CHAPTER ONE
INTRODUCTION

1.1 Background to the study

Sound from various sources is enjoyed by people in one form or the other because hearing is vital to every aspect of daily interactions and transactions. If one is unable to hear, such would, at best find it difficult to participate fully in the activities of the home, workplace and society at large. Various aspects of the working environment such as sawmill where logs of wood are being transformed into planks has been a source of employment and income in every economy of the world with Nigeria not being an exception. The above nevertheless, wood industry has been regarded to be one of the highly harzardous for manufactory employees. The type of the work done in sawmills by employeestogether with the differentinstrumentsused to perform tasks reveals on-the-job hazards and injuries such as noise. Noise is observed as one of these hazards that could expose an individual to potential dangerous situation in workplace settings such as sawmill. Noise, is loosely referred to as annoying sound which is part of daily human activity. In sawmill industries, excessive noise is the order of the day. Thus, a source of hearing loss is exposure tounbearable sound level. Sawmill employees were more prone to loud noise in their workplace.

Exposing an individual to sound level of above 85 decibel (dBA)is considered dangerous to the person.It is believed that normal hearing level will be maintained by a healthy person to about age sixty years especially if the exposure isnot above 85 decibel (dBA) which is termed as excessive noise (Occupational Safety and Health Administration(OSHA, 2007). Exposing persons to excessive noise repeatedly can lead to damage of the auditory system thus resulting to partial or total deafnessotherwise known as noise-induced hearing loss (NIHL) (Haruna and Agu, 2012). There is a possibility to reduce the effect of hearing loss due to noiseexposure in the developing countries through creation of enlightenment and the enforcement of the use of protective measures (Ologe, 2006).

People that develop noise-induced hearing become aware of the loss only when the loss becomes so significant. In Nigeria, workers in the sawmill industry are generally not adequately informed of the damage in persistent exposure to excessive noise, hence, the use of devices was inadequateand consequently make people become vulnerable to hearing loss. Audiometric reports from Department of Ear Nose and Throat (ENT),

Ladoke Akintola University of Technology (LAUTECH) Teaching Hospital, Ogbomoso revealed that the number of sawmill workerswith hearing loss rose from 35% in 2013 to 46.4% in 2015, thus, leading to larger number of people that are in need of medical attention due to noise-induced hearing loss (Oluokun and Adeniyi, 2017).A major risk factor that causes inability to perceive sound globally irrespective of age is industrial noise.

Occupational noise originates from human activities, such as sawmill industry. Though, those working in sawmill industries areas might beaffected by the noise more because they are closer to the source of the noise notwithstanding people in the community will also feel the effect of such excessive noise. The noises generated from these sources are not usually prevented by the vulnerable individuals because the issues of noise and health effect are not considered as anything very serious. Bello (2010) submitted that one of the factors that cause defective hearing is excessive loud noise. Industrial workers such as sawmill in Nigeria lack adequate information about certain deleterious conditions including effects of noise that can affect their health status due to poverty and high level of illiteracy (Osagbemi, La-Kadri and Aderibigbe, 2010). The human environment and health are ravaged by the attendance of destructive properties of this noise. To this end, it has been observed that as a man quest for development, his life and health are thereby exposed to series of hazards which affect his survival if proper care is not maintained.

It is worth to note that not only the developed countries consider sound from sawmill industry a major environmental threat to hearing, the developing countries such as Nigeria in this era of industrialisation, exposure to noise on the part of sawmill industrial workers becomes inevitable (Ologe, 2006). Noises that are not prevented such as industrial noisethrough the use of a protective hearing device will likely lead to damaging the eardrum. Due to the workplace conditions in most sawmillnothing or very little can effectively be done to decreasethe level of noise produced. Wearing protectors will minimize hearing loss risk by reducing exposure to excessive noise. According to Ologe (2006), materials like cotton wool inserted in the ear or wrapping cloth around the head is used as protector by some people to protect their ears from the noise while tying of headgear by some women over their ears to protect them from high noise levels most especially in their workplace. Manufacturing industries that includes' fabrics production, metal production and mining are industry where exposure to high noise

frequentlyoccurred (Osisanya, Oyewumi and Sunmonu, 2014). Occupational hearing noise is not life-threatening challenge but the impact is gradually and may be associated to other factors which might probably be the reason for most people taking it for granted.The inner ear that is sensitive to sound will likely be damagedfrom the effect of exposing the human ear to sound level above 85 dBA for eight hours aday.

Defective hearing as a result of excessive loud sound is characterised by inability to hear at higher frequencies. It is permanent, incurable, and progresses substly with persisitent exposure to sound of high level (Osisanya, Sunmonu and Oyewumi, 2014), which is not realised by most people until it becomes moderately severe (Arezes and Miguel, 2006). Physical, social life, employment and emotional functioning are areas of life affected negatively by continuous excessive loud sound resultingto high burdenson the family members and communities at large.Bello (2010) noted that most of the organisation where individuals are exposed to occupational risk of NIHL are not well-established and as such do notput effective treatment in place at the appropriate time. One of the effective methodsof reducing the impact of the problem therefore is prevention. Federal law of Nigeria mandates hearing conservation programmes should be established where time-weighted sound level ismore than thepermitted limits established by OSHA. For example, exposure longer than 8 hours daily exceeds the OSHA limit for the lowest noise level, 85 dB; the OSHA limit for 110 dB of sound is exceeded when exposure surpasses one-half hour per day (Miles and Mezzich, 2011).

Based on report that failure to wear the protective gears during work, the effectiveness of the protector will diminish quickly while the use for 90% of the time of exposure will decrease the benefit of the gear to less than one third of the original effectiveness (Bello, 2010). Unfortunately, many people in Nigeriado not have adequate knowledge about theharmful impact of loud sound to the human ear. It develops gradually which makes it difficult for most people to identify the presence of the condition before the loss become significant. Sufferers during early stage often report the need to turn up the television volume, difficulty getting oral information while participating in group discussion or interference from background noise (Bakare, 1989). Participation in normal group conversation becomes difficult as the level of hearing loss increases and in some casesone-on-one situation which may be the effect of continuos loud sound, however,early detection is critical for effective management and prevention of NIHL.

The genesis of industrial noise as the major cause of NIHL is traceable to the birth of vast changes in industrial setting which originated from developed countries. Noise pollution is no longer limited to developed countries but it has now become rampant in the developing countries due to the influence of western civilization, Nigeria inclusive. This is so because prolonged exposure of the ear to loud noise is found to cause NIHL (Singh, Bhardwaj and Deepak, 2010). According to them, the causes of NIHL are fairly well understood both at the structural and cellular levels. As far as structural level is concerned, noise could cause rupturing of the tympanic membrane (eardrum). While in the case of cellular level, noise destroys the cells in the cochlea. There is no doubt that hazardous noise conditions produce destruction ofauditory hair cells and that sufficient destruction of elements will produce hearing loss (Jerie, 2012).

Elightenment of the benefits of hearing protector to reduce loud sound among sawmill workers should involve identifying thesource of noise and factors such as attitude, peer influence and lifestyle asmenace of loud noise can be combated effectively.All members of the society are prone to the risk of having noise-induced hearing loss with particularly people working in environment that can be termed as noisy work place such as factories, foundries, working with power tools, plant and machinery and transportation as road works, airport among those likely to be most affected.Complete programme that will ensure hearing conservation is required so that continuos loud sound can be mitigated. No medical cure has been identified for permanent hearing loss, thus, preventionof its occurrence is inevitable. In Nigeria and other developing countries,high level of noise pollution is yet to be properly addressed and laws on safety measures yet to be enforced (Osisanya, Oyewumi and Sunmonu, 2014). The principle guiding typesof protector that should be used and hearing protection level permited for differentworking environments hangs down on degree of sound level being exposed to (Occupational Safety Health Administration, 2007).

Personal hearing protective device (PHPD) is one of the important devices that should be provided to employees in the industries where the noise level is above 85 dB but a major challenge is the desire of employers in such environment to recognise the benefits of providing certified HPDs for employees. Employees lack of knowledge on the outcome of unprotected sound might contribute to huge money spent on compensation in the industry (Hannel, 2010).A behaviour change among workers in the industry is required for the proper implementation of PHPD use because the barrier to itseffective

use is attitude and acceptance of required behavioural changes (Guild, Ehrlich and Johnston, 2006). Noise reduction in any wood processing industries may be practically impossible due to the type of machine that is being used, but using hearing protective device that is properly placed on the earis a potential solution (Clark and Bogl, 2006). Paulus (2009) revealed that effective noise reduction programme depends on attitude of employees to safety rules guiding the work environment. Personal hearing protective devices should be applied regularly if noise level is above 85dB and should not been seen as an option due to failure of engineering and administrative departmentto sufficiently control the hazards.

Some of the health and safety hazards associated with working in such environment should be minimised by using earplugs or earmuffs but the excuse given by some people that the device interferes with their level of understanding as a reason for not using it is not good (Kemp, 2007).Exposure of the human body to noise, dust, and gases may not result in significant damage to effective functioning of the human system but when the exposure level exceeds the homeostatic capacity required by the body, health hazard will likely occur which is a major reason the human body especially the ear should be protected through using suitable device to protect the ear (Zendel and Alain, 2012). The perception of employees in sawmill of noise hazard is that it constitutes a threat to living of people working in such environment. Some workers know HPD is provided for their safety but find a means of avoiding its being used giving different excuses (Jerie, 2010).Adequate consideration of health hazard should be made so that the selection of appropriate HPD is done. The HPD selected should meet a particular safety requirementbased on certification. In view of this, Goldman and Smith (2011) submitted that workers who use HPDs should be trained, educated and motivated adequately. Although, various authorities such as government agencies like Federal Environmental Protection Agency are now making serious attempts to prevent and protect noise pollution but unfortunately, all these efforts are yet to make any remarkable impact in Nigeria (Bello, 2010).

Occupational noise prevention and control include reduction of exposure to noise, use of technology control, and engineering control (NIOSH, 1998). Technology control is consideredfirst to be used to reduce level of sound. However, engineering and administrative noise controls may not be effective in reducing noise in sawmill as creation of barriers between machineries and workers is not feasible. This simply means

that workers cannot be separated from the machines and shifting is not allowed in sawmill industries in Southwestern Nigeria (Akande and Ologe, 2003). In furtherance, using engineering and administrative measures may not subdue the loud sound to the level requiredwhile the use of hearing protectors is good in protecting sawmill workers from having hearing loss (Arezes and Miguel, 2006; Bruhl, Ivarsson and Toremalm, 2007). Thus, the third strategy, use of personal hearing protective, is the most feasible method of protecting workers against hearing loss. McCullagh, Ronis & Lusk (2010) opined that more than half of sawmill workerswho refused to use HPDs are those who experienced NIHL. This simply means that if all sawmill workers realise the important and the useof HPDs, NIHL can be reduced to a minimal level.

Major causes of social problems among workers are occupational noise and trauma (Punch, Elfeubein and James, 2010), although some improvement have been made in the health sectors in order to ensure safety environment at work but occupational noise and resulting impact on an individual and the society at large is on the increase (Hurst and Kirby, 2008). The problem associated with noise is said to havepersistent challenge that must be promptly addressed (Hacker, Brown, Cabral and Dodds, 2008). Understanding the factors that can change workers behaviours is crucial. Efforts at ensuring that there is behavioural change havenot yielded expected positive result due to neglect of psychological change (Hurstand Kirby, 2008). Behavioural change not effected through mere presentation of information which makes it critical to identify factors that is required for successful behavioural change (Booth, 2009). Sawmill worker behaviour towards loud sound contributes to workplace noise hazard, educating such about risks involved in exposing ears to continuous loud sound in the work environment and how to minimise these can help in promoting the use of hearing protectors (Folmer, Griest and Martin, 2007). The use or non use of HPDs in sawmill industries is closely associated with factors like lifestyle, age, gender, attitude to noise and hearing protection, level of education, job duration, peer influence andindustrial noise exposure.

An individual's lifestyle can impact on the health and other areas of life. Lifestyle referred to attributes of people in a particular region or community which includes the behaviours and functions of the person on the job, actions and inaction to life (Karimi, Heidainia and Ghofranipur, 2010). Somepeople do not see any reason for using HPDs in their workplace such as sawmill despite the availability of such. Hence, they encounter sensorineural hearing loss, tinnitus and even death. Problems like noise-induced hearing

lossand tinnitus can be caused by an unhealthy lifestyle such as exposing ears to excessive noise without the use of HPDs, consuming alcohol, smoking, abuse of drugs and depression are unhealthy factors that affect an individual lifestyle. A survey of risky behaviour that affect lifestyle conducted by the Center for Disease Control and Prevention (CDC, 2007; 2008) reported that about 10% of individuals working in thefactory smoke at least 10 cigarettes in a day while the rate of smoking for people between age 18-64 years increases to about 20% (CDC, 2007; 2008).

In the report of Davison, Frankel and Smith (1992) most employeess working in sawmills engage in consuming various alcoholic drinks and probably the use of illicit drugs. The consumption of such illicit drugs may affect the ability of the workers to evaluate the levels of noise. Remembering the adverse symptoms that may occur and report accurately the attitude towards utilization of protective hearing device may be difficult due to the drug intake. The accumulation of hearing loss due to excessive sound exposure and aging are some of the health challenges in the sawmill industry.Hearing loss can lead to experiencing difficulty to understand, hinder discussion with family and friends which will lead to feeling isolated and respond appropriately to warning and hear phones, whistle, and car horn. Hearing loss due to aging occur most often in both ears and the effect is felt equally but develops gradually making it difficult to detect until the loss is irreversiblie.

Tak, Davis and Calver (2009) reported that participation of women in business transactions at various levels has increased which may have led to increase in the rate of exposure to noise. This hazard of industrial noise and the importance of earplugs or earmuffs howeverare viewed and discussed based on male perspective. Most often when women are affected the impact of noise hazard and preventive measure of using protective hearing devices are neglected (Beresford, Croft and Adshead, 2008). Result revealed that the level of noise at which women are exposed is either neglected or not properly monitored (Tak, Davis and Calvert, 2009), which is due to factor relating to bias based on gender and the fact that it happened in non-industrial related activities for example services specifically,education, accommodation among others. Motivation of women is based on the need to protect the privilege and the role play as caretaker in the family. The primary role of women as caretaker is important on the way sickness and other related health issues are handled, and prevented. Accessing health care information, resources for treatment and response to treatment is gender biased whenmen are

compared with women (Vlassoff and Manderson, 1998). The history of certain sicknesses is associated with stigmatization for example deaf, and at there is women marginalization in the society and family thanmen.

The attitudes influence individual disposition towards safety related issues. Sawmill workers' behaviour contributes to workplace noise-induced hearing loss, workers should be enlightened about risks in the work environment and steps that can be taken to reduce these can help to ensure that workers use hearing protective devices. The organisation of mental response that can either be persistent or temporar is known as attitude and is highly an emotional disposition of an individual mind set towards a value such as fears of using hearing protective devices in the workplace (Goldstein and Cialdini, 2007), and linked individuals' knowledge, belief and values, and oscillatingbetween positive or negative. Understanding the attitude of sawmill workers will ensure an effective process in the creation of awareness and design of appropriate programme to meet the working conditions of workers in sawmill across the country. A lot of people do not really care about their hearing until it's too late (WHO, 2013). That non-challant attitude is a problem, experts noted that there is more likelihood of increased in number of with hearing loss related problem due to failure to detect the lost at initial point for possible treatment and preventive measure that will not allow it to deteroriate without complete lose of the ability to hear.

Education also helpspeople to live and improve their health by application of knowledge that will enhance healthy living, availability of information and cognitive ability (Fechter, 2006), while years of schooling will result in improved standard of living and healthy lifestyle. Education is critical in navigation of noise associated with occupation, choice of lifestyle and hearingprotective devices usage. Low levels of education will usually result in poor health, increased in stress and reduced self-confidence because more educational training will bring about a better healthy report regardless of ethnic background. An explanation for the obvious relationship between educational attainment and usage of hearing protective device usage is the benefit education exposes a person to about the outcome of using hearing protection device. Lower educational attainment is responsible for therisk of exposing ears to continuous loud sound and less likely to have opportunity to use earplugs or earmuffs (Goldman and Smith, 2011).

Punch, Elfeubein and James (2010) found out that the longer the years at work in an industry such as sawmill industry induce noise environment, the more industrial workers experience decline in peripheral sensory function that associated with ageing. Thus, the procedure that defines age related decline in the ability to process noise involves peripheral, central and cognitive processes. The ear can be exposed to sound of 120 dB briefly without result in permanent damage but only the feeling of discomfort and pain while exposing the ear to sound of over 80 dB for a long period will lead to irreversible hearing loss. Recent evidence demonstrates the effects of machinery on hearing mechanism due to life-long experience (Zendel and Alain, 2012). Also, Tak, Davis and Calver (2009) posited that industrial workers years at work may affect a person speech perception even in a situation where there is no hearing loss which showssthat natural process of aging affect process of speech even when there is no visible sign.

Demir and Urberg (2006) indicated that 28% of the sampled workforce had hearing problems which was mostly tinnitus was found to be connected with the hours engaged in job. In the study of Gerend and Cullen (2008), it was found that time spent performing a joband the use ofhearing protective device is moderately associated and significant. In the same vein, the study carried out by Dell and Holmes (2007) submitted that the time spent on the job and hearing loss was significant at moderate level with decrease of 12% when hearing protective devices is used. Study has proven more duration of service, not submitted to health appraisal isa crucial factorwhich may lead to an increase in the risk of exposing ears to high sound (Fernandes, Carvalho and Assuncao, 2011). Larsen, Engels, Souren and Granic (2010) reported that older adult sawmill worker that has expended longer years at work without hearing protection experiences greater difficulty hearing in background noise.

The role of peer influenceis significant on an individual lifestyle. Despite the negative impact that peer relationship have made on some people,the relationship is critical for the development of healthy social interaction. Although, the influence ofpeershave potential of developingpositive behaviour in an individual but peers influenced by undesirable behaviour often stated. An individual should be assisted so as tounderstand that peer group are mutually constructive members of the community (Glaser, Shelton and Bree, 2010). Families, people working in the same place, community members and individual can assist in the development of positive relationship among peers and at the same time minimise the impact of negative peer influence.The peer group can be used as an

exampleof acceptable behaviour and attitude through the provision of unlimited access, motivation and the right environmental settings for an individual to emulate (Glaser, Shelton and Bree, 2010). Social Learning Theory opined the importance of adolescent observing specifical social behaviour that can be be adopted; it is appropriate note that peer group will accept such behaviour and exhibit same so that they can be members of the group (Larsen, Engels, Souren and Granic, 2010).

Influence from peers will affect an individual preferred style of dressing, speaking, substance abuse, general behaviour like participation in violence, risky sex behaviour and anti-social behaviour (Demir and Urberg, 2006), although having peer relationship will enable one to learn effective conflict resolution through share experiences and feelings. Social isolation and limited contact will likely be the result of not interacting with peer group because the opportunities to develop one social circle are reduced drastically.

A person well-being psychological is connected to peer relationship that is positive while health hazard is associated with negative peer influence (Laftman and Ostberg, 2006).Interacting with friends in an appropriate environment maybe a source of healthy development because the influence of peer influence is important in encouraging individual to be responsible and engage in act of responsibility for personal health and safety to be ensured, such as individuals that have hearing loss especially adolescents, creating awareness that young people that were exposed to noise can also be affected. In addition, Goldman and Smith (2011) submitted that role models at workplace such as peers are critical in creating norms where minimising the level of exposure to noise will be possible. Influence from the peer may be more valuable when compare that of the foremen because the latter is an enforcer with set goals while the peer support will be view as real without hidden intention. Utilizing peer information with existing hearing loss to counsel others on hearing loss and the effect on both personal and social life may create positive use of hearing protectors.

Haruna and Agu (2012) reported that people who are exposed to continuous loud sound in theirworkplace such as sawmill should be a source of concern globally due to evidence that is connected to highlevel of health issues. The resulting effect of short or long periods of exposure to noise include auditory impact like auditory fatigue, hearing loss and indirect non-auditory symptoms such as annoyance, speech interference, several psychological changes, lowered mental peace and task performance.Exposure to

excessive levels of noise (such as that level that can be considered hazardous to most people hearing) can affect the ability to hear. Exposing ears to high sound from sawmill industry is highly preventable if those working in such environment are well informed on how to use HPDs (Dobie, 2008; World Health Organisation, 1997) and can indicate that exposure was either intensive and brief or extensive and broad.Incidence of hearing loss increases when overall non-linear nature is associated with noise exposure (Toppila, Pykko, Truong, Siriwong and Robson, 2009).

Hearing loss may be immediate or gradual, temporal or permanent. The threshold of hearing loss can shift depending on degree of exposure to noise and the duration and the shift can be ranged from a small threshold that will allow easy detection of sound at different frequencies to total deafness which either affect both or one ear, although the degree of impact is not usually the same when both ears are affected (Verma, Purdham and Roels, 2002). Hearing loss due to noise inducement is indicated by pure- tone threshold of 3000-6000Hz because the tone is higher than what is required of an individual. Shift in the frequencies threshold shows that the hearing loss occur due to defect in the voice of the upper frequencies (Dell and Holmes, 2012). Research revealed that conversation can occur in environment that is quiet at 90% for individuals with moderately hearing loss compared with unimpaired hearing that occur at about 98% (Dias and Cordeiro, 2007).

In environment that is noisy, few words can be grasped effectively. Defective hearing compare to their normal counterparts who by virtue of their normal hearing can understand more than half of the words presented to them (Dias and Cordeiro, 2007). Industrial workers such as sawmills must understand the danger in NIHL and the available methods that can be effectively used to prevent it. Barriers to successful implementation of hearing protection programmes includes failure of individuals working in sawmill to wear the protective giving various excuses, the devices not comfortable and lack of concern for the need of such on health preservation and pressure from the society wearing protection (Booth, 2009). There are different factors that must be considered for the achievement of positive health outcomes which include the educational attainment. The sastifaction an individual get through the ability to understand the requirement for healthy living, obey or read instruction, advocates for oneself and family members and effective communication with health providers is through education (Goldman and Smith, 2011).

Different studies have been conducted in Nigeria on the level of hearing of an individual working in noisy areas using engineering or administrative control. Meanwhile, the cost of engineering implementation and control of noise administratively are major challenges to their adoption. Small and medium industries consider the control of noise as not importantdue to poor economic downturn that has affected most businesses including sawmill industry. Regardless of the impressive number of studies carried out by different researchers on ear protectors in Nigeria, no study has been conducted on the determining factors of hearing protective devices usage among sawmill workers in Nigeria. Consequently, the researcher feels it is high time sawmill workers in Nigeria adopted measures of preventing themselves from loud sound being generated in their workplace. This study therefore investigated personal (lifestyle, age and gender), dispositional (attitude to hearing protection) and contextual (level of education, length of service, peer influence and industrial noise exposure) factors as determinants of hearing protective devices usage among sawmill workers in southwestern Nigeria.

1.2 Statement of the problem

Hearing loss isa common occurrence experienced among sawmills in Southwestern Nigeria due to continuous loud sound experienced by the saw millers. The impact from the noise is neglected by saw millers because the effect is not noticed early andno visible sign detoriation such as bleeding.Some health issues associated with noise-induced hazard are hearing loss, increase distractability,decline productivity and alower life that will eventually result in loss of opportunities for tranquility.A number of cases of hearing loss were reported from sawmill workers in Ogbomoso and its environs. The noise is overlook by most workers in sawmill because they assume it is part of the job hazard; hence, they ignore safety procedures like using protective devices. However, until now, there was little or no information concerning the workers in the sawmill industries perception towards using a protective device in the workplace. Sawmill workers are ignorant of the plausible cause of loud sound to their hearing.

Traditionally, sawmill workersdo not value the impact of exposure to noise that affect interaction with members of the community until frustration set in as a result of permanent communication challenge or re-echoing from the inner ear. The perception of other people within the workplace about those who have developed NIHLcan be that they lack the competency required for the task, easily distracted and lack good

commiunication skills due to handicapping condition impacting upon team work and group productivity. Lifestyles such as excessive smoking and drinking and continuous exposure to loud noise impair the emotional, creative and psychological well-being of individual worker. Aging affects someadults, thus,significantly impactan individuals' quality of life if not treated. Also, gender affects the usage of HPDs among sawmills in Nigeria as noise hazards and the use of HPDs are frequently neglected or forgotten when women are affected.

Most sawmill workers exhibit non-challant attitude towards the psossibility of developing hearing loss and measures such as HPDs. Likewise, individuals with lack or low level of education are exposing themselvesto industrial noise. Workers' years at work without the use of HPDs can affect speech perception and thereby resulting to frustration, poor coordination and inefficiency. Also, peer influence could be encouragement or otherwise from friends, coworkers and supervisors about the use HPDs in the sawmill industry. Discouragement of the use of HPDs from friends could lead to negative attitude of workers towards the use of HPDs in their workplace. However, as the workforce continues to grow, the risk of developing hearing loss will likely increase in corresponding propotion, particularly in the sawmill industries.Hearing protectors are effective in reducing loud sound experienced by sawmill workers, thus, preventing NIHL. Therefore, this study investigated personal (lifestyle, age and gender), dispositional (attitude to hearing protection) and contextual (level of education, length of service, peer influence and industrial noise exposure) factors as determinants of hearing protective devices usage among sawmill workers in Southwestern Nigeria.

1.3 Purpose of the study

The study sought the influence of personal (lifestyle, age and gender), dispositional (attitude to hearing protection) and contextual (level of education, length of service, peer influence,industrial noise exposure) factors on hearing protective devices usage among sawmill workers. Specifically, the study seeks to:

- find out if there is any relationships among the independent variables(lifestyles, age and gender, attitude to hearing protection, level of education, length of service, peer influence and industrial noise exposure) and dependent variable (hearing protective devices usage)

- determine the joint contribution of the independent variables (lifestyles, age and gender, attitude to hearing protection,level of education, length of service, peer influence and industrial noise exposure) on the use of hearing protective devices among sawmill workers..
- determine the relative effect of each of the independent variables (lifestyles, age and gender, attitude to hearing protection, level of education, length of service, peer influence and industrial noise exposure) on the use of hearing protective devices among sawmill workers.

1.4 Research Questions

The following research questions were answered in the study:

1. What is the joint contribution of the independent variables (lifestyles, age and gender, attitude to hearing protection, level of education, length of service, peer influence and industrial noise exposure) on hearing protective devices usage among sawmill workers?
2. What are the relative contributions of each of the independent variables (lifestyles, age and gender, attitude to hearing protection, level of education, length of service, peer influence and industrial noise exposure) on hearing protective devices usage among sawmill workers?

1.5 Hypotheses

The following hypotheses were tested at 0.05 level of significance

1. There is no significant relationship between lifestyle of sawmill workers and the use of hearing protective devices.
2. There is no significant relationship between ages of sawmill workers and the use of hearing protective devices.
3. There is no significant relationship between genders of sawmills and the use of hearing protective devices.
4. There is no significant relationship between attitude to hearing protection of sawmill workers and the use of hearing protective devices.
5. There is no significant relationship between level of education of sawmill workers and the use of hearing protective devices.

6. There is no significant relationship between length of service of sawmill workers and the use of hearing protective devices.
7. There is no significant relationship between peer influence of sawmill workers and the use of hearing protective devices.
8. There is no significant relationship between the industrial noise exposure of sawmill workers and the use of hearing protective devices.

1.6 Significance of the study

The study would shed light on the factors responsible for use or inadequate use of HPDs by sawmills. Likewise, the findings of this study will help the management of sawmill industry to appreciate the need to reduce noise, implement policies that will improve the use of HPDs. It also providessawmill workers with materials (such as earplugs and earmuffs) that can minimise the risk factors responsible for hearing loss among the exposed population. It would enlighten sawmill workers of the need to take appropriate measures to protect themselves from work hazards by using hearing protective devices. The study would equally enables the government aware of the need for quality control to make sure that companies observe and maintain best practice that would take into consideration the wellbeing of workers.

The expected results would give empirical to special educators, occupational therapists, social workers, psychologists, counsellors, non –governmental organizations and other professionals onhealth related matters. This work would provide useful information on HPDs because it attempts not only to bring to the awareness of the public the preventive measures such as earplugs and earmuffs but also audiologists and other professionals as a useful tool for intensifying campaign through seminars, workshops and outreaches on noise and the use of earplugs and earmuffs to prevent such.

The research work would equally bring to the awareness of the employees working in high noise zone of the need to conserve their levelof hearing by using protective hearing devices like earplugs and earmuffs while performing their occupational duties. It would also ensure that programme which caneffectively prevent hearing loss as a result of occupational type are initiated, preserving and protecting their remnant and furnish the employees in sawmill with the knowledge of hearing protective devices that will safeguard them from deterioration. The findings of this study would also assist the occupational and environmental officers to develop tailored interventions on the use of

HPDs in sawmill indusries by providing information and instructions on protective devices.The significance of this study therefore has created the urgency for the law enforcement agencies to wake up to their responsibility by making efforts at enforcing occupational health laws in sawmill industries.

1.7 Scope of the study

This study investigated personal (lifestyle, age and gender), dispositional (attitude to hearing protection) and contextual (level of education, length of service, peer influence and exposure to industrial noise) factors as determinants of hearing protective devices usage among sawmill workers in Southwestern Nigeria.The study comprised of all sawmill workers in Ekiti, Lagos, Ogun, Ondo, Osun and Oyo states.

1.8 Operational Definition of Terms

Personal Factors: These are individual lifestyle, age and gender that influence the behaviour of sawmill worker on the use of hearing protective devices in his or her workplace.

Dispositional Factor: This refers to the individual characteristic, such as, attitude to hearing protection of a sawmill worker in his or her workplace.

Contextual Factors: These are level of education, length of service, peer influence and industrial noise exposure that persuade individual sawmill worker to the usage of hearing protective devices in his or her workplace.

Age: This refers to a period of existence of sawmill worker.

Attitude: This refers to the opinions and feelings that individual worker in the sawmillindustry develop towards the use of HPDs.

Gender: It is the description ofeither male of female individual person working in the sawmill industry.

Hearing Protective Devices: Earplugs or earmuffswhich can be used to reduce impact noise of high frequency and intensity.

Industrial Noise Exposure: This is unwanted sound that is created in sawmill which is above the 85dB accepted level and can lead to permanent hearing loss if repeated for more than 8 hours.

Length of Service: It is the number of years a worker has put into the job in the production sector in a sawmill industry.

Level Education: It is the highest level of formal learning that the sawmill worker has completed.

Lifestyle: The way and manner a saw miller goes about living his life including the common things he does e.g. smoking, excessive drinking and constant exposure to loud noise that can affect hearing.

Peer Influence: This refers to direct action on people by friends, coworkers or supervisors towards the use of earplugs or earmuffs in sawmill.

Sawmill Workers: People who work in the industry where logs of wood are being processed and transformed into planks.

CHAPTER TWO
LITERATURE REVIEW

This chapter presents the review of theoretical and empirical literature related to the study.

2.1 Conceptual Review

2.1.1 Concept of Hearing and Hearing loss

Ear as a sense of hearing is very important tothe human existence. Thus, damage of this necessary organ can destroy the ability of individuals concerned to hear effectively. A normal hearing person may not value quality of his or her hearing organ until such lacks the ability to hear or comprehend conversations. Ademokoya, Onwuchekwa and Oyewunmi (2003) stated that an individual with normal hearing hardly appreciate the capability to communicate effectively within and outside his environments. A congenitally deaf individual finds it difficult to believe that there are various sounds in his environment, thus unable to experience the excitement a melodious music can exert on his feelings unless if he is provided with hearing aids, he may assume that the world is a silent planet. Hearing can be described as the capacity to understand sound by detecting vibrations, differences in sound medium such as through an organ of hearing(Amedofu, 2002).

Hearing is described as the process, function or ability to perceive sound such as noise tones (Owolawi, 1996). Eardrum converts sound into mechanical vibration usinghammer, incus and stapesfor transmiting sound signals to the inner ear. The hair cells send information to the auditory nerve.The inner ear is shaped like a snail and is also called the cochlea. Sound waves in the air are collected by the outer ear and directed to eardrum. The space in the front of the ear is the middle ear which houses the ossicles that is the three small bones in the ear. The ear canal makesthe sound waves passing through the the ear drum to vibrate because it moves the three bones in the middle ear.

The intensity and the duration of sound exposure can destroy the hair cells in the cochlea (Ademokoya, Onwuchekwa and Oyewunmi, 2003). Exposure to sound that is very loud can cause damage on hair cells, making it to become scattered and deteriorated. There is specific number of hair cells which makes it difficult for replacement to take place once a hair cell is dead and resulting effect is the permanent lost of auditory sensitivity (Ademokoya, Onwuchekwa and Oyewumi, 2003).Damage of the hair cellscan

occur due to aging and exposure to loud sound. Damage to or lost of the hairs or nerve cells will prevent the efficient transmission of electrical signals resulting to hearing loss.Most people do not have information about the damaging effect of excessive sound on the ear in the environment, or the levels that noise can be described as harmful to the ear. Factors that are sources of damage to the ear due to level of noise include equipment, power tools, car radio, vehicles, alarm, gun shot, musical instruments, and even television.

An individual that is exposed to sound that is as high as 85 dB A for eight hours a day may find it difficult to process or understand speech.Persons with hearingloss can either hear partially or unable to hear at all (Owolawi, 1996) and can affect either one or both ears (Osisanya, Oyewumi and Sunmonu, 2014). Hearing problem in children can lead to inability to learn and understand spokenlanguage while in adults work related challenges can occur. Hearing loss among the elderly can lead to depression and loneliness (Owolawi, 1996). Hearing loss occurs due to reduction in the level of sound sensitivity that would be heard under normal hearing condition.Hearing impaired or hard of hearing is a term that is used to describe individuals' experiencingsound insensitivity in the frequencies of speech. The degree of hearing loss is classified based on increase in volume above the normal level necessary before a person can detect sound.Hearing impairment is a serious handicapping condition that tends to isolate the individual from normal living.

Hearing loss often brings with it communication problems which in turn can contribute to social and behavioural difficulties (Adejobi, 2012). In addition, according to him, individuals with hearing loss have adjustment challenges when compare to normal hearing. In other words, hearing impaired individuals exhibit characteristics of rigidity, egocentricity, absence of inner controls and impulsivity.Hearing Impairment does a lot of havoc in the life of its victims because so many things are affected. Bello-Imam (2003) opined that it is the man with imperfect hearing that can describe the negative effects of hearing impairment on his total life. In other words, the man with "perfect" hearing enjoys a lot of advantages over the man with "imperfect" hearing.

An individual communicates easily with the next person orally and this is prerequisite to written communication. The man with 'perfect' hearing also uses it to avert dangers and accidents, danger signals can be heard and by this that danger could be averted (Okuoyibo, 2001). In the same vein, an individual with defective hearing who

finds it difficult to communicate with others may develop some personality social and emotional problems, ranging from withdrawal, inferiority complex, aggressiveness and feeling of suspicion (Okuoyibo, 2001). Bello-Imarn (2003)submitted that an individual with hearing problem developed some sort of fear and might not be able to cope in the society considering the enormity of hearing problem. She stated further that hearing problem affectedrelationship with other people thus lead to withdrawal from interacting with people.In her submission, Oyebola (1997) stated that several mental, emotional and behavioural characteristics such as anxiety undue sensitivity, and humiliation, fear and depression are with the stutterers due to their inability to express themselves easily.

These mental, emotional and behavioural characteristics are also in the persons with hearing problems because of their incapability to make use of their ears in associating with the rest of the world. Oyebola (1997) further submitted that the social adjustment trends of the stutters such as maladjustments, insecurity, and feeling of unacceptability are also the traits of persons with hearing impairment. All these are enough to affect the social and psychological adjustments of the individual with hearing impairment. Onwuchekwa(1998) observed that hearing impairment, though an inconspicuous sensory disability, do affect the victim overtly. She opined that hearing impairment like any other disabilities does hinder the normal capability expected of the victims in terms of age, sex and societal adjustment. Hearing impairment no matter the age of onset does affect the victim's psychosocial disposition, communication ability, adjustment capabilities and educational achievement.Onwuchekwa (1998) found out that hearing impairment has negative effect on social and personal adjustment of the afflicted individual. This negative effect is closely connected with communication problems which contribute to social and behaviour difficulties.

In the light of this, Alade (2005) found out a consistent adjustment problem among deaf individuals than their hearing counterparts. It is therefore, very important to make the public and home environments very conducive for the individuals with hearing impairment, in order to alleviate their adjustment problems.Bello-Imam (2003) observed that hearing loss has its social, academic and psychological effects on the individuals with hearing impairment. These effects can be reduced if such can accept their disabilities by adjusting to their social, psychological and academic environment. In addition, an individual with psycho-social effects of hearing impairment may withdraw from activities in the immediate community, discussion with others decline, less frequent, less

spontaneous and less personal, and decrease attention and/or avoidance of social gathering, reduction in social interaction,withdraw from social activities, loss of intimacy, difficulty with responsibility and problems with maintaining relationship.Onwuchekwa (1998) observed that the students with hearing impairment may be self-blaming, blaming others and or God for their predicament, they are often psychologically traumatized when the thought of their physical malfunction get to pathological level.

Factorssuch asgenetics, aging, exposure to noise,infections affecting the ear, complications during birth, trauma to the ear, and use of drugs that are toxicmay cause hearing loss (Owolawi, 1996). Approximately half of the problem leading to some level of challenges isabout 5% of the population globally (NIOSH, 1998). Hearing loss canbe temporary also known as 'temporary threshold shift', that is reduction to sound sensitivity over a wide frequency range. The exposure can be for a short period but loud enough to affect the level of hearingsuch as firecracker, gunshot, engine of a jet, jackhammer, or for a long time during musical concert or visit to nightclub (Amedofu, 2002) but an individual can recover within 24 hours and sometimes may take about a week (Aremu, Aremu and Olukanmi, 2015).Consistent exposure to sound as high as85 dB (A) or above and one-time 120 dB (A) or above may lead to permanent hearing loss (Owolawi, 1991).

Hearing loss is indicated during testing when an individual is unable to detect sound of 25dB at least in one ear. Hearing loss can be categorised as mild, 26dB-40dB,41dB-55dB,56dB-70dB, 71dB-90dB, 91dB and above are moderate, moderate-severe, severe and profound respectively (Campbell, 2004). Three types of hearing loss are conductive, mixed and sensorineural hearing lossess *(*Davis, Kozel and Erway, 2003). Conductive hearing loss is an abnormality in outer ear or middle ear. Typically, conductive hearing losses have fairly flat equall losses at all test frequencies. Most hearing losses in the middle ear are of a slight to mild degree, and a maximum hearing loss in the middle ear does not exceed 60-70dB and this refers to as conductive hearing loss. Common factors responsible for conductive hearing loss are cerumen or foreign body, occlusion of the ear canal, tympanic membrane perforation, otitis media or middle ear growth abnormality. Most conductive hearing lossescan be treated medically or surgically, but when they cannot be corrected, patients or victims with hearing loss in the middle ear benefit very well with hearing aids.

Sensorineural Hearing Loss involves neural otherwise referred to as cochlear and rerocochlear lesions. These are disorders such as presbycusis, acoustic neuromas, or

noise-induced hearing loss and may have both sensory and neural components. Sensor neural hearing loss reveals poorer hearing for the higher frequencies. People with sensori neural hearing loss canbenefit from hearing aids. Sensorineural losses do not respond to medical or surgical treatment and causes are cumulative over a lifetime. However, common causes include noise exposure, aging,meniere disease, infections and genetic syndromes.

Mixed Loss is the combination of conductive and sensorineural hearing losses at the same time.Mixed hearing loss reveals poor response at both air and bone conduction tests.Hearing losscan affect an individual ability to communicate in reciprocating manner, socialisation and interaction with members of the community negatively (Adejobi, 2012). Generally, hearing loss does not only refer to difficulty with volume but result in experiencing challenge to understand conversation when using the phone, during group argument as a result of more than one person talking at a time;the space is too large leading to echo. The effect is that subsequent difficulty on efficient social interaction can result in low self-esteem, increase in shame, and fear (Osisanya et al, 2014).Individuals who develop hearing impairment early in life will feel the impact more than those who experience it later due to social acceptability.

The psychosocial state irrespective age can cause isolation socially which impact on the health and well-being negatively. This can further result in depression particularly when the loss is result in tinnitus. Individuals experiencing hearing loss are at risk of deteriorating quality of life because no matter the source or age can limit the experience that is associated with the benefits of sound on quality of life (Bello-Imam, 2003).

2.1.2 Concept of Noise and Industrial Noise

Physically, noise and sound are related, sound is the sensory perception while noise is described as sounds that are undesired and this further reveals that any disturbance or unwarranted within a relevant frequency band is noise (McCullagh, 2011). All human tasks have a level of noise present and in evaluating the effect on an individual state of health, it is categorised as either noise due to the type of occupation, or as noise from the environment such asnoise from the community, resident, or domestic engagement (such as playgrounds, vehicles, musics and sporting activities). Occupational noise at high level still remains a challenge globally.An example likeUnited

States of America with over 30 million individuals that are in working class are exposed to noise hazard (NIOSH, 1996).

According to WHO (2001) report about 12−15% of Germany workforce which is 4 – 5 million experienced high noisethat is harmful to sound being perceived. However, every task done during the week is associated with noise while some are particularly associated with high level of noise, the most crucial is effect felt by individuals working with processing machine, operating specific materials, and working as pilot. Manufacturing, operating heavy duty equipment, transportation, playing musical instrument, construction, and the military are some of the occupations with high NIHL. There is improvement of the situation in most developed countries, as more awareness has led to the understanding of the danger of the exposure which has resulted in the introduction of protective hearing devices. Information on progress made in developing countries is difficult to find but available report revealed thataverage level of noiseis more than the average proposed level incountries that have developed (Kerr, Lusk and Ronis, 2001; Suter, 2000). The effect of industrialization can be observed in the increase in noise level in developing countries but notaccompanied by laws to protect individuas working in the organization. Noise generated from sawmill industry is persistent and can adversely result in occupational health challenges (NIOSH, 1996). Sound is made up of persistent change in a medium (usually air) which lead to turbulence or vibration. The change in pressure produces wavedischarge from sources that are turbulent or vibrating. Consistent ear exposition to loud sound is a source of loss of hearingwhich can also result in health harzard in the individual. The degree of impact primarily depends on the time an individual is uncovered loud sound as well as level of sound. Hearing loss being a result of unprotected loud sound may be of a limited or an indefinite long time. It is limited if the loss is due to exposures to noise for few hours after whichhearing return to normal level. Prolonged unprotected loud sound may cause loss of hearing permanently.

Frequent occupational hazard is noise that can result to hearing loss complaint among adult population from noise induced related work which makes it a predisposing factor from noise and hearing loss cases over the years. Boilermaker is a term that describes hearing loss of high frequency and was first used in around 1700s. It is commonly observed among manual workers and the diagnosis is doneusing a tuning fork. The increase in mechanization was identify during the manufactory upheaval with an upward relative frequency of ear malfunctioning and about 9 million America labourers are

estimated to be potentially in danger of developing loss of hearingas a result of high sound level among different industries. Thus, implication is that almost 33.5% of 30 million Americans develop hearing loss which makes it almost all common stoppable cause of indefinite long time sensory nervesloss of hearing (McFarlane, Chapman, Benke and McNail, 2007).

The term noise in language is described as sound that is unpleasant or unwanted sound (Osisanya et al, 2014). In medical literaturehowever,noise is excessive and persistent sound that has the capacity of causing harm to the inner ear. The temporal patterns of noise can further be used for its discription. From time to time, there is interruption of noise with a period of quiet but persistently constant and fluctuates by rising and falling over time. The intense and sudden high sound yielded unexpected back and forth loud sound movement. While the former is a source of clash, the latter is caused by a sudden outburst.Generally, measurement of sound takes place through sound level meter. Emphasis of scale is placed on the number of time that an ear of an individual humanbeing is aware ofwhile reducing the impactof frequencies that is extremely low or high. The dosimeter is used for obtaining a more accurate measure from an individual that has been exposed to noise which is almost the same as the device worn byradiologist, the total exposure to noise is determined and estimated risk is evaluated by integrating constant and fluctuating noise over time (Booth, 2009).

Noise is also characterized by acoustic trauma with a hearing loss that can be sudden and permanent due to exposure to a single but intense sound (Bakare, 1989), which is a major factor responsible for impulse noise that is typically associated with an explosion. The levels of sound pressure that can cause acoustic damage differ from one person to the other but averagely about 135dB. Deterioration in ability to hear due to auditory serious injurycan be verified and may vary from tender to deep sensorineural loss of hearing. Individuals that affected by acoustic trauma tend to showa sudden and sometimes painful hearing loss within a short period of time which is usually accompanied the onset tinnitus (Adejobi, 2012). Disruption of the tympanic membrane may be revealed with signs of ossicular damage when otologic examination is carried out. Usually 3-6 KHz sensorineural notch may be shown on the audiogram which is identified as NIHL but more common is the downward slope that affects a number of frequencies. Conductive losses could bea factor forperforation of eardrum and ossicular discontinuity. Most times restriction of the levels of noise level is used in the management of injuries

due to acute acoustic trauma. Generally, improvement can be reported fews days immediately after the injury and performance of different audiograms until there is stability in the hearing level. Exploration of the middle ear will benefit clients who report complete hearing loss (Mehravaran, Zabani, Nabi and Ghousi, 2011).

The consideration of industrial noise is usually from safety point and environmental healthas persistent unprotected loud sound maylead to hearing damage that is irreversible. Industrial noise refers to level of sound produced as a result of machines used in the factories that is unbearable and damaging to the ear (Booth, 2009). Industries using heavy equipment for productionsuch as shipbuilding, sawmill are vulnerable to hearing loss. This poses challenges to the health of people working in such organisation and those living close to the location of the industry. Effective communication on the production floor is crucial which can be harmpered by industrial noise. There may be different reasons for keeping the level of sound within reasonable range in any working environment while it is perceived as noise at level above the acceptable range.Workforce can be distracted due to level of noise thereby creating an unsafe workplace and sometimes resulting to hearing loss. The level of productivity will decline and likely leading to irritation. Difficulty in hearing warning signal may arise when the level of the noise is too loud.Prolong unprotected loud sound may lead to irreparableloss of hearing. Therefore, it is important to controlor eliminate the source of noise for the purpose of maintaining safe work environment (Patrick and Brooks, 2007).

A source of noise that is propagated by a sender and received by two individuals must be identified before problem of noise can exist. The absence of at least one of the three factors implies that noise or sound will not be produced which reveals the way noise problem can be controlled. This is through taking careof one or a combinationof all theelementsrequirednoise production. Hearing impairment due to exposure to sound that is excessively loud is reffered to as inner earloss. Abilityto perceive small frequencies range, coginitively perceived sound including sound sensitivity can be inadequate for individuals with sensorineural hearing loss(Adejobi, 2012). Hearing loss may be gradual like musical instruments, noise from the background or sudden from noise with high intensity but short such as car horn or gunshot. Hair cells are stimulated by sounds which generally result in permanent injuries or death of cells. Hearing of humancannot be restored to the original state once it is lost (OSHA, 2007). Exposure to noise hazards at workplace is connected to hearing impairment which is known as industrial hearing loss.

The most appropriate defense mechanism is prevention against defective hearing as a result of unprotected loud sound from worplace. An appropriate prevention is maintining low level of sound emanating from source while a second method is time of exposure to noise can be minimised so that there will be reduction in injury but where and when possible earplugs can be used to protect the ear from the impact of the noise (OSHA, 2007).

Another source of hearing loss is recreational, residential and military service-related that are unsafe for human ear(Fechter, 2006). Noise in the environment are unlimited and can cause hearing impairment with about 15% of young people developing auditory inefficiencyowing to unprotected leisure sound such as musical concert, sporting activities and listening devices with loud volumes (Booth, 2009). This makes it understandable thathigh decibel sound of any particular source for a long time can result in the development of hearing impairment.Acoustic trauma is a diseaseunlike noise-inducedthat develops gradually owing to theexposition of ears to loudat low intensity for specific time. Mainly, the cause of acoustic trauma is continuous exposure to noiseof high intensity that is super-imposed episodic effect. Sound level that has the capacity of damaging the cochlear and subsequently resulting in hearing impairment is known as "damage risk criteria" founded on the notion of same energy in all respect (McCullagh, 2011). This implies the amount of sound energy that passes through the cochlea is critical in the determination of injury. It is of note that both intense sounds that pass through the ear briefly and sound that is less intense over specific time duration cause harm to the hair cell in the cochlea at equal proportion (McCullagh, 2011).

People who are affected by NIHL are usually described by family members and friends as frustrated due to the reduction in hearing level. However, further assessment revealed that most people are having difficulty as a result of background noise that significantly affect easy communication and not difficulty with the ability to hear speech sound. A major characteristic of hearing loss due to high frequency is difficulty in the ability to discriminate consonant sound such as d, f, k, sh, s and because the sounds is between 3-6 kHzwhich are crucial to ability to produce speech sound intelligently (Ozer, Yilmaz, Yesil and Yesil, 2009). Noise is also capable of causing some physiological problem such as heating of human skin, a sensation of vibration in the bone of the cranium, movement of air in the sinuses and nasal passage, blurring of the visual organ and difficulty in maintaining balance and coordination (Bakare, 1989). Clark and Bogl

(2006) observed changes in the electrical conductivity of the skin, in the electrical activity of the brain, in heart and respiration rate, and in gross motors activity. In fact noise is capable of causing general rise in pressure inside the head, increased perspiration, increase in heart beat, and change in pattern of breathing and muscular contraction generally (Behar, Chasin & Cheesman, 2008). In addition, Barker (2005) made it clear that noise induce is a stress reaction in pregnant mothers and also capable of causing a productive and menstrual disturbance as well as infertility. Long periods of exposure to intense sound level of 90-120dB have been observed to have some psychological effects on the individual exposed to it (Booth, 2009). To this end, Boettcher (2009) pointed out that high level of environmental noise will give rise to feelings of annoyance, irritability and fatigue.

Annoyance is a social consequence of noise that affects individual and a community (Bakare, 1989). Annoying noise may be perceived as unpleasant, disruptive, interfering, frightening, and unnerving, however, because annoyance is subjective it is difficult to quantify (Onyeka and Owolawi, 2012). Parameters that contribute to the unacceptability of sound, however, include loudness, pitch, harshness, intermittence, and impulse character, duration, on set, place, and necessity to ongoing activity. In the same vein, noise having most of its energy in a narrow band thus producing a hum is more annoying than a steady state noise and longer noises are more disturbing than shorter ones, a high pitched noise (above 1500hz) is more annoying than a low pitched noise of the same loudness, the tentative conclusion suggest that for noise lasting several or even minutes at a level of about 30-40dB will result in a ten percent probability awakening of shifting of the level of sleep (Bruhl, Ivarsson and Toremalm 2007; Bhargawa, 2009). High level of noise interferes with verbal communication as it affects the accuracy and the frequency of communication with the excessive noise background, the presenter of speech will strive harder in the tempo of the speech production and this in turn may damage the vibrating elements.Two significant ways of measuring sounds are pitch and intensity which can both determine the level of damage to the ear.

2.1.3 Hearing Conservation (hearing protective devices)

A common physical hazard to health at the workplace is noise which impactsignificantly on the well-being of workers. Workers in areas with high sound are likely to experience some health challenges that cause hearing loss. The programme for hearing conservation

consist of actions and guide intending to eliminating or lowering the impact of high soundon the level of hearing of an individual so that hearing loss is avoided or not triggered (Ntow, Gijzen and Kelderman, 2006). Conservation as a term is described as the process put in place to ensure protection and preservation of something that is important. It is management system that involves efficient planning so exploitation, neglect or destruction of natural resources is prevented. Preservation means to keep alive, intact and free from decay (OSHA, 2007). The protection of the hearing mechanism from injury is known as hearing conservation.

The primary objective ofhearing preservation programme is to ensure that occupational noise hearing loss is prevented, which may be carried out by a variety of activities which include equipment modification, use and evaluation of ear protectors as well as the education and counselling of administrative personnel, employers and employees. Hearing conservation is developed with the goal of protecting workers who are exposed to immoderate loud sound from developing defective hearing despite the fact that exposure to high sound is experienced during all the working life of the individual (McFarlane, Chapman, Benke and Meaklim, 2007). Defective hearing owing to loud sound cannot be cured throughmedical or surgical therapy which makes it important to prevent before it is developed. Most industries concerned with increasing numbers of persons with hearing disability owing to immoderate loud soundadopted hearing conservation programmes (HCPs) which outline guidelines of actions expected to be taken by employers who expose the workforce to excessive noise levelwhich stipulate that employers should caution themselves provided the level at which they experience excessive loud sound is or exceed Exposure Action Levels daily or weekly.

Hearing conservation programme consists ofnoise level assessment, engineering oradministrative controls, using hearing protective devices and serial audiograms. Sound pressure meter or dosimeter for an individual can be used for the identification of noise level that is hazardous. Measuring the level of noise accurately will involve performing sound surveys for a long period. Different measures can be taken once noise level that is hazardoushas been identified to minimise exposure.The technology used in the industries can be changed which means engineering control such as restoring inadequate parts of the machines or redesigning of the machineryto enclose noise making wheels. The office workers' controls refer to reduction of time exposure to noise, the work environment should be made less noisy, and information on how to prevent loss of hearing owing to

excessive loud sound. Failure of administrative and engineering controls to reduce noise to appropriate level will lead to the HPDs (Clark and Bogl, 2009).

Hearing conservation programme onthe use of hearing protective devices ought to involve every individual in the sawmill so as to be well informed on how to prevent hearing loss (Ochire, Kwame and Kusi, 2014; Bello, 2010) primarily because attention is on using hearing protective devices thatwill combine audiometry for the identification of hearing loss without putting into consideration control of noise and training hazard. Most hearing conservation programmes according to Bello (2010) are not effective because it is more of a programme that is about protection.Arezes and Miguel (2006) noted that the problem can be solved by selection of hearing protection and fitting of protective hearing devices on individual worker which will be suitable for anatomic variability while the use of large 'one size fits all' protective hearing device is avoided through the provision of training that is appropriatefor usage and placement of the device, and the maintainance of the devices is also ensured and replacement is carried early where needed. Secondly, Paulus (2009) observed that protective hearing device is not used frequently which may be due to the assumption that it is interfere with the activities while working, strange to the person using it and effective communication of warning signal is affected (Hannel, 2010).

However, it must be noted that the use of protective hearing device is based on enlightenment, attitude and experience while some people may decide not wear regardless of information they have and consequences of not wearing (Paulus, 2009). Hearing loss as a result is not a visible disorder and indicator is not immediately obvious but deterioration is gradual over time. This factor is basically responsible for lack of motivation on the part of workers to independently do anything that will help ensure that their hearing level is maintained at their place of work (Mehravaran, Zabani and Nabi, 2011). The use of protective hearing device is expected to be 100% for it to successful protect the ear from damage but research have shown that the usage is typically about 50% or less which is not effective (Crandel, Mills and Gauthier, 2006; Griest, 2008). Hannel (2010) maintained that exposure of the ear to an environment that is noisycan make long hours of protection against a waste. An example is wearingearmuffs that arerated 30dB attenuation for ten minutes during an hour exposure to noise; the implication is that the effectivenessof protective device has been reduced to only 8dB based on usage (MCBride, Firth and Herbison, 2008). Another that is likely to be

confronted by indviduals using protective hearing device is removal shortly after entering an environment where there is loud sound probably due to discomfort rather than making sure that the device is in use throughout the period of exposure to noise. Generally, this is inappropriate use of the device for the purpose it is intended for which would not be effective for protection from damage (Ologe, 2006; Sexias and Nietzel, 2004), the condition for this is when such identification is the noise and not some type ofprior warning signal or verbal instruction, some degree of exposure will usually be the other of the day. An individual who is at risk of hearing loss during 50% of working day should naturally use protective devices so that the overall level of the hearing loss is reduced drastically which will depend on the level of compliance. Compliance with the appropriate management of the ear is required if the hearing level is to be maintained. Employers should be able to watch high sound level that they are being experienced so that they will not be exposed to sound above 85dB averaged over 8 working hours for effective hearing conservation programme [NOHSAC], 2004).

Audiometric assessment measures hearing level of an individual which also provides an opportunity to enlighten the individual aboutthe benefit ofprevention. Audiograms such as baseline and annual audiograms are used in conservation of hearing programme. The point at which future audiograms are compared is known as baseline audiogtam. The fitting of protective hearing devices on employees whenever the levels of noise experienced ismore than 85 decibels is inevitable and reference audiogram should be conducted after six months of exposure, thus ascertain the hearing status of the employees. Employees exposed to excessive noise in their workplace are supposed to spend not more than14 hours before the assessment of baseline or use of protective hearing device (Kemp, 2007). Testing the hearing level of worker at the end of every production year is crucial so that damage can be detected early and possibly identifying astandard threshold shift (STS)of an individual as soon as possible. Participation on STS will help in initiatingmeasures for protective follow up that will ensure prevention of hearing losswhich is carried out by arecognised otolaryngologist, audiologist or related professional.

The American National Standard Institute (2008) specifies that workers in areas with high noise should use earplugs or earmuffs if;

- Exposure exceed 24 weeks from the first time, the reference audiograms should be carried out.

- The standard threshold shifts has been incurred by the employee which will reveal susceptible to noise.
- If the employees level of exposure to noise is more than the expected limit of 90 dB above an 8-hour.

It is challenging to effectively determine the importance using protective hearing devices. The level at which an employee is exposed to noise depends upon a number of factors, including:

- Decibels (dB) which are used in measuring the sound levels.
- Length of time an employee experiences loud sound.
- Change in exposure to noise level experienced by employee due to moving from one area of work to another.
- High sound produced in one or more sources.

Hearing protection usage is based on the intensity of sound produced and its period of exposition. For example the need for hearing protection will only be required for an employeewho is exposed to noise level of 90 dB for 8 hours per day while another employee withnoise level of 110 dB for 30 minutes will requirehearing protection (OSHA, 2007).

The permissible noise exposure is shown in Table 2.1based on protectivehearing devicesrequirement for workersworking in high noise areas at particular intensity and at a given time. The interval between the maximum occurence of noise level if less than a second will be described as continuous. However, the occurence above one second is considered as loud or sudden noiseswith exposure of140 dB.

Table 2.1

Permissible Noise Exposure

Duration per day, in hours	Sound level in dB*
8	90
6	92
4	95
3	97
2	100
11/2	102
1	105
½	110
¼	115

Source: Occupational Safety and Health Administration (OSHA) 29 CFR 1910.95 (2007)

According to table, 90dB of continuous exposure for eight hours is equivalent to four hours of 95dB exposure. At 100dB, it would be reduced to two hours and so on. These regulations specify 115dB to be the absolute maximum level to which anyone should be exposed and levels beyond that should not be endured for any length of time. Chemak, Curtis and Seikel (2010) observed that hearing loss from occupational noise is quite insidious, in some cases, sound does not become uncomfortably loud for most people until it reaches a sound pressure level of 120dB and according to Nagi, Dhillon and Dhaliwal (2009) in management of deafness', sound does not produce pain until the sound pressure level reaches at least 140dB.For example,drop hammer and a punch press are conditions or equipment that can likely lead to impact or impulse noise. In recognition of these effects, the American Academy of Ophthalmology and Otolaryngology (2008) submitted that no one should be exposed to the level of sound about 85dB or more continuously for five hours or more per day without protective devices.

Employees should be trained annually on the impact of noise; the benfits of variousprotective devices; useand device maintanance; and the importance and procedures of audiometric testing (Truong, Siriwong and Robson, 2009). Motivation to use a protective hearing device will be higher among individual who understand the purpose of the device to preventing hearing loss (Boettcher, 2009). Shift in ability to hear is effectively minimised including protective hearing devices in hearing conservation programme (Bruhl, Ivarsson and Toremalm, 2007). In the similar view, Booth (2009) averred that it is difficult to identify evidence that isscientifically supported of the possibility of completely eliminating disorders of hearing in sawmill industry. Although, the programme for conservation is useful in the identification, monitoring and lessening the impact of defective hearingas a result of noise of high level which appears to be insufficientsolution to preventingexcessive noise. Tinnitus as well astemporary threshold shift is believed to bean indicator of developing defective hearing but it cannot accurately predictpermanent shift in threshold.

Damage in the inner ear can occur before detecting hearing loss (Ochire, Kwame, Kusi and Lawer, 2014), which is described as Standard 'Purposes for Conducting Workplace Audiometry', that shows that damage is accumulated before threshold impairment occurs'. Therefore, possibility of using audiometry is when a person indicates having hearing loss due to years of exposure beyond the permitted level. However, the measurement of crucial shift in threshold using annual assessment is insignificant (Reed, Browing and Westneat, 2006). The identification of programmes that are efficient can be done using audiometry because the indication of no hearing loss among employees using the audiometry reveals that hearing conservation programme is effective. Difference in definition, threshold, and conditions of testing and administrators of the test can result in variation between prior tests that limit the conclusions which may be obtained (American Academy of Otolaryngology, 2008). Besides,poor test administration as well as change in position ofemployees from one role to another within an organisation implies that audiometry may sometimes not be conducted before engaging the employee. Untaking audiometry test consistently and appropriately can be utilized in the observation of hearing loss progression by an employee; however the effectiveness in preventing high noiseis minimal (Williams, 2006). The purpose of hearing preservation is to minimise further hearing loss (Caron, Godin and Otis, 2006). There is a suggestion that further

assessment should be conducted (Backman and Haddad, 2007), specifically in situation where it is appropriate to measure behavioural or 'functional' ability.

Hearing conservation programme is different from the actual achievement in eliminating high noise in various workplaces. Griest (2008) submitted thatassessment of hearing plans is combined with promoting personal hearing protection while noise level is reduced on an engineering level. This may be challenging because it places the problem and failure on the source of the sound and not the culture of the work place. Economic perspective of implementing hearing conservation programme according to Lipscomb (2005) noted that there are different barriers that will affect the positive impact of the programme, specifically lack of desire to participate in the programme as planned. Despite the progress made in technology to control in noise, there are certain situations that minimising the level of noise throught the use of engineering is neither feasible economically nor technically. In assertion of Bello (2010) the use of protective personal hearing device is the best solution to eliminating problem associated to exposure to noise, specifically in situation that does not require oral communication for example wood cutting in sheet and in the circular saw room.

Selecting Hearing Protection

Ample reduction of noise in the workplace requires a good hearing protector which is capable of removing the danger of hearing loss and also gives room for communication with best available level of comfort (Jerrie, 2012). Non-use of hearing protector simply indicates that most workers do not accept it. When using hearing protector, effective communication and comfort should be a thing of serious thought. Heavy hearing protectors with great weight and high pressure may pose a discomfort to the persons using them as such will be difficult to use for a long period of time, thus, appropriate hearing protector should be used at a particular situation. Hearing protector should be used at all times while in noise because non use for few minutes may render its effectiveness useless (Bello, 2010). Therefore, the users should endeavour to accept and use the hearing protectors when necessary. Different measuresdetermine the effectiveness of hearing protectors as comfort differs from one person to another. Also, the head shape and ears vary significantly between individuals.

Ear protection is described as devices such as earplugs and earmuffs used to prevent excessive noise, water, debris from entering the ear through external auditory canal. In

the context of sawmill environment, adequate usage of hearing protectors is necessary so as to avoid noise exposure above 85dB over average work shift of eight hours..

Types of Protectors

Hearing protective devices can be classified into three and these include earplugs, earmuffs and canal caps International Labour Organization (ILO, 2008).Others include helmets with circumaural; muffs with communication,these are devices with electronic amplification or digital circuits. Factor such as comfort, cost, durability, safety, hygiene, stability, wearer acceptability and noise attenuation have to be considered before chosing the most suitable hearing protectors. It is important that each of the protectors to be used should be evaluated in line with individual worker's characteristics (Paulus, 2009).

Earplugs

Earplug is a device that is fitted into the ear canal to prevent excessive noise, keep out water, foreign bodies, wind or dust from entering the opening of the auditory canal. It is made of cotton, wax or plastic and can be individually molded or mass produced, disposable or reusable, cheaper than muffs, easy to wear in hot and humid areas but should be avoided in areas with noise level above 105dB. Also, earplugs are not easily seen in use as muffs. Earplugs must be hygienically and properly fitted soas to provide noise attenuation. Earplug can be pre-molded, custom molded and expandable (ILO, 2008). Pre-molded earplugs are built with soft plasticwith cord. It is characterised by semisolid construction and the users' experiencediscomfort when in use. Custom molded earplugs are made of soft rubber which is inserted into person's auditory canal and provide high degree of noise reduction. Expandable earplugs are the most effective compare to pre-molded and custom molded in that they expand against auditory canal and cover it with lesspressure. Expandable earplugs are made of foam materials which are rolled, pulled into the earcanal and held against the canalfor about 20 to 30 seconds so as to seal the canal completely (Vishakha and Rawool, 2011).

Benefits of Earplugs

Earplugs are inserted into the opening of the auditory external and are effective in protecting ears from loud sound. It is effective for sawmill workers especially those that work in high noise zone. Earplug is not heavy thus convenient to carry along. It is soft, reliable and can be used by children and adults. It is also available and affordable. Earplugs fit without stress into the ear canal and can be worn with other types of hearing protection devices such as helmets and safety glasses.

Negatives of Earplugs

Earplugs cannot be used by persons with ear infections thus uncomfortable and not be a good choice. It does not provide effective protection if not properly fitted and cannot be used in areas with sound level more than 105dB.

Earmuffs

Earmuff is a device used by individuals in areas with high noise to protect their ears against loud noise, temperature vibrations or dust (Vishakha and Rawool, 2011). Rawool, Vishakha and Waman(2012) described earmuff as a pair of soft fabric connected by a band across the top of the head. It is made of metal head-band with a cushion to cover the pinna. Earmuffs are of differing sizes because of the differences in size of the head and the external ear of individuals. Muffs cover the external ear without much effort and can be easily seen by other people(ILO, 2008).A properly fitted muff provides effective protection against noise. The user must ascertain that the muff covers the entire ear while in noisy environment. If the noise is considerably louder with the earmuff is on, then the entire ear is not well covered and paves way for a leakage thereby reducing the amount of protection provided (International Labour Organisation, 2008). Earmuff that is not fitted correctly discourages the individuals from using earmuffs thereby reducing its effectiveness.

Benefits of Earmuff

Earmuffs are easy and do not need specific procedure for fitting. This makes it suitable for construction work.In cooler climates, where fitting of earplugs may be difficult, earmuffs are preferable because fitting of earmuff is easy,comfortable and durable. Earmuff like earplug is also available and affordable.

Negatives of Earmuffs

Earmuff does not provide maximum protection because it paves way for leakages. It is not proper to use earmuff in areas with high temperature thus causing discomfort for the user as a resultof much heat. Unlike earplug, other devices such as helmet and safety glasses cannot be used with earmuff at the same time. Properly fitted earplugs or muffs reduce noise from 15 to 30 dB.Both earplug and muff perform the same function in reducing sound to bearable level though earplug is good for low frequency and earmuff for high frequency. Using earplug and muff together provided additional 10 to 15 dB protection than either used alone. Earplug can be used together with muff when sound level exceeds 105 dB.

Hearing Protector Attenuation

One major step to ensure that ears are prevented from excessive noise is by creating awareness for people concerned on the importance of HPDs. The law requires that HPDs should be labelled with the percentage of protection to be derived from using a particular hearing device for certain period. Although, the labelled rating is usually higher than what is obtained under the working condition which is probably due to inappropriate use of the device or neglect to adhere to usage when exposed to noise while working (Brink, Vander and Rensburg, 2006). Essentially, hearing protective device with highest noise reduction rating (NRR)has to be used constantly by an individual when exposed to noise. No protective hearing device will be appropriate for everyone use, provide the same level of comfort and be effective in all environment. Protection is only possible depending on the frequency of exposure to excessive sound, limited attenuation of noise particularly if the frequency level of the sound is low (Bello, 2010). It is possible for sound to reach a person's inner ears even while using protective hearing device through the following:

1. The hearing protective device is leaking close to the head (for muffs) or ear canal (for earplug)
2. The device vibrates in such a way that the generated sound goes directly to the outer ear canal;
3. Sound is transmitted by the proactive hearing device;
4. Bone and tissue conduction through parts of the head not enclosed by the protector.

The protective hearing device attenuation will probably not be achieved at the maximum due to different factors such as the process of coupling the device, but approximate values for the individual using both plugs and muffs is between 40 to 60 dB which depend on bands of frequency(Brink, Vander and Rensburg, 2006).Achieving the maximum attenuation may be difficult in the real sense. The noise attenuation of a protective hearing device is represented using "Insertio Loss (IL)" which indicates variation between the pressure of soundlevel at the outer ear canal with and without the hearing protector. Bruhl, Ivarsson and Toremalm, (2007) submitted that results from various laboratories test differ in terms of average attenuation and the standard deviation which bring about variation of *NRR*'s values. The reasons for this variation are the fitting, subject selection and training. Even repeating the outcome from the same laboratoryfor similar

protective hearing device may differ which is the reason for using two standard deviations in the calculation of efficiency of the device. The implication is that change that range between 3 to 5 dB in NRRin any practical activities is not relevant.

The Table reveals the level of protection that is ideal for the various levels of sound exposure designed for the use of only one position on a scale of quality prepared alongside ear protective apparatus.Thus, importance of hearing protector attenuation is toprovide instruction on protective hearing device that will appropriately ensure that hearing loss does not occur.

Table 2.2: Hearing Protector Attenuation

Noise level in dB	Select a protector with an SNR of:
85-90	20 of less
90-95	20-30
95-100	25-35
100-105	30 or more

Source: British Standards Institution (2004)

It is crucial to wear a protective hearing device every time an employee is exposed to excessive sound. A protective hearing device that is design for 20 dB(A) attenuation when use for an 8 hours exposure to 100 dB (A) dailyimplies that the employee exposure is 80 dB (A). However, failure to use the device for 50 minutes when exposed to noise for 8 hour in a day reveals that 90 % of the time the device is used, the exposure of the employee is 92 dB (A). On the other hand using the device for only 4 hours will reduce its efficiency to only 3 dB (A) while exposure is97dB (A) on the average (Fechter, 2006).For a person to have maximum enjoyment, the protective hearing device should not be removed because doing that will greatly affect the effectiveness of the protector. The table below presents the maximum protection required for not persistently using protective hearing devicefitted properly.Removing ear protective device for few minutes may render its effectiveness to 20dB.

Table 2.3: Maximum Protection provided by Non-continuous use ofHearing Protection

Percentage used	Maximum Protection in dB
50%	3 dB
60%	4 dB
70%	5 dB
80%	7 dB
90%	10 dB
95%	13 dB
99%	20 dB
99.9%	30 dB

Source: Canadian Centre for Occupational Health and Safety (2012)

OSHA (2007) requires that employees be offered a variety of hearing protective devices and that these devices must be used all the time to get full benefit.

Problems of hearing protectors

Research findings revealed that half of the employees who uses protective hearing device still experience low attenuation capacity of the protective devices just because the devices are not consistently worn and efficiently utilized as recommended or they are not fitted appropriately when using them (Altschuler, Dolan, Miller, Le Prell, Lomax and Schacht, 2003). Using a protective hearing device that is designed to reduce excessive noise of 30 dB continuously during an 8-hour work day if the device is removed for an hour will reduce the effectiveness only 9dB of protection because decibel is measured on the scale of alogarithmic, and the increase in the level of noise is 10 times for each 10 dB increase. An employee ear is exposed to excessive noise of about 1,000 times of sound energy while working and sound level reduces when earplugs or muffs are used as protective hearing devices. The length of exposure is added to which implies that the noise level at home and workplace must be taking into consideration for any particular day of exposure. The maximum time duration a person is expected to remain in areas

with high noise if due process is not followed will not be safe for the protection of the individual hearing (Le Prell, Yamashita, Minami, Yamasoba and Miller, 2007).

The protective hearing device will not be efficient when used inappropriately in an environment that the air is not completely sealed between the skin and the protective device.An individual will be able to determine the proper placement of the device if the person voice is louder and deeper. The duration, comfort and ability to preserve the hearing level efficiently is very crucial than the decibels of attenuation. This is based on the fact that the attenuation is relevant because other factors are necessary such asthe health hazard of the device (especially for earplugs), discomfort, impact on effective communication, effect on directional localization of warning sounds and general safety (Hurst and Kirby, 2008).

2.1.4 Lifestyle

This is described as the daily living of an individual with regards to attitudes, habits and behaviour. An individual does not have control over every aspect of his/her lifestyle;the interaction level from one person to the other varies based on healthy living and well-being for a specific period of time. Factors that determine lifestyleare different aspects that allow a person to carry out activities that affect his life such as work, relaxation, nutrition, problem solving. The implication is that it is not an isolated activity but structure that is connected to each other. The health of a person is affected by the individual lifestyle which includes choices made directly or indirectly such as eating habit, smoking, consumption of alcohol and participation in physical activities (NHS, 2008)and are assumed to be crucial factors exposing one to unhealthy living and sickness. An individual health and lifespan greatly depend on the food consumed including the environment of the person. There is connection between exposures to noise and the health status of an individual. A survey conducted by NHS (2008) revealed that the percentage of people who are actively engaging in smoke is on the decline for both male and female from 28% and 26% in 1993 to 24% and 20% in 2008 respectively. More young people smoke when compare to older people. In 2008 about 28% of individuals between ages35-44 smoked in comparison to 45-54 age with 21% while the percentage of individual between 55-64 agewas compared with 65-74 age to give 17% and 13% respectively (NHS, 2009). The survey also shows that there is tendency for an individual to consume diet that is healthy with significant improvement between 2001 - 2007 in the proportionof

individuals who consume more than five portions of vegetables and fruits per day. Older people had the highest of individual that consume diet that is assumed was 34% among age group of 55-64 when compared withage range of 25-34 and 35-44 respectively with 27% (NHS, 2009).

A diet is described as healthy if six constituent of food is contained in the appropriate proportion for an individual. There is a connection between healthy diet and infection as well as physical engagement and healthy living. However, report shows that an individual health can be improved by consuming recommended proportion of diet and engagement on physical achivities regularly on weekly basis. Poor lifestyle, hunger and inadequate diet are the major sources of unhealthy lifestyles ampng the poor and needy individual in the world with about 30% of people affected with one or more of the multiple forms of malnutrition (WHO, 2000).

Davison, Frankel and Smith (1992) submitted that 17% of 120 patients were treated for abuse of substance also had secondary hearing loss due to amphetamine, cannabis, alcohol, or heroine. The nature of hearing loss described by these individuals consistently manifested as bilateral, fluctuating and reversible type of hearing loss. The basic complaint of patients was the perception of sounds as less intense and less sharp than regular (Igbal, 2004).Five hundred and four (504) employees working with manufacturing company were exposed to sound>85 dB but also smoke was investigated. Findings demonstrated that non smoker had lower defective heaing when compared with employees who smoked. The result revealed that individual's who smoke for about 40 years will develop addiction which is linked to excessive sound particularly at 8 kHz leading to loss of hearing. Result revealed that age is crucial to hearing loss among employees who are expose to sound above 98 dB (Fishbein, and Ajzen, 2009).Findings have shown relationship between tobacco inhalation and inadequate level of hearing(Beresford, Croft and Adshead, 2008; Parrott and Madoc-Jones, 2008). The relationship between the performance of the ear and smoking with the present of connection between exposure to noise and smoking have been established by some studies (Ferrite and Santana, 2005; Beresford, Croft and Adshead, 2008). A mojor influence on an individual health is lifestyle like smoking, consumption of alcohol, type of diet and involvement in physical activities (NHS, 2008).

Fishbein and Ajzen (2009) found that generallythe health and life expectancy may improve consistently in the United Kingdom as a result of access to education and

improvement in the provision of health services which in turn influences an individual lifestyles and the resulting effect is observed in reducting the rate of smoking cigarette, a daily rise in consuming fruits as well as rise in the percentage of individualsparticipating in physical activities as recommended. Generally, smoking (of tobacco products) is pointed out as the single largest factor that affects health and lifespan of an individual negatively due to its effect on the lung resulting in cancer of the lungs and contributes significantly to heart diseases (Mohammadi, et al, 2008).

2.1.5 Age

Inadequate protective hearing device when participating in activities such as work,gun shot and listening to music with excessive levelof noise among adolescent can addsignificantly to communication develoment challengessometimes in the future. Permanent and increasing auditory deficit found in elderly persons of age range 60- 65 and above is known as presbyacusis (England and Larsen,2014). Presbyacusis is different from auditory loss due to excessive sound in the pattern of occurence and symptons (Holland, 2008). Findings revealed that exposure to noise specifically loud sound are more dangerous than the process of natural aging of auditory hair cells. A cumulative of impact loud noisewhich can increase susceptibility by accelerating the damage done to the hearing in later life, even when the person is no longer exposed to noise (Chung, Meunier and Eavey, 2005). Therefore deterioration of the cochlear due to exposure to noise in early stage can be affected by natural aging (Smith, Davis and Ferguson, 2000). Although, the relationship is not a simple one asauditory deficit owing to excessive loud sound with presbyacusis frequently coexistingthis makes differentiating between the two a challenging issue (England and Larsen, 2014).

Hearing loss due to natural aging otherwise known as presbycusis occurs gradually in people. The causes of presbycusis are complex and these includefactors such asintrinsic and extrinsic. The result in exposing ears to noise is auditory hearing deterioration which is regarded as critical(Davis, Kozel and Erway, 2003).The postulation of excessive sound on the ear in causing presbyacusis is recorded in many research findings over the years but the challenge is that one factor cannot be singled out as the major cause of the condition for a long time (Candreia, Martin, Stagner and Lonsbury-Martin, 2004). The connection between hearing loss due to excessive sound withauditory deficit as a result of

aging interwoven and difficult to pin point which is also not properly understood (Davis, Kozel and Erway, 2003).

Poorer pure tone thresholds have been found especially in noise-exposed elderly men than in those not exposed for occupational noise (Lee, Matthew, Dubno and Mills, 2005). It is common condition that affects the elderly with about one out of every three affected in the United States between the ages of 65 and 74, thusdeveloping hearing loss while about half of individuals from 75 and above have challenges with hearing clearly (Kock, 2013). However, the causes of hearing loss due to natural aging are many but it affects majorly inner ear as aging set in which can lead to modification in the auditory canal leading to ossicular bones and also cochlea hair cells to the auditory cortex (Cullen and Gerend, 2008).Factors such as aging, ototoxicity, exposure to intense noise infect-contagious diseases, hereditary successionand cranial-encephalic traumatism, may cause harm to the auditory organ.

The problem of hearing loss is critical because of the effect it has on an individual life and may result in exclusion from social interation during group discussionbecause of the challenges that communicating may have on the person making difficult to attend to family enagement and social event(Davis, Kozel and Erway, 2003). The most common hearing change among adults with range of 40 – 50 years is the presbiacusis or ear deterioration which persists for the rest of life (Folmer, Griest and Martin, 2002).Gradual increase in the thresholds of an individual hearing sets in as one age while most affected frequency is 4000Hz and in male particularly (Hafidi, Beurg and Dulon, 2005).Other factors that can influence presbiacusisare environment and genetic. This implies that the ear aging occurs as a result of the natural hearing system "stress" and the combine impact of the influence like trauma, infection, family disposition and exposure to noise.An important factor in the work place is noise because it leads to hearing alteration among adults which is a hearing loss that induced by noise. Research finding showed that occupational sound is a regular source of auditoryalteration among adults (Folmer, Griest and Martin, 2002).

2.1.6 Gender

The role and responsibility of gender in most cultures tend to differ based on values and norms. This difference is often reflected in the conception of health and illness. However, the appropriate way of approaching the gender difference is through the

use of research to determine the evolving charactteristics of gender over time in a specific cultural setting and the impact of the changes on health care provision, process of decision making and interpretation. In most culture, the idea that the women have about health and illness is mostly contributed to the functions they performed in their community either as wife or mother who provide health care for family members.The relationship between the positive aspects of assumed safety in the work environment and the protective hearing devices supports that report of Sherman and Azulay (2013) for male and female employees. There is tendency for the women to be more social in behaviour which can be observed in where they are working and are influenced by the need to protect themselves from health hazard. Furthermore, women have the tendency of reporting more health challenges but are also likely to be more committed to practising behaviour that is healthy likeregular checkup, compliance with treatment and other recommendations that will ehance healthly living (Kumar, 2011).

The reason for this may be due to patterns in behaviourand culture as well as consciousness andresponsibility as caregiver, especially to their offspring. These might be the characteristic effects that are specifically related to type of workand organisation that engage female that may likely affect the findings. It is necessary to understand the difference between men and women based on the perspective of gender. The effect of discrimination affects the women more when compare to the men, such discrimination includes lower wages even while performing the same job, obtacles that can serve as limitation in prospective promotions, may not involved in union activites, and may not possess enoughpolitical, lessvisibility and political capital in making decisions (Gerend and Cullen, 2008). Previous findings on risky behaviour and exposure to excessive sound among individuals working in sawmill revealed that women and men behaviour is not significantly different when it refers to protective hearing devices. However, the situations is more critical for women when compare with the man.

A research finding of Gerend and Cullen (2003) revealed that gender difference did not significantlyinfluence behaviour toward the use of HPDs and exposure to noise but male were likely to use protective hearing device when compare to female respondents. The reason for this may be as a result of more male experiencing hearing loss more often than female and will want to protect their ear from loss by using protective hearing devices. The report is consistent with the findings of employees who are not working in sawmill by Tak, Davis and Calvert (2009) but not collaborated by the

submission of Lusk, Ronis and Boer (1998). It is not particularly clear the reason for using gender differences, but may probably be connected to the various work groups. A woman role hasinfluenced the epidemiology and prevention of diseases traditionally (Vlassoff and Manderson, 1998). For example, Finerman (1989) submittedthat most women may be willing to postponed health care depending on severity.

The inequality of power inmost culture between male and female has led to the need to develop distinct expected and recommended behaviour that are based on their differences(Underwood and Zaman, 2003). Teaching of sex and risky sexual behaviour is done based on gender differences. Teaching assertiveness and demand that partners use condomsto protect against sexually transmitted diseases (STDs) to girls is an addition but fundamentallyan element that genderspecific in the creation of awareness about STD planned for teenage girls. The concept of ill health and health care, difference in roles and responsibilities based on gender factorcould be a challenge to health communication programmerelated issue (Underwood and Zaman, 2003). Thus, the characteristic of male and female in health care settings require proper understanding, supervision together with periodic assessment relatively to theimpact it will derive from health communication programmes. Thesevariations can possibly influence concepts of health care and ill health that is gender-related and describe the interaction that exists between the various elements of health communication environment.

Researchers believe that HPDs were less use among femaleeven when the level of noise they are exposed is the same as that of the male. Gilles and Paul (2014) submitted that less protection is provided for female though they are more vulnerableto progressingauditory defect due to excessive loud sound when compare to male. This submission is confirmed by Sherman and Azulay (2013) who reported that refusal to monitor and prevent the level of noise that female are exposed to be responsible for increased hearing loss among them. A lot of women have been employed in organisation that is assumed to be less connected with therisk of occupational noise hearing loss but the environment does to the hearing (Marjorie, McCullagh, Tanima and Micheal, 2016). The issue is more prominent in situation where the health regulation is more advanced when female amd male are compared, the use of HPD is 50.7%, and 68.9% respectively (Gilles and Paul, 2014). Men frequently use of protective hearing device may be connected to the type of job and environment of the job where there is exposure to

excessive sound levels like construction, mining and manufacturing (Marjorie, et al., 2016).

Miles and Mezzich (2011) averred that high sound generated in the sawmill industries is nottraditionally recognised asdangerous to men like education, health care and hospitality. Another observation is that generally women get less training and fewer recommendations about the use HPD unlike men. Findings by Stephenson (2009) asserted that there is a linke between variables that cause hearing impairment except gender. Hong, Lusk and Ronis (2005) revealed no significant difference fromgender usage of protective hearing device which is as a result of inequality in the determinant that 99% of the population were male but it related to the direction and magnitude of influence that corraborate previous research findings that concluded that despite similarity in two main determinant in the use of hearing protector (self-efficacy and barriers) varied between male and femalewhile the use by male was predicted by age.

2.1.7 Attitude to Hearing Protection

The oxford advanced learner dictionary defines attitude as “the way people think and feel about a thing, a person or an object”. It is a behavioural pattern, feelings and thinking of the sawmill workers which may affect their use of hearing protection devices. Williams, Forby-Atkinson, and Purdy (2006) described attitude as the ability of the human mind to prepare for action in a particular manner. Since attitude cannot be measured directly, a person’s attitude towards an issue or object is deduced from the behaviour in situations involving that object.

Employers are expectedto develop programmes that will ensuring hearing conservation of employees when exposed to excess sound that is beyond the specify limit but this is neglected by most people working in sawmill even while being exposed to harsh hearing condition that can possibly result in developing hearing loss because of failure to use protective hearing devices (OSHA, 2007).A hypothetical construct is that attitude is represented by a person like or dislike.

Studies have shown a number of other variables that can affect the attitude of sawmill workers, Comlman, Ezinah, Nambo and Obiang (2007) observed that education, social class, religion, gender and knowledge influence the sawmill workers’ attitude towards the use of hearing protective devices. Other studies reveal personal characteristics of sawmill workers as they make effective and competent use of earplugs

and earmuffs.Similarly most definitions on attitude basically focus on the view thatdeals with measurement of people disposition, issues and objects in the proportion of positive to negative. Two components used for the measurement of attitudes are cognitive and affective (values and beliefs). Attitude as a cognitive input explains the sawmill workers' behaviour in the workplace setting (Vogel, Brug, Hosli and Raat, 2008). Truong, Siriwong and Robson (2009) argued that an individual's attitude to an object or issue is always related to the expected result associated with that object or issue and the expected outcome of a positive attitude is a pleasant feeling or result.

Favourable attitude triggers action while lukewarm attitudes result in negligence or lack of concern. Sawmill workers may have the competence to perform the task of inserting earplugs into the auditory external or cover the entire ear with earmuff and may not have the desire to do so effectively. In other words, the ability to do certain task is linked with competencies while attitude refers to the willingness to perform certain tasks (Reed, Browning, Westneat and Kidd, 2006). Sawmill workers may be competent but may lack the desire to use hearing protective devices which explains McCullagh, Ronis and Lusk (2010) findings that the characteristics of the sawmill workers like personality, past experience, values habits needs may influence their perceptual process of the hearing protective devices. The hearing protective devices therefore pose a challenge to such sawmill workers and many develop emotions like disgust and fear to use hearing protective devices.

Laird (2007) posits that the things sawmill workers do based on emotions and the views of others usually disturb sawmill workers. In like manner, the views of friends and peers disturb sawmill workers who cannot use hearing protective devices effectively, which means the perception of sawmill workers may also affect their attitude to the use of hearing protective devices either in negative or positive form (McBride, Firth and Herbison, 2008). Hurst and Kirby (2008) discoveredthat attitude develops as a result of perception and that attitude affects perception, sawmill workers may perceive the usefulness of the hearing protective devices, the ease of use and the enthusiasm affects using hearing protective devices. There is a strong tie between attitude, values; and attitude is a function of what sawmill workers feel and think (Knobel and Lima, 2014).

2.1.8 Level of Education

World health organization (2013) defined education in term of health asthe skills that acquired for logic and relation with individuals' motivation,understanding and usinginformation in promoting and maintaining good health. Health literacy refers to the ability to decode the information on pamphlets and successfully make appointments that will ensure an individual's accessibility to health information which is essential for empowering an individual (Renkert and Nutbeam, 2001). However, the gap that exists between lifespan of individual sawmills with high level of education and those with low or lack of education is becoming wider. The possibility of individuals with high level of education considering and reporting their poor health is likely to be more than those with low level or lack of education.World Health Organization (2013) report showed that manufacturing workers such as sawmill who are illiterates die from occupational hazards than those who had education.

The report also showed that those with low education were over 1.5 times probably going to develop high blood pressure when compare the people that obtained higher education. Other factor such as disease, such as smoking, decrease as a person's educational attainment increases. The result of Sherman and Azulay (2013) emphasised this point and also showed that sawmill workers that are not involved in tobacco inhalation are the ones with higher learning qualification no matter their earning.Zaman and Underwood (2003) concluded that education is crucial to the standard of living of sawmill workers as this enhance less probability of contacting acute and chronic diseases like hearing loss, stroke, hypertension, heart condition, cholesterol, asthma attacks, diabetes, and ulcer. People who are educated will likely not develop hypertension or suffer because they have better ways of managing both physical and mental functioning.

A crucial mechanism for the improvement of sawmill worker's health status depends on education acquired as this enable him to have access to information on the reduction of risky health behaviour that is connected to costs of dependence, lost earnings and challenges (Fechter, 2006). It ensure that healthy lifestyle is promoted and sustained with making positive choice, giving required support and nurturing interepersonal relationship, human development that has to do with personal life, family member and the society well-being in relation to the workplace, education reduces the possibility of an individual working in environment that is hazardous to health. The impact of education in an organisation has great influence not only on economic and social aspect but also

individual's absolute well-being. There is an aggregate impact through which an increase in the level of education can enhance using the medium (Zaman and Underwood, 2003).

Other researchers have found that even among well-educated workers who are aware of the hazards and the associated health impacts, the use of protective hearing devices is still not fully employed in all situations where the law would require it (Ochire-Boadu et al, 2014). There is serious effect associated with working in an environment that is hazardous to the health of individual globally. The different level of hazard is broad, that range from exposure to agricultural chemical and other related adverse ergonomic conditions which may increase the risk of developing health issues such asear injuries,cancer, cardiovascularies, disorders of resipirationreproductive and emotional distress (WHO, 2013). Workplace related injuries are major source of hazard experienced in performing the task. The risk level associated to working in an office is not as high as industrial and agricultural work because such people will likely fall infected and exposed to poisoning. Globally, injuries due to accupational occur to about 0.9% or 13.1 million (WHO, 2013). Chemicals like asbestos, beryllium, cadmium, chromium, diesel exhaust, nickel and silica are occupational hazards responsible forcancer of the lung in 1.3%, trachea and bronchus and leukaemia among 2.4% identified globally worldwide. There is probability of developing related ill health depending on the dosed administered, potency, interaction with other present carcinogens, and susceptibility of the person. The cases of death due to exposure to carcinogens is about 146 000 (0.3%) of deaths (WHO, 2013).

2.1.9 Length of Service

Amajor source of inability to hear stem from the level at which persistent sound becomes harmful especiallyat the level more than 85dBA for a long time (Onyeka and Owolawi, 2012). The potential danger inherent in diminished sensitivity to hearing could be attributed to excessive sounds characterised by intense and time interval which are experienced by sawmill workers.The time of safety with decrease with increase in intensity and duration of exposure to excessive sound that is above appropriate level. Hearing loss due to noise occurs initially at frequencies that high (4000 and 6000KHz) but the persistency in the level will result in other frequencies leading to hearing loss. In congruence, Onyeka and Owolawi (2012) reported that exposing an individual to excessive noise in the workplace can lead to inner ear damage owing to vasoconstriction

of blood vessels in the cochlea and too much stimulation of the auditory fibers as a response to excessive loud sound which inturn may reduce the supply of nutrients and oxygen to the cells and also put an obstacle the performance of assigned task in the workplace. The finding of Sherman and Azulay (2013) revealed that generally exposure to excessive sound for a long time will typically lead toirreversible diminished sensitivity to hearing, a release of addictive drugwill occur due to the overloaded metabolical of the cells which will make the cell going through a processreferred to as "apotosis".

The damage cell will not be able recover the literalfragment and part of the calls are released into cochlea fluid. Hearing loss known as sensorineural hearing loss and sometimes tinnitus is the effect of such damage. Persons that are affected will most time complain about having difficulty to understand speech when discussing in group or in the absence of background sound during the early stages. It becomes challenging to communicate effectively as the hearing loss worsens. Studies by Punch, Elfenbein and James (2011) found that the longer the years at work in a factory induced noise environment the more factory workers experience reduction in peripheral sensory functions that is associateds with aging. Thus, they reported that peripheral, central and cognitive processes are the mechanism underline deterioration that is linked to age ability in hearing in noise. Research has shown that the effects of machinery on auditory performances due to life-long experience are bad (Zendel and Alain, 2012: Parrot and Madok-Jones, 2008). Also, Grose and Mamo (2010) posited that factory workers years at work without the use of hearing protective devices may affect speech-in-noise perception of persons without or with hearing loss which shows the probability that the duration will not only result in hearing loss but also affects the ability to process speech even when the signal is audible. Gilles and Paul (2014) explained that diminished sensitivity to hearing is a result of regularwork done in areas with excessive sound higher than 85dBA over long periods.

2.1.10 Peer influence

This refers to the beliefs about how much others such as family members, friends, supervisor, and coworkers could influence individuals' towards the use of hearing protection (Bies and Hansen, 2003). The effect of various types of peer influence has been examined in various studies with the conclusion that most potent source of influence is best friends with more potential than individuals who are mere acquitants, network of

friends generally or broad-based peer networks (Bies and Hansen, 2003; Hallberg, 1996; Shield, 2006).The influence of friends, co-workers and family membersis crucial to determining factors responsible for not using protective hearing devices among employees in the organisation and the effect can be enhanced by behaviour towards usingprotective hearing devices among peer groups. However,Glaser, Shelton and Bree (2010)noted thatcritical understanding of associationone belongspredicts type of behaviour an individual experiences, the influence on the person behaviour will be higher with those they are closer to.The perception of reciprocal friendship and quality will exert more influence on the person (Demir and Urberg, 2006).

The influence of peers such as friends, family members, coworkers, and supervisors can encourageor support the use of protective hearing devices. Most professionals that work on hearing understand that the use of protective hearing devices is not appreciated by most people except it is in the environment where exploration or other high-technology activities are being carried out (Tarantino, 2005). However, behaviour that is imitated due to the perception that such a person is recognised as leaders can lead in position of lower social impact to act like the person, which has led to using peer as facilitators to educate young and old adults about various health behaviour issues such as noise and hearing protection. Peer presenter are described as having realistic understanding of the reason for the used of drugs; the reception rate of information among children is higher when peer presenters are used when compare to health officer or other adults; generally peer-led educational learning is more convinent and interesting for teaching.Moreover, agegroup presenters are effective in the presentation of instruction to learners in third graders about the hazards excessive sound and how the presvention of hearing loss can be achieved (Verma, Purdham and Roels, 2002).

The use of peers or older-age peers is well documented in changing attitude and behaviour of an individual. There is possibility of the role model to minimise taking risk in both the target audience and those selected as leaders of the older peer. Critical elements in the environment where people work and live are peers and social networks. Another aspect of social relationship is peer groups which can occur in all contexts and that affect cultural value development and norms that are crucial to the impact of healthy behaviour and lifestyle. There are evidences that revealed one major predictor of risk behaviour that affects the health of adults which is the type of friends an individual keep and the type of behaviour that they engage in. Social scientists have concluded based on

findings of such relationship that considerable influence is exerted by peers on adults. The submission of critics is that the connection between the behaviours of and conclusion of friends behaviour cannot be accepted as the evidence for peer influence (Verma, Purdham and Roels, 2002; Swuste, Hale and Pantry, 2003).

Research finding has also averred that the description of an individual may not conclusively explain the behaviour and disposition of their peers (Tarantino, 2005). Another criticism associated with traditional research shift is that the changes in peer influence are mixed up with the process of selection (Viljoen, Nie and Guest, 2006; Tarantino, 2005): that the reason for choosing friends by an individual is due to predetermined similarity in values, personality dynamics, and life orientations that is also common. Risky healthy behaviour can be encouraged through such values and orientations like listening to music at high intensity. Individual who selects friends based on set of common values and orientationsare usually predisposed to developing risky healthy behaviour irrespective of the influence from peers.

2.1.11 Industrial Noise Exposure

The term industrial noise or occupational noise-related usually refers to undesired sound that is risky to human health which is relatedtoenvironmental health and safety of an individual, that if not checked can result in damaging the ability to hear permanently.Exposure to loud sound irrespective of the soucre has been linked to having psychological and social effect that will adversely affect the person such as depression, anxiety, restlessness and fatigue (McBride, Firth and Herbison, 2008; Shield, 2006) which can increase job hazard such as accidents (Bies and Hansen, 2003; McCourt, 2004). Moreover, the level of job dissatisfaction and the ability to perform complex task is related to occupational noise (Demeester, Wieringen, Topsakal and Hendrick, 2009). Which also affect the ability to recognise speech and warning signal that contribute to dysfunctional balance (Hallberg, 1996) and invariably lead to increased in the rates of accident in the workplace (Dias and Cordeiro, 2007). For example, Dias and Cordeiro (2007) reported on a study that exposure to excessive sound that is in excess of 82decibels with auditory deficit that is above 25dB HL are hazardous to the safety of an individual but further submitted that exposure tosound of high intensity withauditory

deficit estimated at43% of injuries sustained among the study population (Dias and Cordeiro, 2007)).

Hearing loss that is both permanent and irreversible can occur owing to immoderatehigh level of noise because surgery or use of hearing aid can not effectively be used to correct it. A brief modification of ability to hear and constant ringing in the ear known as tinnitus is associated to short term exposure to excessive sound. In the context of workplace environment, noiseis harmful to the hearing of an individual because of the repeated long term exposure will result in hearing loss. The source of the noise must be closed to the ear of the employees if hearing impairment is to occur with the individual been exposed for a long time.A permanent shift in the auditory threshold can occur from industrial noise because auditory hair cells can be destroyed in the process.The safety of an individual working in such environment will be likely affected by the noise because it can be one of the factors that is responsible for accident in the workplace, both by masking the danger and warning signals and inturn imped the ability to concentrate. The tendency of been involved in an accident increases while the level of productivity will decrease due to the interference of high intensity noise in communication process when engaged in performing a task with over 600 million people estimated to be exposed to workplace related noise globally, thus,higher than the approved standard in a workplace (Kopke, Weisskopf, Boone, Jackson, Wester & Hoffer, 2000).Exposure to excessive levels of sound in the submission of Osisanya, Oyewumi and Sunmonu (2014)is responsile for deterioration observed in an individual health status working in such environment. A factor that accounts for most of the hearing disorder is continuous exposure to sound that is not necessary.A report by the International Organisation on Health Programme for hearing loss Prevention (1997) asserted that excessive sound is an evitablefactor that accounts globally for permanent hearing loss, just as hearing impairment associated with noise is the most prevalent irreversible occupational hazard and requires compensation.

Also, Osisanya,Oyewumi and Sunmonu (2014) posited that the United States have about nine million employees that are exposed to sound level above 85 dB (A) OverTime Weighted Average (TWA) but about 10 million have defective hearing as a result of unwanted sound of about 225dBbeing experienced in the workplace. The percentage of European Unionsurveyed revealed that 28% of employeesreported that they were exposed to excessive sound at least one fourth of the period they spent on the job to the point that

they have to raise the level of their voice while talking with people around to about 85 to 90 dBA. Evidence has shown that sawmill workers have little or no knowledge on the statistical impact of exposure to noise in most industries and other organisations in Nigeria. Furthermore, exposure to noise in the workplace were reported in 17 research work on the continent of Africa, South America and Asia covering not onlymanufacturing and mining industries but also other sectors of production (Osisanya, Oyewumi and Sunmonu, 2014).

2.1.12 Sawmill industry

Sawmill is a place where manufacturing of planks takes place. It can be described as a manufactory where woods from trees are being processed into boards by machines. Prior to the discovery of the sawmill, planks were being produced through manual ways such as cleave and planned or more frequently hand sawn by two persons with a crosscut saw, one above and the other in a saw pit under (Aiyeloja, Oladele and Ezeugo, 2012). Sawmills were at the beginning located within villages around coastal areas very close to streams which paved ways for transporting woods by floating, producing about 450 timber planks each day. Invention of new techniques emerged contributing to the establishment of larger mills which produce logs and planks in large quantity daily for both internal and external consumptions. Thereafter, circular blades were introduced precisly in the nineteeth century for ripping and translating. During this period, sawmills were not only condusive but also harzardous for workers as many of them lost their lives from the sharp teeth blades (Izekoh and Izekoh, 2011). After 1945, mechanization and new technologies were put in place. The electricity replaced steam, and many sawing machines manifested. Sawmill industry is regarded as a place where facilities and equipment required for transforming wood into semi-finished products used for construction, renovation, woodwork and carpentry (Sekunade and Oluwatayo, 2011).

Woods are produced in Nigeriamainly from Cross-river, Edo, Ogun, Ondo and Oyo states of Nigeria. Sawn production from round wood has continued to increase in Nigerian rainforest belt due to the preponderance of sawmill but the production output concentrate on domestic consumption by the construction and furniture industry with limited further processing. Several studies which evaluated the performance of the sawmill industry in Nigeria, Izekoh and izekoh (2011), Fuwape (2001), Aiyeloja, Ogunsanwo and Asiyanbi (2010) observed a wide gap between installed capacity and

operating capacity. Findings from their work indicated that the sawmill contributed significantly to domestic and foreign trade in the 1960s to 1980s and in 1998 to 2012 during the massive exploitation of teak and Gmelina wood to Indian and Chinese market.

For Nigeria to remain relevant in tropical wood supply trade, it is necessary to embrace further processing of the sawn wood which can open opportunities up to bring revenue and employment opportunities to the ever increasing unemployed population both rural and urban (Sekunade and Oluwatayo, 2011). However, the noise generated in sawmill industries by the use of machineries ranges from 95dBA to 115dBA which necessitate the use of HPDs by sawmill workers to prevent themselves from high noise in their workplace. Despite the high noise generated in the sawmill industries, the fact remains that sawmill industry does not only provides employment to the people but also infrastructure for development, hence, it is not overstated that the coming of sawmilling activities is pertinent to the development of the nation.

2.2 Theoretical Review

2.2.1Theory of Planned Behaviour

Ajzen (1991) theory of Planned Behaviour described the function of intention to perform a routine. This theory supplies three ideas that fundamentally refer to plan change to risky behaviour; these are individual's knowledge and perception of how individuals view the behaviour and attitude about the behaviour towards a subject or an object. Findings from various studies consistently demonstrate the relevant of the theory. Hacker and colleagues (2007) concluded based on a study that the Theory of Planned Behaviour was critical in developing prevention of hearing loss among young adults. Regarding the knowledge of preventing hearing impairment due to exposure to noise, majority of the people in developing countries are not enlightened about the impact of such exposure to the ability to hear and the importance of the protective hearing device. Kwon and Vogst (2010) found that tailored messages can increase individual awareness of the risk associated with exposing an individual to excessive sounds, but do not have information on what should be done to minimise the danger. Such persons can benefit from education that is design for the development of skills required in preventive behaviours. Dramatic impact of the attitude of peers has been confirmed by other research report on the use of protective hearing device and avoiding exposure to excessive sound (Griest, 2008). In his research study Griest (2008) asserted that older peers that are trained were more efficient in

enhancing knowledge acquisition, change of attitude towards the use of protective hearing device.

The behaviour of adults in developing the disposition of young people with regards to avoiding hearing loss is important (Laird, 2010).The findings of Critcher and Giloyich (2010) with reference to hearing reveals that employees working in sawmill who are trained on the prevention of hearing loss will probably adhere to the use ofprotective hearing device. However, Critcher and Giloyich (2010) concluded that employees working in sawmill or other industrial who know how to measure the appropriate risk level of noise and who are able to command critical behavioural skills will possibly participate in the behaviours.A critical factor in strengthening the feeling of an individual self-efficacy that involves the skill to communicateespecially when there is need for peers to interact with one another. The interaction can be relevant in the establishment of relationship between norms that are socially acceptable and appropriate behaviour in use of protective hearing devices. Individuals that learn how to explain the importance of protective hearing device to peers will likely use it more since such behaviour is related to increase the possible of an individual actually engaging in the use.

2.2.2 The Social Cognitive Theory

The theory of social cognitive by Bandura (1986) has made significant contributions to studing behaviour commonly has to do with healthy living. The theory is based on the behaviour which measures the relationship that exists between an individual and the social environment. The argument of Bandura's theory is that behaviours is learnt and adapted based on social interaction with member of the society and the environment in a reciprocal arrangementsuch that the person can understand and predetermine the result of planned behaviour. The theory further noted that learning takes place through an individual observation, anticipation of outcome of behaviour, imitating the skills learnt and confidence is developed from the one that is successfully imitated. Possitive or negative experiences with a planned behaviour will determine repetition of such behaviour. In situation that has to do with behaviour associated with protective hearing, the emphasis of Social Cognitive Theory is on the importance of identifying and handling efficiently pressures that is related to social interaction whcich is not in consonance either with the significance of ability to perceive sound or degrade struggle to refrain thepossibility of the hazardous situations.

The reward that associated immediately with physiological tanning, consumption of alcohol or other illicit drugs is not obscured; also, there is possibility of rewarding socially young individual who participate in activities that make them appear “cool”, full grown individual or more in command of the choices that is made. Experts that work on the earare of the opinion that the use of protective hearing device is rare except it has to do with space exploration or other high-technology activities. Thus, behaviourimitated byan individual that appreciates such attribute can result to acting in the same way by young persons who are in lower positions of influence socially. The fact has therefore resulted to the use of “peer presenters” as instructor in learning institution on various challenges that affect the behaviour associated with health which was reported to be efficient in programme presentation on the hazard of exposure and effective prevention of cancer of the skin (Reding, Fisher, Gunderson and Calvert, 2006).

This theory provides informationis on the use of hearing protective devices in sawmill industry as revealed in previous studies.Interventions on health behaviourthat is based on the theory have focused on improving adolescent girls participation in physical activitivities (Levers-Landis, Burant,Drotar and Mogan, 2007; Fulkerson and Hannan, 2006; Dishman, Sallis, Dunn and Welk, 2008; Hortz and Petosa, 2006). This theory has also developed interventions on dietary and diabetic for both young and old adults (Trevino, Pugh and Ramirez, 2008; Baranowski, Cullen, Nicklas and Thompson, 2007), identification of perceptions (Burgess-Champoux, Marquart, Vickers and Reicks, 2006) and increased inself-efficacy (Rinderknecht & Smith 2010).

2.2.3 Theory of Reasoned Action

This theory which was developed by Ajzen and Fishbein (1980)suggested that behaving in a specific way is fundamentally predicted by individual ability to perform act as proposed. Two factors are majorly identified to account for such intentions (Health Communication Partnership, 2005; Coffman, 2002):

• The attitude of the person towards behaving in a specific way. Attitude is widely seen as emotional disposition that can either be desirable or undesirabletoward behaviour, a person, concepts or ideas like “I . . . eat rice and beans”; “I . . . my brother’s friend”).

• The subjective norm of an individual about behaviour. The subjective norms according to TRA are described as the views or judgment which can either be positive or negative, that peers, family members, coworkers, professional bodies, or other important people

hold onattitude, for example, “My friends go against using hearing protective devices”; “My doctor recommends that I use hearing protective device every time I’m exposed to loud noise in the factory”).

Specific actions using TRA towards something are based on an individual perception about the reward for acting in such a way, an example is marijuana smoking that is associated with negative effect on a person level ofconcentration and performance at workplace which is referred to behavioural beliefs. People’s opinion or judgement is determined by normative belief thatdeals with individual’s approval are likely to get from others for engaging in a specific behaviour (for example, “I have the feeling that my friends will not approve of it if I smoke marijuana”). Another element of normative beliefs is the motivation a person has to comply with the ideas and possible approval of other people (Coffman, 2002), for example, if the normative belief is (“I have the feeling that my friends will not approve of it if I smoke marijuana”). An individual motivation to follow instructionmay be determined by asking questions such as: “ Idon’t care about what my friends say concerning the use of substances, hence, I cannot do away from it” One current theory that can influence communication in health and the used programme evalution is TRA (Coffman, 2002), it is however critical to be cautious and not to conclude in haste that the plan to adopt certain attitudes usually implies general change in attitude.The role of effective communication is crucial in supporting behavioural intentions and increasing the likelihood that they would become actual behaviours. Appropriate tools should be developed that will be use for facilitating and making it easy for the adoption, and integration of new behaviour that healthy and ensure lifestyle that is better (Health Communication Partnership, 2005).

2.2.4 Self Perception Theory

Self-perception theory developed by Yee and Bailenson (2007)averred that an individual will determine his or her attitudes and preferences through the interpretation of personal behaviour. Research works that incorporatetheory of self-perception has persisted recently,some times it is used in conjunction with research that deals with mind-wandering, terrorism, and the inclusion of others in the self. Furthermore, this theory can be applied to organisation and influence its goals thus, complementing intence principles based on the establishment of such organisation (Critcher and Gilovich, 2010). They observed the intensity at which old behaviours are being transformed into new

dependable behaviours. They also observed carefully whether people still consider their unnoticed behaviours when inferring attitudes and preferences either by induction or deduction. Their study affirmed that unnoticed behaviour may be positive to certain recent events as opposed to previous activities(Critcher and Gilovich, 2010). Considering the behaviours of others whether such behaviours conform to their behaviour and perform the same task, participants were believed to have the feelings of integrated selfhood with an agent of feedback showing overlapping behavioural parterns. It was stressed further that qualities that are germane to the person exhibiting behaviour are being incorporated into their own concept leading to change in their behaviour.An important usage of the theory of self-perception is on behaviour modification either by persuasive or therapeutic approach.

Self-perception theory when used for therapy has different application for problems that are psychological to that of the traditional perspectives (Goldstein and Cialdini, 2007). Problem that is either traditionally or psychologically arise come from the mind of a person. However, the submission of self-perception theory is that a person gets the inner feelings or abilities from behaviour that is external to them. The adjustment of such behaviour will be attributed to lack of ability to adapt effectively and therefore will bear the consequence for the same psychological problems. The concept can be applied in the treating individual psychological problems due to failure to adjustby guiding them to change their attitude first while the problem is dealt with later.

According to Laird (2007) a major reason for employee failure to use protective hearing device is because it impedes on the ability to communicate effectively while the feelings of discomfort is increased and at the same time difficulty to hear warning signals isdecreased. Susceptibility to diseases that are related to smokingis perceived by most young and older people to be higher than hearing loss that induced by exposure to noise. For this reason, self-perception theory may be applicable to examining hearing protection behaviour. Profession that works on hearing assessment understands the importance of using protective hearing device like earplugs or earmuffs,it is sometimes observed asappropriate except, the sound levels exceed 150dB (Gilovich, Keltner and Nisbett, (2006). Young and older individuals believed that excessive noise is risky to their health, thus, encouraging their positive use of earplugs and or earmuffs.Laird (2007) established four relevant and crucial factors that may encourage or discourage sawmill workers from using hearing protective devices. Firstly, there are perceived barriers to the use of HPDs.

Secondly, the advantages to be derived by individual worker from using hearing protective devices. Thirdly,the area and volume of vulnerability to excessive noise exposure and lastly, the extent of severity associated with high noise level exposure.

Experience has revealed thatthere is increase concern of employees working in sawmill developing hearing loss which might be low among most young when compare to older people. There is also misconception that ispervasive about the developing hearing injuries while working in industry that exposes employees to excessive sound. There are other benefitsthat can be derived from using protective hearing devices, or from avoiding of injuries that may occur while working. There are also wide impediments of force from relations or friends to accept dangerously loud industrial/factory noise such as sawmill. These factors are important hindrances to the usage of hearing protective devices by young and older individuals. Though, friends and relations could also be useful in a long way to encourage those that work in high noise areas to make use of hearing protective devices where necessary as this in no small measure improves their health status. In addition, this theory emphasizes the use of cue to action such as mass media campaign, advice from others which can strongly mode their beliefs regarding the need for a positive behaviour towards the use of hearing protective devices.

2.3 Empirical Review

2.3.1 Lifestyles and hearing protection devices usage

A study by Tao, Davis and Heyer (2013) investigated the effect of exposure to environment with excessive sound resulting to effect of tobacco inhallation. Their finding revealedthe interaction of smoking and noise and the extent to which smoking predicts hearing loss. The study design adoptedcross-sectional methodaimed atassessing the outcome of smokingon hearing loss among 517 male employees (number of non-smokers were 199; while smokers were 318) who were exposed to industrial noise that exceed the approved environmentalnoise level limits in China. Long shift in the unperpetual physical wave of excessive sound that employees were exposed to and audiometric threshold level were measured for all selected participants. Participants were individuals who have consistently used protective hearing devicesat least a year before the commencement of the study.

Findings revealed that hearing loss due to exposure to noise was affected adversely by smoking among employeesin the industry. Thus, there isaverage high

frequency threshold of hearingamong smokers than non-smokers who were exposed to excessive noise for a period above 10 years which was measured at 4.0 and 6.0 kHz. Hearing loss due to noise was not adversely affected by smoking among employees whose exposure to noise was 10 years and below. Multiple regression analysis indicated that the Odds Ratio (OR) for hearing loss due to high frequency (that isthreshold for hearing that is higher than 40 dB at 4.0 kHz) were 1.94 for smokers comparedto non-smokers counterparts. The implication of the result is that: (1) the likelihood of smokers developing hearing loss due to high frequency is higherwhen compare to non-smokers in the same work environment when exposed to industrial noise and (2) the interaction between inhallation of cigarette and exposure to noise at high-level may be additive. It is important that the study population with well-documented exposure to noise and histories of smoking haveproper understanding of the predictive influence of smoking on hearing that is induced by noise as a result of exposures to industrial noise. The effect of smoking canincorporatetherisk factors when assessing hearing loss due to noise exposure.

Individuals who smoke cigarette are directly expose to the intake of nicotine, as well as other types of chemicals such asbenzene,vinyl chloride,formaldehyde, arsenic and hydrogen cyanide through inhalation of the smoke (Sharabi, Reshef-Haran, Burstein and Eldad, 2002). The study by Sharabi, Reshef-Haran, Burstein and Eldad (2002) revealed that hearing loss known as conductive was prevalent in most of the group that participated in the studysuch as 20-68 years. Furthermore, about 6.1%individuals who smoke cigarettes develop at least a mild degree (< 40dB across the 125-8000Hz) of conductive hearing loss. There is increase possibility for smokers to develop mild sensorineural hearing losses (>25 dB either of the high or low frequencies) when compare with non-smokers. Nakanishi, Okamoto, Nakamura, Suzuki, and Tatara (2000) finding revealed that male employee smokers within the age bracket 30-59 years working in officewere likely to develop hearing loss at 4 kHz than at 1 kHz compared with non-smokers.

2.3.2 Age and Hearing Protective Devices Usage

Age as a factor contributes tohearing loss as aging sets in. Differentiating hearing loss caused by old age from hearing loss due toother causes such as exposure to industrial noise may be hard. The damage or injury can affect sensory hair cells in an individual ear. The hair cells once damaged do not get replaced by growing leading to diminished hearing ability in a person. Conditions can easily contribute to hearing loss in older

people includes high blood pressure and diabetes. It is rare for hearing loss due to aging to be a reason for abnormalities in the ear. The abnormalitiesreduce the effective functioning of tympanic membrane or declinein functioning of the ossicles that transmit sound waves from the tympanic membrane to the inner ear. Auditory defects in adults may be as a result of old age in addition with unprotected excessive sound from sawmill industry.There is possibility of a person using protective measures to prevent hearing loss through the use of protective hearing device or avoiding exposing the ear to excessive sound for a period longerthan what is required.The effect of noise to the hearing must be taken in cognisance sources of such as listening to music that is too loud, snowmobiles, firearms, lawn mowers, and leaf blowers. It is crucial to avoid excessive sound, reduce the time spent in exposing the ears to loud sound while the use of hearing protective devices like earplugs or earmuffs should be consistent so that hearing loss is not developed as aging sets in. Failure to adequatelyprotect the hearing when performing task such as shooting firearms and listening music from loud source by teenagers can contribute significantly to the development communication difficulties later in life.

Age related problem is progressive and irreversible in nature and affects those who are from 60 years and above (Hannel, 2010).The effect of hearing loss due to aging is different from the pattern of noise-induced hearing loss (McBride, Firth and Herbison, 2008). Finding reveals that exposure to noise, especially loud sound above approve limit will cause more injuries to the cochlea when compare to the process of natural ageing (Shield, 2006). The impact of excessive sound on the ear is cumulative and can increase the rate at which the ear is susceptible to hearing deterioration later in life, or after the exposure to noise has stopped (McCourt, 2004; Paulus, 2009). Hence, the degeneration of the cochlear from early exposure to noise can make the ears more vulnerable to the impact of age-related hearing loss (McBride, Firth and Herbison, 2008). Industrial noiseand presbyacusis co-exist in most cases which makes it difficult to bedifferentiated. Presbycusis is a common condition that affects most elderly who are 65 years and above. Another term for describing hearing loss that is due to aging is presbycusis. Presbycusis is notlife-threatening but can have an impact that is significant when nottreated. Symptoms of hearing loss due to aging usually start with difficulty to hear sounds that are high-pitched and background noises. Age-related hearing loss cannot be prevented but reduced by regular use of protective hearing device wherever there is exposure to excess approved level of sound.

Age and various health factors such as body mass index, consumption of alcohol triglyceride levels among others were controlled in the study and the result indicated that as the quantity of cigarettes smoked in a day and number of packs annually increases, the risk of having hearing loss of high-frequency also increases, while there was no different in low-frequency hearing loss. Various research findings have revealed that hearing loss as a result of excessive sound exposure and smoking of cigarettes may be aggrevated by aging. Wild, Brewster and Banerjee (2005) opined that those who smoke cigarettes for a long-term with exposure to occupational noise can develop higher risk of irreversible auditory loss at high frequencies (3-4 kHz) than non-smokers with similar exposure. Likewise, Mizoue, Miyamoto and Shimuza (2003) asserted that smoking and exposure to noise had additive effect on high-frequency hearing loss.

The effect of smoking and aging on auditory ability was investigated by Noorhassim and Rampal (1998) and the result indicated that the predisposing risky factors that cause hearing impairment were age and pack years of smoking. The rate of prevalent of smoking on hearing loss was 40 years old. However, there was a developing hearing loss among those who do not smoke as a result of aging but the effect was not as the one observed among smokers. The effect of smoking and aging on individuals who smoke was further calculated and the result revealed that it was multiplicative. This is supported by Toppila, Pyykko, and Starck (2001) who reported that confounders such as smoking, serum cholesterol, systolic or diastolic blood pressure and use of analgesics have great impact in young and elderly participants hearing status. However, when the particpants were paired based on age, noise exposure, blood pressure and serum cholesterol, susceptibility to hearing loss due to exposure to noise was higher among the elderly when compare to the younger participants which showed that one factor that predicts hearing loss susceptibility was age. A study by Ferrite and Santana (2005) found that age, smoking and exposure to noise have interaction effect on increasing hearing loss when compare to each factor alone. They also reported non-smokers who were not exposed to smoking as second hand smoker in 20-40 years age category were not likely to develop hearing loss while smokers above 40 years with a history of exposure to noise had more possibility of developing hearing loss. These synergistics impact were more consistent with biological interactions.

2.3.3 Gender and Hearing Protective Devices Usage

The rate of using HPD among female working at sawmill is lower when compared to male (Tak, Davis and Calvert, 2009).The percentage of male that are involved in economic sector is much more higher compare to female particularly in sectors where there is exposure to noise such as mining, manufacturing, utilities, and construction. Finding from previous study indicated that the social interpretation for body image and physical appearance of adolescents and young adults (Hannel, 2010; Paulus, 2009) and specifically, females (Taylor, Melloy, Dharwada and Toler, 2004) is critical and higher for the type of job an individual engages in. These may contribute to the refusal to use protective device by females who are employed in such economy because they do not want to be described as timid when performing assigned task.

Refusal to use of protective hearing device may be influenced by the need to preserve self-image and avoid the perceptions towards female in the sawmill industries. Usage of hearing protective devices based on gender is positively significant, with the attitudes of male to the usage of the devices; men use the devices when offered than female (Boateng and Amedofu, 2004). In abid to enhance the use of protective hearing devices among employeeswho are employed in sawmill industries, Weichbold and Zorowka (2003) opined that enlightenment programme that will involve lectures, multimedia presentation, group discussion and familiarisation of protective hearing devices like earplugs and earmuffs will be required.

2.3.4 Attitude to hearing protection and hearing protective devices usage

A number of factors affect the disposition of sawmill workers, Comlman, Ezinah, Nambo and Obiang (2007) observed that disposition influences the sawmill workers' attitude towards the use of hearing protective devices. Other studies reveal personal characteristics of sawmill workers as they make effective and competent use earplugs and earmuffs, thus recording a relationship between attitude and behaviour. Similarly,thefocus of most definitions on attitude is on the perception thatbehaviour could either be positive to negative. There are two components to this measurement which are cognitive and affective (value and belief). Attitude as a cognitive input explains the sawmill workers' behaviour in the workplace setting (Vogel, Brug, Hosli and Raat, 2008).

Truong, Siriwong and Robson (2009) argued that an individual's attitude to an object or issue is always related to the expected result associated with that object or issue and the expected outcome of a positive attitude is a pleasant feeling or result. Sawmill

workers may have the competence to perform and may not have the willingness to perform efficiently. This implies that, competencies deal with thecapability to excute a function while attitude involved the willingness to perform such function (Reed, Browning, Westneat and Kidd, 2006). Sawmill workers may be competent but may lack the desire to use hearing protective devices which explains McCullagh, Ronis and Lusk (2010) findings that the characteristics of the sawmill workers like personality, past experience, values, habits and needs may influence their perceptual process of HPDs. The hearing protective devices therefore pose a challenge to such sawmill workers and many develop emotions like disgust and fear to use hearing protective devices. Laird (2007) posits that the things sawmill workers do based on emotions and the views of others usually disturb sawmill workers.

In like manner, the views of friends and peers disturb sawmill workers who cannot use hearing protective devices effectively, which means the perception of sawmill workers may also affect their attitude either in negative or positive form (McBride, Firth and Herbison, 2008). Hurst and Kirby (2008) discovered that attitude develops as a result of perception; sawmill workers mayrealise the importance of the hearing protective devices, the ease of use and the enthusiasm affects using hearing protective devices. There is a strong tie between attitude, values; and attitude is a function of what sawmill workers feel and think (Knobel and Lima, 2014).

2.3.5 Level of education and hearing protective devices usage

Individuals who have education can benefit from the various resources that they are able to access for their well-being and use it for health-related challenges (Roberts, Kuncel and Shiner, 2007). Failure to aquire high level of education adversely affect productivity and the employees'efficiency because the ability to read health and safety notices, posters and signals to avert accident in the cause of performing the assigned task will be limited (Jerri, 2012). The association between personal hearing protective devices usage and education attainment has been demonstrated in several research studies. Roberts, Kuncel and Shiner, (2007) pointed out that inadequate education of workers in manufacturing industries may be an important contributor to the nonuse of hearing protective devices.

Other researchers have found that even among well-educated workers who are aware of the hazards and the associated health impacts, hearing deviceis yet to be fully

employed in all situations where law would require it (Ochire-Boadu, Kusi and Lawer, 2014). Indidviduals who are not highly educated have the tendency of working in noisy environment and are easily exposed to high levels of sound and the different levels of risk such as hearing loss that induced by noise (Goldman and Smith, 2002). It was observed that the importance of education is not limited to the knowledge acquired by a person on specific area of study or for employment opportunity but also furnished every individual with information on health related issues in any environment he found himself (Roberts, Kuncel and Shiner, 2007). Sherman, Azulay and Chertok (2014) observed that sawmill workers with good educational backgroundhad the tendency usingprotective hearing devices while those with lower educational attainment,the perception of safety was not related to using protective hearing device. This submission was particularly connected to the availability of employer committed to safety, the existence of clear rules aimed at prevention of injuries and accident in the place of work and the level of information the employee is provided relating to safety in the workplace.

2.3.6 Length of service and hearing protective Devices Usage

Aremu, Aremu and Olukanmi (2015) posited that sawmill workers years at work has influence on verbal communication as it affects the accuracy and the frequency of communication with the excessive noise background, the presenter of speech will strive harder in the tempo of the speech production and this in turn may damage the vibrating elements. Boateng and Amedofu (2004) found that older adult sawmill workers that have expended longer years at work experience more challenges in hearing where there is background noise when compare to teenagers and these variations may not be explained only by reducing audibility. Study by Boateng and Amedofu (2004) revealed a significantly positive association between duration of work at the sawmill industry and noise induced hearing loss. According to Hong, Samo Hulea and Eakin (2008), repeated and persistent exposure to sounds that is above 85dB without the use of hearing protective devices may not result to only hearing loss but also some vascular problems such as an increase in blood pressure hypertension, ,metabolic and bio chemical disorders. Wong, Ettlinger, Sheppard, Gunasekera and Dhar (2010) found that the longer the years at work in a factory induce noise environment, the more factory workers experience degeneration in the functioning of the auditory sense organ.

Thus, damages that occur in the ear have been raised to illustrate the causes of hearing impairment as a result of aging in perceiving sound; they include the peripheral, central, and cognitive processes. However, decline based on age-related which can lead to reduction in auditory performance is not avoidable.Long periods of exposure to intense sound level of 90-120dB have been observed to have some psychological effects on the individual exposed to it (Booth, 2009). In essence, excessive noise makes human develops low level of tolerance, uncomfortable state of the mind as well as having reduced productivity capacity. The proportion of sawmill workers with hearing impairment was higher among those who have been working for a long period of time without the use of hearing protective devices. Boateng and Amedofu (2004) submitted that analysis of manifold indicated that use of earplugs or earmuffs lower the tendency of getting defective hearing amidst sawmill workers.

Hong (2009)opined that no association exsist in the use of hearig protectors and the level at which an employee perceives sound. According to a WHO bulletin on environmental burden on disease (2013), the first priority in minimising hearing loss is to reduce noise through technical solutions like introducing protective hearing programme for employees where engineering controls are not applicable or insufficient. It was however, advocated that the protective devices must be properly selected, worn, and maintained. Use of hearing protective devices showed a protective effect on development of hearing loss. Efforts should be made by professionals and people concerned to see to the availability of the devices and ensure that such are used at the appropriate time and place so as to reduce the prevalence of the illness especially the elderly and long serving workers who areat risk of having hearing loss (Osagbemi, La-Kadri and Aderibigbe, 2010).

2.3.7 Peer influence and hearing protective devices usage

Based on a research that investigated the peer influence on risky behaviours, Enon (1998) observed thatin sawmill industry where young adults are discouraged from using hearing protective devices in their workplace through the influence of peers, adults too may not be willingly participated in the use of HPDs. Chalder, Elgari and Bennett (2005) found that the growth of young people will gradually lead to surrendering to peers influence while their parental guide is rejected because they feel their peers have better opinion. Sometimes an individual is motivated by their peers to participate in action that

is not desirable like exposure to sources of high level sound. Rewards are given by groups while approval is given for conforming to such attitude by an individual; rather than censure,commendation is given. In situations that such influence is used by members of the group to ensure conformity, Bany (1994) noted that the person may not have information about the influence and the transformation that will be impacted on an individual behaviour.This type of influence leads to the development of loyalty, beliefs, habits, and expectations of the group that may not be doubted. The approval may be given to behaviour sanctioned by group while behaviour disapproved by the group may be discarded by the individual.

On the other hand, Black (2002) asserted that peer group may influence an individual to develop personal normative perception and interpretation of information that is risky to healthy behaviour. Kandel, Kessler and Margulies (1978) averred that friends may persistently develop attitude due to likeness and engage in exhibiting the attitude such as use of protective hearing device to prevent exposure to loud sound. Steinberg and Silverberg (1986), and Burton, Ray and Mehta (2003) observed that the influence of friends is a crucial factor in determining the use of protective hearng device by adults, which can result in developing behaviours that are not healthy. Generally, they submitted that the influence of peers is the source of common demonstration in negative activities. Yeh (2006) concluded that peers' social interaction is critical in determining the influence of individual perception on the use of protective hearing device particularly among adults. National Institute for occupational and safety health (NIOSH, 1998) opined that peer groupis significant in predicting workers' attitudes towards hearing protection usage Similarly, a survey carried out in United State by the Occupation Safety and Health Administration (OSHA, 2007) found out that adults begin using hearing protection and this was as a result of other older adults and that such might consequently influenced their friends to inculcate the habit of using hearing protection while at workplace. Occupational Safety and Health Administration as a matter of fact are trying their level best to promote hearing conservation programmes.

2.3.8 Industrial noise exposure and hearing protective devices usage

A study carried out by Williams, Forby-Atkinson, Purdy and Gartshore (2006) averred that the variation in the usage of hearing protectors across different organisation was significantly different, with compliant rate for using the device ranging between 10%

and 100% in existing ‘ear protection zones’. The report was collaborated with the submission of Paulus (2009) that employees use hearing protection only in environment already identified as noisy. Employees in organisations that are either medium or large in terms of employment size are likely to experience exposure to sounds level that is above the approved limit while working most or all of the time. On the other hand, employeewhose job was based on shifting hourswas morelikely to have occasional noise exposure (Williams, Forby-Atkinson, Purdy and Gartshore, 2006). According to Hannel (2010),a major source of occupational noise is the process involved in performing the task related to production.

Hannel (2010) pointed out that about 50 per cent of workers that were surveyed reported using protective hearing devices most of the time when working while the other 40 per cent used it for some time and 10 per cent never use the device when working. Ogundiran (2012) findings revealed that in order of magnitude, noise exposure (β =0.41) contributed more to the hearing loss of elderly patients compare to diabetes mellitus (β =0.23) and hypertension (β =0.11). Ogundiran further contended that the implication of hearing loss is not just about the inability to perceive speech sound but also theeffective functioning of an individual concerned significantly.The devices mightnot be worn pending the time an employee assumes that the level of the sound cannot be tolerated which may be too late. Irrespective of the disposition of employee to device, it is must be used regularlyso as to have complete protection against noise that has damaging effect on the ears. Cowley, Else and LaMontagne (2004) found that seven employees out of ten that were surveyedhave positive disposition towards the use of protective devices while working in environment with excessive level of sound. Wearing hearing protectors was predictably variable in the eighteen worksites surveyed, with the rate of usage between10% to 100%. The reason stated for irregular use of the device was consistent with previous reports which are discomfort and communication inflow. Paulus (2009) pointed out that the rate of using hearing protective devices wasspecifically low in situations where superior officer had designated areas for noise hazard arbitrarily (the areas poorly defined or all-inclusive areas required for the use of protective hearing device that is unwarranted). In such situations, employees found some reasons to 'cheat' on the need for using a protective hearing device—even in situation that it was necessary.

The report of Cowley, Else and LaMontagne (2004) based on investigation that employees who had been diagnosed with hearing loss caused by noise-induced, 82.8%

wore protection devices while 20.2% did not use it. The indication is that 20% employees failed to realise the importance of using protective devices, in spite of the benefits in preventing hearing loss. Impaired communication and hearing loss are the end result of exposing ears to loud soundotherwise referred to as industrial noise. Occupational noise also results in harmful effect other than hearing loss. Report indicated that exposure of foetal to immoderate sound can cause auditory defects (Bies and Hansen, 2003). Constant ringing or experience of buzzing in the head or hear otherwise known as tinnitus is the absence of source of sound externally. This ringing can be mild but at the same time irritating to discomforting. In situation where it is serious, ringing in the ear also may causeinsomnia, unhappiness, suicide and stress. Different factors may lead to ringing in the ear of which is exposure to loud sound andsometimes identified as the most common (Weichbold, et al, 2003). Generally, ear ringing is always followed with inability to hear properlybut is usually preceded ear pains by considerable amount of time. There is a link between cccupational noiseand hazard health conditions for example pulse rate is quickened and hypertension (McBride, Firth and Herbison, 2008; McCullagh, 2011; McCourt, 2004).

Finding revealed that there is relationship between occupational noise and absenteeism from workplace (Shield, 2006). A study conducted in Swedeen concluded that there is relationship between increase in noise exposure in the workplace and decrease in employee'sannual productivity from 77% to 44% (Shield, 2006)).It is important to note thatattributing the change to increase in exposure to noise alone is not reliable. Despite these limitations, correlation between occupational noise and productivity of employees has been interpreted through the examination of the impact of occupational noise on factor that influencesproductivity on the job, such as job satisfaction (Shield, 2006). Research findings have reported that there is significant positive relationship between excessive loud sound and the action of an employee (Arlinger, 2006), while the conclusion of others revealed that the relationship is either not complex or significant (Taylor, Melloy, Dharwaka, Gramopadhye and Toler, 2004). Broadbent's arousal theory can be used to explain findings that are counter intuitive and inconsistent (Bies and Hansen, 2003) which indicate that noise is related to certain level of productionbut noise lower or higherthan this level may lead to a decline in production (Bies and Hansen 2003; Taylor, Mello, Dharwaka and Toler, 2004).

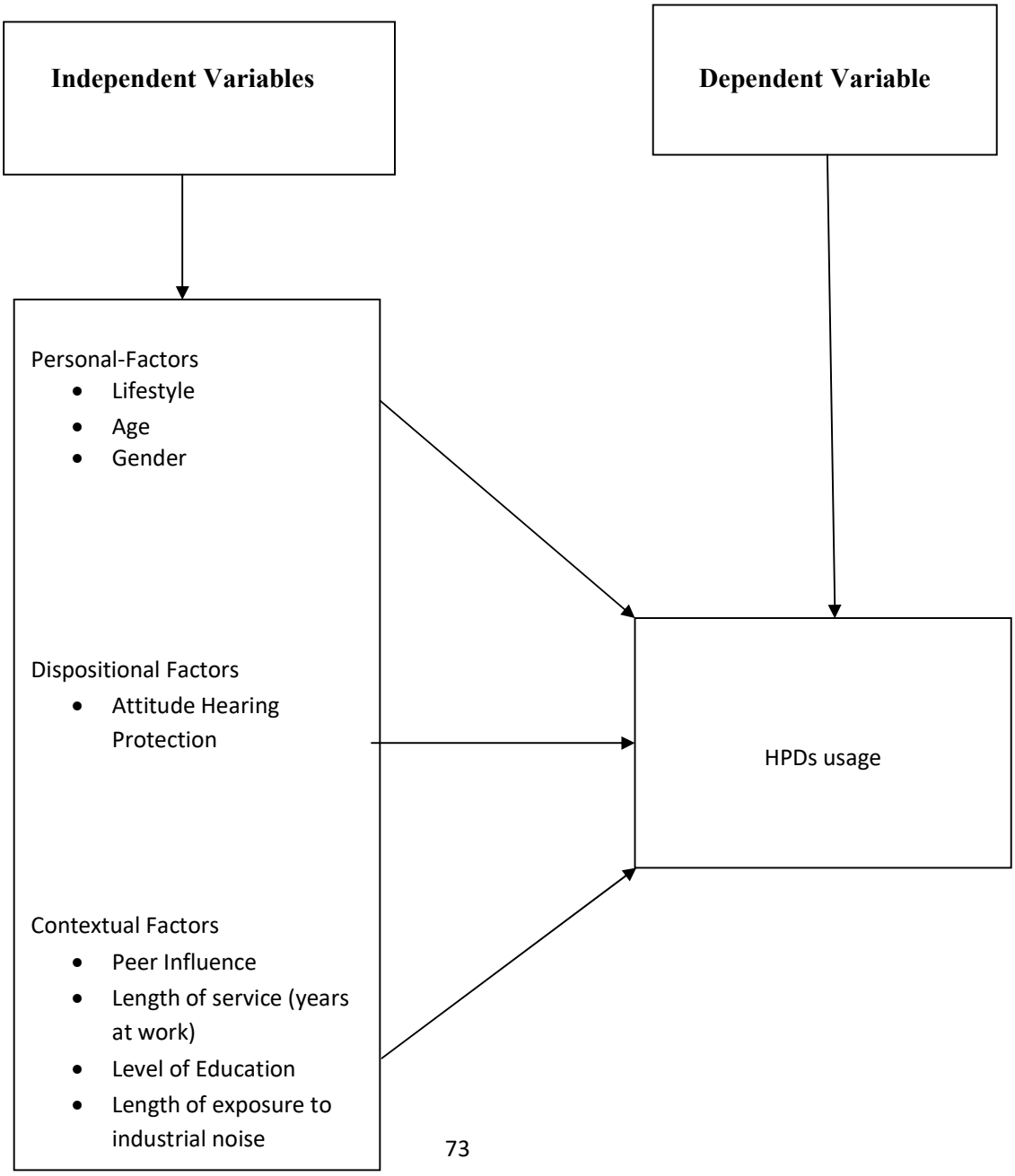
There are other problems that can arise owing to defective hearing such as exclusion from family engagement and increase level of stress in relationship and mark of infamy and detachment (Hallberg, 1996), unhappiness (Shield, 2006), the quality of life will generally decline (Shield, 2006), and earnings reduced (Olagunju, 2010). Exposure to noise can have hazardous impact even when the level of hearing is not affected. Some of the effect includes annoyance and anxiety. The relative low level of noise for example can affect employee's concentration which in turn will be observed on efficiency and productivity negatively (Kjellberg, Landstrom, Tesarz and Soderberg, 1996). Research revealedthat noise that is as low as 65dB (A) or less can affect an employee's emotional status negatively and have negativeimpact on accomplishment (Shield, 2006). Reseach result has further shown mental performance will decrease due to low-level noise (Taylor, Mello, Dharwaka and Toler, 2004; Hallberg, 1996). Specifically, a distracting and annoying occurence is intermintent as well asconstant noise (Demeester, Topsakal, Wieringen and Hendrick, 2009).

2.4 Appraisal of literature

Literature review in this study has shown that usage of earplugs and or earmuffs is growing and fast emerging as a public health concern in a magnitude way. The increase rate of sawmill industries in our communities is high and this lends to the alarming rate of excessive industrial noise hearing loss among sawmills. The review of literature also revealed that in Nigeria as in other parts of the world, hearing protection usage among sawmill workers is determined by a broad range of personal (lifestyle, age and gender), dispositional (attitude to hearing protection) and contextual (level of education, length of service, peer influence and industrial noise exposure) factors and these encourage the saw millers to make use ofearplugs or earmuffs in their workplace. This implies that when considering the device to be used, one must understand the advantages and disadvantages of each of the devices. Also in assessing the use of hearing protection, factors that have impact on the use of the devices must be taken into consideration. In addition to evaluating each factor individually, it is necessary to determine how well these factors work together and function as a whole. Changes to one factor might (and probably will) have an effect on others. Therefore effective assessment involves understanding how each factor contributes to overall hearing protection usage among sawmill workers. Workers in the sawmill industries need to be recognised as mentally, socially and economically productive in the society, thus efforts to improve their health behaviours is necessary.

People cannot deny the fact that the effort should be made to explore different technique interventions so as to create full awareness of hearing protectors. Workers in the sawmill industries should therefore be given adequate education and information to better their understanding of hearing protection so as to reduce the incidence of occupational noise common among workers in the sawmill industries.

2.5 Conceptual Framework of the Study



Sawmill workers related factors as predictors of HPDs usage in Southwestern Nigeria. This model explains relationship among the independent variables and dependent variable in the study.

CHAPTER THREE

METHODOLOGY

This chapter deals with the methodology adopted for the study which includes: research design, population, sample and sampling technique, instruments, procedure for test administration and method of data analysis.

3.1 Research Design

This study adopted a descriptive survey research design of correlational type. It is a type of design that seeks to establish relationships, but researcher has no control over the variables of interest and therefore cannot manipulate them.

3.2 Population

The population for this study comprised all workers in the sawmill industries in Southwestern Nigeria including Ekiti, Lagos, Ogun, Ondo, Osun and Oyo States.

3.3 Sample and Sampling Technique

Purposive sampling technique was used to select 18 sawmills representing three sawmills per state based on their size, capacity of the equipment used and level of noise generated. Stratified random sampling technique was used to group all the participants in southwestern Nigeria into four strata (operators, feeders, packers and stackers). Five hundred and fifty four (554) consisting four hundred and fifty two (452) males and one hunded and two (102) females working in high noise zones were selected using proportionate sample size technique (Ekiti- 90, Lagos- 90, Ogun- 93, Ondo- 90, Osun- 91 and Oyo- 100).A sound level meter was used to ascertain sound levels of the areas considered as high noisewithin the workplace.

3.4 Instruments

Four instruments were used to collect data in this study and these include: Peer Pressure Inventory (PPI), Attitude of workers to Hearing Protective Usage Questionnaire, Lifestyle Questionnaire, and Hearing Protection Assessment (HPA)

3.4.1 Description of the Instruments

The Peer Pressure Inventory

The influence of peer group was measured using the Peer Pressure Inventory (PPI). The instrument was prepared by Burks and Keller (1995). The Peer Pressure Inventory contains 22-items that were pairedwhich described the influence ofpeers on each other. The statement was in pairs which imply that respondents will indicate if whether they will likely be encouraged by their peers to act in a particular way or not. Scores were allocated to each item from -3 to +3 with the "no influence" option scores as zero. Thus: 3 = a lot, meaning a lot of influence from peers; 2 = somewhat, meaning a bit of influence; 1 = little, meaning little influence from peers, and 0 = no influence. In addition, -1 = little, meaning that friends do not encourage you to do something; -2 somewhat, -3 = a lot. Coding were as follows: -3 = 0, -2 = 1, -1 = 2, 0 = 3, +1 = 4, +2 = 5, +3 = 6. The potential range is from 0 - 132. 0 – 44 was the range for negative influence, 45 – 89 was was range low influence while 90 – 132 was the range positive influence. High scores implied that peer group had influence from the positive direction or negative peer group influence from the negative direction.

Attitude to hearing protection Questionnaire

The instrument developed by Folmer, Griest and Martin(2007) is a ten item questionnaire with items such as: use of HPDs is irrelevant and disturbing to workers like me; wearing HPD while working can reduce my work output; I think I should not be forced to use HPDs. This was used to determine the attitude of sawmill workers towards the use of HPDs It has a response choice weight range of 1(strongly disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree) and 5 (strongly agree).

Lifestyle Questionnaire

This instrument was used to measure sawmill worker lifestyle pattern. It is a self constructed 15 item questionnaire with items such as: I do not bother about the level of the noise in my workplace; On the average, I drink more than 9 units of alcohol a day; I

always use sharp objects to remove dirt's from my ear; I enjoy music only when it is very loud. It is prepared on a 5-point Likert scale rating format. A designed demographic questionnaire was used to measure factors such as length of service, level of education, age and gender.

Hearing Protection Assessment (HPA) Questionnaire

This instrument was used to evaluate hearing protection usage among sawmill workers. Hearing protection assessment (HPA) was developed by Reddy, Welch, Ameratunga and Thorne (2014) and has been widely used to evaluate health behaviours such as sunscreen usage and breast cancer (Aveyard, Markham, Almond and Cheng, 2003). The instrument consisted of eighteen item questionnaire with items such as: Wearing personal protective devices is uncomfortable; I benefit by wearing personal protective devices; I am confident that I can obtain the proper personal protective devices when I am exposed to noise hazards at work. It is prepared on a 5-point Likert Scale ranging from strongly disagree to strongly agree.

3.4.2 Validity and Reliability

To validate the instruments used, the researcher ensured that the items on the questionnaire correspond with the objectives of the study. Thereafter, the draft copies of the questionnaire were given to experts for scrutiny. Suggestions from different experts were incorporated. Item analysis of the questionnaire was done to ensure that the construct validity of the instrument was appropriate. Further validation was carried out by the researcher to determine the reliability and validity of the instrument by subjecting the instrument to a pilot study.Pilot study was conducted to assess the reliability (internal consistency) of the questionnaire in order to enhance its accuracy for assessment and evaluation. Participants for the pilot study were selected from two sawmill industries apart from those that were used for the real study. The results obtained in the pilot test were analysed with the Cronback Alpha for validation purpose and stated in the description for the instrument to determine the reliability. Lifestyle Questionnaire 0.78; Attitude to Hearing Protective Devices Usage 0.77; Peer Influence 0.82 and Hearing Protection Assessment 0.86.

3.5 Procedure for Data Collection

The researcher after collecting a letter of introduction from the Head of Department of Special Education, University of Ibadan employed the services of three research assistants for the purpose of the research. The administration of the instrument took eight weeks. Permission was sought from the supervisors/directors ofsawmills selected upon makingthe intention of the research known to them, and this was adequately granted.

During the selection of the participants in the various locations used, they were duly informed about the purpose of the study. This enhanced objectivity of the study. Research assistants and supervisors/ directors that assisted in the exercisewere briefed about the vital instructions and modality of the exercise. Therefore, the copies of the questionnaire were distributed among the participants. Both researcher and the research assistants waited to collect the responses of the participants at different locations after they have been adequately attended to and they were properly checked by the researcher and research assistants to see that there was no error in each of the questionnaire.

3.6 Method of Data Analysis

Data was analysed with the use of inferential statistics. Pearson Product Moment Correlation (PPMC) and Multiple Regressions Analysis were employed in the analysis of the data.Pearson Product Moment Correlation established relationship between independent and dependent variables while Multiple Regression Analysis established relative and composite influenceamong variables under study (independent and dependent).

CHAPTER FOUR

RESULTS

4.1 Analysis of Research Questions and Hypotheses

This chapter presents the results of the findings. The study examined lifestyle, age and gender, attitude to hearing protection, educational qualification, length of service, peer influence and length of industrial noise exposure as correlates of hearing protective usage among sawmill workers.Two research questions were answeredand eight hypotheses tested using Correlation and Multiple Regression Analysis. The summary of the findings were presented in the following tables.

4.1RQ1: What is the joint contribution of educational qualification, age, and gender, length of service, peer influence, attitude to hearing protection, lifestyle and length of exposure to industrial noise as correlates of hearing protective devices usage among sawmill workers?

Table4.1: Summary of Regression Analysis of the combined Prediction of hearing protective devices usage among sawmills workers by the Eight Independent variables.

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.455	0.207	0.195	9.21143

SUMMARY REGRESSION ANOVA

	Sum of Squares	Df	Mean Square	F	P	Remark
Regression	11011.21	8	1376.40	16.22	0.000	Sig
Residual	42085.83	545	84.85			
Total	53097.04	553				

Table4.1 showed that the prediction of all the eight independent variables to the dependent variable was significant. That is, hearing protective usage among sawmill workers correlated positively with the eight predictor variables. The table also shows a

coefficient of multiple correlations (R) of 0.455 and a multiple R square of 0.207. This means that 20.7% of the variance in the hearing protective usage among participants is accounted for by all the eight predictor variables, when taken together. The significance of the composite contribution was tested at $p<0.05$ using the F- ratio at the degree of freedom (df = 8/496). The table also shows that the analysis of variance for the regression yielded an F-ratio of 16.22 (significant at 0.05 levels). This implies that the joint contribution of the independent variables to the dependent variable was significant and that other variables not included in this model may have accounted for the remaining variance.

4.2RQ2: What is the relative contribution of educational qualification, age, and gender, length of service, peer influence, attitude to hearing protection, life style and length of exposure to industrial noise as correlates of hearing protective devices usage among sawmill workers?

Table4. 2: Relative contribution of the independent variables to the dependent variable (Test of significance of the Regression coefficients).

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	β	Std. Error	Beta		
(Constant)	21.914	2.800		7.825	.000
Lifestyle	.016	.172	.013	0.95	.924
Age(years)	-.545	.607	-.037	-.898	.370
Gender	-.173	.860	-.008	-.201	.841
Attitude	.540	.157	.371	3.438	.001
Level of education	-.392	.557	-.030	-.704	.482
Length of service	.251	.438	.023	.537	.567
Peer influence	.181	.065	.220	2.798	.005
Noise exposure	-.629	.860	-.030	-.732	.465

a. Dependent Variable: Hearing protective usage

Table4.2 reveals the relative contribution of the eight independent variables to the dependent variable, expressed as beta weights. The partial correlation coefficients of educational qualification, age, and gender, length of service, peer influence, attitude to hearing protection, life style and length of exposure to industrial noise as correlates of hearing protective usage among sawmill workers have negative and positive relationship with the hearing protective usage among sawmill workers. The values of gender, age, educational qualification and level of noise exposure to hearing protective usage is actually encouraging the idea of not using hearing protective device while positive value of the effects of peer influence, length of service, attitude to hearing protective usage and life style is actually determined by positive reinforcement of these four variables. Using the standardized regression coefficient to determine the relative contributions of the independent variables to the explanation of the dependent variable attitude ($\beta = 0.540$, $t= 3.438$, $p < 0.05$) is most potent contributor to the prediction and followed by length of service ($\beta = 0.251$, $t = 0.573$, $P > 0.05$) followed by peer influence ($\beta = 0.181$, $t = 2.798$, $P < 0.05$) followed by life style ($\beta = 0.016$, $t= 0.095$, $p > 0.05$), followed by gender ($\beta = -0.173$, $t = 0.201$, $P > 0.05$) followed by educational qualification ($\beta = -0.392$, $t = -704$, $P > 0.05$) followed by age ($\beta = -0.545$, $t = 0.898$, $P > 0.05$) and finally followed by noise exposure ($\beta = -0.629$, $t = 0.732$, $p > 0.05$) in that order.

4.3 Hypothesis one: There is no significant relationship between lifestyle and hearing protective devices usage among sawmill workers.

Table 4.3: Correlation Table between Lifestyle and Hearing Protective Devices Usage among Sawmill Workers

Variable	**N**	**df**	**Mean**	**StdDev**	**R**	**p**	Remarks
Life style	554	552	35.95	7.89	0.429	< 0.05	S
Usage of Hearing Protective Devices	554		42.30	10.26			

S = Significant

The results from Table 4.3 showed that $r = 0.429$ and $p = 0.000$, since $p < 0.05$ it implies that there is significant relationship between life style and hearing protective devices usage among sawmill workers. Therefore, the null hypothesis is rejected in favour of

alternative hypothesis and the researcher concludes that there is significant relationship between life style and hearing protective devices usage among saw millers.

4.4Hypothesis Two: There is no significant relationship between ages of sawmill workers and the use of hearing protective devices.

Table 4.4: Correlation Table between Age and Hearing Protective Devices Usage among Sawmill Workers

Variable	**N**	**df**	**Mean**	**StdDev**	**R**	**p**	Remarks
Age	554	552	1.62	0.70	0.045	>0.05	NS
Usage of Hearing Protective Devices	554		42.30	10.26			

NS = Not significant

The results from Table 4.4 showed that r = 0.045 and p> 0.05, since p>0.05 it implies that there is no significant relationship between age and hearing protective devices usage among sawmill workers. Therefore, the null hypothesis is accepted and the researcher concludes that there is no significant relationship between age and hearing protective devices usage among sawmill workers.

4.5 Hypothesis Three: There is no significant relationship between genders of sawmill workers and the use of hearing protective devices.

Table 4.5: Correlation Table between Gender and Hearing Protective Devices Usage among Sawmill Workers

Variable	**N**	**df**	**Mean**	**StdDev**	**R**	**p**	Remarks
Gender	554	552	-	-	-0.026	>0.05	NS
Usage of Hearing Protective Devices	554		42.30	10.26			

NS = Not significant

The results from Table 4.5 showed that r = -0.026 and p> 0.05, since p>0.05 it implies that there is no significant relationship between gender and hearing protective devices

usage among sawmill workers. Therefore, the null hypothesis is accepted and the researcher concludes that there is no significant relationship between gender and hearing protective devices usage among sawmill workers.

4.6 Hypothesis Four: There is no significant relationship between attitude and hearing protective devices usage among sawmill workers.

Table 4.6: Correlation Table between Attitude and Hearing Protective Devices Usage among Sawmill Workers

Variable	N	df	Mean	StdDev	R	p	Remarks
Attitude	554	552	25.93	7.05	0.398	< 0.05	S
Usage of Hearing Protective Devices	554		42.30	10.26			

S = Significant

The results from Table 4.6 showed that r = 0.398 and p = 0.000, since p < 0.05 it implies that there is significant relationship between attitude and hearing protective devices usage among sawmill workers. Therefore, the null hypothesis is rejected in favour of alternative hypothesis and the researcher concludes that there is significant relationship between attitude and hearing protective devices usage among sawmill workers.

4.7 Hypothesis Five: There is no significant relationship between levels of education of sawmill workers and the use of hearing protective devices.

Table 4.7: Correlation Table between Level of Education and Hearing Protective Devices Usage among Sawmill Workers

Variable	N	df	Mean	StdDev	R	p	Remarks
Educational Qualification	554	552	-	-	0.065	>0.05	NS
Usage of Hearing Protective Devices	554		42.30	10.26			

NS = Not significant

The results from Table 4.7 showed that r = 0.065 and p> 0.05, since p>0.05 it implies that there is no significant relationship between level of education and hearing protective

devices usage among sawmill workers. Therefore, the null hypothesis is accepted and the researcher concludes that there is no significant relationship between level of education and hearing protective devices usage among sawmill workers.

4.8Hypothesis Six: There is no significant relationship between length of service and hearing protective devices usage among sawmill workers.

Table 4.8: Correlation Table between Length of Service and Hearing Protective Devices Usage among Sawmill workers

Variable	**N**	**df**	**Mean**	**StdDev**	**R**	**p**	Remarks
Length of Service	554	552	1.62	0.94	0.028	>0.05	NS
Usage of Hearing Protective Devices	554		42.30	10.26			

NS = Not significant

The results from Table 4.8 showed that r = 0.028 and p = 0.524, since p>0.05 it implies that there is no significant relationship between length of service hearing protective devices usage among sawmill workers. Therefore, the null hypothesis is accepted and the researcher concludes that there is no significant relationship between length of service and hearing protective devices usage among sawmill workers.

4.9 Hypothesis Seven: There is no significant relationship between peer influence and hearing protective devices usage among sawmill workers.

Table 4.9: Correlation Table between Peer Influence and Hearing Protective Devices Usage among Sawmill Workers

Variable	**N**	**df**	**Mean**	**StdDev**	**R**	**p**	Remarks
Peer influence	554	552	43.79	12.47	0.256	< 0.05	S
Usage of Hearing Protective Devices	554		42.30	10.26			

S = Significant

The results from Table 4.9 showed that r = 0.256 and p = 0.000, since p < 0.05 it implies that there is significant relationship between peer influence and hearing protectivedevices usageamong sawmill workers. Therefore, the null hypothesis is rejected in favour of

alternative hypothesis and the researcher concludes that there is significant relationship between peer influence and hearing protective devices usage among sawmill workers.

4.10 Hypothesis Eight: There is no significant relationship between lengths of exposure to industrial noise of sawmill workers and the use of hearing protective devices.

Table 4.10: Correlation Table between Lengths of Exposure to Industrial Noise and Hearing Protective Devices Usage among Sawmill Workers

Variable	**N**	**df**	**Mean**	**StdDev**	**R**	**p**	Remarks
Noise exposure level	554	552	1.37	0.48	-0.021	>0.05	NS
Usage of Hearing Protective Devices	554		42.30	10.26			

The results from Table 4.10 showed that r = -0.021 and p> 0.05, since p>0.05 it implies that there is no significant relationship between length of exposure to industrial noise and hearing protective devices usage among sawmill workers. Therefore, the null hypothesis is accepted and the researcher concludes that there is no significant relationship between length of exposure to industrial noise and hearing protective devices usage among sawmill workers.

4.2 Discussion of Findings

Joint contribution of personal, dispositional and contextual factors to hearing protective devices usage among sawmills workers: -The results in table 4.1 show the joint prediction of theindependent variables to the dependent variable.This implies that all the independent variable jointly contributed to the dependent variable. Though there were scanty literatures that collectively addressed the significant effect of the independent variables (educational qualification, age, and gender, length of service, peer influence, attitude to hearing protection, lifestyle and length of exposure to industrial noise) on dependent variable (hearing protective devices usage) among sawmill workers, nevertheless, this is in line with the studies of McCullagh, Ronis and Lusk (2010) that pointed out that friends sometimes exhibit similar attitudes and engage in same habits

such as hearing protective devices usage against excessive loud sound.Foxcroft and Kimberly (2002) and Igba (2004) also revealed significant contribution of each independent variable such as attitude; peer influence and lifestyle on sawmill workers usage of hearing protective devices. Furthermore, the findingsof Osagbemi, LaKadri and Aderibigbe (2010), Taylor, Melloy, Dharwada and Toler (2004), Hannel (2010), Paulus (2009), Boateng and Amedofu (2004) pointed out that gender, age and industrial noise exposure jointly contributed to the use of hearing protective devices.

Relative contribution ofpersonal, dispositional and contextual factors to hearing protective devices usage among sawmills workers:-Table 4.2 shows the relative contribution of all the independent variables to the dependent variable, expressed as beta weights. The relative correlation of lifestyle, age and gender, attitude to hearing protection, length of service, level of education, peer influence and length of exposure to industrial noise as correlates of hearing protective usage among sawmill workers have negative and positive relationship with the hearing protective usage among sawmill workers. The derived values of gender, age, level of education and noise exposure level are indicationfor not using hearing protective device while positive value of attitude to hearing protective usage, length of service,peer influence and lifestyle are determined by adequate reinforcement of these fourvariables. Using the standardized regression coefficient to determine the relative contributions of the independent variables to the explanation of the dependent variable attitude is most potent prediction. Therefore, their orders of contributions areattitude, length of service,peer influence, lifestyle, gender, level education, age and level of noise exposure. Attitude to hearing protection contributed significantly followed bylength of service, peer influence, lifestyle, educational qualification, length of noise exposure, age and gender to hearing protective devices among sawmills.

Relationship between lifestyle and hearing protective devices usage among sawmill workers: - The result in table 4.3 shows that there is significant relationship between lifestyle and usage of hearing protective among saw millers. Therefore, the null hypothesis was rejected and the researcher concludes that there is significant relationship between lifestyle and usage of hearing protective among saw millers. Lifestyle that has significant relationship with hearing protective devices usage among sawmill workers in southwestern Nigeria could be that most sawmill workers involve themselves in consuming various amounts of stimulants such as alcohol and illicit psychotropic agents

which sometimes distort rational thinking and eventually influence negative decision. This implies that the ingestion of such substances may alter the belief of workers in the ability of HPDs to reduce environmental noise at workplace.

The finding is in consonance with NHS (2008) which stated that lifestyle of some sawmill workers such as smoking of cigarette, consuming of alcohol; healthy diet and physical exercise have a major influence on health and are considered to be important risk factors for many illnesses and conditions. Consistent with this finding is the report of Wild, Brewster and Banerjee (2005) which stated that long-term cigarette smokers who expose their ears to industrial noise exposure without preventive measures such as HPDs may be at a greater risk for developing a permanent hearing loss than smokers with a similar history of industrial noise exposure but with HPDs.

Relationship between age and hearing protective devices usage among sawmill workers: - The results in table 4.4showed that there is no significant relationship between age and usage of hearing protective among saw millers. Therefore, the null hypothesis was accepted and the researcher concludes that there is no significant relationship between age and usage of hearing protective among saw millers.This could be attributed to misconception of hearing loss from sawmill workers tha hearing loss is inborn and could be acquired through illnesses but not by age. This simply means that age has nothing to do with hearing loss. This could be as a result of elderly people who have been working in sawmill industries with past decades but without having hearing loss and that those with hearing loss in sawmill industry have had it before they were employed. This is in line with Holland (2008) who found out that exposure to noise is more dangerous than the process of natural aging of auditory hair cells. This findingcorroborates with Hannel (2010) that pointed out that both young and old adults in sawmill industries were not using HPDs.This finding is consistent with Davis, Kozel and Erway (2005) who submitted that the connection between hearing loss due to excessive sound with auditory deficit as a result of aging interwoven and difficult to pinpoint which is also not properly understood. However, this finding is contrary to Smith, Davis and Ferguson (2000) who affirmed that poorer pure tone thresholds have been found in noise exposed elderly men than in those not exposed for occupational noise. This finding is in line with Hannel (2010) that pointed out that both young and old adults in sawmill industries were not using HPDs.

Relationship between gender and hearing protective devices usage among sawmill workers: - The results in table 4.5 revealed that there was no significant relationship between gender and usage of hearing protective among saw millers. Therefore, the null hypothesis was accepted and the researcher concludes that there was no significant relationship between gender and usage of hearing protective among saw millers. Gender that was not significantly correlated could be attributed to the fact that noise exposure and positive use of hearing protective devices are not function of whether somebody is male or female. This simply means that gender did not have any impact on being knowledgeable about the use of HPDs in sawmill industries. This finding is consistent with Gerend and Cullen (2008) who revealed that women and men behaviour is not significantly different when it refers to hearing protective devices usage. In addition Hong, Lusk and Ronis (2005) revealed no significant difference from gender usage of protective hearingdevice which is as a result ofinequality in the determinant that 99% of the population were male.This findingcorroborates with the study by Troung, Siriwong and Robson (2009) and Taha,(2000) who also found the same results.This finding is also in line with Tak, Davis and Calvert (2009), Daniel, et.al (2006), Ologe (2006) that reported in their study that factors such as gender were not associated with HPD use. Contrary to this finding, Gilles and Paul (2014), Sherman and Azulay (2013), Boateng and Amedofu (2004) demonstrated that women are less protected and more vulnerable with increased risk of NIHL, compare with men. They concluded that more frequent use of hearing protection by men may be related to the job tasks and industries most frequently performed by men in which high noise exposure levels are common such as sawmills.

Relationship between attitude and hearing protective devices among sawmill workers: -The results in table 4.6 showed that there is significant relationship between attitude and usage of hearing protective among saw millers. Therefore, the null hypothesis was rejected in favour of alternative hypothesis and the researcher concludes that there is significant relationship between attitude and usage of hearing protective among saw millers. The possible reason for the significant relationship that exists between attitudes of sawmills and the use of HPDs could bethat attitude to noise among sawmills emanated from a background that noise is one of those things that nobody can avoid when carrying out day-to-day activities.However,sawmill workers may know the implication and right usage but lack the desire to use hearing protective devices which explains McCullagh,

Ronis and Lusk (2010) findings that the characteristics of the sawmill workers like personality, past experience, values habits needs may influence their perception of hearing protective devices. This is supported by Theory of Planned Behaviour which states that an individual's intention to carry out behaviour is dependent on his or her attitude such as perception of one's ability to perform behaviour (Ajzen, 1991).

In line with this study, Comlman, Ezinah Nambo and Obiang (2007) reported that people's awareness about noise exposure and its effects could help in developing adequate disposition of HPDs. This implies that attitude is an important factor for understanding and influencing HPDs among saw millers as a preventive behaviour relation to hearing risks.

This finding lends credence to the findings of Braham, Finch and Mc.crory (2004) whose study observed a favourable attitude to the use of hearing protective device by respondents. This finding is also in line with Truong, Siriwong, and Robson (2009) who stated that attitude towards the use of HPDs in the sawmill industry was not encouraging. He concluded that sawmill workers should be fully involved in programmesthat can raise their awareness on health challenges and improve their attitude and practices towards HPDs. This finding also agrees with Reed, Browning, Westneat and Kidd (2006) which stated that sawmill workers may be competent but may lack the desire to use HPDs which also explains McCullagh, Ronis and Lusk (2010) findings that the characteristics of the sawmill workers like personality, past experience, values, habits and needs influence their perceptual process of the hearing protective devices.

Relationship between level of education and hearing protective devices usage among sawmill workers:-The results in table 4.7 revealed that there is no significant relationship between educational qualification and usage of hearing protective among saw millers. Therefore, the null hypothesis was accepted and the researcher concludes that there is no significant relationship between educational qualification and usage of hearing protective among saw millers.This implies that education has no influence on the use of hearing protective devices. Even though those with good education do not see any reason for using HPDs, that is to say education has no regard for use of HPDs in sawmill industries.

In this study, the level of education did not have an impact on the knowledge about HPDs among sawmill workers in Southwestern Nigeria.The reason for this is thatthe respondents had low levels of formal education; they acquired their expertise through

substantial years of work experience as revealed in this study.This result is consistent with the outcome of the study by Ochire-Boadu, Kusi and Lawer (2014) which found that even among well-educated workers who are aware of the hazards and the associated health impacts; the use of personal hearing protective devices was not popular in all situations where the law would require it. The finding was also congruent with the results of the study conducted by Taha (2000), even though the level of education was not considered. There is no influence of being educated or not being educated and the usage of HPDs.However, the finding contradicted the study carried out by Roberts, Kuncel and Shiner (2007) that pointed out that inadequate education of workers in manufacturing industries may be an important contributor to the non-use of HPDs.

In addition, this finding did not correspond with the results found by Ziauddin, Swathi, Maruthi and LakshmanRao, (2006) which demonstrated a high level of relationship between educational attainment and the use of HPDs.Individuals with lower levels of educational attainment are at greater risk of exposure to industrial noise such as NIHL and may be less likely to have buffers that reduce the impact of industrial noise-induced hearing loss. Lack of education of participants adversely affected the efficiency of the workers as most workers could not read health and safety notices, posters and signals to avert dangers of the workplace.

Relationship between length of service and hearing protective devices usage among sawmill workers: - The results from Table 4.8 showed that there is no significant relationship between length of service and usage of hearing protective among saw millers. Therefore, the null hypothesis is accepted and the researcher concludes that there is no significant relationship between length of service and usage of hearing protective among saw millers. The results revealed that the workers in the sawmill industries lack prior knowledge about how to use the hearing protective devices and would have negative influence on the acceptance of these devices. The finding of this study isconsistent with the results of previous studies, such as a study carried out in Sistan Baluchestan Province of Iran. It was shown that majority of sawmill workers did not use HPDand their main reasons for not using HPDs were inconvenience during use, disability in hearing conversation, sweating and itching of ears and inadequate training.(Sharabi, Reshef-Haran, Burstein and Eldad, 2002). Contrary to this finding, Gerend and Cullen (2008) found that duration of jobmoderately associated with the use of hearing protectors. In the

same vein, the study by Kock (2013) also reported that duration of job was moderately significant showing 12% decrease in interest in using hearing protective devices.

Relationship between peer influence and hearing protective devices usage among sawmill workers: -The results in table 4.9 showed that there was significant relationship between peer influence and usage of hearing protective among saw millers. Therefore, the null hypothesis was rejected in favour of alternative hypothesis and the researcher concludes that there was significant relationship between peer influence and usage of hearing protective among saw millers. The relationship between peer influence and sawmill workers' usage of hearing protective devices revealed by this study corroborated Steinberg and Silverberg (1986) who found that as young people grow; they surrender to the influences of their peers as they shed off their parental orientation and replace it with dependence on their peers. The implication is that friends may encourage their peers to engage in undesirable acts like exposure of ears to high noise of various sources without the use of hearing protective devices. In the same vein, Kimberly (2002) reported that social interaction with peers is a key determinant of the hearing protection usage among adults.This indicated that peer influence enablespeople touse hearing protective devices in their workplace through discussion. This finding is in line with Kimberly (2002) that pointed out that if friends do not engage in activities like using hearing protective devices in the workplace with high noise, friends working in similar environment may also be encouraged from not using it.The finding also corroborates Chalder, Elgari and Bennett (2005) reported that peer group influence is a key determinant in causing non-compliance to the use of hearing protection among industrial workers and this influence could be enhanced by using hearing protection behaviours of the individuals in peer groups themselves. This finding was also consistent with Steinberg and Silverberg (1986) that reported social interaction with peers is a key determinant that results into hearing protection usage among adults. The finding is also in consonance with Bies and Hansen (2003) that pointed out that what the group sanctions, individuals will approve, what it condemns, individuals will discard. Friends may encourage their peers to engage in undesirable acts like exposure of ears to high noise of various sources.

Furthermore, the finding corroborates the studies of Kerr, Lusk, and Ronis (2002), Mc-Cullagh, Lusk, and Ronis (2002) and Tonchumporn (2007) affirmed that the peer influence level also influences workers' use of hearing protection. Of particular note, some indicated that supervisor and coworkers' use of hearing protection is particularly

important to their decision to use HPDs themselves. Seeing coworkers or supervisors using HPDs influences them to wear hearing protection, and it facilitates other hearing protective behaviour. It can be concluded that these individuals (coworkers and supervisors) can role model hearing protection. Additionally, some participants believed that supervisors or those in charge of workers can influence workers' use of hearing protection in other ways (both positive and negative). For example, they can support the workers' use of HPDs by encouraging, praising, or advising workers.

Relationship between lengths of exposure to industrial noise and hearing protective devices among sawmill workers: - The results in table 4.10showed that there is no significant relationship between length of exposure to noise and usage of hearing protective among saw millers. Therefore, the null hypothesis was accepted and the researcher concludes that there is no significant relationship between lengths of exposure to noise and usage of hearing protective among saw millers.The length of exposure to noise in the working environment was shown to be not significant in the study thereby indicating the influence of the other variables on the use of HPDs. The study revealed that the workers that participated on this research lack prior knowledge about how to use HPDs, and this aspect would have negative influence on the acceptance of these devices by employees in the period prior to the beginning of this investigation. The finding was congruent with the finding of Booth (2009) which pointed out that HPDs if appropriately provided and properly used, they reduce the amount of sound energy absorbed by the individual.The finding was also consistent with Boateng and Amedofu (2004) that found little or no relationship between length of exposure to noise and the use of HPDs. He concluded that in the absence of noise, production tends to be low. Hence, noise was seen as being a core part of being productive. In other words, worksite noise may lead to high production.

4.3 Summary of findings

The findings of the study are summarized below:

1. The study revealed that joint prediction of all the eight independent variables (lifestyle, age, and gender, attitude to hearing protection, level of education, length of service, peer influence, length of industrial noise exposure) to the dependent variable (hearing protective devices usage).

2. The study revealed that attitude mostly contributed to the hearing protective devices usage among sawmill workers than other independent variables.
3. Hypothesis one was rejected because there was significant relationship between lifestyle and the use of hearing protective devices.
4. It was also found that there was no significant relationship between ages of sawmills and the use of hearing protective devices.
5. Hypothesis three was also accepted because there was no significant relationship between gender and the usage of hearing protection among saw millers.
6. The findings further revealed that there was significant relationship between attitudes of sawmill workers and the use of hearing protective devices.
7. Hypothesis five was accepted because there was no significant relationship between educational qualifications and hearing protective devices usage among sawmill workers.
8. It was also found that there was no significant relationship between length of service of sawmills and the use of hearing protective devices.
9. The study also showed that there was significant relationship between peer influences of sawmills and the use of hearing protective devices.
10. The eighth null hypothesis was accepted based on the fact that there was no statistical significant relationship between length of industrial noise exposure of the saw millers and the use of hearing protective devices

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This study extensively investigated the personal, dispositional and contextual factors as determinants of hearing protective devices usage among sawmill workers in Southwestern Nigeria. The related literatures on personal, dispositional and contextual factors as well as hearing protective devices were reviewed conceptually, theoretically and empirically.

In carrying out this research work, a descriptive survey research design of correlational type was adopted. Stratified random sampling and purposive sampling procedures were used to select participants that were highly exposed to noise. Also four instruments were used to gather informationfrom five hundred and fifty four (554) participants by the researcher with the help of the research assistants. The results were analysed with the use of Pearon's Product Moment Correlation and Multiple Regression Analysis.

The independent variables made a joint contribution effect of 20.7% and ANOVA results from the regression analysis shows that there was significant effect of the independent variables on the dependent variable. Also, in order of magnitude, attitude to hearing protection devices made the highest relative contribution to determining hearing protective devices usage among sawmill workers followed by length of service, peer influence and lifestyle. Age and gender made the least contribution.This study also revealed that attitude mostly contributed to the hearing protective devices usage among sawmill workers.

It was also found that lifestyle, attitude and peer influence have significant relationships with hearing protective devices usage among sawmill workers. However, age, level of education, length of service and period of exposure to industrial noise were not significantly correlated with hearing protective devices usage among sawmill workers.

5.2 Conclusion

The study investigated personal, dispositional and contextual factors as the determinants of hearing protective devices usage among sawmill workers in Southwestern Nigeria.The study established that the independent variables (lifestyle, age and gender; attitude to hearing protection;level of education, length of service, peer influenceand industrial noise exposure) relatively contributed to hearing protection usage in Southwestern Nigeria. Hence, the reduction of industrial noise exposure and the use of HPDs is the ultimate goal in assessing attitude to hearing protection usage among sawmill workers. Attitude to hearing protection plays a critical role for sawmill workers as a main predictor for HPD use. The sawmill workers lack adequate knowledge of health implication of the hazardous nature of the work they do, hence, they handle safety with levity. Sawmill workers also believe that they cannot be involved in NIHL. This makes them not to use hearing protection.

5.3 Implication of the study

The study has established that lifestyle, age, and gender, attitude to hearing protection, level of education, length of service, peer influence and industrial noise exposure are significantly related to HPDs usage among sawmill workers in Southwestern Nigeria. The study therefore has several implications for government and private employers of labour, audiologists, occupational therapists, social workers, environmental and public health workers, organizations and occupational law enforcement agencies.

The study has established the need to create awareness by occupational health providers such as audiologists, social workers and public health workers on the dangers inherent in exposing ears to excessive noise and provide adequate information, orientation and training on the use of hearing protective devices in sawmill industries.

The study confirmed that sawmill workers who expose their ears to sound above 85dB are prone to noise-induced hearing loss and that hearing loss may be permanent throughout lifetime.

It also established the need for Environmental Protection Agencies to wake up to their responsibility by making efforts at implementing policies guiding the prevention of noise exposure.

There is dire need for government to employing more health professional providers and ensure that such are well renumerated and motivated so as to have adequate and proper care of those concerned.

5.4 Limitations of the study

The sample size utilized in this study is not sufficiently large; increasing such would improve the representative of these findings. Sawmill industries were only used in this study to determine the usage of hearing protective devices in areas with high noise, other occupations with excessive sound generation were not included, thus similar study should be carried out on other industries that generate high sound. This limitation could easily be remedied in future surveys by extending the range of industries studied.

Another limitation of this study was related to thesawmill industries used as majority of which were initially rather reluctant to participate in the study.Also, the researcher encountered uncooperative attitudes of some sawmill workers because of the level of their literacy and fear of victimization from their employers.

5.5 Contribution to Knowledge

This study has made significant contribution to knowledge in the following ways:

Lifestyle, age and gender, attitude to hearing protection, level of education, length of service, peer influence and industrial noise exposure strongly predicted Hearing Protective Devices usage among Sawmill workers in Southwestern Nigeria.

The study further revealed that attitude to hearing protection was the most potent predictor to HPDs usage among sawmill workers.Attitude is the most potent factor that can influence the decision of man in life. In other words, attitude is paramount in determining life event of man.

The study is also an addition to the existing literature on the factors that determine the use of hearing protective devices among sawmill workers.

5.6 Suggestions for Further Research

This study provides a robust standing for further research. Therefore, it is suggested that further researches and studies in the area of factors influencing the use of

HPDs in sawmill industries in Nigeria should be conducted and replicated inorder to gather more facts and information on the use of hearing protective devices.

5.7 Recommendations

People that work in sawmill industries should be educated, trained and motivated to practice the use of HPDs when the need arises and dispute misconceptions and any form of irrational beliefs about the use of HPDs in their workplace should be dismissed.

The researcher also recommends that there should be synergy between various stakeholders such as occupational therapists, audiologists, social workers, employers of labour and public health workers in the areas of advocacy and public enlightenment to showcase the importance and benefit of using HPDs in sawmill industries in Nigeria.

The managements of sawmill industries in conjunction with Health worker should be willing to be involved in the health and safety programme of sawmill workers in order to give support where necessary. In view of this, seminars, workshops and outreaches should be organized for the employers and employees so as to enable them acquire adequate knowledge about hearing protection and its usefulness.

Government should be willing and interested in sponsoring intervention programmes aimed at fostering healthy work related behaviours among sawmill workers.

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Appendix A

DEPARTMENT OF SPECIAL EDUCATION,
UNIVERSITY OF IBADAN, IBADAN, NIGERIA

Dear Respondent,

This questionnaire is designed to elicit information from you. Please indicate your opinion with utmost sincerity by ticking (√) the appropriate response. The information shall only be used for research purposes. You can be assured that your response will be treated with utmost confidentiality.

Thanks for your co-operation.

SECTION A: Demographic Information

i. Sex: Male ( ) Female ( )

ii. Marital Status: Single ( ) Married ( )

iii. Age: 18-25 yrs ( ) 26-35yrs ( ) 36-45yrs ( ) 46-55yrs ( ) 56-65yrs ( )

iv. Educational Qualification: Primary School Cert. ( ) WASC/SSCE ( ) OND ( ) HND ( ) B.Sc/BA ( )

v. Department: Production ( ) Distribution ( )

vi. Position: Junior staff ( ) Senior staff ( )

vii. Length of Service: 5-10yrs ( ) 10-15yrs ( ) 16-20yrs ( ) above 20yrs ( )

SECTION B: Peer Influence Questionnaire

Here are some pairs of statements describing Peer Influence, which is when your friends encourages you to do something and not to do something else. For each pair, read both statements and decide whether friends mostly encourage you to do the one on the RIGHT or one on the LEFT. Then, circle one of the boxes on the side towards the

statement you choose, depending on HOW MUCH your friends encourage you to do that ("A lot", "Somewhat"; "Little",). If you think there is no influence from friends to do either statement, mark the middle "No influence" box. Remember: Circle only "ONE" pair of statement.

		A lot	Somewh	Little	No	Little	Somewh	A lot	
How strong is the influence from your Friends									
1.	My friends encourage me to live a healthy life.	3	2	1	0	-1	-2	-3	My friends do not encourage me to live a healthy live.
2.	My friends encourage me to work in the Sawmill Industry.	3	2	1	0	-1	-2	-3	My friends do not encourage me to work in the Sawmill Industry.
3.	Getting advice on the use of HPD from your friends makes your indecisive.	3	2	1	0	-1	-2	-3	Getting advice on the use of HPD from your friends do not make you indecisive.
4.	Wear the same types of hearing protective devices your friends wear.	3	2	1	0	-1	-2	-3	Do not wear the same types of hearing protective devices your friends wear.
5.	Do away from any work with noise as friends required.	-3	-2	-1	0	1	2	3	Do not do away from any work with noise as friends required.
6.	The presence of my friends in my workplace determines the number of	-3	-2	-1	0	1	2	3	The presence of my friends in my workplace does

	days and hours I work.								not determine the number of days and hours I work.
7.	I do not communicate with friends when at work.	3	2	1	0	-1	-2	-3	I communicate with friends when at work.
8.	Communicating with friends at work reduce my level of output.	3	2	1	0	-1	-2	-3	Communicating with friends at work does not reduce my level of output.
9.	Seek the opinion of the supervisor on the use of HPDS	3	2	1	0	-1	-2	-3	Refute the opinion of the supervisor on the use of HPDS.
10.	My friends insist that I should continue with the job even if HPD is not provided.	3	2	1	0	-1	-2	-3	My friends insist that I should discontinue with the job even if HPD is not provided.
11.	My friends approve that noise is part of the job, use of HPD is necessary.	3	2	1	0	-1	-2	-3	My friends approve that thought, noise is part of the job use of HPD is not necessary.
12.	My friends affirmed that use of HPD makes work slow.	3	2	1	0	-1	-2	-3	My friends affirmed that use of HPD does not makes work slow.
13.	I do enjoy conversation with friends with HPD on.	3	2	1	0	-1	-2	-3	I do not enjoy conversation with friends with HPD on.

14.	Co-workers advise you to wear hearing protector at all times when at work.	-3	-2	-1	0	1	2	3	Co-workers do not advise you to wear hearing protector at all times when at work.
15.	I get the approval of job to be done in the Sawmill from friends.	3	2	1	0	-1	-2	-3	I do not need the approval of job to be done in the Sawmill from friends.
16.	I can leave the job if my friends asked me to.	3	2	1	0	-1	-2	-3	I cannot leave the job even if my friends asked me to.
17.	I do like to work if my friends are not around me.	-3	-2	-1	0	1	2	3	I do not like to work when my friends are not around me.
18.	Can use HPD without approval from friends	3	2	1	0	-1	-2	-3	Cannot use HPD without approval from friends.
19.	Discuss the use of HPD with my friends.	3	2	1	0	-1	-2	-3	Do not discuss the use of HPD with friends.
20.	Wear the same type of hearing protective devices your friends wear.	3	2	1	0	-1	-2	-3	Do not wear the same type of hearing protective devices your friends wear.
21.	Work in area your friend thinks is good.	3	2	1	0	-1	-2	-3	Work not in area your friend thinks is good.

22.	Do things to impress only your friends in your workplace.	-3	-2	-1	0	1	2	3	Do things not only to impress your friends in your workplace.

SECTION C: Attitude of Sawmill workers towards HPDs.

Please tick ( ) the correct option to which you agree with each statement below:

1 = Strongly Disagree; 2= Disagree, 3 = Neither agree nor disagree;4 = Agree;5 = Strongly Agree

S/N	ITEMS	SD	D	U	A	SA
1	HPDs is very important for workers working in high noise zones, so I can use it.					
2	Use of HPDs is irrelevant and disturbing to workers like me.					
3	HPD is a waste of money.					
4	HPD is meant for workers working in the firms and industries.					
5	HPD is highly expensive and so I may not want to use it.					
6	I may not want to use HPDs because I do not have problem with my hearing.					
7	Using HPD does not prevent me from having hearing loss.					
8	I think I should not be forced to use HPDs.					
9	Even if my boss made compulsory the use of HPDs in my workplace, I have a way of avoiding it.					
10	HPD is not common in Nigeria because we do not value it.					

SECTION D: Life style Questionnaire

Please tick ( ) the correct option to which you agree with each statement below:
1 = Strongly Disagree; 2= Disagree, 3 = Neither agree nor disagree;4 = Agree;5 = Strongly Agree

S/N	ITEMS	SD	D	U	A	SA
1	I don't care about the volume of the noise in my workplace.					
2	I put on my earpiece all the time, no minding the danger it will cause to my ear.					
3	I believe that loud noise cannot be injurious to my hearing.					
4	On the average, I drink more than 9 units of alcohol a day.					
5	On the average I am a carefree person.					
6	I don't see anything wrong in smoking.					
7	I am not aware of any centre for the treatment of hearing loss.					
8	I like to experiment any habit even if it injurious to my health.					
9	Most times, I don't wear the HPD provided by my employer.					
10	I enjoy noise only when it is very loud.					
11	I can cope with life even if I lose my hearing.					
12	I have not gone for ear test in the past 10 years.					

13	There is no need to consult specialist whenever I have ear ache.					
14	I always use sharp objects to remove dirt's from my ear.					
15	I use drugs that are not prescribed to me at will.					

SECTION E: Hearing Protection Assessment Questionnaire

Please respond to the following items as they apply to you.

S/N	ITEMS	SD	D	U	A	SA
1	Wearing personal protective devices is not always available to me.					
2	Wearing personal protective devices is uncomfortable					
3	Personal protective device interferes with my ability to do my job.					
4	Personal protective device is not always available to me.					
5	My co-workers would make fun of me for wearing personal protective device.					
6	My supervisor seldom wears personal protective devices when required.					
7	My supervisor is aware of my compliance with personal protective device guidelines.					
8	I would need to develop a new habit for wearing personal protective device and this is difficult.					
9.	Wearing personal hearing protective devices will prevent future hearing problem for me.					
10.	Personal protective devices prevent					

	exposure to the noise hazard I am around on the job.					
11.	I don't worry about getting an occupational hearing loss when I use personal protective devices.					
12.	I benefit by wearing personal protective devices.					
13.	My supervisor gets the example on wearing personal protective devices when exposed to noise hazards.					
14.	I am confident that I will remember to use personal protective devices when I am exposed to noise hazards at work.					
15.	I am confident that I can obtain the proper personal protective devices when I am exposed to hazards at work.					
16.	I am confident that my job performance will not be adversely impacted by wearing personal protective devices.					
17.	I am confident that the personal protective devices I use when I am exposed to noise hazards at work is the proper devices to protect me.					
18.	I am confident that I will remember to use personal protective devices when I am exposed to noise hazard at work					

Appendix B

Maximum Protection provided by Non-continuous use of Hearing Protection

Percentage used	Maximum Protection in dB
50%	3 dB
60%	4 dB
70%	5 dB
80%	7 dB
90%	10 dB
95%	13 dB
99%	20 dB
99.9%	30 dB

Source: Canadian Centre for Occupational Health and Safety (2012)

OSHA (2007) requires that employees be offered a variety of hearing protection devices and that these devices must be used all the time to get full benefit.

Appendix C

1 Earplugs

Earplugs are small inserts that fit into the outer ear canal. To be effective, they must totally block the ear canal with an airtight seal. They are avsilable in variety of shapes and sizes to fit individual ear canals and can be custom made.

2 Earmuffs

Earmuffs fit over the entire outer ear to form an air seal so the entire circumference of the ear canal is blocked, and theyare held in place by an adjustable band

Appendix D

Logs of wood in one of the sawmills used for the study

Appendix E

Logs of wood already transformed into planks in one of the sawmills