to improve their level of understanding of the timber work.
 5. Managers of the timber industry should prioritize safety and health workers by enforcing the consistent use of safety devices to prevent the aftermath.

References

- Agbara, B.E., Joshua, A. O., Daikwo, M. A., & Metibola, L. O. (2016). Knowledge of occupational hazards among sawmill workers. *Niger Postgraduate Medical Journal*, 21(9), 25-32.
- Aguwa, E. N., Nduka, I., & Arinze-Onyia, S. U. (2014). Assessment of business among health workers and bankers in Aba South local government area, Abia State, South-East Nigeria. *Nigeria Journal of Clinical Practice*, 17(3), 296-302.
- Ahmed-Refat, A. R. A., Mohammed, A. H., Aboel-Magd, S. A., & Hammam, R. A. (2008). Ergonomic Aspects and Health Hazards On Computer Workstations' Operators at Zagazig University: An Occupational Risk Management Approach. *Zagazig Journal of Occupational Health and Safety*, 1(1). 11-22.
- Amadi, A. N. (2011). *ABC environmental health*. Readon Publishers.
- Dutkiewicz, J., Skórska, C., Milanowski, J., Mackiewicz, B., Krysinska-Traczyk, E., Dutkiewicz, E., ... & Golec, M. (2001). Response of herb processing workers to work-related airborne allergens. *Annals of Agricultural and Environmental Medicine*, 8(2).
- Faremi, F. A., Ogunlbwokan, A. S., Mbada, C., Olatuhi, M. I., & Ogungbemi, A. V. (2014). Occupational hazard awareness and safety practices among Nigerian sawmill workers. *International Journal of Medical Science and Public Health*, 3(4), 1244-1249.
- Ganiyu, S. O., Olabode, J. A., Stanley, M. M., & Muhammad, I. (2015). Patterns of occurrence of work-related musculoskeletal disorders and its correlation with ergonomic hazards among health care professionals. *Nigeria Journal of Experimental and Clinical Bioscience*, 3(4), 18-23.
- Hamid, A., Ahmad, A. S., Dar, S., Sohail, S., Akram, F., & Qureshi, M. I. (2018). Ergonomics hazards and musculoskeletal disorders among workers of health care facilities. *Current World Environment Journal*, 13(2), 129-140.
- Kemei, R., & Nyerere, J. (2016). Occupational accident, patterns and preventive measures in construction sites in Nairobi. *Business American Journal of Civil Engineering*, 17(2), 333-350.
- Krause, N., Burgel, B., & Rempel, D. (2010). Effort-reward imbalance and one-year change in neck-shoulder and upper-extremity pain among call center computer operators. *Scandinavian journal of work, environment & health*, 42-53.
- Malinska, M., & Bugajska, J. (2010). The influence of occupational and non-occupational factors on the prevalence of musculoskeletal complaints in users of portable computers. *International Journal of Occupational Safety and Ergonomics*, 16(3), 337-343.
- National Institute for Occupational Safety and Health (NIOSH) (2014). Workplace safety and health topics. *International Journal of Safety and Health Topics*, 23(9), 111-134.
- Nkporbu, A., Auquo, E., & Douglas, K. (2016). Assessment of risk factors for psychosocial hazards among workers in a tertiary institution in Nigeria: The need for a safer work environment. *Open Access Library Journal*, 3(1), 1-16.
- Odibo, A. K., Nwagazie, I. L., Achalu, E. I., & Ugbebo, J. N. (2018). Assessment of occupation of occupational hazards in sawmills. *Journal of Occupational Hazards Assessment*, 7(7), 666-678.
- Oluwagbemi, B. (2011). *Themes issues in occupational health and safety (2% edm) Bangalore*. Verbal Media Limited Publishers.
- Osagbeuni, G. K., La-kadiri, R. T., & Aderigblbe, S. A. (2010). Awareness of occupational hazards, health problems safety measures among sawmill workers in North Central Nigeria. *Journal of Table of Preventive Medicine Bulletin*, 9(4), 325-338.
- Park, K. (2009). *Park's textbook of preventive and social medicine (20th ed)*, India. M/S Banaasidas Bhanot Press.
- Pepple, N. M., Akpan, E. U., & Edem, M. J. (2017). Impact of workplace movement on health workers. *Occupational Mental Health Journal*, 5(28), 11-28.
- Pintakham, K., & Siritwong, W. (2015). Prevalence rate and risk factors associated with health hazards to select the magnitude of health problems among street sweepers in Chiang Rai province. *Journal of Environmental Science, Toxicology and Food Technology*, 9(8), 15-21.
- Qutubuddun, S. M., Hebbal, S. S., & Kumar, A. C. S. (2012). A review of effect of industrial noise on the productivity. *International Review of Applied Engineering Research*, 2(1), 43-51.

- Occupational hazards associated with timber workers in Anambra South Senatorial District of South-Eastern Nigeria
- Raymond, A. (2005). *Occupational health for healthcare worker. Occupational environment medicine*. England
- Ritti, T., Grewe, K., & Kessener, P. (2007). Lumber manufacturing western wood products association. *Journal of Lumber Western Wood Product*, 8(22), 149-153.
- Sambre, L. N., Tee, N. T., & Dagha, B. I. (2016). Profitability analysis of timber trade in Benue State, Nigeria implication for poverty alleviation. *Asian Journal of Agriculture Extension*, 11(2), 11-32.
- Segun, R. B., & Yahaya, M. Y. (2010). Assessment of injuries in small scale sawmill industry of western Nigeria. *Journal of Scientific Research and Development Manuscript*, 88(9), 155-162.
- Tumwesigye, N. M., Atuyambe, L. M., & Kobusingye, O. K. (2016). Factors associated with injuries among commercial motorcyclists: Evidence from a matched case-control study. *Journal of Commercial Motorcyclists*, 11(2), 145-179.
- Warnakulasuriya, S. S. P., Peris-John, R., & Sivayogan, S. (2012). Work-related musculoskeletal disorder among mail sorting officers in Sri Lanka: A cross-sectional study. *Journal of College Community Physician*, 17(9), 40-66.
- Yusul, A. Q., Adegbite, E. A., Awotedu, O. L., & Akinosho, O. H. (2014). An empirical verification of occupational health hazards on sawmill workers. *Academic Journal of International Studies*, 22(9), 2281-4612.