CHAPTER ONE: INTRODUCTION

This study focused on examining the level of awareness and knowledge traders in Onitsha and Ogbete Main Markets have as regards to the health risks associated with exposure to noise pollution and concomitant actions by these traders in order to protect themselves. It also investigated the scope of campaign initiatives on the health risks associated with exposure to noise pollution in these markets.

1.1. Background of the Study

Noise pollution is an environmental issue that is rapidly increasing in most parts of the world and it is capable of challenging environmental sustainability. Although noise is not new to the human environment, it is however becoming more problematic (Hogan, 2012). American Industrial Hygiene Association (2015) observed that humans are now surrounded by noise. This means that we practically live with noise. Mead (2007) noted that as people are surrounded by noise, with time they tend to get accustomed to it as normal part of life. As people get used to noise, it appears as if exposure to noise does not have negative effects on people. However, getting habituated to noise does not stop the adverse physiological damage and health impairments from occurring. The scholar observed that the implications of increasing noise pollution for future generations will be more challenging and also emphasised the need to check the situation now. Goines and Hagler (2007) remarked that noise pollution is a major public health issue as the people at risk and the causes of noise that people are exposed to keep increasing. The increase, they argued, is due to increase in population size, urbanization, and increase in the use of different gadgets that produce noise. The above authors also noted that environmental noise pollution jeopardises the health and well-being of people. Noise has the capacity to impair health, and reduce the quality of residential, social, working and learning environments. According to the scholars cited above, noise also disturbs sleep, concentration, communication and recreation.

Similarly, the World Health Organization (2015) observed that noise is a major nuisance in the environment that is being underestimated. Most people do not understand that it is a threat that can cause many short-and-long-term health problems. The health impacts of environmental noise on human health identified by WHO include: cardiovascular diseases, cognitive impairment,

sleep disturbance, tinnitus and annoyance. Exposure to noise is linked with so many other health issues including increase in blood pressure, increase in blood viscosity as well as increase in levels of blood lipids. Noise pollution can also increase the development of mental disorders. Other health impacts of exposure to noise pollution include: anxiety, stress, nervousness, nausea, headaches, emotional instability, sexual impotence, mood changes, neurosis, hysteria and psychosis (Goines & Hagler, 2007). Noise pollution can also lead to stress-related illness, high blood pressure, speech interference, hearing loss, sleep disruption and loss of productivity. Lower resistance to disease and infection, circulatory problems, ulcers, asthma, headaches, gastrointestinal disorders are also among the many physiological and psychological problems linked to noise pollution.

Noise-induced hearing loss is the most commonly known and discussed health challenge resulting from noise pollution. Goines, and Hagler (cited above) stated that exposure to occupational noise is one of the major causes of hearing loss. They noted that hearing is very important for human health and safety. This implies that hearing impairment is a major health challenge. World Health Organization Fact Sheet (2015) indicated that about fifteen per cent (15%) of adults in the world experience some degree of hearing loss while about five per cent (5%) of global population are suffering from disabling hearing loss. This means that about three hundred and sixty (360) million people in the world are suffering from disabling hearing loss. WHO added that one third of the people over sixty-five (65) years of age, suffer from disabling hearing loss. This implies that hearing loss is an issue that requires urgent attention.

WHO Fact Sheet (cited above), observed that cases of hearing-loss are prevalent in South Asia, Asia Pacific and Sub-Saharan Africa. It added that majority of people suffering from disabling hearing loss are residing in low-and-middle income countries. This implies that Nigeria needs to take the issue of noise-induced hearing loss very seriously. Hearing loss can affect only one of the ears; it can also affect both ears. American Academy of Otolaryngology (2014), reported that approximately 28 million Americans have lost some or all of their hearing. In 2017, it was reported that about 36 million adults and about 48 million people of all ages in America are experiencing hearing loss. Furthermore, twenty per cent (20 %) of people in their twenties experience hearing loss in America (EarQ, 2017). Hearing loss affects the ability to understand normal speech. In other words, hearing loss negatively impacts an individual's ability to communicate. It can lead to communication disorder as one who has difficulty understanding

normal speech will find it difficult communicating effectively. When noise gets too loud, it begins to kill hair-cells in the inner ear which makes hearing possible. With prolonged exposure to loud noise, more hair cells are destroyed leading to decrease in hearing. American Industrial Hygiene Association (2015) warned that once the hair-cells are destroyed, the damage is permanent without any possibility of reversal. The only thing that could be done is to protect the hearing that remains by avoiding further exposure to noise. Centre for Disease Control and Prevention (CDC, 2013) affirmed that noise-induced hearing loss cannot be medically or surgically corrected.

March 3, is observed as World Hearing Day in most countries of the world annually. The day was set aside by the World Health Organization to draw attention to the economic impact of hearing loss. The theme of the 2017 World Hearing Day was 'Action for Hearing Loss: make a sound investment'. According to the WHO, hearing loss is costly to the global economy. It estimated that the global economy loses about seven hundred and fifty ($750) billion dollars annually to unaddressed hearing loss (WHO, 2017).

The College of Health at the University of Utah (2015) emphasised that communication is an essential characteristic of humans and that communication is very essential for learning, working and interacting with others. Consequently, impairment in communication (communication disorder) can affect all aspects of an individual's life negatively. Hearing loss has been identified as the third most common physical condition reported in the United States (EarQ, 2017). It should therefore be given adequate attention.

In most nations including Nigeria, noise pollution has not received as much attention as other types of environmental pollution like air pollution and water pollution. Noise in Nigerian cities is becoming very alarming. People now practically live with excess noise. Most people conduct their daily activities in noisy environment. The roads are very noisy, markets, schools, public motor parks and recreational facilities are all excessively noisy during the day. Religious worship places and activities are now characterized by very loud sounds, shouting, and drumming. Most of these noisy religious places and activities are situated within residential areas and are mostly conducted in the evenings / nights when residents are supposed to be resting. Loud speakers are usually mounted outside the religious places contributing to noise in the environment. In some cases, many of such religious worship places are engaged in noise producing activities at the

same time in the same neighborhood. Noise is indeed part of us. It is becoming almost unavoidable in most cases.

There are so many research evidences confirming that the level of noise in Nigerian cities is growing at an alarming and dangerous level. Studies and reports confirming that the level of noise in Nigerian cities is far higher than the levels suitable for human health and wellbeing include: Onwumere (2015); Environment Today (2015); Adejobi (2012); Anomahanran (2013); Olayinka (2013). Interestingly, The Union (2014) observed that Nigeria is probably the noise capital of the world. This remark is based on the report of the United Nations which indicated that Nigeria is not only the largest country in Africa, but also Africa's noisiest and loudest country. Several scholars who measured the level of noise in several cities in Nigeria also reported that in all cities studied, the level of noise in areas used for commercial activities are significantly higher than the level of noise recorded in other locations. In addition to the scholars cited above who measured the level of noise in some cities in Nigeria and who found that areas used for commercial activities record higher level of noise are these scholars: Alkasim and Abubakar-Sadiq (2010) as well as Aremu, Aremu, and Olukanni, (2015).

Nwobi-Okoye *et al*. (2015), as well as Madu, Uyaelumuo and Orji (2018) measured the level of noise in the city of Onitsha. Both studies reported that the level of noise in the city is higher than the recommended safe level. The researcher could not find studies that measured the level of noise in the city of Enugu. However, based on the findings by the scholars identified above, the researcher believes that studies relating to the awareness and knowledge of health risks associated with exposure to noise pollution should focus more on people who spend many hours of their daily lives in very busy markets that experience the most concentration of commercial activities. The researcher decided to conduct a study in two major markets located in the South East of Nigeria. These markets are Onitsha Main Market located in Onitsha North Local Government Area of Anambra State, Nigeria and Ogbete Main Market located in Enugu North Local Government Area of Enugu State, Nigeria. These markets like most large markets in Nigeria are usually characterised by very high occupational noise. Most traders spend about eight to ten hours daily in such environment that is characterised by very high noise.

Onitsha is a popular commercial city in Nigeria. It is home to the popular Onitsha Main Market which is one of the largest markets in West Africa. Some also say it is the largest market, not

only in Africa but in the world (Adimike, 2011); Jannah (2014); Eze (2014). Traders visit the market from different countries of Africa and beyond to buy and / or sell different wares and services. A visit to the market confirms that the market is usually charged with commercial and other related activities producing noise at high levels. Sounds from different sizes of power generating sets, loudspeakers and megaphones announcing different things at the same time compound the noise generated by thousands of human voices talking at the top of their voice to call attention of potential customers or to clear the way for load carriers and barrow pushers. Various organized groups of beggars singing with different musical instruments contribute to increase noise pollution in the market. Many market evangelists can be heard preaching with public address systems at very high volumes all at the same time as people are conducting their business activities. The roads leading to the market experience heavy vehicular and human traffic with the attendant noise generated. This market, being the largest market in Nigeria, is therefore considered as the most relevant area to conduct studies relating to traders' awareness and knowledge of health risks associated with exposure to noise pollution. A similar situation as found in Onitsha Main Market is also experienced in Ogbete Main Market in Enugu. These two markets form the area for this study.

1.2 Statement of the Research Problem

Noise is now getting more omnipresent, yet it is the most unnoticed form of pollution. It kills subtly and slowly. Human beings, animals, and non-living things like buildings, bridges are all victims of increasing noise in the environment. If definite steps are not taken to reduce noise in the environment, more people will be adversely affected (Adejobi, 2012). Aside from the many health implications, exposure to noise pollution can also lead to negative economic impacts, as people with hearing loss are less likely to get quality employment especially in developing countries (WHO, 2015). Of course when people are down with hearing-loss and other serious health challenges as a result of exposure to noise pollution, their contribution to the economy of their families and the nation suffers greatly also.

Against the backdrop of the health risks of exposure to noise pollution, there appears to be insufficient awareness in this direction among the general public and traders in particular. People continue to appear comfortable and relaxed in noisy environment without any protection. It seems also that there is a gap in communication interventions geared towards public

enlightenment on the dangers of exposure to noise pollution and on what members of the public can do to protect themselves. Looking at Onitsha Main Market and Ogbete Main Market, the question is: are the traders aware of the health risks to which they are constantly exposed? One wonders if they are aware of protective measures they can adopt to reduce the negative impacts of exposure to noise pollution and if there have been efforts made in terms of campaign initiatives to raise awareness among the traders and the general public on the dangers of exposure to noise-pollution. If the traders are sufficiently aware of the dangers of exposure to noise pollution and the measures to adopt to stay safe, do they actually do the needful to protect their hearing and health? These issues form the specific problems that this research work sought to address.

1.3 Objectives of the Study

The key objective of this study was to examine the scope of Onitsha and Ogbete Main Markets traders' awareness on the dangers of exposure to noise pollution as well as the scope of communication interventions aimed at creating such awareness. Specific objectives of the study were:

1. To examine Onitsha and Ogbete Main Markets traders' awareness of the health implications of exposure to noise pollution.
2. To determine how knowledgeable Onitsha and Ogbete Main Markets traders are of the protective measures that could help reduce health risks of exposure to noise pollution.
3. To ascertain the practice of traders in Onitsha and Ogbete Main Markets as it relates to adopting necessary protective measures to reduce dangers of exposure to noise pollution.
4. To examine the scope of communication interventions aimed at creating awareness on the dangers of exposure to noise pollution in Onitsha and Ogbete Main Markets, as well as in Anambra State in general.

1.4 Research Questions:

In line with the research objectives, the following research questions were raised:

1. To what extent are traders in Onitsha and Ogbete Main Markets aware of the health implications of exposure to noise pollution?

2. How knowledgeable are traders in Onitsha and Ogbete Main Markets of protective measures to reduce health risks of exposure to noise pollution?
3. What is the practice of traders in Onitsha and Ogbete Main Markets as it relates to adopting necessary protective measures to reduce dangers of noise pollution?
4. To what extent is communication intervention directed towards creating awareness on the danger of exposure to noise pollution to human health in Onitsha and Ogbete Main Markets as well as in Anambra State in general?

1.5 Significance of the Study

This study is significant in different ways. One, it has been established that exposure to noise pollution can be dangerous to human communication and general health / well-being (Goines & Hagler, 2007); (WHO, 2015). As a health-communication study, this study could contribute to safeguarding the health and well-being of Nigerians if it succeeds in raising awareness on the need to urgently take the issue of noise pollution seriously. Two, WHO (2015) says that 15 % of adults in the world are already victims and that one third of the people over sixty -five years of age are victims of disabling hearing loss. The findings from this study could be essential in assessing and / or influencing policies, campaigns and other measures towards protecting people from the dangers of further exposure to noise pollution. It may contribute towards awakening consciousness of all concerned towards control of exposure to noise, not only in markets but in all places. Specifically, one of the findings from this study is that there is no report of any significant campaign directed towards creating awareness on protective measures against exposure to noise pollution in Onitsha and Ogbete Main Markets and Anambra State in general. Governmental and non-governmental agencies that have shown interest in other environmental and health issues can start thinking in the direction of noise pollution in Onitsha and Ogbete Main Markets and other markets. Academically, the study could also add to existing knowledge in the area of health communication, especially as it relates to awareness of the dangers of exposure to noise pollution in Nigeria. The study found that people may be aware that exposure to certain things like noise could be harmful to human health, but most people may not know that they can be protected. This supports the idea that campaigns should not only focus on creating awareness about health issues, but should be designed to focus more on what people can do to protect themselves. Theoretically, this study was helpful in verifying if the key idea of the

Health Belief Model is obtainable and applicable on the issue of peoples' reaction to noise pollution in Nigeria. The model upholds that one's behaviour can be predicted based on how vulnerable the person considers himself to be. If one believes that he is susceptible to a particular risk and considers the consequences as serious, he is most likely to avoid the risky behaviour (Corcoran, 2007). Most traders do not protect themselves from exposure to noise because they think that they are not susceptible. They think that it is not their portion from God, though it may be the portion of others. Campaigns should therefore focus on making all to see themselves as susceptible to the harmful effects of exposure to noise.

1.6 Scope of the Study

Noise pollution and its consequences are very broad issues. One study cannot address all aspects of noise pollution. This research work could have focused on recreational noise or noise generated from religious activities but it was delimited to focus on occupational noise. There are many occupations which expose people to noise; however, the study deliberately focused only on noise pollution in markets. The study was further delimited to Onitsha and Ogbete Main Markets. This decision was made because available literature confirms that Onitsha Main Market is the largest market in Nigeria and in West Africa (Adimike, 2011); Jannah (2014); Eze (2014). The researcher decided to extend the study to involve traders in Ogbete Main Market in Enugu to provide a balance to the study in case there are peculiar circumstances that may influence the experience and response of traders in Onitsha Main Market in ways different from the experience and response of traders in Ogbete Main Market located arguably in an assumed less noisy city.

1.7 Operational Definition of Terms

The following terms in the context of this work are defined in the sense identified below:

Awareness: This means being sufficiently informed about the possible harmful implications of certain practices or experiences and what can be done to prevent such harm.

Communication disorder: This refers to a disruption of the ability to communicate (hear or speak) properly like other human beings of same characteristics. It is the existence of problem with communicating.

Communication intervention initiatives: This refers to efforts made towards solving a problem through creating awareness, advocacy and spreading of vital information to all concerned.

Decibels (dB): This is the unit of measuring how loud or low sound is.

Disabling hearing loss: This is impairment in hearing that incapacitates the victim's hearing significantly.

Environmental noise: This is the noise that emanates from human activities in a given place.

Hazard: This is a situation that poses risks and danger to people.

Hair cells: These are cells in the inner ear that help to conduct sound for human hearing.

High decibel sound / dangerous decibel: This refers to sound that is loud enough to cause immediate or gradual harm to human hearing.

Hearing loss: This refers to a situation where the ability to hear is reduced either completely or partially.

Markets: This is a physical location or place where people gather to exchange goods and services for money.

Noise-pollution: This refers to distortion of normal state of an environment due to disturbing and loud sounds as a result of human activities.

Occupational noise: This refers to excessive sound that people are exposed to as a result of the work they do or the activities they are engaged in for a living.

Preventive-measures: These are practices and actions which individuals can adopt and implement to prevent exposure to things and experiences that could be harmful to them.

Recreational noise: This refers to noise that people are exposed to while engaging in leisure, pleasure or relaxation activities.

CHAPTER TWO: LITERATURE REVIEW

This chapter focused on review of literature relevant to the study. It essentially reviewed what scholars have written about the subject matters / concepts relating to the work. Theoretical framework on which the study is built is reviewed also. The concepts reviewed include: noise pollution, communication disorder, and high decibel sounds. Other subjects reviewed are: Noise pollution in Nigeria, signs of hearing loss, communication intervention, the media and awareness / attitude change campaigns.

2.1 Review of Concepts

2.1.1 Noise Pollution

Noise pollution is an environmental concern that is beginning to gain the attention of scholars in recent times. Noise is made up of sound that is transported by air (Ijaiya, 2014). Abotutu (2015) noted that all noise is sound and that any sound that is unpleasant to the ear is noise. Similarly, Mohammed (2008) cited in Olayinka (2012) said that noise is different from sound only on the grounds that noise is sound that is causing inconvenience to someone. Luqman *et al*., (2013) agreed with Thompson (1994) that noise can be described as wrong sound, made in the wrong place and or at the wrong time. Singh and Davar (2004) as cited in Awosusi and Akindutire (2014) stated that noise is derived from a Latin word nausea which means unwanted sound or sound that is loud, unpleasant or unexpected. Pollution on its own is derived from the Latin word pollutionem which means to defile or make dirty. This implies that environmental pollution is an undesirable alteration in the characteristics (physical, chemical, biological etc) of the environment which could cause harm to human life and others (Olayinka, 2012).

Noise pollution has been defined as noise that is displeasing or excessive and which may disrupt the activity or balance of human or animal life. It is also described as level of sound that is generally considered likely to annoy, distract or even harm other people in a given environment (Ogunmosunle, 2014). Fadairo (2013) described noise pollution as a form of pollution that can only be heard and not seen, yet, it defiles the air medium reducing convenience for human beings. It has also been described as an act of man or machines which produces sound that disturbs equilibrium of human or animal life in the environment. It is unwanted sound that is pushed into the environment without considering its harmful effects on the environment

(Olayinka, 2012). It is unwanted sound which is harmful and that intrudes upon human activities (Hogan, 2012).

Noise pollution is not a new phenomenon. It has been part of human existence. Most activities of human beings produce noise. This has been the situation from the time human beings began to exist in societies. However, noise being generated by human activities in this generation is rather getting alarming. On its own, noise is not harmful until it becomes unusually loud and uncontrolled (Ijaiya, 2014). Originally, the earth in which human beings have lived for over forty thousand (40,000) years was pure, uncontaminated and very conducive. Efforts of human beings to exploit the natural environment in search of developments lead to alterations, changes and pollution of that original state of the environment. These activities of men lead to various kinds of pollution. Seven key pollutions arising from the activities of human beings on earth have been identified to include: air pollution; water pollution; land pollution; industrial pollution; sewage pollution; noise pollution; and radiation pollution (Olayinka, 2012). Growth in economic, social and population indices lead to increase in noise generation as noise is generated from human activities especially urbanization, transportation and industries (Adejobi, 2012). Of all these pollutions, noise has been given less attention. This may be because most people do not yet know that it could portend more danger than most other pollutions in the environment.

Nunez (1998) predicted that noise is increasing at such a level that will soon make it to become a major threat to the quality of lives experienced by humans. True to that prediction, Ijaiya (2014) observed that noise has become one of the key environmental dangers facing humanity. It is now recognized as a one of the key challenges confronting the world today (Anomahanran, 2013). The level of noise in an environment doubles every ten (10) years in response to increasing social and industrial progress (Olayinka, 2012).

Otukong (2002) as cited in Awosusi and Akindutire (2014) stated that the environment which human beings live in impacts on their survival and healthy existence. A disruption in the environment through noise pollution, for instance, will be expected to affect the health of individuals in such environment. Noise pollution is a major element of environmental pollution. It is no longer seen as only a nuisance in the environment but now as hazardous and a serious threat to the quality of life in urban cities (Anomahanran, 2013). Mead (2007), reported that the problem with noise is that most people become used to noise with time and that the dangerous

effects of noise are so imperceptible at the on-set. However, despite being accustomed to noise, the adverse physiological effects are still occurring, impacting negatively on human health. Confirming that noise pollution is associated with many health conditions, the scholar observed that public health implications of noise pollution for future generations will be huge than it is today.

Awosusi and Akindutire (2014), reported that exposure to excessive noise can have negative impacts on both the physical, mental and social health and behaviour of people. They observed that good sleep is required for maintenance of good health as well as good physiological and mental functioning. People living in noisy environment are most likely to experience sleep disturbances. They are likely to experience difficulty in falling asleep, changes in sleep pattern or depth of sleep and awakenings. Some of them may develop the need to use sleeping pills or ear plugs to enable them sleep. The scholars also established that environmental noise can cause annoyance. They pointed out that in a typical Nigerian environment, the noise generated by neighbours' power generating sets can cause annoyance which may lead to conflicts, unhealthy relationships and aggression in the environment. They cited Kryter (1985), as well as Evans and Lepore (1993) as studies that confirm that exposure to noise can lead to lack of concentration on tasks and lack of effective reading. It may also impact negatively on cognitive function and comprehension. According to the studies, children exposed to constant noise, like those whose homes or schools are close to noisy places like highways and airports have been found to have difficulties with concentrating when compared with children from schools and environments that are less noisy. Similarly, they cited Singh (1984) who reported that those who work in environments that are noisy are prone to circulatory problems, cardiac diseases, hypertension, neuro-sensory and motor impairments. They noted also that noise is a major cause of stress, high blood pressure, headache and accidents. Noise can prevent people from hearing warning signals of an impending danger, thereby making it difficult for them to avoid the accident or escape the danger.

Noise interferes with communication and speech. Abotutu (2015) observed that background noise of forty-five to sixty decibels disturbs speaking slightly. When the background noise is up to sixty decibels, one has to literary shout to be heard. Such interference by noise may affect inter-personal or group conversation. It could also affect listening to radio or television communication. Formal classroom teacher-student communication can also be hampered by

noise. Noise makes communication process more laborious, annoying and frustrating. Noise interferes with speech as it can mask speech, making it inaudible or reducing its intelligibility even when audible (Olayinka, 2012). Contributing further to the literature on negative impacts of noise, Olayinka (cited above) noted that exposure to excessive noise during pregnancy can lead to loss of hearing for the yet to be born babies. It can cause intrauterine growth retardation, disruption to the normal growth and development of infants. Excessive noise can harm a person's nervous system thereby impairing the person's physical and psychological behaviour. It can cause nausea, vomiting, pain, hypertension, high blood pressure, cardiovascular problems, sleep disturbances, restlessness, depression, fatigue, allergy, mental stress and annoyance.

2.1.2 Communication Disorder

Communication disorder is a term used to refer to certain problems affecting people's speech, language, and auditory processing. Communication disorders affect an individual's use of speech, and ability to understand speech and language. It can affect the receptive language skills or expressive language skills of an individual or both. When it affects receptive language skills, it leads to difficulties understanding spoken language. When it affects expressive language skills, it results to difficulties producing speech (Listen and Learn Centre, 2014). Two classes of communication disorder are identified. One is hearing disorder, while the other is speech and language disorder. When people suffer hearing disorder, they will not hear certain sounds clearly. They may hear sounds faintly, or in distorted way. The victim of hearing disorder may need to turn his or her ear towards the source of sound. He or she will frequently ask the speaker to repeat what he or she said often. He or she turns the television or radio up too loud. Three types of hearing disorder are identified. They are conductive, sensorineural and mixed hearing disorders (hearing loss). In conductive hearing loss, sound is not passed well through the outer and or middle ear. This leads to sounds not being clear. Conductive hearing loss can be corrected medically or surgically. Sensorineural hearing loss is as a result of damage in the inner ear or nerve pathways to the brain. This type of hearing loss cannot be corrected medically. Once it occurs, the only help will be using a hearing aid or other amplification devices. Mixed hearing loss is a combination of conductive and sensorineural hearing loss.

It has been noted that communication is an essential aspect of the human social structure, culture and economic organisation of society. It is an integral aspect of the existence of human beings as social animals. It is so indispensable that there will be no human existence without

communication (Okunna and Omenugha, 2012). Communication disorder as a result of hearing impairment can affect other aspects of an individual's life.

Hearing is very important for the well being and safety of individuals. Most cases of hearing loss are as a result of noise, especially occupational noise and recreational noise (Goines & Hagler, 2007). Continuous exposure to excessive noise is the most common cause of hearing loss. Hearing loss can occur due to exposure to noise in work place which is called occupational noise (Mathur & Roland, 2014). Dangerous Decibels (2015), reported that over forty million Americans suffer from hearing loss. Ten million of such cases are said to be attributed to noise-induced hearing loss. Sounds can be harmful when they are too loud, whether exposure to such high sound is for a short time or for a longer time. This is because sounds can destroy sensitive parts of the inner ear and can lead to noise-induced hearing loss (NIDCD, 2014). Exposure to loud sounds can damage microscopic hair cells that send sound signals to the auditory nerve (Dangerous Decibels, cited above). However, intermittent exposure to noise is much less likely to produce permanent injury than continuous noise at the same intensity level (Mathur & Roland, 2002).

Fligor (2015) noted that the negative impact of noise on hearing is often neglected by many people because the harm occurs gradually. However, noise induced hearing loss can also be immediate. It may, in some cases, not be noticeable until after a long while in the future. Noise-induced hearing loss may be either permanent or temporary; it can affect one or both ears. Moreover, there is no age barrier as anyone including children, teens, young adults, and older people could be at risk of noise-induced hearing loss (NIDCD, 2014).

2.1.3. High Decibel Sounds

From the discussions on noise pollution above, it is clear that there is no noise if there is no sound. In most cases, the dangerous sound is high, loud, long, and intensive. Such loud sound is described as dangerous decibel or high decibel sound. High decibel sound refers to sound that is loud to the point that it may jeopardise hearing health. American Hearing Research Foundation (2015) noted that sound is measured in two ways: intensity and pitch. Intensity of sound is measured in decibels (dB). This ranges from the faintest sound that is 0 dB to over 180 dB. Continual exposure to sound higher than 85 decibels can cause gradual hearing loss for most people. When the noise gets louder, the danger it poses gets higher also. Similarly, the longer one

stays in the noisy environment without protection, the more the negative impacts on the persons' hearing. Moreover, the level of the noise determines how long an individual should stay around it. If one is not using any protection for the ear, the allowed exposure time decreases by one-half for each additional 5 dB in the level of noise. If the recommended exposure time is maximum of eight (8) hours per day at ninety decibels (90 dB), recommended maximum exposure time will be limited to four (4) hours per day at ninety-five decibels (95 dB). It will become two (2) hours per day at one hundred decibels (100 dB). It is noted that the highest level of permissible noise is one hundred and fifteen decibels (115 dB) for only fifteen (15) minutes per day. Exposure to noise above one hundred and forty decibels (140) dB without adequate protection is not permitted at all. It is also recommended that those working in environment with up to ninety decibels (90 dB) sound, should reduce the time spent at work or make use of protective devices for their ears.

Anomahanran (2013) noted that the level of sound-pressure which is capable of causing pain to the human ear is known as the threshold of pain. This corresponds to 120 decibels. The weakest sound that can be detected by the human ear is referred to as threshold of hearing. He also noted that a change in sound level of about three decibels is enough to make the change noticeable, while an increase in sound level of ten decibels will be perceived to be as high as double of the actual loudness of the sound. NIDCD (2014) noted that sound less than 75 decibels is not likely to be harmful even when one is exposed to it for a long period of time. Noise must be at or above 85 decibels to be harmful.

American Hearing Research Foundation (2015) asserted that those attending musical concerts are exposed to danger as the level of noise in most concerts usually exceeds one hundred and twenty decibels (120 dB). Musicians playing musical instruments are also at risk as they spend long hours practicing. Listening to loud music using headphone exposes many people to the danger of hearing loss. Other sources of noise and their levels highlighted include: firecracker (180 dB), Gunshot (167 dB), Car stereo (154 dB), Rock concerts (120 dB), movie (94 dB). The foundation also noted that when one thinks he has got used to loud sound, it means that the ear has probably been damaged. American Academy of Otolaryngology (2014), confirmed that people who attend rock concerts are at risk of noise induced hearing loss as sound in most concerts have been found to range from ninety decibels (90 dB) to as high as one hundred and twenty two decibels (122 dB). People at higher risk of hearing loss due to exposure to noise

includes those who work in factories and heavy industries, transportation workers, military personnel, construction workers, miners, farmers, fire-fighters, police officers, musicians, and professionals in the entertainment industry (Fligor, 2015). Some recreational activities that are characterised by loud sounds can expose one to the risk of noise induced hearing loss. These includes: target shooting and hunting, snowmobile riding, listening to MP3 players at high volume through ear buds or headphones, playing in a band, and attending loud concerts (NIDCD, 2014).

Physical quantification of sound is done using units of sound level (SPL). This is calibrated to a constant sound pressure level that does not vary with frequency. On audiograms, intensity of sound is calibrated in hearing level (HL). Pitch is measured in sound vibrations per second, otherwise called Hertz (Hz). The higher the pitch of the sound, the higher the frequency. Frequency is measured in cycles per second. When the pitch is lower, the vibrations per second will be fewer. When the pitch of the sound is higher, the frequency will be higher also. Noise-induced hearing loss occurs at a pitch of about 2000-4000 Hz. A child whose hearing is good can distinguish sounds from about 20 Hz, which is equivalent to the lowest sound on a pipe organ to 20, 0000 Hz. Human sound ranges from 300 to 4000 Hz. At the onset of hearing impairment, the high frequencies are often lost first, making it difficult for people with hearing loss to hear high pitched voices. Sometimes, even when the sound is heard, it may be distorted, making it difficult for one to understand what is said. People with hearing impairment may find it difficult to distinguish between words that sound alike, especially words that contain S, F, SH, CH, H or soft C, sounds. The sound of these consonants is in a much higher frequency range than vowels and other consonants (American Hearing Research Foundation, 2015).

2.1.4. Signs of Hearing Loss and How to Prevent Noise-Induced Hearing Loss

Fligor (2015) suggested that if one has to raise his or her voice to shout above the noise so as to be heard by someone within an arm's length away, such noise could portend serious risk to the person's hearing. She noted some signs that suggest that one may have been exposed to hazardous noise. These are:

- You hear ringing or buzzing (tinnitus) in your ears after exposure to noise.
- You notice that you can hear people talk, but you have difficulty understanding them, after exposure to noise.

- You experience fullness in your ears after leaving noisy area.

Centres for Disease Control (2013), added some further signs and symptoms of hearing loss as follows:

- Muffled or distorted hearing.
- Difficulty hearing sounds such as birds singing, cricket chirping, alarm clocks, watch alarms, telephone or doorbell.
- Difficulty understanding speech during telephone conversations or while participating in group conversations.
- Pain or ringing in the ears after exposure to excessively loud sounds.

Fligo (2015) noted that preventing hearing loss requires that people should be diligent and sensitive to situations that can expose their hearing to risk. The scholar further noted that one can prevent hearing loss by moving away from places where noise is excessive or by protecting the ears using ear plugs. To guard against hearing-loss, the scholar added that it is important to reduce exposure to noise producing activities at home and advised that people should monitor their listening level and how long one listens to personal listening devices like MP3 players. She also recommends that people buy quieter products (low noise products) instead of products that produce loud noise. She further underscored the importance of going for hearing test routinely, knowing one's hearing test result and tracking it annually. NIDCD (2014) pointed out that the simple rule for safety is to avoid noise that is too loud, too close or that lasts long. It gave further guide on how to prevent noise-induced hearing loss as follows:

- Know which noise can cause damage (those above eighty five (85) decibels)
- Wear earplugs or other protective devices when involved in loud activity.
- If you can't reduce the noise or protect yourself from it, move away from it.
- Be alert to hazardous noise in the environment.
- Protect the ears of children who are too young to protect their own.
- Make family, friends and colleagues aware of hazards of noise.
- Have your hearing tested if you think you might have hearing loss.

Centre for Disease Control (2013) propagated the need to promote hearing loss education in schools as a key measure to preventing hearing loss. It also observed that when people are educated about noise-induced hearing loss and hearing loss prevention, they are more likely to use ear protection devices when engaged in occupational and recreational settings that produce noise. It suggested that education on hearing protection should be introduced as part of school's health education curriculum. It may otherwise be included in topics across curricula and into other school programs. Apart from teaching students about hearing loss prevention, the Centre advocates the reduction of noise in school premises. It also recommends that students should be screened for existing noise-induced hearing loss cases.

During the 2017 World Hearing Day campaign, WHO recommended that hearing loss can be addressed by the following interventions:

- Allocating suitable resources
- Integrating ear and hearing care into health systems.
- Building human resource capacity.
- Implementing early identification and intervention programs.
- Increasing awareness among all sectors of society.

WHO advocated that it is cost effective to prevent hearing loss by protecting against loud sounds and by identifying and treating ear infections promptly. It also advocated screening of newborns, school children and adults who are above fifty years as a way of identifying hearing loss early. Rehabilitation and provision of support for sustained use of hearing aids is also identified as important cost effective action. The campaign also called for improved access to cochlear implants. When these actions are implemented, the WHO believes that the society and countries have so much in return as benefits. Among these are: financial savings and significant return on investment; increased access to education; greater employability and earning which benefits the economy; lower costs related to depression and cognitive decline; and an integrated society (WHO, 2017).

2.1.5. Noise Pollution in Nigeria

Noise pollution is one of the key environmental challenges in modern cities. Different countries of the world have been making several efforts to control the increase of noise pollution and to make the environment safer and less noisy. In Nigeria, noise as a form of environmental pollution appears to be largely neglected despite the huge negative impacts noise has on the society and on the residents. Unlike other forms of environmental pollution, noise keeps increasing and so does the impacts on the health of people. It has been observed also that environmental noise in Nigerian cities increases as population, commercial activities and road traffic increases. Migration from the rural areas to the urban areas increases human population, vehicular movements and other human activities in the cities, thereby increasing the level of noise in Nigerian cities. Controlling noise in Nigeria appears difficult largely because of ignorance on the part of the people and the government (Olayinka, 2012).

Information about noise pollution in Nigeria is very limited as there are not many studies in this direction. This is because most people do not recognize the seriousness of the health hazards associated with noise pollution (Etusim et al., 2013). Onwumere (2015) observed that noise is everywhere in Nigeria and that some people assume that it is normal to make noise or that noise cannot harm them. He reported that the Nigerian Hearing and Speech Association (NIHSA) raised concerns over increasing cases of hearing problems. This they said is linked to increasing noise pollution in Nigeria. Similarly, the president of the Speech Pathologists and Audiologists Association in Nigeria (SPAAN), Prof. Ademokoya Juluis, raised alarm on the need for the national and state houses of assemblies to make laws to check increasing noise pollution in Nigeria. Ezeugwu (2015) reporting for The News Agency of Nigeria said that Prof Ademokoya was speaking at a public awareness programme on speech disorders and hearing loss management. He lamented that the level of noise in the country led to many Nigerians suffering from hearing impairment and warned that if the situation is not checked, many Nigerians will become deaf. Prof Ademokoya confirmed that Nigeria is one of the noisiest countries in the world. He also advocated proper town planning to separate industrial areas from residential areas; as well as the establishment of legalised enforcement agencies to check noise pollution in Nigeria.

Anomaharan (2013) noted that the major sources of noise in Nigeria include automobiles, commercial motorcycles, recording houses, electricity generating plants, trucks, and various commercial activities. He also observed that Nigerians do not view noise and its possible dangers seriously and that unlike other nations, there are no serious actions to control and regulate the peril of excessive noise in Nigeria. Abotutu (2015) noted that human ear is not made to handle the high level of noise that is now common in Nigeria's urban cities. According to him, the Nigerian environment is currently going through a revolution which is expected to make it safer for habitation. Issues like solid and liquid waste disposal, flood prevention and fire hazards are getting attention now. However, noise is not yet given adequate attention. Describing the Nigerian environment, the above scholar observed that the typical sources of noise in the Nigerian environment include: drum-size speakers from mosques and churches, musical systems of neighbours, horns of motorcycles, piercing sirens of escorts, thunderous weekend open parties, harsh explosions of numerous record and cassette selling kiosks. He traced the increasing problem of noise in Nigeria to certain factors. One is socio-economic and cultural factors. He discussed the increasing rate of urbanization, accelerated socio-economic progress and deepening religious culture. As more people migrate to the urban cities, their activities also lead to increase of noise in the cities. Similarly, the nation he said has experienced some economic progress which has lifted the standard of living of some people. More people now have cars and possess various electronic and other household gadgets that generate noise. All these contribute to noise pollution in Nigerian cities. He also observed that attitudinal and behavioural factor is one of the factors responsible for increasing environmental noise pollution in Nigeria. People do not care about the implications of their activities to others. Most Nigerians believe that because they like a particular music, everyone in the neighbourhood should enjoy the music with him / her. Such persons will turn-on the volume of their radio, television or home theatre too high to broadcast such music to everyone in the neighbourhood. Another factor discussed is the structure of Nigerian cities. According to the scholar, apart from Abuja, all other cities in Nigeria are characterised by mixed land uses. Most of the cities were not properly planned as modern cities initially. In most streets of the cities, commercial activities are carried out as every open space is available for open-market or is being used as playing ground for children. In some cases, industries and motor vehicle garages are located very close to residential houses. These generate heavy noise in residential areas which are supposed to be quiet. Unfortunately, despite the noisy

environment, hospitals and such facilities that require quite places are also cited within such noisy environment.

2.1.6. Studies / Reports on Noise Pollution Level in Nigerian Cities

There are several reports about noise situation in various parts of Nigeria. Similarly, various scholars conducted studies in different cities in Nigeria. These studies all confirmed that Nigerian cities are characterised by high level of noise pollution. Some of the reports are presented below.

Lagos is one of the major cities in Nigeria. It is the commercial capital of the country. Writing on the problem of noise in Lagos, Onwumere (2015) said that most residents have been complaining about the increasing state of noise in the city. He cited an open letter written by one Mr Bayo Olupohunda as a concerned resident of Lagos, to the then Governor of Lagos State, Babatunde Fashola. In the letter published in a newspaper, Bayo wrote that noise has made living in Lagos a nightmare. There is no part of the city where one is spared the bedlam which is affecting people's health. He also noted that due to the high level of noise in the city of Lagos, the city has been rated very low consistently by Economic Intelligent Unit in global liveable cities' ranking. It is in response to such concerns and complaints by residents of the city that Lagos state government under the then Governor Fashola initiated a campaign as a measure to sensitize residents of Lagos state on the need to reduce noise pollution in the city. The government declared October 15 of every year a Horn Free Day. The day is set aside as a day to raise the consciousness of Lagos residents on the need to reduce environmental noise. Campaign messages on the need to curb noise are spread during the day using the various available media. Motorists are encouraged to drive without using their horns throughout the day. The then governor of Lagos state, Babatunde Fashola, emphasized that reducing noise will be beneficial to the health of everyone and that individuals need to show personal commitment and dedication to reducing noise in the environment (This Day Live, 2014); Channels Tv (2014); Lagos State Govt. (2014).

Environment Today (2015) reported that in response to thousands of such complaints by residents of Lagos over the alarming increase in the level of noise in the city, the Lagos State Environmental Protection Agency (LASEPA) had to shut down some hotels, religious houses, industries and clubs that were alleged to be contravening the guidelines on noise, air and

environmental pollution. The then General Manager of LASEPA, Mr Ademola Shabi was quoted to have said that shutting down the indicted facilities was a measure aimed at restoring sanity to the environment. The LASEPA boss explained that the recommended level of noise in industrial areas is 90 decibels at daytime and 80 decibels at night. In areas having a mix of residential and industrial establishments, the recommended level of noise is 65 decibel during the day and 55 decibels at night. However, in most cases these recommendations are far exceeded constituting solid noise pollution that is hazardous to the well being of residents. He noted that in Lagos, hotel and bar operators usually play very loud music throughout the night without minding the nuisance their action may constitute for other residents. Similarly, operators of religious worship centers misuse public address systems as many of them mount very big loudspeakers outside their buildings, thereby adding to the noise in the environment. Unfortunately, this happens mostly at night when residents are expected to be resting.

Adejobi (2012) analyzed the level of noise pollution in Lagos state, focusing mainly on Oshodi-Agege route. Oshodi like most parts of Lagos is characterized by a mixed use of land for residential, social, industrial and other economic related purposes. This he noted complicates the situation of noise, not only in Oshodi but in most parts of Lagos metropolis and elsewhere in Nigeria. Most key traffic routes accommodate trading activities along them. Oshodi-Agege route is one of the major traffic routes in Lagos city. It is a major road that has many bus stops which are usually congested with vehicles, waiting passengers, as well as traders. The route also houses many industrial establishments. Consequently the key sources of noise in the area includes: electricity generating plants used by most of the houses and commercial as well as industrial establishments because of the poor supply of public electric power to the area. Vehicular traffic and hawking are other sources of noise in Oshodi. Others are construction and industrial noise as well as noise from households.

The study found that noise level in Oshodi-Agege route is much higher than the recommended level for residential and industrial / commercial areas. Interestingly, in all places measured, there was a marked increase in noise level on Fridays and a significant decrease of noise on Sundays. All Sunday readings fall below the recommended levels at both residential and industrial areas. This suggests that activities along Oshodi-Agege axis are at a peak on Fridays and that on Sundays, human activities are drastically reduced along the route. The situation is found to be

different however around the airport, where the noise level recorded does not show any reduction on Sundays.

The scholar concluded that residents and workers along the route are at high risk of noise related ailments. Like most other scholars he made recommendations that could help reduce noise in Nigerian cities. One is that the National Assembly should enact laws on noise control. Two, is the need to adopt technological innovations to measure and control noise. Gadgets like insulator, sound proofing to doors, walls, and ceilings can be of help. Zoning urban areas so as not to mix residential areas with excessive noise generating establishments may also be found helpful. Raising public awareness and encouraging scientific research is another recommendation. He noted that governments at all levels, individuals and corporations should fund researches on noise and other environmentally related concerns. He also recommended that noise measuring meters should also be provided for the professionals to enable them carryout noise measurements in key urban areas as this will help in planning and monitoring of noise.

He also observed that most nations of the world have taken serious measures against environmental noise pollution. In the USA, he says that some places are clearly marked as areas where noise will not be tolerated. The European Union requires that big cities must have noise maps. The Netherlands do not allow building of residential houses in areas where twenty-four hours average noise exceeds fifty decibels. The Noise Act empowers local authorities in the Great Britain to confiscate noisy equipment and to place fine on people creating excessive noise during the night. According to the scholar, no such serious measures against noise pollution are accounted for in Nigeria.

Anomahanran (2013) conducted a study on noise pollution in Abuja, the capital city of Nigeria. He reported that the rapid development of Abuja and the increase in population of the city leads to increase in noise generation in the capital city. He carried out noise level measurement in thirty five (35) locations around the city and found that most parts of the city are excessively noisy. About seventy one percent (71%) of the city was found to have high noise level that is considered unsatisfactory. The mean noise level of the city is found to range from 73.2 decibels to 83.6 decibels during the day time. The noise level of Abuja city was found to be good at night time with mean noise level ranging from forty-four (44) decibels to fifty-six (56) decibels. The night time he said may serve as good recovery time for residents exposed to excessive noise

during the day. The Central Business district of Abuja was found to have the highest day to night noise level of eighty two (82) decibels, while Asokoro district was found to have the lowest day to night noise level of seventy one (71) decibels. The Central Business district has high level of noise because it usually experiences high vehicular traffic and business activities.

Olayinka (2013) studied the level of noise pollution in the city of Ilorin and observed that noise pollution is a big challenge for the quality of life in urban cities. He added that the problem is widespread in Nigeria as studies confirm that noise level exceeds specified limits. He lamented that the government in Nigeria and her citizens appear to be unconscious of the impacts of noise on their health. According to him, Nigerians do not pay attention to the issue of noise because of lack of understanding that noise reduces the quality of life in the cities. Ilorin is one of the state capitals in Nigeria and therefore a major city. Out of the forty-two (42) locations studied in Ilorin, only six (6) locations were found to have noise levels that were considered normal. Locations near busy roads / road junctions, commercial centers and passenger loading parks were found to have higher noise levels than low density residential areas. The study concluded that noise pollution in Ilorin is a serious threat to the health of residents and that it also causes discomfort and irritation. This situation can negatively impact on productivity in both public and private concerns. The scholar warned that if the trend is not checked, it may soon reach the point where permanent loss of hearing and deaths may become common. Furthermore, he recommended a complete ban of the use of loudspeakers from 8pm to 7am and that drivers should be educated against unnecessary use of vehicle horn. The public should also be educated on the need to reduce environmental noise and on the dangers of excessive noise. He specifically emphasized on the need to use the media effectively in this regard.

Another study on noise in Ilorin was carried out by Aremu, Aremu, and Olukanni, (2015). The study focused on sawmills activities in Ilorin city. The scholars noted that most places of work and industries generate much noise. There is therefore the need to measure the level of occupational noise generated by such places of work or industries. They sought to determine the level of noise from the sawmill industry which is thriving in Ilorin. According to them, people depend on wood for various purposes from the beginning of human civilization. Building industry in particular is noted to have continued to rely on the use of wood for various purposes making wood very important as the demand of wood is on the increase. The report indicates that sawmilling is a huge industry in Ilorin as the business thrives in the city due to its nearness to

some rainforest states and its location as a link between the north and south of Nigeria. Wood processed in Ilorin finds markets in various parts of the country. Sound level meter was used to measure the level of noise in sixteen (16) sawmills within Ilorin metropolis.

Background noise was measured in each of the mills during normal activities when machines were not in use. Another measurement was recorded when machines are operating. It was found that background noise without machine noise in the mills studied ranges from 58.1 dB to 64.86 dB. This is as a result of other human, commercial and industrial activities thriving around those sawmills. The noise level at these sawmills when machines are not in operation is therefore within the prescribed industrial limit of 85 dB. It was found that the noise level goes high when machines are in operation. The noise level when machines are in use ranges from 81.1 dB to 98. 8 dB in most sawmills using regular machines like circular, planning, rip saw and rabetting. In two sawmills using band saw and chain saw, the noise level was found to be higher, ranging between 106.4 dB to 112.3 dB. These measurements far exceed the noise level limit recommended for industrial environments. The study further indicated that noise from these sawmills spreads to other parts of the city causing nuisance to the public. Majority of the workers in these sawmills complain of adverse health conditions associated with constant exposure to noise. 98.9% of the workers are not happy with the level of noise in these sawmills; 96.6% of the workers experience tinnitus; 86.6% complain of headaches while 71.9% complain of hearing loss. It was found also that despite being unsatisfied with the noise level in these sawmills, 97% of workers do not use any form of ear protection. There is no noise control barrier in these sawmills. Only 8 out of 320 respondents studied have gone for any hearing tests, indicating that most of the workers do not know about their hearing health status.

All these findings suggest that enlightenment on the implications of exposure to noise / high sounds is very low among the workers. As noted in the report, Nigeria is the largest wood producer in Africa as over one hundred million cubic meters of wood are produced annually in the country. Most cities in Nigeria other than Ilorin has sawmills of various sizes catering for the wood needs of their environs and beyond. If noise from sawmills in Ilorin is of such disturbing magnitude, noise from other sawmills should also be of concern to researchers.

Fadairo (2013) wrote on noise in Akure, the capital city of Ondo state, Nigeria. He noted that Akure, a fast growing urban centre has five (5) major sources of noise pollution. One is

commercial sources. Commercial activities generate so much noise along the urban streets of Akure. The noise is mostly from power generating sets, grinding mills, transport vehicles and motorcycles. Other commercial sources of noise in Akure are record sellers, barbing saloons, and traders announcing their wares using high wattage loudspeakers. Others are government agencies like the then Power Holding Company of Nigeria (PHCN) and Waste Management Authority in Akure who usually move around the streets of Akure with vans mounted with loudspeakers and recorded messages to ask people to pay their bills. The second source of noise in Akure is socio-cultural activities / ceremonies. These include: birthdays, burials, marriages, naming, housewarming, and other ceremonies. All of these are usually accompanied by singing, drumming, and dancing. There is also a growing trend of blocking streets for such ceremonies, thereby increasing the nuisance to the environment. Unfortunately, any complaint against such disturbances in Akure is regarded as a manifestation of envy or sign of antagonising the celebrants.

Religious activities from the two dominant religious groups in Akure (Islam and Christianity) were discussed as the third source of noise in Akure. Religious prayer in homes, especially in the early hours of the morning and at bed time is another culprit. These are usually characterised with loud singing and clapping and in some cases ringing of bells. The fourth source of noise discussed is industrial sources. This includes noise form production plants and construction plants / sites. In some cases these are located so near residential homes. The fifth source of noise in Akure as discussed in the work is domestic noise. This is mostly from leisure music, news and programmes on radio and television, the barking and howling of domestic dogs, bleating of goats and others.

Abotutu (2015) studied the perception of residents in Warri about environmental problems. Warri is one of the major cities in Delta state of Nigeria. The problems studied included solid wastes, flood, fire hazard, liquid waste and noise. About one thousand two hundred and ten (1,210) residents were interviewed in twenty one (21) neighbourhoods. As relates to noise, the study found that forty-one percent (41%) of the respondents reported that noise in their neighbourhood in Warri was very repulsive and dissatisfactory. They reported that deafening sound from record players in the neighbourhood is top on the list of sources of noise. Others are grinding machines, inter-city traffic, and power generating plants, religious worship, open markets and motor parks. The respondents also revealed that they consider the noise at work

more tolerable than noise at home because noise at work may be inevitable but they wish they had more quite homes. This is another confirmation that noise is a problem in most parts of the country.

Earlier, Anomohanran *et al.* (2008) conducted a study to measure the noise level in Abraka another town in Delta state. Abraka then was a small but fast growing university town, hosting the only university in the state at that time. It records so much socio-economic activities within a small area. The scholars mapped out ten (10) locations for noise level measurement, using 65 Noise Dosimeter. The study found that most residents do not recognize noise as a serious pollutant that could harm them. They merely considered noise as a nuisance at night when they are sleeping. Noise level in some of the places measured was moderate and at other locations the noise levels were found to be high, particularly at Abraka junction which recorded one hundred (100) decibels. This makes it an unhealthy place for anyone to stay for a long time. It far exceeds the recommended level. The junction is described as a busy junction where everyone leaving the town or entering into it must pass through. This leads to heavy vehicular traffic and congestion. This situation in addition to the heavy commercial and economic activities going on around the junction explains the high level of noise recorded there.

The study also reports that noise level at night time measured in four locations in the university town exceeds sixty-five (65) decibels, making it very noisy and unsuitable for concentration on serious academic studies and research at night. Abraka junction, Campus 1, Umono Street, and Ekrejeta were all found to be unhealthy at night. The only area where the noise level at night is found to be safe is at Campus 2 area. The scholars found that the major source of noise in Abraka is diesel power generating plants which is mostly used by most residents for domestic and commercial power generation. They believe that if public power supply is improved, the level of noise in Abraka will drastically reduce also. Another cause of high level of noise they noted is the single road leading into and out of the town. They believe that opening up of road networks will reduce heavy vehicular traffic and congestion at Abraka junction, thereby reducing noise in that area.

Alao and Avwiri (2010) measured the level of noise in Rivers state Nigeria, specifically in Ogba, Egbema, and Ndoni local government areas. These areas play host to several oil installations such as flow stations, gas plants, well heads, vast network of pipelines and construction

companies. They carried out several readings at various sides of the facilities after which the average noise level was computed. Key sources of noise found in the area included gas flares from the gas nozzles, generators, pumps, compressors, gas turbines station, motor bike riders, and other related activities. It was found that sound levels in the areas normalizes at about 1.4 km within the communities and that brick walls built around the oil installations for security purposes helps to reduce the noise levels significantly. The maximum level of noise recorded was about 78 dB which is lower than the recommended level for industrial areas. The readings were also lower than those made at similar oil installations in the Niger- Delta region of Nigeria. It is also lower than the results from industrial plants where fabrications and welding take place as documented by other scholars. The scholars therefore concludes that the noise levels from oil installations at Ogba, Egbema and Ndoni local government areas are not likely to pose any immediate physiological or psychological injuries on the people in the short run. However, in the long term, there may be negative impacts on the communities as the activities of these oil installations are on daily and continuous basis.

They recommended that efforts should be made to further reduce noise from the installations by changing old pumps with electric motors. Similarly, soundproof plants or generators should be used instead of the conventional types that generate much noise. They also recommended that the oil companies should extend training programmes on environmental safety to their host communities and the contract staff. Such training will help them to be knowledgeable and well informed as regards to how to protect themselves from noise as well as other pollutants in their work place and the community in which they live.

Alkasim and Abubakar-Sadiq (2010) studied the effect of human activities on noise level measurement in Kano metropolis. Kano is a major city in northern Nigeria reputed for its dense population and heavy commercial activities. The scholars measured the level of noise in twenty one (21) selected areas of the city using Rion sound level meters. It was found that the average noise level in Kano is above the standard recommended limit. Gidam Murtala round-about was found to have the highest level of noise measuring about 95.43 decibels. The scholars reported that in most of the places measured, the noise level gets to the highest levels in the afternoon as human activities (especially commercial activities) are high and decreases in the evening when human activities decrease. However, in government residential areas and Tamandu close, noise level was found to be higher in the mornings and in the evenings. This is because in the morning

most people are either going to work or taking their children to schools. In the evening, they are either returning from work or bringing back their children from school. The afternoon is usually not noisy in these areas as most people are out of the area. The scholars recommended that because of the high level of noise in Kano city, it is important that residents use ear protecting devices and also go for ear checks regularly. Similarly, they recommended that it is better to reside in government residential quarters or in the out sketch of the city where the level of noise is low than to live in the centre of the city where the level of noise is found to be very high.

Etusim *et al*. (2013) conducted an environmental impact assessment of quarry mining on noise pollution in Uturu community of Abia state, Nigeria. The study involved recording the level of noise in several quarry mining sites at Ugwuele community, regarded as site A in the study. Umuanyim, Abia State University community was coded as site B representing residential areas. In site A, (representing commercial / industrial areas) quarry activities involve extracting, removing and disposing quarry resources buried under the earth surface. Earth moving machines, power generating sets and vehicular movements involved in the process all generate heavy noise. Noise level measurements taken at different locations at the quarry mining community ranged from 95 dB to 97 dB. These readings are all above the recommended noise limit of 85 dB at industrial areas. Noise level measurement in residential areas ranged from 70 dB to 87 dB. These readings are higher than the recommended limit for residential areas. The scholars concluded that it is clear then that residents of Uturu are at high risk of noise induced adverse health conditions both in the residential areas and in the commercial / industrial areas. The scholars called for regulation of noise generation in Uturu community and for the conducting of hearing tests on the residents. They also recommended that the activities of mining companies should be regulated and lamented that the relevance of pre and post environmental impact assessment is not taken seriously due to high level of ignorance on environmental awareness.

Luqman *et al* (2013) conducted a study of occupational-environment noise levels in two selected commercial areas in Ibadan, the capital city of Oyo state, Nigeria. The areas are Agbowo and Ajibode business areas. Agbowo business area is located right opposite the University of Ibadan and is known to be an area of very high small scale commercial activities. Ajibode area is also a commercial area; however, business activities there are not as much as business activities found in Agbowo area. The scholars measured noise levels in different designated locations of each area at the early hours of the day between 6am to 8am; during the mid day, between 11am and

1pm and then at close of commercial activities between 4pm to 6pm. The scholars found that higher volume of small scale business activities leads to higher number of environmental noise sources such as power generating sets, music recording houses, automobiles and motorcycles and religious houses. These were all found to be more in Agbowo business area than in Ajibode business area.

Similarly, Agbowo business area recorded higher traffic counts per hour much more than what was recorded in Ajibode business area. It is not surprising therefore that the mean noise level recorded in Agbowo business area was about 79 dB higher than the level recorded in Ajibode business area which was about 66 dB. When the noise levels that actually filter into workers' ears was measured, it was found that workers in Agbowo business area are exposed to mean noise level of 81 dB which ranges from 63 dB to 99 dB in the different locations studied; while workers in Ajibode business area were found to be exposed to mean noise level of 62 dB ranging from 60 dB to 82.7 dB in the different locations studied. It was also found that in both areas, the highest levels of noise were recorded during the peak hours of business activities which are between 11am and 1 pm. It is clear therefore that the higher the number of small scale business activities in an area, the sources of environmental noise will likely be higher and consequently, the level of noise should be expected to be higher as well than will be the case in an area with lower small scale business activities.

Nwobi-Okoye *et al.* (2015) measured the level of noise in the city of Onitsha in Anambra State. The scholars reported that instead of abating, the level of noise in the commercial city of Onitsha is increasing. They attributed the increase in the level of noise in the city to increase in vehicular population and commercial activities in the city. The scholars selected twelve areas for measurement. These areas included two commercial centres, three busy roads, three passenger loading parks, two high density and two low density residential areas. They carried out noise measurements within different time belts: 8am-9am (morning), 11am-12noon (noon), 2-3pm (afternoon) and 5-6pm (evening). They reported that busy road junctions recorded the highest level of noise in the city. This was followed by commercial centres, passengers loading parks, high density residential area and finally low density residential area all of which were found to have noise level above the permissible limit.

Alao, Avwiri, and Okite (2018) conducted an evaluation of noise pollution levels in Aba Industrial Clusters of Abia State, Nigeria. Aba is one of the major commercial cities in Abia State, located in South East of Nigeria. The scholars noted that the city is characterised by rapid expansion and industrialisation which results to increase in the level of noise pollution in the city. They measured the level of noise in three industrial areas of Aba which are: Old Aba Industrial Layout, Osisioma Industrial Layout and Ariaria Leather Cluster. They carried out noise measurement of the areas indicated using two digital sound level meters and a handheld GPS. The scholars reported that Aba Old Industrial Layout recorded noise level that ranges between 71dB to 94dB. Osisioma Industrial Layout recorded noise level that falls within the range of 82dB and 89dB while Ariaria Industrial Layout recorded noise level within the range of 79dB to 94dB. The report indicated that the level of noise recorded in Aba Old Industrial Layout and Ariaria Leather Cluster were above the standard set by the Federal Environmental Protection Agency (FEPA) for industrial layouts which is 90db. At 89dB, the level of noise recorded in Osisioma Industrial Layout was found to be slightly but insignificantly lower than the standard for industrial areas. All the three areas measured were found to record level of noise far above WHO standard of 75dB for industrial environment. Similarly, the level of noise in all the three areas were found to be above the standard set by National Institute for Occupational Safety and Health (NIOSH). The study found that noise pollution in Aba is mostly from traffic noise and from commercial activities in the area. It also revealed that Ariaria Leather Cluster recorded highest level of noise than all other areas because of the concentration of commercial activities there. The major sources of noise found in the area include noise from heavy traffic, noise from generators, noise from different machines, noise from loudspeakers etc. The scholars warned that continuous exposure to the level of noise recorded in those areas can lead to permanent noise induced hearing loss and other health issues.

Earlier, Nwankwoala and Obioha (2014) carried out a preliminary assessment of air and sound quality in Ariaria Market in Aba, Abia State. They used different hand held tools for the study. These tools included Cole-Parmer Extec Sound Level Meter, Aerosol Mass Monitor and IBRID MX6 Multi-Gas Monitor. The samples from different areas in the market were taken for a period of eight hours per day, while readings of all parameters were determined every two hours. The scholars found that noise level was up to 94dB which is higher than recommended standard safe for human beings. The result indicated that most sections of the market that recorded very poor

air quality also recorded very poor sound quality. This situation according to the scholars affects the geomorphology of the areas within and outside the market negatively. This in turn poses serious health risks for human beings operating within and around the market. The scholars noted that the high level of noise pollution recorded in the area is attributed to high level of human activity, existence of many small scale manufacturing companies and the presence of heavy motorized traffic. They recommended among other things that it is important that the State Government set up an agency that will have responsibility of monitoring the quality of the environment in the state, especially in areas with heavy human activities like markets. Such agency will also have the responsibility of enforcing environmentally friendly practices in such markets and their environment. They also recommended improvement in transportation infrastructure such as roads and road networks. Efficient traffic management to reduce idling time and layover time for vehicles as well as orientation campaign to promote environmental friendly practices by all were also part of the recommendations by the scholars.

Ijaiya (2014) observed that the key sources of noise pollution in Nigeria are electricity generating plants, vehicular traffic noise, and engine and pressure horns. Others are construction / industrial noise, machinery noise, noise from religious worship places, and household noise. According to him, noise from electric generating plants is higher than noise from other sources. This is because electric power is used in all places including homes, industries, and for agricultural and transportation purposes. People rely mostly on these power generating plants which run for so many hours daily as public power situation is very erratic. Noise from vehicular traffic is also on the increase as more vehicles are on Nigerian roads now than before. On noise from religious worship places, the scholar observed that Nigeria is a multi-religious society which is prone to religious activities most of which generate much noise.

Olayinka (2012) discussed the key sources of noise pollution in Nigerian cities and notes that the country's quest for industrialization, scientific and technological developments contributes to increasing noise in the society as most of the activities in this direction produce immense noise. He adds that Nigerians are good at celebrations, festivals, marriages, religious activities. All of these produce noise which is magnified and extended by loudspeakers at very high pitch. He observes that there is increase in the number of automobiles plying the Nigerian roads. Screeching tyres, squealing brakes, screaming sirens, blaring horns are all sources of noise

generated from the use of automobiles on the road. Nigerians use vehicle horns recklessly while driving. Vehicle horn is used as a greeting sign.

Other sources of noise discussed include industrial and commercial establishments which are in most cases located very close or within residential areas; power generating sets which is used by almost all the households because of the poor supply of public electricity power. Construction activities of various types and magnitudes which are geared towards meeting the needs of living in the modern society also produce noise. Construction of buildings, highways and city streets most times makes use of heavy equipment like bulldozers, loaders, dump trucks, and pavement breakers. All these produce disturbing noise. In the household, various items needed by modern man in Nigerian homes also produce lots of noise. The television, radio, vacuum cleaners, mixers, and several kitchen utensils also produce noise. Commercial noise comes from efforts of traders to get the attention of people to the goods or services they have to offer. The scholar cited above observes that the use of vehicles with loudspeakers mounted on them to advertise and sell products is common along Nigerian streets and in the markets. GSM service providers, local herbs sellers, transporters are said to be mostly involved in the practice.

Abotutu (2015) discussed measures that could help reduce noise in Nigeria. The measures discussed are legislation, physical planning and education. On legislation, he noted that most countries of the world have passed laws on noise reduction. The UK passed The Noise Abatement Act in 1960, while the US passed The Noise Control Act in 1972. In Nigeria, apart from laws made in some states, there is no known federal law on noise control. He noted that there is urgent need of law on noise control from the federal government which will in turn give direction on the roles of states and local governments as regards reduction of noise. However, he observed that law on its own cannot make Nigerian cities less noisy without proper enforcement. For the law to be enforceable, they should be made simple, practical, and realistic. He pointed out that it must be made clear that law on noise is only intended to reduce excessive noise as noise cannot be totally eradicated from human environment. Furthermore he noted that for the law to be properly enforced, the issue of manpower should be considered as the limited manpower available to law enforcement agents may hinder effective enforcement as the authorities may focus the available manpower to other areas like combating armed robbery and so on as Nigerians do not view the issue of noise as seriously as it should be viewed.

On physical planning, he decried the situation in Nigeria where the principle of spatial separation of incompatible land uses is not practiced in most cases. He said that hospitals, educational institutions and residential areas which are noise sensitive should be cited in places that are less noisy and different from areas allocated for transportation, manufacturing and commerce which are insensitive to noise. Another physical planning method he recommended is the use of vegetation-sound barrier. This involves the use of noise barriers like tress, and grasses as spatial separation of noise sensitive land uses from sources of noise. He noted that when thickness is up to 25 meters and above, acoustic green barriers are very useful in noise control. This could reduce noise with about 10 to 15 decibels.

There is therefore the need to consciously use tree planting as measures to serve as noise barriers. On education, he noted that every other measure will not work out effectively without the cooperation of the citizens. If people do not care about the issue of noise, they will not cooperate. They will not care about noise if they are not educated on the negative impact of noise on their wellbeing. This re-echoes the need to raise general public awareness to make people understand the impact of noise on their health, the reason for anti-noise law, the provisions of the law and citizens' role.

2.1.7. Legislation on and Regulation of Noise Pollution in Nigeria

Ijaiya (2014) observed that Nigeria does not have laws specific to noise pollution as other nations like United States of America and United Kingdom. However there are some policies regulating noise in Nigeria. The major law relating to noise pollution in Nigeria according to the scholar is: The National Environmental Standards and Regulations Enforcement Agency (Establishment) Act of 2007. The Act empowers the agency to identify major noise sources, noise criteria and noise control technology. The agency is also required to make regulations on noise, emission control and abatement as may be necessary to preserve and maintain public health and welfare. The agency is also mandated to enforce compliance with existing regulations and to recommend programs to control noise originating from industrial, commercial, domestic, sports, recreational, transportation or other similar activities. According to the scholar, other policies on noise regulation in Nigeria are the National Policy on the Environment of 1988, The National Environmental Protection (Pollution Abatement in Industries and Facilities Generating

Wastes) Regulations of 1991 and National Guideline and Standards for Environmental Pollution Control in Nigeria of 1991.

Fadairo (2013) noted that the first Federal law for regulating noise pollution in Nigeria is The Noise Control Act of 1972. The law according to him established the office of Noise Abatement and Control (ONAC) within the Environmental Protection Agency (EPA). Apart from establishing the office, the law did not do much in terms of spelling out control against noise pollution in the nation. Some other policies have been muted since then. Ijaiya (2014) notes that these policies may sound good but they are not properly implemented. He calls for complete review of policies, plans and programmes of the federal government as relates to noise pollution and environmental health. He also recommended sensitization of the public on the risks and dangers of exposure to noise pollution. This is where awareness campaigns by the media become very crucial. Olayinka (2013) pointed out that there is no serious legal framework for the control of noise in Nigeria. Federal Environmental Protection Agency (FEPA) according to him only recommended daily noise exposure limits for industry workers at 90 dB for eight hours. He called on relevant authorities to pass laws that would help to control the increasing menace of noise pollution in the cities.

Discussing noise control in Nigeria, Olayinka (2012) noted that effective control of noise is essential in order to achieve sustainable urban development. Sustainable development implies that efforts are made to exploit the environment for the good of man today without jeopardizing the possibility of the environment being conducive tomorrow. He observed that noise is a major challenge making the Nigerian cities unsuitable for human living. Certain measures that could help in combating noise were discussed. They include reducing noise from source. This can be achieved through proper and regular maintenance or replacing of worn out parts of necessary machines to reduce noise production.

Another measure is the covering of outer areas of machine rooms with sound absorbing material in order to reduce the intensity of sound. Regarding traffic noise, the scholar cited above recommends a change in road traffic profiles, use of low noise pavements, repairing of faulty silencers and vehicle suspensions in order to reduce exhaust and rolling stock noise. He also recommended that there should be restrictions on the use of certain vehicles on certain roads, as well as on the allowed speed and hours of operating. Acoustic barriers can also be erected on

some roads. Another measure advocated strongly is the need to embark on information and education campaigns to sensitise the people on the dangers of noise pollution in the environment. Enactment of laws on excessive noise production is another step that could be taken towards reduction of noise in Nigeria.

The scholar cited above calls on the National Assembly to pass a bill on combating noise in Nigerian cities and to mandate all the state and Local governments to do same. Similarly, a regulatory agency that will be responsible for the control of noise and enforcement of the law should be established. He also called on town planners, architects, environmental engineers and others to be concerned about noise when citing roads, shopping centres, schools, and hospitals, commercial and residential houses. Preparation of noise map is yet another measure that could help check noise in the Nigerian cities. Noise maps are tools for communicating results of environmental noise assessment to the public and the government so as to enable them evolve necessary noise control measures. Noise maps provide baseline data for town planners, engineers, researchers and other professionals. Noise map is necessary for every city. Another measure that will help reduce noise in Nigerian cities as discussed is the use of advanced technology in measuring and controlling noise. Gadgets like insulator, sound proofing for doors, walls, and ceilings can be found useful. It is noted that it is time to review environmental policies, plans and programmes of the federal government regarding noise pollution and environmental health in Nigeria.

2.1.8. Reflections on Religious Noise in Nigeria

From the reviews of literature, it is evident that religious noise is an issue in Nigeria. Dickson, Audu and Nwomah (2012) examined the issue of religious noise in Nigeria and concluded that religious noise arises from convictions which adherents to the three major religions in Nigeria uphold. These convictions are manifested by adherents of these religions in the daily practice of their religion as an expression of their faith. A review of the work provides a good background to understanding why religious noise may remain an issue if no systematic measure is applied to curb it.

The scholars cited above are convinced that Nigerians do not see their religion as theoretical. They see it as demanding total commitment in beliefs and practices. They also see it as a way of life. Religion shapes the way of life, worldview, behaviour and choices of religious adherents in

Nigeria. Reflecting on the Christian religion, the scholars pointed out that many stories of the Holy Bible seem to make noise a part of the Christian religious experience. These include: thunder and lightning accompanying the revelation of God to the Israelites; sound of trumpets and great shouting causing the walls of Jericho to fall; several calls in scripture to make joyful noise to God; outpouring of the Holy Ghost characterised by the sound of mighty rushing wind; the second coming of Jesus Christ which the Bible says will be accompanied with great noise, voice of the archangel and sounds of trumpet; the visions of John in Revelation having so many images and pictures of great noise and thundering. These images they say appear to build in adherents of the Christian faith the conviction that noise is part of their worship.

The scholars however pointed out that the practice of the Christian faith in Nigeria was initially noiseless till some adherents with new shades of belief began pulling away from conservatism to dynamism. The Evangelicals and Pentecostals according to the scholars introduced indigenous African worship temperament. This changed the tempo, and rhythm of Christian music and songs. The noisy music induces dancing. Similarly, the new brands of Christian faith in Nigeria introduced a shift from the quiet, contemplative prayer style to vibrant and noisy prayers believed to be potent spiritual weapon against enemies. Prayers are then accompanied with shouting, screaming, jumping, and the so-called casting and binding. This new shade of Christianity also led to people pursuing the command of Jesus to preach the gospel everywhere with new zeal. Itinerant evangelists wake early hours of the morning to preach, some ringing bells, others singing and clapping in groups with megaphones and loudspeakers. These efforts at evangelism all constitute noise in the environment, disturbing the early morning sleep and meditation of others.

Reflecting on religious noise in Islam, Dickson, Audu and Nwomah (cited above) noted that the Koran appears to be silent on images that connote noise as part of religion. However, they say, the call to praise God in Wise. 062.001 suggest that noise is generated in praising God. The major aspect of Islamic religious practice that is seen as constituting noise and environmental nuisance is the call to prayer which precedes the Salat that holds five times daily. They established that the noise generated by the Muslim call to prayer has been generating concern in different parts of the world. Usually someone makes the call of prayers using loudspeakers to extend the reach as far as possible. This becomes more worrisome when there are many mosques

within a particular community. The call can be disturbing especially the early morning call before the 5am prayer.

On religious noise in African traditional religion, the scholars cited above noted that for the adherents of African traditional worship, their religion and culture are one. African religion is characterised by the performance of various rituals in designated places and following prescribed patterns. These rituals are accompanied by music, dance and prayers. The music is usually characterised by beating of drums and playing of other instruments. African traditional religion is also characterised with festivals like Gelede and Egungun in Yoruba land, New Yam Festival and Masquerade Festival in Igbo land. These festivals usually involve moving from one place to another as people beat drums and play other musical instruments. Some of them are also carried out very late when people are supposed to be sleeping. These are the reasons why religious noise may be difficult to curb in Nigeria. The scholars noted that there is need for systematic measures to bring the situation under control.

2.1.9. Gaps in Literature

The literature on noise in Nigeria as reviewed above provides extensive knowledge with facts describing the situation of environmental noise in Nigerian cities. It is clear from all the works reviewed that noise is a major issue in all Nigerian cities where studies in this direction had been carried out. Sources of environmental noise in Nigeria were well explored in the review. Practices and believes of people that encourage the generation of environmental noise were extensively examined also. The review also revealed that efforts have also been made by scholars to suggest measures that could be introduced to reduce noise pollution in Nigeria. However, the researcher did not find studies that examined the people's awareness of health implications of exposure to noise pollution or their knowledge and practice of protective measures to reduce the risk of exposure to noise pollution. Similarly, the researcher did not come across studies that examined the existence of communication interventions geared towards creating awareness about the dangers of exposure to noise pollution in Onitsha, Onitsha Main Market, Enugu, Ogbete Main Market Enugu or any part of Anambra and Enugu States. There seems to be a gap of information in these regards. This research work hopes to fill in the identified gaps in literature.

2.1.10. Communication intervention

Communication is one of the vital interventions that stakeholders now use in promoting health and confronting health-challenges in the world today. Using communication as intervention in health related matters falls within what is popularly discussed as health communication. It is an emerging practice that is seen as indispensable in the fight against diseases. Okoro, Nwachukwu and Ajaero (2015) observed that health communication can have positive effects on all aspects of preventing and controlling disease as well as on the promotion of good health. The scholars cited above listed twelve steps outlined by UNESCO as steps that make health communication effective. The steps are:

1. Define clearly what health behaviour you are trying to promote.

2. Decide exactly who in the population you are trying to influence.

3. Ask whether the new behaviour requires new skills.

4. Learn about the present health knowledge, beliefs and behaviour of the target audience.

5. Enquire whether the health behaviour you are trying to promote has already been introduced to the community.

6. Investigate the target audience's present sources of information about health.

7. Select the communication channels and media which are most capable of reaching and influencing the target audience (These include mass media and interpersonal channels).

8. Design health messages which are:

i. Easily understandable, using local languages or dialects and colloquial expressions

ii. Culturally and socially appropriate.

iii. Practical.

iv. Brief.

v. Relevant.

vi. Technically correct.

vii. Positive.

9. Develop and test your educational materials.

10. Synchronize your educational programmes with other health and development services.

11. Evaluate whether the intended new behaviour is being carried out.

12. Repeat and adjust the messages at intervals over several years.

Okoro, Nwachukwu and Ajaero (2015) further noted that existence of health communication or health campaigns may not automatically lead to general adoption of health interventions. They believe that certain factors can influence the reception, acceptance and adoption of the health intervention. The factors they discussed include: culture, efficacy of the promoted interventions, education, socio-economic factors, and the message.

Ozoh and Ndolo (2011) discussed community approach to delivering communication interventions. They emphasised that using this approach shifts the control of planning and execution processes to the members of the concerned community. This builds on the community's rights to inclusion and self-determination. The argument is that aiming at transforming a whole community (the norms and practices) is more beneficial than aiming at changing an individual. This requires approaching communication as a relationship and cyclical process and not as a sender-receiver process. This approach aims at making members of a community active participants and not mere passive recipients of communication interventions. The scholars cited above believe that communication intervention can lead to behaviour change. However, they noted that the success of any communication intervention will depend on how all the critical inputs are appropriately mixed. They also noted that effective application of communication-intervention would require conceptual clarity, especially in terms of what communication really is and the methodologies and approaches for its application.

2.1.11. The Media and Information / Awareness Campaigns

The place of the media in creating awareness on issues and spreading vital information among the public is no longer in serious doubts. Scholars have over the years established that because the media are important part of the lives of most people, issues raised in the media can form the basis of public discussions. Several studies suggest that this situation can impact on public

opinion and behaviour (Burke, 1999). This has been discussed as agenda setting role of the media. Nwokeafor (2015) observed that agenda-setting theory of the mass media talks of the ability of the media to influence the way people perceive things and what the people view as important matters. He talks of the media moulding people's mind and directing their thinking and thereby creating awareness through spreading of information and news which consequently impacts on the attitudes of their audience, causing them to alter their behaviour. He cited Lipmann (1922) who argued that the media has the ability to create pictures in the minds of the audience and therefore stated that whatever the media plays up as important will in turn be upheld by the people both privately and publicly. Sandman (2000) argued that the power of the media to influence public discourse is not in doubt. He noted that in the United States, certain campaigns run in the media have set agenda for public discussions. Televised political debates where key contenders did not do well have led to swaying of public opinion. Powerful advertisements he argued have been used to sell various products. He noted however that the problem is that it is not very easy to use this enormous power of the media effectively. The masses receive so many messages from the media on daily basis. For a campaign message to be effective, it should be skilfully crafted and executed.

Using the mass media to spread information is found to be very effective as mass media campaigns get to large populations at low cost. They influence awareness, knowledge and beliefs and could lead to intention and behaviour change (Cavill & Bauman, 2007). The media has been found to be useful in influencing decision makers indirectly and also in helping to boost advocacy. Other uses of the media as relates to information campaigns include changing public attitude and behaviour; informing the public about issues and proposed solutions; recruiting possible allies among the public and decision makers; raising money for a cause; getting issues onto political agenda; making issues visible and credible in policy debate; as well as influencing decision makers. When the media takes up the initiative to play up issues of public health importance repeatedly, it is believed that on the bases of the foregoing, the public will see such issues as important and this will in turn influence the attitude and behaviour of the public towards the problematic health issue.

Among the various available mass media, using radio for information campaigns has been found to more effective as radio messages get to a wider audience than other mass media channels. Radio pierces through the barriers of geography, conflicts, illiteracy and poverty with ease.

Burke (1999) noted that radio is a medium that can be used anywhere. Community radio he noted can be very useful in increasing participation and opinion sharing, improving and diversifying knowledge and skills. For Okunna and Omenugha (2012) radio does not recognize the restrictions of illiteracy. Similarly, poor infrastructural facilities does not constitute barrier to radio unlike the print media. It is the ideal mass medium in developing nations. It is cheap and does not depend on electricity. It is portable and accessible everywhere. It can be used in remote rural areas. Despite these noted strengths of the radio in reaching more people with information campaigns, scholars and stakeholders agree that no singular medium can on its own alone be fully relied on to achieve effective campaigns. What they advocate is multi-media approach or media mix approach. Using this approach, a message is carried to the target audience using a combination of mass media and smaller personal media (Okunna, 2002).

While the issue of the role of the media in raising awareness appears to be no longer in doubt the debate about the power of media campaigns to effectively lead to change in attitude and behaviour of the public continues. It seems that it is safe to stand with Sandman (2000) on the view that information alone may not lead to behaviour change, but information can lead to change in attitude which if sustained can lead to change in behaviour. A review of some empirical studies along this line becomes important.

2. 2. Review of Empirical Literature

Over the years various efforts have been made to use the media for information campaigns aimed at creating awareness and changing attitudes and behaviour relating to important issues in societies in various parts of the world. **S**cholars in different parts of the globe have over the years also studied the influence of mass media campaigns on the public as relates to successful awareness creation and change of attitude and behaviour. Some of these studies are here reviewed.

2.2.1 Studies on Media Campaigns and Awareness Creation.

Zowawi *et al*. (2015) studied the potential role of social media platforms in community awareness of antibiotic use. These researchers sought to know how effective it is to use social media tools to create awareness of appropriate antibiotic use among the general public and in the medical communities of the Arabian Peninsula. They content analyzed various users of

Facebook, Twitter, and YouTube and found that social media platforms are valuable for delivering awareness messages to a large number of users because of their growing popularity. They found that it is also possible to track the reach of messages sent through social media platforms. They believe that the use of social media for awareness creation can enhance awareness campaigns delivered through the conventional mass media channels. They however pointed out that members of the target population who may not have access to social media platforms should be considered while planning and executing the campaigns. Concluding that social media platforms are useful in creating awareness, they added that further research is needed to find out if the messages sent through social media have impacts on the understanding and behaviour of the public.

Boles, Adams, Gredler and Manhas (2014) conducted a study which was targeted at examining the ability of mass media campaign to influence knowledge, attitude and behaviour about sugary drinks and obesity. The study was conducted to check the effectiveness of a campaign that was aimed at creating awareness on the quantity of sugar added in Soda and other sugar-sweetened beverages and the health implications of consuming such drinks. The scholars reported that most of the respondents who were exposed to the campaign demonstrated knowledge about the health challenges that could result from consuming too much sugar. Consequently, they concluded that media campaigns about sugar-sweetened beverages are effective in raising awareness about excess sugar in such beverages. The found that campaigns are also effective in increasing knowledge about health problems related to consumption of excess sugar.

Thainiyom (2011) studied the impacts of media campaign to increase awareness and prevention of human trafficking in Asia. For the campaign, documentaries were developed as multi-media, multi-platform awareness and prevention campaign against human trafficking. The documentaries were aired in twenty one countries in the Asia Pacific. The study of the impacts of that campaign found that the campaign was effective in creating awareness in Thailand. Before the campaign, people in Thailand believed that they were not at risk of human trafficking but the documentary broke through the denial barrier and made the people realize that they were at risk. In India, the study found that the people who were at risk were aware of the existence of human trafficking however; they did not initially fully realize the extent of the risk that they were facing. After being exposed to the documentary, they realized that it was not only women or

rural people that were at risk of human trafficking. The campaign was found to be helpful in giving them more information and making them understand the enormity of the possible risks. The Indonesians also reported a better understanding of the risks of human trafficking. Before the campaign, they felt it was very limited across target groups and some only linked human trafficking with adopted babies and sex trafficking for prostitutes. For most respondents in Philippines, before exposure to the documentary they did not have sufficient facts about human trafficking. They usually saw themselves unlikely to become victims of human trafficking, but the campaign helped to change that view.

Dumesnil and Verger (2009) conducted a review of various public awareness campaigns targeted at raising awareness of suicidal crises and depression. They sought to see how effective these campaigns have been. About two hundred (200) publications were reviewed for the study. The review found that the campaigns improved public awareness and information about suicide or depression and mental illness at least in the short term. However, the campaigns did not lead to improvement in the knowledge of where to get information and professional help. The scholars found also that combining various strategies in campaigns (like: distributing educational materials, media campaigns, training of gate-keepers and health workers) was more effective than using one strategy. Furthermore they found that campaigns targeting local levels with unique messages adapted for each homogenous population were more effective than those having a national outlook. They also noted that targeting one or two diseases rather than attempting to target mental illness in general was more effective because each mental disease had different characteristics and treatment approaches. The study also confirmed that repeated exposure to campaign message reinforces the message, thereby making it more effective. Similarly, using several types of media and focusing on clarity and specificity of the message was found to be effective. Involving persons with mental illness to share their own experience was also found to promote a reduction of stigmatization.

Keating et al. (2006) studied the impacts of the VISION project in contributing to increased awareness and prevention of HIV/AIDS in Nigeria. The VISION project was funded by the U.S Agency for International Development (USAID) with the aim of increasing the use of family planning, child survival and HIV/AIDS services. The scholars sought to find out if exposure to program information leads to increased knowledge, awareness, and prevention of HIV/AIDS. They found that using a combination of media helped to get the message to many people among

the target population. Majority of the people were exposed to the program information through radio while television ranked lowest as a media through which people got the message. Printed adverts performed better than television but lower than radio. They also found that there is link between education and HIV/AIDS awareness and perception about using condoms as a measure to reduce HIV/AIDS transmission. However, there was no link between education and condom use. They concluded that more efforts should be directed at increasing awareness of places where condoms could be gotten and at increasing access to condoms within communities.

Cavill and Bauman (2006) in their study of the role of the mass media campaigns in changing the way people think about health-enhancing physical activity confirms that majority of the target population were sufficiently aware of the campaigns. Most of the respondents were able to recall the media campaign messages about health-enhancing physical activities. This is a clear demonstration that the media campaigns were very effective in creating knowledge and raising awareness. They concluded that the mass media campaign demonstrates capacity to reach large populations at relatively low cost and leads to increase in knowledge about campaign issues.

2.2.2 Studies on Media Campaigns and Attitude / Behaviour Change.

Boles *et al.* (2014) reported that though a media campaign whose impact they studied had significant impact on raising awareness and knowledge, the campaign did not lead to any significant change in behaviour. The scholars conducted a survey which measured awareness, attitude towards obesity, knowledge about health issues related to consuming excessive sugar, and behavioural intentions as well as behaviour towards Soda and other sugar-sweetened beverages. Majority of the respondents who were exposed to the campaign demonstrated an intention to reduce the quantity of Soda or sugary drinks they gave to children as a result of the information gotten from the campaign. However, they did not show any significant change in their personal consumption of Soda and other sugar-sweetened beverages. The scholars reported however, that the campaign may be effective in prompting behavioural intentions as about fifty percent of the respondents indicated the intention to reduce consumption of Soda and other sugar-sweetened drinks. The scholars found that attitude towards childhood obesity is a determining factor in understanding intentions to reduce the quantity of Soda and other drinks given to children. They recommended that it may require conducting longer studies /follow-up to

determine if the campaign had any effects on people's consumption of Soda and other sugary drinks.

Grill, Ramsey and Minozzi (2009) assessed the effects of mass media interventions on the utilization of health services. The study involved searching through various reputable journals for studies on using mass media intervention to promote health services. They observed that most of the primary research in the area had limitations as relates to methodological quality and completeness of reporting of studies. However, there were evidences that the media may be effective in influencing the use of health care services. They consequently recommended the use of the mass media not only for encouraging the use of effective health services but also for discouraging the use of those with unproven effectiveness. They also found that mass media impacts is not limited to planned campaigns but that unplanned mass media coverage of health issues also yields positive impacts. However, they noted that the studies could not define the characteristics of successful campaigns or the differences between the effects of planned campaigns and unplanned coverage. Furthermore, they observed that the studies have not addressed the cost effectiveness of using mass media-based strategies to influence health services. They recommended that because of the impact of the media as demonstrated in the studies, there was need to ensure that health related issues that are reported in the mass media represent the correct and best available knowledge on the effectiveness of health care interventions.

Borland and Balmford (2001) studied the impact of media campaigns on smokers. They sought to explore the immediate impact of the 2001 National Tobacco Campaign (NTC) advertising on movement towards quitting in a broadly representative sample of smokers. The researchers conducted repeated studies after two weeks intervals. A total of 1000 current smokers aged between 18 to 40 years were interviewed. Respondents were interviewed in Sydney and Melbourne without first exposing them to the campaigns. In Brisbane and Adelaide respondents were exposed to the campaign before the initial survey. The intention of the study was to measure frequency of negative thoughts about smoking and passive smoking, positive thoughts about smoking, and thoughts about the conduct of tobacco companies; perspective on change; and thoughts and actions about quitting. At the initial survey, respondents in areas that were exposed to the campaign demonstrated higher level of thoughts about quitting. Between surveys, 33% progressed toward cessation and 21% regressed. 69% of participants reported recalling

National Tobacco Campaign advertising at follow up, which was significantly associated with greater self reported quitting activity and a greater increase in frequency of negative thoughts about smoking.

From their findings, the researchers concluded that since the results show increased frequency of negative thoughts about smoking and an increase in quitting related thoughts and actions following onset of the NTC campaign, there was also evidence of sustained increase in cessation activity for a month following onset of the campaign. These all occurred in the context of considerable naturally occurring smoking cessation activity, suggesting that the challenge of campaigns in Australia is to induce progress toward quitting among people who are generally engaged with the issue at some level, rather than attempt to stimulate fundamentally new consideration of smoking. The study informs that there is now considerable evidence that mass media anti-smoking counter advertising campaigns can inspire quitting activity and can lead to detectable reduction in smoking prevalence.

Dumensil and Verger (2009) conducted a review of different campaigns seeking to change attitude and behaviour about suicidal crises and depression. They found that the campaigns were not only useful in creating public awareness. The campaigns were successful in leading to improvements in public attitude towards mental illness, the treatment of mental illness and attitude to people having mental illness. However, there were no clear evidences as to the impacts of the campaigns on the behaviour of the public as relates to intention to seek care, seeking care and suicidal behaviour.

Keating *et al.* (2006) in their study of the effectiveness of a HIV/AIDS campaign project in Nigeria concluded that the project was very effective in the area of creating and raising awareness. However, the awareness did not translate clearly to change in attitude and behaviour as no link was found between awareness and actual use of condom. Only sixteen per cent (16%) of respondents used condom at last sex. They also found that education played a significant role in the level of HIV/AIDS awareness and perception about using condoms as a measure to reduce HIV/AIDS transmission among the target public. However, education was not found to lead to actual use of condom during sex.

Escobar-Chaves *et al*. (2005) studied the impact of the media on adolescent sexual attitude and behaviour. The scholars were concerned with the available statistics that young people in the United States were engaging in sexual activities at very tender ages and that many of them report having multiple sexual partners. It was reported that some of the children started experimenting with sex before they were thirteen years old. They also alluded that early sexual experience among young people had also been linked with other health-endangering behaviours like alcohol, marijuana, and other drug use. The scholars believed that exposure to sexual content on the media could be a major factor accounting for the rising rate of sexual experimentation at very tender ages. They reviewed available literature which informs that the average American youth spends one third of each day on the media, and that the majority of the time children spent with the media is without parental oversight. They believe that as mass media have been shown to have an influence on a broad range of behaviour and attitude including violence, eating disorders, tobacco and alcohol use, unchecked, excessive exposure to the media by young people could also have impacts on their sexual activeness and may indeed be blamed for the situation where young people now report getting sexually active very early.

Cavill and Bauman (2006) studied the role of the mass media campaigns in changing the way people think about health-enhancing physical activity. The study involved a review of fifteen (15) media campaigns that focused on physical activity. They found that the campaigns achieved high recall as about seventy per cent (70%) of the target groups were aware of the campaigns. Increase in knowledge and attitude to physical activity was demonstrated also. However, population wide increase in physical activities was not achieved. They recommended that to achieve long term behaviour change, media campaigns would need to focus more on targeting to influence variables such as social norms, policies and change in the environment.

Morris and Katzman (2003) studied the impact of the media on eating disorder in children and adolescents. The study involved review of several empirical studies. The search was prompted by the observation that dissatisfaction with body image and unhealthy eating behaviour are important issues for adolescent girls. Many young women believe that they are overweight and want to weigh less. The scholars reported that 44% of adolescent girls believed they were overweight and 60% were actively trying to lose weight even though the majority of these young girls were within normal weight range. This development they found points to positive link between exposure to beauty and fashion magazines and an increased level of weight concerns or

eating disorder symptoms in girls. They report that the concern to look thin like ladies seen on television, in movies or in magazines is the root cause of young girls (9 to 14 years old) seeking to reduce their size at least monthly. The report also indicated that it has been found that both boys and girls (aged 9 to 14 years old) who were making an effort to look like the figures in the media, were more likely than their peers to develop weight concerns and become constant dieters.

A study of the relationship between media and eating disorders among undergraduate college students found that media exposure predicted disordered eating symptomatology, drive for thinness, body dissatisfaction and ineffectiveness in women, and endorsement of personal thinness and dieting in men. In a cross-sectional survey of 548 girls from grades 5 to 12, it was found that those who frequently read fashion magazines were twice as likely to have dieted and three times as likely to have initiated an exercise program to lose weight, than infrequent readers.

These methodologically diverse studies according to the scholars demonstrated that exposure to unrealistic and often unhealthy body images can influence young people's perceptions of their own body shape and size as well as their own sense of body satisfaction. The effect of the media may also extend to the development of specific, and possibly harmful, weight losing behaviour. The study recommended that physicians should regularly inquire about media involved behaviour including television watching, video watching, the use of video games, time spent in front of the computer and listening to radio programs, and types of magazines read. Health care providers, parents, teachers, school officials and other professionals should be aware of the kinds of programs that young people are exposed to, the content of the programs and the media-associated health risks. Those concerned about the media's negative impact on body image, self-esteem, food, dieting and eating disorder need to consider a number of different interventions such as health communication campaigns, entertainment education, media advocacy and media literacy training. Such interventions need to be evaluated with respect to the media's portrayal of the idealized and unattainable images of beauty that young people are exposed to and its impact on disordered eating behaviour and eating disorder. This study essentially suggested that media contents can wield tremendous influence on people's attitude and behaviour to themselves, specifically as it relates to the physical presentation.

International Family Planning Perspectives (2000) noted that women's exposure to mass media is linked to attitude toward contraception in Pakistan, India and Bangladesh. The report stated that exposure to general media programming and to family planning messages through the media had a strong impact on reproductive attitude and behaviour in Pakistan, India and Bangladesh. According to analyses of national survey data, women in all three countries who regularly watch television and those who have been exposed to explicit family planning messages were found to be more likely than other women to approve of family planning. Having listened to explicit family planning messages on radio or television was found to have link with contraceptive use in all three countries. In Pakistan, the analysis of media effects was based on data from the National Demographic and Health Survey of 1990- 1991 and the Pakistan Contraceptive Prevalence Survey of 1994-1995. The samples for these surveys included 6,611 ever-married women aged 15-49 and 7,922 married women aged 15-49, respectively. The husbands of one-third of the women in the earlier survey were also interviewed. Then the data for India was from the 1992-1993 National Family Health Survey, in which 90,000 ever-married women aged 13-49 were interviewed. No husbands were included in the survey. The survey found out that women exposed to television and family planning messages on television or radio were more likely than women without media exposure to approve of family planning. At Bangladesh, overall, 49% of married women were exposed to either radio or television in 1996-1997, and 19% were exposed to both media; 45% heard family planning announcements on either radio or television. Women were more likely to have heard such messages on the radio than to have been exposed to them on television (39% vs. 22%). Both general programming and family planning messages on television and radio were significantly related to family planning attitude in Bangladesh in 1993-1994 and 1996-1997. Women who watched television were 30% more likely than those who did not to approve of family planning in the earlier period and twice as likely to do so during the later period.

In a study conducted by European Monitoring Centre for Drugs and Drug Addiction (2013) it was found that media campaigns have been widely used for the prevention of illicit drug use among young people. The campaigns often address specific substances with the aim of reducing drug use and raising awareness about the associated problems. Most of the campaigns are targeted at young people because of the belief that drug use often starts during adolescence, when young people are more likely to experiment with cigarettes, alcohol and banned drugs. An

analysis of different studies that evaluated the effectiveness of mass media campaigns to influence drug use, intention to use, or the attitude towards illicit drugs of young people under the age of twenty six (26) was carried out. The review found that in most countries, the studies conducted were focused merely on assessing whether people had seen the campaign, had discussed the slogans with their friends, liked the idea or the slogans, or increased their knowledge. It was found that campaigns on drug use can have unintended harmful effects on the public. Evaluation of a media campaign which aimed at reducing cannabis use revealed that young people exposed to the campaign were slightly more likely to think that smoking cannabis with friends would be enjoyable compared with young people who were not exposed to the campaign. The result of the analysis showed that most of the media campaigns had no positive effect on reduction of drug use. It also showed that they had a weak effect on reducing intention to use illicit substances. Reports of possible unwanted effects in terms of young people declaring that after watching a media campaign they were willing to try drugs was a concern to the scholars. They concluded that exposure to media awareness campaigns on drug use might affect individuals differently, depending on their level of awareness. This suggested that being informed may not necessarily have a direct effect on behavioural change. A perception by young people that use of drug is a norm (the perception that everybody is using drugs) may have an unintended impact on them.

2.2.3 Gaps in Literature

The review of literature along studies on media campaigns as presented above, suggests that most of the studies focus on evaluating the influence or impact of campaigns carried out to address specified issues. They essentially focus on knowing if these campaigns are effective in raising awareness and changing attitudes or behaviour. The researcher did not find many studies that sought to examine the existence and scope of communication-intervention initiatives geared towards creating awareness of health risks associated with exposure to noise pollution. This research work seeks to fill-in the identified gap in literature.

2.3. Theoretical Framework: Health Belief Model

Health Belief Model (HBM) is considered a relevant theoretical framework on which this work is anchored. It is the most commonly used theory in health education and promotion. It was developed in the early 1950's by Hochbaum, Rosenstock and Kegels. They were social

psychologists working in the U.S. Public Health Services. HBM is a psychological model that seeks to explain and predict health behaviour by focusing on the attitude and beliefs of individuals (University of Twente, 2012). The foundation on which the model is built is that there are two key components of health-related behaviours. One is the desire to avoid illness or the desire to get well if already ill. Two, is the belief that a given health action will either prevent the occurrence of illness or lead to cure (Boston University, 2016). The key idea of the model is that an individual's health behaviour is determined by the person's perceptions about the health problem and about the measures of decreasing the possibility of its occurrence. The model upholds that one's behaviour can be predicted based on how vulnerable the person considers himself to be. If one believes that he is susceptible to a particular risk and considers the consequences as serious, he is most likely to avoid the risky behaviour (Corcoran, 2007).

Health Belief Model originally talks of four key perceptions that could influence people's health behaviour. They are perceived seriousness, perceived susceptibility, perceived benefits and perceived barriers. The idea of perceived seriousness is that an individual who does not perceive a health risk to be serious, may not be bothered about changing behaviours that could predispose him or her to such health problems. If one thinks that getting a particular sickness as a result of a particular behaviour does not portend any serious concerns, consequences or costs, such a person may not consider changing such behaviour. On the other hand, if one perceives that getting the sickness will lead to serious consequences, he may most likely want to consider changing the behaviour that could expose him to such sickness. Perceived susceptibility suggests that the level to which people perceive their susceptibility to a health problem could influence their behaviour. If they believe that the possibility of their getting a particular disease is high, the likelihood that they will avoid the risky health behaviour that could expose them to the disease will be high. If on the other hand they do not perceive that they have chances of getting the disease, the likelihood that they will bother to change the behaviour will be very low.

The model also upholds that if perceived susceptibility is high, and there is also high perceived seriousness, then, there will be perceived threat. This situation will most likely hasten the likelihood that the new health behaviour will be adopted. As regards to perceived benefits, the model stipulates that if an individual sees changing a risky behaviour as having value and being useful, he or she will most likely change the behaviour. People who believe that adopting a new behaviour will be useful in reducing their chances of getting a serious disease; will most likely

adopt the new behaviour. People are not likely to do something if they do not believe that it is beneficial to them. The last of the initial perceptions in the Health Belief Model is the perceived barrier to change. This deals with how an individual evaluates the obstacles to adopting the new behaviour. For someone to change from an old, risky behaviour to a new healthy one, it is necessary that he or she believes that the benefits of the new behaviour far outweigh the consequences of keeping to the old behaviour. Having this kind of belief will help the person break any barrier which may want to stop him from adopting the new behaviour.

Aside from these four initial perceptions, two concepts were later added to the Health Belief Model. These are cues to action and self-efficacy. HBM believes that cues for action are necessary to influence change of behaviour. Cues to action may include events, advice from people, reminder postcards, warning labels, and television or radio stories about an illness e.t.c. Self-efficacy deals with an individual's belief in his or her ability to do something. If someone does not belief that he or she can do something, such a person is not likely to attempt doing it. The person must also believe that the change will produce benefits that outweigh the barriers to adopting the new behaviour. Similarly, fear of inability to perform a new behaviour correctly can keep one away from trying. In addition to all these, HBM recognizes the possibility of certain modifying variables that may affect an individual's health behaviour despite all the conditions discussed above. These include: individual differences; culture; educational level; past experiences; skills and motivation (Boston University School of Public Health, 2016); Corcoran, (2007); University of Twente (2012).

Health Belief Model is found relevant for this work. For people to take adequate measures to protect themselves against exposure to noise pollution, they should understand (awareness) the enormity (seriousness) of the consequences of exposure to noise without protection. There is also the need for individuals to know that all humans (irrespective of age, gender, status etc) are susceptible to harmful effects of noise or high sounds. This is where information campaigns through the media become very important. Also for the campaigns to be effective, individuals need to believe that there are benefits in staying away from noise or protecting one's hearing and that these benefits outweigh the reasons for not wanting to protect one's hearing. Similarly individuals would need to perceive that they can actually stay away from noise or /and that they have the ability to consistently and successfully use protective devices. They should also be

made to believe that the benefits of using ear protecting device far outweigh the stress or inconveniences it may cause.

2.4. Summary of Literature Review

The review presented in the preceding discussions is here summarised as it relates to the present research work. Noise pollution is a major environmental threat that has enormous capacity to harm the health of individuals in modern cities. The level of noise in Nigerian cities is far above the recommended limits of noise both in residential areas and in commercial / industrial areas. One major reason behind the continued increase in the level of noise in Nigeria and the unconcerned attitude of the government and the people to noise pollution is lack of adequate information / awareness on the health dangers that could be caused by exposure to noise pollution. Urgent measures must be taken to address the issue of increase in noise pollution in Nigeria. One of the key measures recommended by various scholars is the raising of public awareness of the health implications of exposure to noise pollution. From the reviews, there have not been serious documented efforts towards raising awareness on the health risks associated with exposure to noise pollution in Nigeria and about what people can do to mitigate such risk.

The review of empirical studies suggests that it is safe to conclude that the mass media can be very useful when it comes to creating or raising public awareness on issues of public health. However, to use the mass media effectively in creating and raising awareness on the issues with noise pollution in Nigeria, various means of communication, including all the mass media channels, local mobilization and interaction mechanisms should be jointly used. Similarly, localised campaigns with messages specifically tailored for each area should be adopted rather than using a uniform approach and message in a nation-wide campaign. From the review, it can also be concluded that though there are various illnesses that could result from noise pollution, addressing one of those illnesses per campaign message may be more effective than seeking to address all the illnesses at the same time in a single campaign. Victims of noise induced hearing loss and other noise induced illnesses will add to campaign effectiveness if they are involved in the campaigns. Furthermore, the campaigns should not only seek to create general knowledge about the health issues associated with noise pollution. People should be specifically educated and directed to specific places around them where they can go for hearing tests, for purchase of hearing protection devices and for seeking further relevant counselling. The campaigns will be

made more effective also if there is reinforcement by repeating the campaign messages as much as possible over a period of time.

Moreover, it is evident from the reviews that although campaigns have been found to be effective in raising awareness on issues, they may not on their own alone, influence people's attitude and behaviour. Consequently, for campaigns to successfully attempt influencing people's attitude and behaviour as regards to noise pollution in Nigeria, the messages and approaches should be developed and administered based on proven behaviour change theoretical frameworks. This is where Health Belief Model is found to be very relevant in this research work.

2.5 Hypotheses

The following hypotheses were developed for testing in the study:

Hypothesis one:

H_1 : Traders who perceive noise as harmful to their health will significantly walk away from noise generating sources.

H_o : Traders who perceive noise as harmful to their health will significantly not walk away from noise generating sources.

Hypothesis Two:

H_1 : Traders who believe that exposure to noise can affect their hearing will significantly use ear plugs while in a noisy environment.

H_o : Traders who believe that exposure to noise can affect their hearing will significantly not use ear plugs while in a noisy environment.

Hypothesis Three:

H_1 : Traders who believe that routine medical check of their hearing is necessary significantly visit the clinic to check their hearing / ear.

H_o : Traders who believe that routine medical check of their hearing is necessary significantly do not visit the clinic to check their hearing/ear.

CHAPTER THREE: RESEARCH METHODOLOGY

This chapter presents the methodology adopted for the research work. Here, the following are presented: research method, population of study, sample size and sampling techniques, measuring instruments, pre-test and validation of research instrument, as well as data analysis method.

3.1 Research Design

This study adopted the mixed survey method approach. The approach involved the use of structured interview and key informant interview to generate data. Using this approach, the researcher generated both quantitative and qualitative data. The reason for adopting this approach is that using both methods of data collection strengthens the weakness inherent in using only one method. With this design, the researcher gathers both quantitative and qualitative data.

3.2 Study Population

The population of the study was made up of all traders in Onitsha Main Market and Ogbete Main Market. For Onitsha Main Market, the traders are grouped into three zones (Zone 1, 2 and 3) and into one hundred and eighteen (118) lines (Ogbos) dealing on different types of goods and services. The estimated number of stores in Onitsha Main Market is about six thousand, six hundred and ninety three (6,693). This is made up of two thousand, one hundred and one (2101) stores in Zone 1, Two thousand and fifty-nine (2059) stores in Zone 2, and One thousand, seven hundred and twenty two (1722) stores in Zone 3. There are additional eight hundred and ten (810) stores in private buildings at Jonz / Jaqua Plaza and UAC (Onitsha Main Market Census Report, 2003). (See Appendix 2 for a full list of the zones, the lines under them and the number of stores in each line). For the purpose of this work, the population of the stores was used as the estimated population of key traders with the assumption that each store is officially allocated to one particular trader. This figure excludes the apprentices and those who share spaces in the stores. The estimated population of the traders was consequently put at 6,693. For Ogbete Main Market, the population of traders is about five thousand. (Source: Mr Obute Aloysius, Vice President, Ogbete Main Market Amalgamated Traders' Association). There is no document specifying the details of the zones, lines and number of stores in Ogbete Main Market as obtained in Onitsha Main Market. According to Mr Aloysius, there are about 100 commodities lines in the market. Consequently, the total population of study made up of traders in Onitsha and

Ogbete Main Markets is derived as 6,693 + 4,000= 10,698. The population of study is therefore taken as ten thousand six hundred and ninety eight (10,698)

3.3 Sample and Sampling Procedure

Quantitative Sample size determination

The researcher adopted the Australian National Statistical Service (NSS) online sampling calculator to determine the sample size of the study to be administered with the research instrument among the traders. This is widely used by both social sciences and physical sciences researchers. Using the Australian Calculator developed by the National Statistical Service (NSS), the required data were imputed and it automatically generated the sample size. In using this calculator, once the values for the needed variables are provided, the calculator derives the others. The variables supplied include: *Confidence level = 95percent, Proportion = 0.5, Population = 10,698 and Confidence interval = 0.05.* The Australian Calculator gave the sample size of 371. The result was crosschecked with other online sample size calculators including those by Survey System, Raosoft, and Survey Monkey. The result was found to be consistent. Therefore, the sample size for the study among the traders at Onitsha Main Market and Ogbete Main Market is three hundred and seventy one (371).

Qualitative Sample Size

Key informant interview session: To generate qualitative data for the study especially as relates to the demonstration of communication intervention initiative more effectively, the researcher conducted key informant interviews. Those interviewed include: two representatives of the Ministry of Environment in Anambra state, a representative of the Ministry of Information, Anambra State, a representative of the Ministry of Health, Anambra State, an officer of National Environmental Standard and Regulation Enforcement Agency (NESREA), a representative of the media in Anambra state and a representative of the Environmental Health Department, Onitsha Local Government Area, Anambra State. Therefore, seven (7) persons were interviewed in the process of seeking to generate qualitative data. The interviews were conducted only in Anambra State to see if key stakeholders in the state have demonstrated communication intervention initiative as relates to creating awareness on the health risks of exposure to noise pollution.

Sampling Techniques

The sampling technique for the administration of structured interview for this study in the markets included multi-stage, cluster and simple random sampling procedures.

Stage 1 involved the division of the sample size between Onitsha and Ogbete Main Markets. The sample size was therefore divided into 2. This yielded 185, remaining 1. Consequently, 186 traders were selected from Onitsha Main Market while 185 traders were selected from Ogbete Main Market.

Stage 2 involved selecting the participants in their already existing groupings (zones). As indicated earlier, there are three (3) zones in Onitsha Main Market. 186 was divided by the number of zones (3). This resulted to 62. Consequently, 62 traders were selected from each zone to participate in the study. Selecting the 62 traders from each of the three zones was done through random sampling. For Ogbete Main Market, there are 100 commodities lines. Random sampling technique was adopted to select 185 traders from these lines, ensuring that at least one trader was chosen from each line.

3.4 Data Collection Instruments and Data Collection Methodology

Structured interview specifically designed for the study was used as the instrument to generate quantitative data for the study. This instrument was used by the researcher and his assistants who asked the traders questions while recording their responses. The reason for this approach was that most traders may be very busy and unable to fill-in the questionnaire on their own and return same promptly. Some of them may also not be adequately literate to understand the instrument and fill it in completely on their own.

Key informant interview guide was used as instrument for the generation of qualitative data. This was used for interviewing the selected interviewees as indicated in section 3.3 above. The structured interview and key informant interview guide were carefully designed to accommodate the major variables in the study. Key informant interview was also used to substantiate the responses gathered from the structured interview.

3.5 Measurable Variables

The variables measured in this work are: awareness on the danger of exposure to noise pollution; knowledge of preventive practices; practice /adoption of protective measures; communication-intervention initiative.

3.6 Pre-test and Validation of Research Instrument

The validity of the structured interview instrument and key informant interview questions were tested using face validity technique. The instruments were given to the researcher's supervisor, two other communication scholars who are senior lecturers in the Department of Mass Communication, Godfrey Okoye University, Enugu, and two readers. First, they were tested to see if the questions are related to the topic under consideration and whether they actually address the research questions raised for the study. They were also tested for clarity and ambiguity. Corrections were made thereafter.

To check for the reliability of the structured interview, a pre-test was conducted in Onitsha Main Market using pilot study strategy. A total of 20 respondents were drawn for this purpose. The reason was to determine whether the responses would be in line with the results expected from the instrument.

3.7 Data Analysis Method

The quantitative data that were generated from the structured interview were presented in tables and analyzed systematically. The aim was to provide answers to the identified research questions one after another. It means that data that address each research question are presented and analysed under that research question. Chi-square was used to test research hypotheses.

The qualitative data generated through key informant interview were used to complement the quantitative data generated using the structured interview. The data from key informant interview were presented in prose-like manner and analysed thematically.

CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

The chapter deals with data presentation and analysis. As a mixed method study, data presented and analysed include both quantitative and qualitative data. The quantitative analysis focused on data generated from structured interview, while the qualitative analysis looked at data from the key-informant interview exercise.

4.1 Analysis of Quantitative Data

This segment has to do with the analysis of data got from the structured interview.

Table 1: Return Rate

Option	Frequency	Percentage
Returned and used	**355**	**96%**
Mortality rate	**16**	**4%**
Total	**371**	**100%**

The analysis in table 1 above indicates that the study recorded 96% return rate of the research instrument, while 4% of the instrument were not retrieved. At 96%, the return rate appears to be very impressive. Some of the traders asked to be given the instrument to fill in themselves and requested for the researchers to return and collect them. Some of these instruments were not returned.

4.1.1: Analyses of Bio-Data of Respondents

This aspect has to do with the demographics of the respondents.

Table 2: Demographic characteristics of respondents

Characteristics	**Frequency** (n=355)	**Percent (%)**
Gender		
Male	266	74.9
Female	89	25.1
Age Range		
Less than 30 years	118	33.2
30-40 years	91	25.6
41-50 years	129	36.3
50-60 years	16	4.5
Above 60 years	1	.3
Duration of Trading		
Less than 5 years	70	19.7
Between 5-10 years	132	37.2
Above 10 years	153	43.1

From table 2 above, it was revealed that 74.9% of the respondents were male, while 25.1% of the respondents were female. This implies that there were more male respondents than female respondents. It is not surprising as it can be argued that there are more male traders in both markets than female traders.

Analysis of data in table 2 above also revealed that 33.2% of the respondents were less than 30 years, 25.5% were between 30-40 years, 36.3% were between 41-50 years, 4.5% were between

50-60 years, while 0.3% of the respondents were above 60 years. This means that majority of the respondents were between 41-50 years. This is not surprising also as the study targeted shop owners (Ndi oga). Also, the very low percent of respondents who are above 60 years is not surprising too. It can be argued that most 'ndi oga' above 60 years may have retired or handed over their trading business to successors.

From the table above, it was further revealed that 19.79% of the respondents have traded in the markets for less than 5 years, 37.2% for between 5-10 years, while 43.1% of the respondents have traded in the markets from 10 years and above. This implies that majority of the respondents have traded in the markets for over 10 years. Therefore, their responses cannot be said to be that of novices or new comers to happenings in the markets.

4.1.2: Analyses of Psychographic Data of Respondents

This aspect deals with analyzing data in response to the research questions identified in the study.

4.1.2.1: Research Question One: To what extent are traders in Onitsha and Ogbete Main Markets aware of the health implications of exposure to noise pollution?

To respond to this research question, items number 3, 4, 5, 6 and 7 were used.

Table 3: Respondents' opinion on noisy environment being dangerous to human health

Responses	Frequency	Percent
Strongly Agree	174	49.0
Agree	100	28.2
Undecided	28	7.9
Disagree	14	3.9
Strongly Agree	39	11.0
Total	355	100.0

Table 3 above indicates that 174 (49%) respondents strongly agree that noisy environment is dangerous to human health, 100 (28.2%) respondents agree. This means that over 70% of the respondents agree and strongly agree altogether that noisy environment is dangerous to human health. This implies that most traders in Onitsha and Ogbete Main Markets are sufficiently aware that exposure to noise pollution can be dangerous to human health.

Table 4: Respondents' view on whether noisy environment reduces the ability to hear well and can lead to deafness

Responses	**Frequency**	**Percent**
Strongly Agree	126	35.5
Agree	128	36.1
Undecided	4	1.1
Disagree	22	6.2
Strongly Disagree	75	21.1
Total	355	100

From table 4 above, it was revealed that 126 (35.5%) respondents strongly agree that noisy environment can reduce the ability to hear well and can lead to deafness. 128 (36.1%) respondents agreed. This means that over 70% of the respondents agree and strongly agree that noisy environment can reduce the ability to hear well and can lead to deafness. It is clear that most of the traders are aware that exposure to noise pollution can be dangerous to human hearing ability.

Table 5: Respondents' view on whether noisy environment can lead to serious sickness and can cause death

Responses	Frequency	Percent
Strongly Agree	102	28.7
Agree	96	27.0
Undecided	42	11.8
Disagree	48	13.5
Strongly Disagree	67	18.9
Total	355	100.0

From table 5 above, it was revealed that 102 (28.7%) respondents strongly agree that noisy environment can lead to serious sickness and can cause death, 96 (27%) respondents agree. This implies that over 55% of the respondents agree and strongly agree that noisy environment can lead to serious sickness and can cause death. It can be concluded that a slight majority of the respondents believe that exposure to noise pollution can lead to serious sickness and death.

Table 6: Respondents' view on whether noisy environment can lead them to serious sickness that can cause them untimely death as an individual

Responses	**Frequency**	**Percent**
Strongly Agree	78	22.0
Agree	86	24.2
Undecided	30	8.5
Disagree	72	20.3
Strongly Disagree	89	25.1
Total	355	100.0

Analysis in table 6 above shows that 78 (22%) respondents strongly agree that noisy environment can lead them to sickness that may cause untimely death, 86 (24.2%) respondents agree, 30 (8.5%) respondents were undecided, 72 (20.3%) respondents disagree, while 89

(25.19%) respondents strongly disagree that noisy environment can lead to untimely death. This implies that below 45% of the respondents agree and strongly agree that noisy environment can lead them to serious sickness and untimely death. Previously, about 55% of the respondents indicated that they believe that exposure to noise pollution can cause human beings serious sickness and can lead to death. However, when the question was now personalized, some of them do not believe it can happen to them.

Table 7: Respondents' view on whether noisy environment can reduce their own ability to hear well

Responses	Frequency	Percent
Strongly Agree	90	25.4
Agree	146	41.1
Undecided	14	3.9
Disagree	14	3.9
Strongly Disagree	91	25.6
Total	355	100.0

Table 7 above reveals that 90 (25.4%) respondents strongly agree that noisy environment can reduce their own ability to hear well, 146 (41.1%) respondents agree. This implies that over 65% of the respondents agree and strongly agree that noisy place can reduce their ability to hear well. There is an above average acceptance by the traders that exposure to noise can affect their ability to hear well negatively.

Summary of Research Question One: To what extent are traders in Onitsha and Ogbete Main Markets aware of the health implications of exposure to noise pollution?

Findings relating to research question one revealed that majority (over 70%) of the respondents agree and strongly agree altogether that noisy environment is dangerous to human health. It was also revealed that majority (over 70%) of the respondents agree and strongly agree altogether that noisy environment reduces human ability to hear well and can lead to deafness. Further analysis showed that slightly above average (55%) of the respondents agree and strongly agree

that noisy environment can lead to serious sickness that can cause death. This implies that most of the respondents are to a large extent aware of the health implications of exposure to noise pollution.

However, only about 45% of the respondents agree and strongly agree altogether that noisy environment can lead them to sickness that may cause untimely death. This implies that about 10% of those who believe that exposure to noise can cause serious sickness that can lead human beings to untimely death do not believe it can affect them. Similarly, while over 70 % agree and strongly agree that exposure to noise can lead humans to challenges with hearing and deafness, only about 65% of the respondents agree and strongly agree that exposure to noisy environment can reduce their own ability to hear well or lead them to deafness. This implies that about 5% of those who are aware that exposure to noise can lead to loss of hearing and deafness do not believe it can happen to them.

4.1.2.2: Research Question Two: How knowledgeable are traders in Onitsha and Ogbete Main Markets of protective measures to reduce health risks of exposure to noise pollution?

In order to respond to this research question, items number 8, 9, 10, 11 and 12 were used.

Table 8: Respondents' view on whether they can be protected from noise

Responses	Frequency	Percent
True	**132**	**37.2**
False	**223**	**62.8**
Total	**355**	**100.0**

The analysis of table 8 above revealed that 223 (62.8%) of the respondents were of the view that traders cannot be protected from noise.

Table 9: Respondents' view on whether traders can take measures to protect themselves from noise

Responses	Frequency	Percent
True	174	49.0
False	181	51.0
Total	355	100.0

From table 9 above, it was revealed that 181 (51%) of the respondents were of the view that traders cannot take measures to protect themselves from noise. This implies that slight majority of the respondents believe that traders cannot take measures to protect themselves from noise. It suggests that they believe that trading is associated with exposure to noise pollution.

Table 10: Respondents' view on whether traders' use of earplugs can protect them from noise

Responses	Frequency	Percent
True	**88**	**24.8**
False	**267**	**75.2**
Total	**355**	**100.0**

Table 10 above revealed that 267 (75.2%) of the respondents were of the view that it is not necessary for traders to use earplugs to protect themselves from noise. This means that majority of the respondents said that traders' use of earplugs is not necessary.

Table 11: Respondents' view on whether it is important for traders to walk away from noisy place if not using earplugs

Responses	Frequency	Percent
True	252	71.0
False	103	29.0
Total	355	100.0

In table 11 above, it was revealed that 252 (71%) of the respondents were of the opinion that it is important for traders to walk away from noisy place if not using earplugs. This means that majority of the respondents are knowledgeable of the fact that it is important for traders to walk away from noisy place if not using earplugs.

Table 12: Respondents' view on whether it is important for traders to visit the clinic to check their hearing or ear

Responses	Frequency	Percent
True	192	54.1
False	163	45.9
Total	355	100.0

Table 12 above revealed that 192 (54.1%) of the respondents were of the opinion that it is important for traders to visit the clinic to check their hearing or ear. This implies that slightly above half of the respondents are knowledgeable of the importance of visiting the clinic to check their hearing or ear periodically.

Summary of Research Question Two: How knowledgeable are traders in Onitsha and Ogbete Main Markets of protective measures to reduce health risks of exposure to noise pollution?

Findings to this research question revealed that 62% (majority) of the respondents said that traders cannot be protected from noise. It was also revealed that 51% of the respondents said that traders cannot take measures to protect themselves from noise. This implies that above average of the traders believe that noise cannot be avoided by traders and there may not be anything they can do to protect them from noise. They are not adequately knowledgeable that they can be protected from noise. There is need for information campaign in this direction.

A good majority (75.2%) of the respondents demonstrated their lack of adequate knowledge of the need for earplugs as they believe that is not necessary for traders to use earplugs as protective device against noise pollution. They need to be properly informed about the need to use ear plugs while in noisy places. However, majority (71%) of respondents are knowledgeable of the importance of walking away from noisy places. Similarly, over 50% are knowledgeable that it is important to visit the clinic to check their hearing/ ear periodically.

4.1.2.4: Research Question Three: What is the practice of traders in Onitsha and Ogbete Main Markets as it relates to adopting necessary protective measures to reduce dangers of exposure to noise pollution?

To generate data in response to this research question, items number 13, 14, 15, and 16 were used.

Table 13: Respondents' use of earplug to protect their ears from noise

Responses	Frequency	Percent
No	316	89.0
Yes	39	11.0
Total	355	100.0

Analysis of table 13 above shows that 316 (89%) of the respondents said that they do not use earplug to protect their ears from noise. This implies that majority of the respondents do not use earplug to protect their ear from noise.

Table: 14 Respondents' practice of walking away from noise generating areas when their ears are not protected

Responses	Frequency	Percent
No	96	27.0
Yes	252	71.0
Can't say	7	2.0
Total	355	100

Table 14 above, indicates that 252 (71%) of the respondents said they do walk away from noise generating areas when their ears are not protected. The implication of this is that majority of the respondents do walk away from noise generating areas when their ears are not protected.

Table 15: Respondents' practice of visiting the clinic to check their hearing or ear

Responses	Frequency	Percent
No	266	74.9
Yes	82	23.1
Can't say	7	2.0
Total	355	100.0

Table 15 above indicates that 266 (74.9%) of the respondents said that they do not visit the clinic to check their hearing or ear. This implies that majority of the respondents do not visit the clinic to check their hearing or ear.

Table 16: Respondents' practice of reporting noise generating situations to the leadership of the market association

Responses	Frequency	Percent
No	269	75.8
Yes	73	20.6
Can't say	13	3.7
Total	355	100.0

From table 16 above, it was revealed that 269 (75.8%) of the respondents said that they do not report noise generating situations to the leadership of the market association. This implies that majority of the respondents do not see the need to report noise generating situation to the leadership of the market association.

Summary of Research Question three: What is the practice of traders in Onitsha and Ogbete Main Markets as it relates to adopting necessary protective measures to reduce dangers of exposure to noise pollution?

Findings to this research question revealed that 89% of the respondents do not use earplug to protect their ear from noise. It was also revealed that 71% of the respondents do walk away from noise generating areas when their ears are not protected. Further analysis indicated that 74.9% of the respondents do not visit the clinic to check their hearing or ear, while 75.8% of the respondents do not report noise generating situation to the leadership of the market association.

4.1.2.5: Research Question Four: To what extent has communication-intervention been directed towards creating awareness on the dangers of noise pollution to human health in Onitsha and Ogbete Main Markets?

To respond to this research question, items number 17, 18, 19 and 20 were used.

Table 17: Respondents' response to whether there have been campaign efforts by anyone or group to create awareness on the dangers of noise pollution in Onitsha and Ogbete Main Markets

Responses	Frequency	Percent
No	**318**	**89.6**
Yes	**23**	**6.5**
Can't say	**14**	**3.9**
	355	**100.0**

Analysis of table 17 above showed that 318 (89.6%) of the respondents said that there has been no campaign effort by anyone or group directed towards creating awareness of the dangers of noise pollution. This implies that majority of the respondents said there has been no campaign effort by anyone or group towards creating awareness of the dangers of noise pollution in Onitsha and Ogbete Main Markets.

Table 18: Respondents' response to whether they know of any radio or TV program on the dangers of noise pollution and its preventive measures

Responses	Frequency	Percent
No	**278**	**78.3**
Yes	**57**	**16.1**
Can't say	**20**	**5.6**
Total	**355**	**100.0**

From table 20 above, it was revealed that 278 (78.3%) of the respondents said that they do not know of any radio or TV program on the dangers of noise pollution and the preventive measures against it. This means that majority of the respondents do not know of any radio or TV program on the dangers of noise pollution and preventive measures against it.

Table 19: Respondents' response to whether they have received or seen any leaflet, poster or handbill on the danger of noise pollution and its preventive measures

	Frequency	**Percent**
No	**324**	**91.3**
Yes	**16**	**4.5**
Can't say	**15**	**4.2**
Total	**355**	**100.0**

Table 19 above indicated that 324 (91.3%) of the respondents said that they have not seen any leaflet, poster or handbill on the dangers of noise pollution and its preventive measures. The implication of this is that an majority of the respondents have not seen any leaflet, poster or handbill on the dangers of noise pollution and its preventive measure.

Table 20: Respondents' answer to whether there has been meeting of traders where anyone, government or non government agency addressed traders on the danger of noise pollution and its preventive measures

Responses	Frequency	Percent
No	331	93.2
Yes	9	2.5
Can't say	15	4.2
Total	355	100.0

Analysis from table 20 above revealed that 331 (93.2%) of the respondents said that there has never been a meeting of traders where anyone, government or non-governmental agency addressed the dangers of noise pollution or its preventive measures. This means that majority of the respondents have never been in a meeting of traders where anyone, government or non-governmental agency addressed the dangers of noise pollution nor its preventive measures.

Summary of Research Question Four: To what extent has communication-intervention been directed towards creating awareness on the dangers of noise pollution to human health in Onitsha and Ogbete Main Markets?

Findings to this research question revealed that 89.6% of the respondents said there has been no campaign effort by anyone or group towards creating awareness of the dangers of noise pollution in Onitsha and Ogbete Main Markets. Also analysis revealed that 78.3% of the respondents do not know of any radio or TV program on the dangers of noise pollution and preventive measures. Further analysis found that 91.3% of the respondents have not seen any leaflet, poster or handbill on the dangers of noise pollution and its preventive measure. Analysis also revealed that 93.2% of the respondents had never been in a meeting of traders where anyone, government or non-governmental agency addressed the dangers of noise pollution nor its preventive measures.

4.2 Analysis of Qualitative Data

This section presents analysis of data got from key-informant-interview used as instrument for generating qualitative data. Key-informant-interview was conducted with representatives of various ministries and organisations which are stakeholders in matters relating to the environment and public health. The interviews were meant to elicit responses on the ministries' and organisations' awareness of existence of noise pollution in Onitsha Main Market and their efforts as regards to communication intervention initiatives towards helping to create awareness among the public and traders in particular of the health dangers associated with exposure to noise pollution and how to protect themselves from such dangers.

Major themes which relate to noise pollution and communication intervention were identified. The themes include existence of noise pollution, health implications of exposure to noise pollution, knowledge of protective measures, and extent of communication intervention.

The organisations / ministries covered include:

Ministry of Environment in Anambra State: This is the ministry saddled with the responsibility of taking care of environmental matters in Anambra State. The Director,

Environmental Health and Pollution Control and Environmental Health Officer 11, in the Ministry were interviewed respectively.

Ministry of Information, Anambra State: This ministry plans, packages and coordinates the dissemination of information on behalf of the Anambra State government. A Senior Film Production Officer in the ministry was directed to be part of the interview on behalf of the ministry.

Ministry of Health, Anambra State: This ministry is concerned with any matter that relates to the health of residents in the state. They are key stakeholders when looking at noise pollution and its effects on human health in Anambra State. They should be expected to be involved in initiating, planning and executing programmes and actions for the common health of the masses in the state.

National Environmental Standard and Regulation Enforcement Agency (NESREA): This is a federal government agency which sets standards and enforces regulations that seek to make the environment safer for human habitation. Its activities cover the entire nation. They are expected to be at the forefront of initiatives and interventions aimed at combating pollutions in the environment and reducing the dangers of exposure to such pollutions.

Anambra Broadcasting Service (ABS): This is a media organisation owned and operated by Anambra State government. ABS was chosen to represent broadcast media stations in Anambra State. It is believed that broadcast stations are major stakeholders when it comes to communication interventions targeting the general public. They may not be expected to initiate communication intervention programmes on their own, but any such initiative is expected to involve the use of the media. They should have information about such interventions if any.

Environmental Health Department, Onitsha North Local Government Area, Anambra State: This is the department responsible for environmental health matters at Onitsha North Local Government Area of Anambra State. Onitsha Main Market is located in Onithsha North Local Government Area. Grassroots campaigns that concern the market may be expected to be coordinated by the local government area council.

Therefore, a total of seven (7) persons were interviewed in the process of seeking to generate qualitative data for the study.

Issues covered in the interviews with the representatives of the various organisations:

Some of the issues covered in the interview with the representatives of the identified stakeholder-organisations include:

- Awareness of existence of noise pollution in Onitsha Main Market.
- Efforts towards creating awareness on health implications of exposure to noise pollution in the market and in Anambra State in general.
- Knowledge of preventive measures that people can adopt to reduce the health risks of exposure to noise pollution.
- Extent of communication intervention directed to or intended to be directed towards creating awareness on dangers of exposure to noise pollution.

The interviews were collated and analysed to portray identified similarity of knowledge/ levels of awareness and scope of commitment, plans and actions directed towards communication intervention as relates to noise pollution. Those interviewed were major stakeholders in their various organisations and had sufficient capacity and information to represent the views, opinion and practices of their various organisations.

The analysis based on the identified themes is presented below:

Awareness of existence of noise pollution in Onitsha Main Market

All the respondents affirmed that they are sufficiently aware of the existence of noise pollution in Onitsha Main Market. The Director, Environmental Health and Pollution Control in the Ministry of Environment confirmed that they have received several complaints about the level of noise generated in the market. The Environmental Health Officer 11 in the Ministry of Environment affirmed that the level of noise pollution in Onitsha Main Market and all over the state is high. He was quick to add that top leaders in the ministry may not appreciate the level of noise generated in Onitsha Main Market as they do not visit the market themselves. People usually supply whatever they need directly to them. The representative of Anambra Broadcasting Service believes that markets should generally be expected to generate noise. The Environmental Health Officer at the local government level confirmed that the level of noise in Onitsha Main Market is high.

From the above report, it is safe to conclude that all relevant stakeholders are sufficiently aware that noise pollution is an issue of concern in Onitsha Main Market.

Efforts to create awareness about health implications of exposure to noise pollution

All those interviewed indicated that their ministries, departments or organisations are sufficiently aware that exposure to noise pollution can be harmful to human beings. However, they seem to be doing nothing to create such awareness among the general public and traders in particular. Their reasons for not doing anything revolve around bureaucratic bottlenecks, lack of budgetary allocation, and lack of harmony between the various agencies and ministries.

The Director, Environmental Health and Pollution Control in the Ministry of Environment, Anambra State, confirmed that the ministry has not carried out any specific campaign on noise pollution. He said: 'we know the implication of noise to human health that is why we included the issue of enlightenment campaign on noise pollution in our budget estimate. The State House of Assembly removed it and said that enlightenment campaign on noise pollution is of no relevance to be included in the budget. So, we decided to forget about the project'. This reveals that it is not enough for a government agency to know what needs to be done. Getting the necessary budgetary allocation and approval may hinder the execution of such good initiatives / projects. The Environmental Health Officer at the local government level said it is important to conduct information campaigns about the dangers of exposure to noise pollution. However, they have not done so because of lack of manpower, logistics and equipment.

However from the interview, it is clear that some government agencies do not think it is important to create awareness about serious environmental and health issues that could affect the masses. The representative of National Environmental Standard and Regulation Enforcement Agency (NESREA) believes that everyone is expected to know that exposure to noise pollution is harmful to human health. According to him, there is no need to create awareness about it. He further said that talking to traders about the danger of exposure to noise pollution will not achieve any result. Hear him: 'Besides, if you tell them, what will they do? They won't leave their business or avoid switching-on their generators to sell. The issue of noise pollution cannot be curbed'. He also said that they see such activity as a waste of time as the traders may not listen to them.

The Ministry of Health is waiting for official information / directives before they can think of what to do about letting people know the danger of exposure to noise pollution. The Ministry of Information is waiting for the Ministry of Trade and Commerce to bring the matter of noise pollution to them as the Ministry of Commerce is the ministry overseeing markets. If that is not done, then, they are not officially aware that there is need to initiate a campaign about dangers of noise pollution and how to reduce such dangers in the market. This reveals that lack of central coordination of policies, programs and activities by government agencies could be one of the factors militating against execution of needed initiatives and programs for the public good. Ministries and agencies believe that they will not do what they should do except another ministry or agency officially passes the ball to them.

Similarly, the study reveals that national/ federal agencies like NESREA cannot initiate or execute any project at state levels no matter how important the projects are without getting directives from their national headquarters in Abuja. The representative of NESREA said that they have informed both the federal and state governments about the issue of noise pollution not only in the market but all over the state and that till an order is given, they can do nothing.

Extent of communication intervention directed towards creating awareness of health dangers associated with exposure to noise pollution

The study reveals that almost all the relevant ministries, agencies or organisations expected to be stakeholders in environmental and public health matters do not have any intention of doing anything relating to communication intervention about dangers of exposure to noise pollution. All the interviewees had earlier indicated that they haven't taken any significant steps relating to communication intervention targeted at creating awareness of the dangers of exposure to noise pollution. The researcher sought to find out what they would likely do in this direction in the future.

Interestingly, most of the respondents affirmed that they do not have any intention or plan of embarking on communication intervention about the health dangers associated with exposure to noise pollution in the future and so cannot be thinking about what they may likely do in that direction. The Ministry of Information said that they can only get involved if they have official information about the situation and added that the only thing they can do is to bring up the matter

in meetings to see if anything can be done. The representative of NESREA in Anambra State noted that they won't take any step except there is a national program and directive from the national headquarters. The two representatives of the Ministry of Environment indicated that the best communication intervention approach will be visiting the market to communicate with the traders and the use of the radio respectively. The Director believes that use of the Mass Media may not be necessary while the Film Officer believes that using the radio will be more effective as radio will reach more people. The officer however noted that it is the responsibility of their planning committee to decide on the best approach. At the grassroots level, the Environmental Health Officer at Onitsha North Local Government Area believes that the best approach would be to take the campaign down to the markets as traders are usually very busy. She also noted that printing of handbills and sponsoring of programs on radio, television and through other local channels should be done by the government.

Non-governmental organisations' involvement in communication intervention towards creating awareness of health dangers associated with exposure to noise pollution and how to prevent them

The researcher sought to find out from the Ministry of Environment if there are non-governmental organisations that are interested in matters relating to noise pollution in the environment in the state. The response was negative as the two representatives of the ministry said that they are not aware of any such agencies. Representative of Anambra Broadcasting Service also said they are not aware of any non-governmental organisation showing interest in the area of campaigns related to health risks of exposure to noise pollution and how people can protect themselves against such risks.

4.3 Discussion of Findings

As earlier established, the quantitative aspect of this study distributed 371 copies of the questionnaire from which 96% was returned and used, while 4% of the questionnaire was not retrieved. Demographic analysis revealed that 74.9% of the respondents were male, and that majority of the respondents which is 36.3% were between 41-50 years. It was also revealed that 43.1% of the respondents have stayed in Onitsha Main Market for over 10 years.

Research Question One: To what extent are traders in Onitsha and Ogbete Main Markets aware of the health implications of exposure to noise pollution?

Findings relating to research question one revealed that over 70% of the respondents agree and strongly agree that exposure to noise is dangerous to human health. It was also revealed that over 70% of the respondents agree and strongly agree that exposure to noise pollution reduces human ability to hear well and that it can lead to deafness. Further analysis showed that 55% of the respondents agree and strongly agree that noisy environment can lead to serious sickness that can cause death.

However, only about 45% of the respondents agree and strongly agree altogether that exposure to noise pollution can lead them to sickness that may cause untimely death. This implies that about 10% of those who believe that exposure to noise can cause serious sickness that can lead humans to untimely death do not believe it can happen to them. Similarly, while over 70 % agree and strongly agree that exposure to noise can lead humans to loss of hearing and deafness, only about 65% of the respondents agree and strongly agree that exposure to noisy environment can reduce their own ability to hear well or lead them to deafness. This implies that about 5% of those who are aware that exposure to noise can lead to loss of hearing and deafness do not believe it can happen to them. Some of them told the research team that 'it is not their portion'. In conclusion, majority of the traders are sufficiently aware that exposure to noise pollution has adverse implications for human health, but they do not think they are susceptible to such harmful impacts of exposure to noise pollution.

The findings support the views of World Health Organization, (2015), that noise is a major nuisance in the environment that is being underestimated. Most people do not understand that it is a threat that can cause many short-and-long-term health problems. Similarly, Fligor (2015) argued that the negative impact of noise on hearing is often neglected by many people because the harm takes place gradually.

Research Question Two: How knowledgeable are traders in Onitsha and Ogbete Main Markets of protective measures to reduce health risks of exposure to noise pollution?

Findings relating to this research question revealed that 62% of the respondents said that traders in Onitsha and Ogbete Main Markets cannot be protected from noise. They believe that you cannot expect to be a trader in a busy market and not be exposed to noise. Most of them told the researchers that a trader who doesn't want noise is not yet ready for trading business. To them, exposure to noise is part of trading experience.

It was also revealed that 51% of the respondents said that traders cannot take measures to protect themselves from noise. Moreover, 75.2% of the respondents said that it is not necessary for traders to use earplugs to protect themselves from noise. Some of them told the researchers that it will be stupid for a trader to cover his ears when he / she should be busy calling for potential customers. Interestingly, a good majority (71%) of the respondents know that it is important for traders to walk away from noisy place if they are not using earplugs. It was also revealed that 54% of the respondents know that it is important for traders to visit the clinic to check their hearing or ear, even though 45.9% of the respondents were of the opinion that it is not important for traders to visit the clinic to check their hearing or ear.

These findings indicate that though traders are aware that exposure to noise pollution is harmful to human health, so much needs to be done as relates to educating traders on the possibility and availability of protective measures to protect themselves from noise pollution as many of them do not yet know it is possible and important to protect their ear if they must stay in a noisy place. It does appear that they view noise as merely a discomfort as majority of the traders know that it is important to walk away from noise. Traders' knowledge of the need to visit the clinic to check their hearing periodically is found to be slightly above average.

Qualitative data generated for the study indicates that no significant campaign effort has been made to enlighten the general public in Anambra State and traders in Onitsha Main Market in particular on the health implications of exposure to noise pollution and protective measures to reduce the risk of exposure to noise pollution. Some relevant agencies do not think it is necessary to enlighten the people about health implications of exposure to noise pollution as they assume that it should be common knowledge. Ministries that believe that they should do something in

that direction are handicapped by bureaucratic bottlenecks and non-allocation of financial resources.

These findings agree with Mead (2007), who reported that the problem with noise is that most people become used to noise with time and that the dangerous effects of noise are so imperceptible at the on-set. However, despite being accustomed to noise, the adverse physiological effects are still occurring, impacting negatively on human health. The findings also agree with Onwumere (2015), who observed that noise is everywhere in Nigeria and that some people assume that it is normal. This explains why they do not think seriously about measures to protect themselves from exposure to noise.

Research Question Three: What is the practice of traders in Onitsha Main Market as it relates to adopting necessary protective measures to reduce dangers of noise pollution?

Findings relating to this research question revealed that 89% of the respondents do not use earplug to protect their ear from noise. That means that practice of using ear plug to protect the ear is very low among the traders. This is not surprising as majority (75.2%) of the respondents earlier indicated that use of earplug is not necessary. It was also found that 71% of the respondents do walk away from noise generating areas when their ears are not protected. This agrees with findings made earlier that most traders (71%) are aware that it is important to walk away from noisy environment.

Further analysis indicated that 74.9% of the respondents do not visit the clinic to check their hearing or ear. Meanwhile 54.1% had earlier indicated that they know that it is important to visit the clinic to check their hearing. It is surprising that over 70% do not do what a slight majority of them know is necessary. This suggests that knowledge alone does not automatically translate to positive action. More needs to be done to sensitize the traders on the need to adopt the practice of routine medical checks. It was also found that majority (75.8%) of the respondents do not report noise generating situation to the leadership of the market association. They do not get bothered. This suggests that they see noise pollution as the norm and nothing strange. It appears that they are used to noise.

These findings support the position of Fligor (2015), who argued that the negative impact of noise on hearing is often neglected by many people because the harm takes place gradually. The

scholar also observed that people do not pay attention to their hearing until their own hearing loss deteriorates to the point where it leads to communication disorder. Meanwhile, the traders are not to be blamed seriously as there has not been any reported campaign effort to make them aware of the need to protect themselves from noise and how they can do that.

Research Question Four: To what extent has communication intervention been directed towards creating awareness on the dangers of noise pollution to human health?

Findings to this research question revealed that 89.6% of the respondents said there has been no campaign effort by anyone or group to create awareness on the dangers of noise pollution in Onitsha and Ogbete Main Markets. Analysis also revealed that 78.3% of the respondents do not know of any radio or TV program on the dangers of exposure to noise pollution and preventive measures. Further analysis found that 91.3% of the respondents have not seen any leaflet, poster or handbill on the health risks associated with exposure to noise pollution and its preventive measure. Analysis also revealed that 93.2% of the respondents have never been in a meeting of traders where anyone, government or non-governmental agency addressed the dangers of noise pollution and its preventive measures. These findings imply that there is a very wide gap in campaign efforts towards creating awareness about health implications of exposure to noise pollution and what people can do to protect themselves from such harm.

Qualitative data generated for the study also suggests also that communication intervention in the area of health risks associated with exposure to noise pollution and how people can protect themselves is not only non-existent in the major markets studied. It appears to be non-existent in Anambra State generally. The only organisational intention that was directed towards creating awareness of dangers of exposure to noise pollution was killed at the State House of Assembly. The responses also reveal that no non-governmental agency is doing anything in the area of communication-intervention on noise pollution in Anambra State. Based on the research findings, it is evident that there is zero level interest on the matter both at the governmental level and at the level of non-governmental agencies. It is surprising that no agency both governmental and non-governmental is showing any interest or concern in the area of letting people know about the dangers of exposure to noise pollution and how to protect themselves from such dangers despite the well documented associated health risks. Meanwhile, some other health related issues record a number of agencies jostling to get involved and do something.

These findings support the views of Anomaharan (2013), who noted that Nigerians do not view exposure to noise and the health risks associated with it seriously and that unlike other nations, there are no serious actions to control and regulate the peril of excessive noise in Nigeria.

4.4 Test of hypotheses

4.4.1 Test of hypothesis one: H_o Traders who perceive noise as harmful to their health will significantly not walk away from noise generating sources.

To test for this hypothesis, data from table 7 was cross-tabulated against data from table 15 which centered on harmful effect of noise and walking away from noise generating sources respectively.

Respondents' view on whether noisy environment is dangerous to human health * Respondents' view on whether it is important for traders to walk away from noisy place if not using earplugs cross tabulation

			Respondents view on whether it is important for traders to walk away from noisy place if not using earplugs		
			True	False	Total
Respondents view on whether noisy environment is dangerous to human health	Strongly Agree	Count	174	0	174
		Expected Count	123.5	50.5	174.0
		% within Respondents view on whether noisy environment is dangerrous to human health	100.0%	.0%	100.0 %
		% within Respondents view on whether it is important for traders to walk away from noisy place if not using earplugs	69.0%	.0%	49.0 %
	Agree	Count	78	22	100
		Expected Count	71.0	29.0	100.0
		% within Respondents' view on whether noisy environment is dangerous to human health	78.0%	22.0%	100.0 %

		% within Respondents view on whether it is important for traders to walk away from noisy place if not using earplugs	31.0%	21.4%	28.2 %
	Undecided	Count	0	28	28
		Expected Count	19.9	8.1	28.0
		% within Respondentss view on whether noisy environment is dangerous to human health	.0%	100.0%	100.0 %
		% within Respondents view on whether it is important for traders to walk away from noisy place if not using earplugs	.0%	27.2%	7.9%
	Disagree	Count	0	14	14
		Expected Count	9.9	4.1	14.0
		% within Respondents view on whether noisy environment is dangerous to human health	.0%	100.0%	100.0 %
		% within Respondents view on whether it is important for traders to walk away from noisy place if not using earplugs	.0%	13.6%	3.9%
	Strongly Disagree	Count	0	39	39
		Expected Count	27.7	11.3	39.0
		% within Respondents view on whether noisy environment is dangerous to human health	.0%	100.0%	100.0 %
		% within Respondents view on whether it is important for traders to walk away from noisy place if not using earplugs	.0%	37.9%	11.0 %
Total		Count	252	103	355
		Expected Count	252.0	103.0	355.0

	% within Respondents' view on whether noisy environment is dangerous to human health	71.0%	29.0%	100.0%
	% within Respondents' view on whether it is important for traders to walk away from noisy place if not using earplugs	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.717E2[a]	4	.000
Likelihood Ratio	322.236	4	.000
Linear-by-Linear Association	238.741	1	.000
N of Valid Cases	355		

a. 1 cells (10.0%) have expected count less than 5. The minimum expected count is 4.06.

Result

Using chi-square likelihood ratio, the test of hypothesis revealed that calculated value 322.236 is greater than table values 9.3351, hence the null hypothesis was rejected and the alternate accepted. This means that "traders who perceive noise as harmful to their health will significantly walk away from noise generating sources".

4.4.2 Test of hypothesis Two: H_o Traders who believe that exposure to noise can affect their hearing will significantly not use ear plugs while in a noisy environment.

To test for this hypothesis, data from table 8 was cross-tabulated against data from table 14 which centered on harmful effect of noise and using ear plug respectively.

Respondents' view on whether noisy place reduces the ability to hear well and lead to deafness * Respondents view on whether traders' use of earplugs can protect them from noise Cross-tabulation

			Respondents view on whether traders' use of earplugs can protect them from noise		
			True	False	Total
Respondents' view on whether noisy place reduces the ability to hear well and lead to deafness	Strongly Agree	Count	88	38	126
		Expected Count	31.2	94.8	126.0
		% within Respondents' view on whether noisy place reduces the ability to hear well and lead to deafness	69.8%	30.2%	100.0%
		% within Respondents view on whether traders' use of earplugs can protect them from noise	100.0%	14.2%	35.5%
	Agree	Count	0	128	128
		Expected Count	31.7	96.3	128.0
		% within Respondents' view on whether noisy place reduces the ability to hear well and lead to deafness	.0%	100.0%	100.0%
		% within Respondents view on whether traders' use of earplugs can protect them from noise	.0%	47.9%	36.1%
	Undecided	Count	0	4	4
		Expected Count	1.0	3.0	4.0

		% within Respondents' view on whether noisy place reduces the ability to hear well and lead to deafness	.0%	100.0%	100.0%
		% within Respondents' view on whether traders' use of earplugs can protect them from noise	.0%	1.5%	1.1%
	Disagree	Count	0	22	22
		Expected Count	5.5	16.5	22.0
		% within Respondents' view on whether noisy place reduces the ability to hear well and lead to deafness	.0%	100.0%	100.0%
		% within Respondents' view on whether traders' use of earplugs can protect them from noise	.0%	8.2%	6.2%
	Strongly Disagree	Count	0	75	75
		Expected Count	18.6	56.4	75.0
		% within Respondents' view on whether noisy place reduces the ability to hear well and lead to deafness	.0%	100.0%	100.0%
		% within Respondents' view on whether traders' use of earplugs can protect them from noise	.0%	28.1%	21.1%
Total		Count	88	267	355
		Expected Count	88.0	267.0	355.0
		% within Respondents' view on whether noisy place reduces the ability to hear well and leads to deafness	24.8%	75.2%	100.0%
		% within Respondents, view on whether traders' use of earplugs can protect them from noise	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.126E2[a]	4	.000
Likelihood Ratio	243.326	4	.000
Linear-by-Linear Association	99.532	1	.000
N of Valid Cases	355		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is .99.

Result

Using chi-square likelihood ratio, the test of hypothesis revealed that calculated value 243.326 is greater than table values 9.3351, hence the null hypothesis was rejected and the alternate accepted. This means that "traders who believe that exposure to noise can affect their hearing will significantly use ear plugs while in a noisy environment".

4.4.3 Test of hypothesis Three: H_o Traders who believe that routine medical check of their hearing is necessary significantly do not visit the clinic to check their hearing/ear.

To test for this hypothesis, data from table 16 was cross-tabulated against data from table 18 which centered on harmful effect of noise and walking away from noise generating sources respectively.

Respondents view on whether it is important for traders to visit the clinic to check their hearing or ear * Respondents view on whether they visit the clinic to check their hearing or ear when they feel sick Cross-tabulation

			Respondents view on whether they visit the clinic to check their hearing or ear when they feel sick			
			No	Yes	Can't say	Total
Respondents view on whether it is important for traders to visit the clinic to check their hearing or ear	True	Count	192	0	0	192
		Expected Count	143.9	44.3	3.8	192.0
		% within Respondents view on whether it is important for traders to visit the clinic to check their hearing or ear	100.0%	.0%	.0%	100.0%
		% within Respondents view on whether they visit the clinic to check their hearing or ear when they feel sick	72.2%	.0%	.0%	54.1%
	False	Count	74	82	7	163
		Expected Count	122.1	37.7	3.2	163.0

	% within Respondents' view on whether it is important for traders to visit the clinic to check their hearing or ear	45.4%	50.3%	4.3%	100.0%
	% within Respondents view on whether they visit the clinic to check their hearing or ear when they feel sick	27.8%	100.0%	100.0%	45.9%
Total	Count	266	82	7	355
	Expected Count	266.0	82.0	7.0	355.0
	% within Respondents view on whether it is important for traders to visit the clinic to check their hearing or ear	74.9%	23.1%	2.0%	100.0%
	% within Respondents view on whether they visit the clinic to check their hearing or ear when they feel sick	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.399E2[a]	2	.000
Likelihood Ratio	175.223	2	.000
Linear-by-Linear Association	128.809	1	.000
N of Valid Cases	355		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 3.21.

Result

Using chi-square likelihood ratio, the test of hypothesis revealed that calculated value 175.223 is greater than table values 5.3391, hence the null hypothesis was rejected and the alternate accepted. This means that "traders who believe that routine medical check of their hearing is necessary significantly do visit the clinic to check their hearing/ear".

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The findings of the study revealed that 74.9% of the respondents were male, and that majority of the respondents which is 36.3% were between 41-50 years. It was also revealed that 43.1% of the respondents have stayed in Onitsha and Ogbete Main Markets for over 10 years.

Results in answer to research question one revealed that over 65% of the respondents are aware to a large extent that exposure to noise pollution has serious health implications. It was also revealed that over 70% of the respondents agree and strongly agree altogether that exposure to noise pollution can reduce the ability to hear well and can also lead to deafness. 55% of the respondents agree and strongly agree that exposure to noise pollution can cause serious sicknesses and can cause death for human beings. However, only 45% of the respondents agree and strongly agree altogether that exposure to noise pollution can lead them to sicknesses that may cause untimely death. Similarly, only 65% of the respondents agree and strongly agree altogether that exposure to noise pollution can reduce their own ability to hear well.

Findings related to research question two revealed that above 60% of the traders had low knowledge of the possibility of being protected from noise pollution and of the preventive measures to take in order to avoid the health challenges associated with noise pollution. It was also revealed that 51% of the respondents do not know that traders can take measures to protect themselves from noise. 75.2% of the respondents are not aware that it is necessary to use earplugs to protect themselves from noise. 71% of the respondents are aware that walking away from noisy environment, if not using earplugs, is necessary. It was also revealed that 54% of the

respondents believe it is important for traders to visit the clinic to check their hearing or ear as a routine even when they are not feeling sick.

Findings related to research question three revealed that 89% of the respondents do not use earplug to protect their ear from noise. It was also revealed that 71% of the respondents do walk away from noise generating areas when their ears are not protected. Further analysis indicated that 74.9% of the respondents do not visit the clinic to check their hearing or ear, while 75.8% of the respondents do not report noise generating situations to the leadership of the market association.

Findings to research question five revealed that 89.6% of the respondents said there has been no campaign effort by anyone or group to create awareness of the dangers of noise pollution in Onitsha and Ogbete Main Markets. Also analysis revealed that 78.3% of the respondents do not know of any radio or TV program on the dangers of exposure to noise pollution and its preventive measures. Further analysis found that 91.3% of the respondents have not seen any leaflet, poster or handbill on the dangers of exposure to noise pollution and its preventive measures. Analysis also revealed that 93.2% of the respondents have never been in a meeting of traders where anyone, government or non-governmental agency addressed the dangers of noise pollution and its preventive measures. Qualitative data analyzed also indicated that no government agency had embarked on any communication intervention about noise pollution. There is also no non-governmental agency showing any interest to carryout communication-intervention about dangers of exposure to noise pollution in Anambra state.

5.2 Conclusion

The study concluded that although the traders studied have high exposure to noise pollution within their surroundings and are aware of the possible health implications, they do not yet adopt and practice the basic protective measures against health risks of exposure to noise pollution. In other words, their awareness did not translate to deliberate efforts geared towards protection against the dangers of noise pollution and this could be linked to the low communication intervention in that regards. This could also be because although most of them know that exposure to noise pollution is harmful to human health yet, they do not believe the harm could affect them as individuals.

5.3 Recommendations

It is recommended that:

1. Awareness campaigns should be floated by relevant agencies and organizations on the health dangers associated with exposure to noise pollution without protection. This is very important for traders in large markets like Onitsha and Ogbete Main Markets. This should be given all seriousness.

b). Awareness campaigns in this regards should be very explanatory on the health implications of exposure to noise pollution.

c). All avenues of information should be used to educate traders on the protective measures they can adopt against health risks associated with exposure to noise pollution. This is very important as about 60% of the traders have low knowledge of the measures to take in order to reduce the impact of exposure to noise pollution.

2. Traders should be encouraged to take steps that will help secure their health, especially against noise pollution. This could include the use of earplugs, sound proof generators and equipment. Traders should be made to see the need of regular visits to health clinics to check their hearing/ear even when they do not think that they have developed any ear related health issues.

3. There is urgent need to carry out advocacy visits to the legislative arm of government. This is very important so as to sensitize them on the dangers of noise pollution. It is hoped that this may change their perception that enlightenment campaign about dangers of exposure to noise is of no relevance.

b). All relevant agencies concerned with environment and public health should be sensitized to establish necessary bureaucratic orders that will lead to actions in this regards by field officers.

4. Governments at all levels should make budgetary allocations in support of campaigns about dangers of exposure to noise pollution.

5. Non-governmental agencies that have shown interest in other public health issues should be called upon to look at the direction of the health dangers associated with exposure to noise pollution in Onitsha and Ogbete Main Markets in particular and in Anamabra State in general.

5.4 Contribution to Knowledge

The contribution of this work to knowledge is the fact that it revealed that certain health related challenges do not seem to get the attention of relevant agencies, organizations and individuals in Nigeria, even when these health issues are predominant, well spread and well documented by the World Health Organization, other international organizations, as well as local authorities and scholars concerned with health matters. The study reveals that much needs to be done as relates to creating awareness of the issues associated with noise pollution.

The study also revealed the facts that traders may know what should be done to protect their health but their practice may not be positively associated with their knowledge if they are not adequately sensitized and mobilized to take the necessary actions.

Another significant contribution made by this work is that legislative and bureaucratic processes may slow down, hinder and kill important health-communication intervention initiatives. Consequently, beyond academic and official documentations of such health issues, this study has highlighted the importance of carrying out advocacy visits to relevant legislative and executive organs of government as well as to other non-governmental agencies.

5.5 Recommendation for Further Studies

It is recommended that future researchers should look at the motivating factors that induce health related campaigns sponsored by relevant government and non-governmental agencies. This might help reveal why some serious health challenges do not have any significant campaigns at the level of social communication or mass media, while some receive more than adequate attention. There is need to interrogate why no governmental and non-governmental agency is interested in communication intervention about health dangers of exposure to noise pollution despite wide documentation of these dangers. Also, given that 89% of the respondents do not use earplug to protect their ear from noise, and that practice of other protective measures is very low, it may be safe to argue that the chances of traders having ear related health challenges and other health challenges associated with exposure to noise is high. Who knows whether this situation could be interrogated as one of the possible causes of high mortality rate in the state and in other parts of the country? Who knows if this is associated with the observation that one of the signs of ageing in this part of the world is difficulty in hearing? Future researches could explore these issues also.

It is also recommended that other researchers could look at awareness and communication intervention as regards to religious noise pollution, recreational noise pollution, and noise pollution in residential areas.

5.6 Limitation of the Study

Some of the traders who were chosen to be part of the study bluntly refused to participate in the study. Some were afraid that the research team may be enumerators who came to collect data that would be used for tax purposes. Some asked the research team to allow them fill-in the questionnaire themselves and return to collect them but they did not return the instrument. Some kept telling the team to come back after a while as they are still busy attending to customers and have not completely filled in the research instrument. However, the number of returned instruments was considered enough to generate the needed data as all zones and lines of the markets were adequately covered.

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Appendix 1

Department of Mass Communication,
Nnamdi Azikiwe University, Awka,
Anambra State.

April 8, 2017.

Dear Respondent,

REQUEST FOR YOUR PARTICIPATION IN RESEARCH PROCESS.

I am a student of the above named institution conducting a research relating to awareness about issues of noise pollution with focus on traders in Onitsha Main Market.

I request that you cooperate with me and my research assistants as we seek to get your responses to the questions contained in the research instrument.

Please note that there are no right or wrong responses. Your identity is also not required. You are therefore required to feel free to indicate responses to the questions that best reflect your personal experience, beliefs and practices as relates to issues of noise pollution in Onitsha Main Market. Your responses are very important as they shall be used as data that will be analysed and used for scholarly and related purposes.

Thank you so much for participating in the process.

Yours faithfully,

Mr Benjamin Onwukwalonye.

QUESTIONNAIRE

General Guideline: Please indicate the response that you consider most appropriate.

Section A: Respondents' Demographic Data

1. Gender. (a). Male [ ]. b). Female [ ]
2. Age range. (a) Less than 30 years [ ]. (b) 30 – 40 years [ ]. (c) 41-50 years [ ]. (d) 50- 60 years [ ]. (e) Above 60 years [ ]

b. How long have you been trading in Onitsha Main Market?

a). less than 5 years. [ ] (b). Between 5 – 10 years [ ]. (C) Above 10 years [ ]

Section B:

3. Do you agree that staying in a noisy environment can be dangerous to human health?
   (a). Strongly Agree. (b). Agree. (c). Undecided. (d) Disagree. (e). Strongly Disagree.
4. Do you agree that staying in a noisy place can reduce someone's ability to hear well and may also lead to deafness?
   (a). Strongly Agree. (b). Agree. (c). Undecided. (d) Disagree. (e). Strongly Disagree.
5. Do you agree that staying in a noisy place can lead someone to other serous sicknesses that can cause death?
   (a). Strongly Agree. (b). Agree. (c). Undecided. (d) Disagree. (e). Strongly Disagree.
6. Do you agree or perceive that there is the possibility that staying in noisy place can expose you to serious sicknesses that can lead to untimely death?
   (a). Strongly Agree. (b). Agree. (c). Undecided. (d) Disagree. (e). Strongly Disagree.
7. Do you agree that there is the likelihood that staying in a noisy place can reduce your own ability to hear well?
   (a). Strongly Agree. (b). Agree. (c). Undecided. (d) Disagree. (e). Strongly Disagree.
8. A trader in a busy market like the Onitsha Main Market can be protected from noise?
   (a) True. (b) False
9. There are measures a trader can take to protect him/her from noise while in the market?
   (a) True. (b) False
10. Using ear plugs to protect your ears while in a noisy place is very necessary?

(a). True. (b) False

11. It is important to walk away from a noisy place if you are not using ear plugs?

    (a). True. (b) False

12. It is important to visit the clinic to check your hearing / ear from time to time though you do not think you have any problem with your ear/hearing?

    (a). True. (b) False

13. Do you use ear plug to protect your ear when in a noisy place?

    (a). No. (b). Yes. (c) Can't say.

14. Do you visit an ear clinic to check your hearing / ear when you don't feel sick?

    (a). No. (b). Yes. (c) Can't say.

15. Do you usually walk away from noise generating sources/areas when your ears are not protected?

    (a). No. (b). Yes. (c) Can't say.

16. Do you report noise generating situations to the leadership of the Market Association?

    (a). No. (b). Yes. (c) Can't say.

17. Has there been any efforts /campaign by anyone or group seeking to create awareness about dangers of noise pollution and preventive measures in Onitsha Main Market?

    (a). No. (b). Yes. (c) Can't say.

18. Do you know of any radio / television programme on the dangers of noise pollution and preventive measures in Onitsha Main Market?

    (a). No. (b). Yes. (c) Can't say.

19. Have you received or seen any leaflet, poster or handbill on danger of noise pollution and preventive measures being distributed in Onitsha Main Market?

    (a). No. (b). Yes. (c) Can't say.

20. Has there been a meeting of traders were anyone, government or non-governmental agency addressed the traders on the dangers of noise pollution to human health and preventive measures?

    (a). No. (b). Yes. (c) Can't say.

Appendix 11

Department of Mass Communication,
Nnamdi Azikiwe University, Awka,
Anambra State.

April 5, 2019.

Dear Respondent,

REQUEST FOR YOUR PARTICIPATION IN RESEARCH PROCESS.

I am a student of the above named institution conducting a research relating to awareness, knowledge and action about issues of noise pollution with focus on traders in Ogbete Main Market, Enugu.

I request that you cooperate with me and my research assistants as we seek to get your responses to the questions contained in the research instrument.

Please note that there are no right or wrong responses. Your identity is also not required. You are therefore required to feel free to indicate responses to the questions that best reflect your personal experience, beliefs and practices as relates to issues of noise pollution. Your responses are very important as they shall be used as data that will be analysed and used for scholarly and related purposes.

Thank you so much for participating in the process.

Yours faithfully,

Onwukwalonye Benjamin C

QUESTIONNAIRE

General Guideline: Please indicate the response that you consider most appropriate.

Section A: Respondents' Demographic Data

1. Gender. (a). Male [ ]. b). Female [ ]
2. Age range. (a) Less than 30 years [ ]. (b) 30 – 40 years [ ]. (c) 41-50 years [ ]. (d) 50- 60 years [ ]. (e) Above 60 years [ ]
b. How long have you been trading in Ogbete Main Market?
   a). less than 5 years. [ ] (b). Between 5 – 10 years [ ]. (C) Above 10 years [ ]

Section B:

3. Do you agree that staying in a noisy environment can be dangerous to human health?
   (a). Strongly Agree. (b). Agree. (c). Undecided. (d) Disagree. (e). Strongly Disagree.
4. Do you agree that staying in a noisy place can reduce someone's ability to hear well and may also lead to deafness?
   (a). Strongly Agree. (b). Agree. (c). Undecided. (d) Disagree. (e). Strongly Disagree.
5. Do you agree that staying in a noisy place can lead someone to other serous sicknesses that can cause death?
   (a). Strongly Agree. (b). Agree. (c). Undecided. (d) Disagree. (e). Strongly Disagree.
6. Do you agree or perceive that there is the possibility that staying in noisy place can expose you to serious sicknesses that can lead to untimely death?
   (a). Strongly Agree. (b). Agree. (c). Undecided. (d) Disagree. (e). Strongly Disagree.
7. Do you agree that there is the likelihood that staying in a noisy place can reduce your own ability to hear well?
   (a). Strongly Agree. (b). Agree. (c). Undecided. (d) Disagree. (e). Strongly Disagree.
8. A trader in a busy market like the Ogbete Main Market can be protected from noise?
   (b) True. (b) False (c) Can't say
9. There are measures a trader can take to protect him/her from noise while in the market?
   (b) True. (b) False (c) Can't say
10. Using ear plugs to protect your ears while in a noisy place is very necessary?
   (a). True. (b) False

11. It is important to walk away from a noisy place if you are not using ear plugs?
    (a). True. (b) False
12. It is important to visit the clinic to check your hearing / ear from time to time though you do not think you have any problem with your ear/hearing?
    (a). True. (b) False
13. Do you use ear plug to protect your ear when in a noisy place?
    (a). No. (b). Yes. (c) Can't say.
14. Do you visit an ear clinic to check your hearing / ear when you don't feel sick?
    (a). No. (b). Yes. (c) Can't say.
15. Do you usually walk away from noise generating sources/areas when your ears are not protected?
    (a). No. (b). Yes. (c) Can't say.
16. Do you report noise generating situations to the leadership of the Market Association?
    (a). No. (b). Yes. (c) Can't say.
17. Has there been any efforts /campaign by anyone or group seeking to create awareness about dangers of noise pollution and preventive measures in Ogbete Main Market?
    (a). No. (b). Yes. (c) Can't say.
18. Do you know of any radio / television programme on the dangers of noise pollution and preventive measures in Ogbete Main Market?
    (a). No. (b). Yes. (c) Can't say.
19. Have you received or seen any leaflet, poster or handbill on danger of noise pollution and preventive measures being distributed in Enugu Main Market?
    (a). No. (b). Yes. (c) Can't say.
20. Has there been a meeting of traders were anyone, government or non-governmental agency addressed the traders on the dangers of noise pollution to human health and preventive measures?
    (a). No. (b). Yes. (c) Can't say.

Appendix 111

Key Informant Interview Guide

The following ideas derived from the research questions guided key informant interview questions and follow up questions administered to the select representatives of the identified stakeholders on the subject matter of the research.

1. The first question will seek to find out what the stakeholders are doing / have done in order to create awareness about issues of noise pollution among traders in Onitsha Main Market in particular and the general public.
    - Follow up questions.
2. The second question will seek to find out the communication strategy designed by the stakeholders and if such strategy is designed to improve the knowledge level of traders on how to prevent the dangers of noise pollution to human health.
    - Follow up questions.
3. The third question will seek to find out the channels that the stakeholders believe are better in effectively reaching traders in Onitsha Main Market with campaign messages.
    - Follow up questions.
4. The third question will seek to find out if there are non-governmental organisations or other stakeholders involved in campaigns on noise pollution in Onitsha/ Anambra state.
    - Follow up questions.

Appendix 1V

Responses to key informant interview:

Interview with Mrs Ebele Ezeanata,

Director, Environmental Health and Pollution Control, Ministry Of Environment, Anambra State.

Question: Is your ministry aware of the existence of noise pollution in Onitsha Main Market?

Answer: Yes! Very much aware

Question: So, what has this ministry done to raise awareness and sensitize the people of the dangers of exposure to noise pollution?

Answer: The Ministry of Environment has not done anything about it. We know the implication of noise to human health which made us include it in the capital estimate so that people could be enlightened but when it was brought up in the state House of Assembly, it was annulled. They said that the issue of noise is of no relevance. So we decided to forget about the intended project.

Question: Okay! What kind of strategy were you hoping to use in order to achieve this goal?

Answer: First of all, we wanted to procure a noise meter that will help us to measure the amount of noise in Onitsha that is to know the exact decibel. Then, we planned sensitizing and educating the masses on the implication of noise to their health.

Question: Do you plan doing the education with any media, newspaper, Radio, TV etc?

Answer: No! We planned to go there ourselves, get the traders together and talk to them directly so that they can ask direct questions if they have any.

Question: Are you aware of any non-governmental organization that is conducting a campaign on noise pollution in Anambra state?

Answer: To the best of my knowledge, there is none!

Question: So the bottom line is that without directives or approvals, you cannot do anything to sensitive the people about noise

Answer: Yes! We can't because we work with orders here and we follow due processes.

Interview with an Anonymous Officer of

National Environmental Standard and Regulation Enforcement Agency (NESREA)

(Note: He doesn't want his name mentioned)

Question: Is your agency aware of the menace of noise pollution in Onitsha Main Market?

Answer: Yes our agency is aware because we have received complaints from the residents of Onitsha.

Question: Is there any campaign you have done to sensitize the people on the harmful effects of noise pollution on their health?

Answer: The last sensitization we did as regards to noise was three (3) years ago, and since then nothing has been done, even till this very moment

Question: So, knowing that noise pollution is harmful to human health, why haven't your ministry done anything since three years?

Answer: The reason is because we work on directives from our headquarter in Abuja. We haven't gotten a go ahead order to do any form of sensitization. So until then, nothing is going on. But NESREA and the Ministry of Environment have tried to bring to the notice of the federal and state government the issue of noise pollution in Onitsha Main Market but until they give an order, we can't do anything.

Interview with a Director in the Ministry of Health,

Anambra State.

Qustion: Is the Ministry of health in Anambra state doing anything in form of sensitizing traders in Onitsha Main Market and the general public about the harmful effects of exposure to noise pollution?

Director: Everybody knows that noise could be harmful to human health, so I don't think there is need creating awareness and telling them. Besides, if you tell them, what will they do? Of course they won't leave their goods or avoid switching- on their generators to sell. So the issue of noise pollution cannot be curbed.

Qusrtion: During interaction with some of the traders in Onitsha Main Market, they seem not to be aware that noise pollution can be harmful to their health. So I think the Ministry of Health should have plans of informing them so that they can at least be aware of the dangers it can pose to their health.

Director: As of now, the Ministry is not planning any sensitization program on noise pollution because they see it as a waste of time as those traders may not even listen to them.

Question: But ma, I still think they should be informed through the media so that they will at least be cautious

Director: Well until then, but for now, nothing has been done to that effect.

Interview with Mr Agustine Aniesona,

Environmental Health Officer 11, in the Ministry of Environment, Anambra state.

Question: Is your Ministry aware of existence of noise pollution in Onitsha Main Market?

Augustine: Of course, the Ministry is very much aware of it. Noise is measured in decibels. The level of noise that is tolerated in Nigeria is 80 decibels and I think that the level of noise in Onitsha Main Market is beyond 90 decibels.

Question: So what are you doing as key stakeholders to sensitize the traders in Onitsha Main Market on the issue of noise pollution?

Augustine: For now, we are not doing anything about creating awareness but there was a publication in an international journal about Onitsha being the most polluted city in the whole world.

Question: When you are set to make plans of creating awareness on noise pollution, which of the media would you be thinking of using?

Augustine: Since I am not in the planning committee, I would not know that, but I think that radio reaches to people easily. Again, you should try and get a sound meter to measure the amount of noise in Onitsha to know the exact decibel. So, until this is ascertained, I don't think the Ministry will take any action.

Question: Have you heard of any non-governmental organizations trying to campaign on noise pollution in Onitsha Main Market or the state in general?

Augustine: Well I haven't heard or seen any non-governmental agency campaign on noise pollution.

Interview with Mrs. Harriet Ajoku,

Senior Film Production Officer, Ministry of Information

Question: Has there been any attempt by your Ministry to create awareness or pass information to the traders in Onitsha Main Market and elsewhere about harmful effects of noise pollution?

Harriet. The issue of noise in Anambra State especially in Onitsha Main Market is a terrible shit. Personally, I am aware of the menace of noise pollution in Onitsha but some of the high positioned people in the Ministry may not be aware because they have people that supply products for them.

Question: So, ma, you are trying to say that the Ministry of Information has done nothing to sensitize the people about noise pollution.

Harriet: That is what I am trying to say. Nobody has reported to the Ministry so far about the noise pollution in Onitsha Main Market and since it's so, there is no way you can set out to tackle a problem you are not aware of.

Me: But ma, this is the Ministry of Information, I thought your duty is to get information and pass to the public.

Harriet: Not exactly. Now, it is the duty of Trade and Commerce industry to report to the Ministry of Information but since they haven't reported yet, it is seen that the ministry knows nothing about the menace and so, they don't yet involved. The Ministry will be involved when they are aware of the noise pollution in Onitsha, but the only thing I can do is to bring it up in our next meeting so that something can be done about noise pollution in Onitsha Main Market**.**

Interview with Mrs Kate I.G Okeke

Head of Program, Anambra Broadcasting Service Awka,

Question: Is your organization aware of the situation of noise pollution in Onitsha Main Market?

Answer: Yes we are.

Question: Has your organization carried out any form of program or campaign to sensitize the people on the dangers of exposure to noise pollution.

Answer: No

Question: Why if I may ask?

Answer: The reason is that we have not really gotten a complaint from any of the traders.

Question: So, nobody or organization has come to your studio to say anything on noise?

Answer: No, none that I know of

Question: Do you have plans of using any of your programs to create awareness on the dangers of noise pollution considering the importance of creating awareness or noise?

Answer: For now no! We don't have any such intention.

Interview with Mrs Janefrances Kosisochukwu,

Environmental Health Officer, Environmental Health Department,

Onitsha North Local Government Area, Anambra State

Question: How would you rate the level of noise in Onitsha Main Market?

Answer: The level of noise in Onitsha Main Market is very high. The market is usually overcrowded with traders, both buyers and sellers. Sellers usually make a lot of noise in order to advertise their products. Some make use of loudspeakers and generators in the market.

Question: Are you aware that exposure to noise pollution can be harmful to human beings?

Answer: Yes. Exposure to noise pollution can lead to impaired hearing. It makes the environment unfavourable for human beings and can lead to many health issues.

Questions: Do you think that people can do anything to protect themselves when in noisy environment?

Answer: Yes. When in a noisy environment, it is advisable to wear ear plug. It is also important to avoid spending much time in such environment.

Question: Do you think it is important to conduct information campaign to inform the public, especially traders of the dangers of exposure to noise pollution?

Answer: Yes. I think it is very important to conduct such campaigns because traders may not be aware of the effects of exposure to noise pollution on their health.

Question: As you know of the importance of such campaign, what have your department done in that direction?

Answer: We have not embarked on such campaigns because we do not have adequate manpower for such campaign. We also lack logistics and equipment for such exercise.

Question: What methods do you think should be adopted if you want to carry out such campaign to the traders in the future?

Answer: The information should be taken to the traders at the market. You know that traders are always very busy. Also, handbills should be printed and handed to them. They can refer to the handbills later. Government should also sponsor programs on radio, television and through other local communication channels where dangers of exposure to noise pollution will be discussed.

Appendix V

THE REPORT OF THE CENSUS COMMITTEE, ONITSHA MAIN MARKET TRADERS UNION

PREABLE

Following the resolution of Onitsha Main Market Trader's Union reached during a meeting held on 15th October 2003, the union resolved as follows:

1. That census shall be conducted to know the exact number of stalls/shops in Onitsha Main Market.
2. The number of private stalls under the Umbrella of Main Market.
3. The number of boots and tables that are enjoying the services of the Onitsha Main Market.
4. That the committee shall make results available in a report to Onitsha Main Market.
5. That the following persons shall constitute the Census Committee.

i.	Emmanuel Atuegbu	Zone III	Chairman
ii.	Hon. Leo Ukatu	Zone II	Secretary
iii.	Hon. F. M. Akaolisa	Zone I	Member
iv.	Innocent Okeke	Zone I	Member
v.	Hon. Kengeorge Okafor	Zone I	Member
vi.	Mr. Ezekiel Duru	Zone II	Member
vii.	Stanley Madukasi	Zone II	Member
viii.	Don. Mary Elemuo	Zone III	Member
ix.	Patrick Okoloafor	Zone III	Member
x.	Valentine Ndukauba	Zone III	Member
xi.	Geogory Maduakor	Zone II	Member
xii.	S. O. Okeke	Zone I	Member
xiii.	Hon. Basil Okeke	Zone III	Member

And that the line chairmen and secretaries shall assist the committee to discharge these assignments.

INAUGURATION

This committee was inaugurated by the chairman of the market Mr. Obi Egbuna during the Morning Prayer session on Monday, 20th October 2003. The chairman used the occasion to highlight entire traders the essence of the census and the benefits of the census as well. In compliance to the resolution of the union and in pursuance of the noble cause, the committee moved into action on 27th October 2003. During the exercise the committee faced some constraints ranging from non compliance of some chairmen and secretaries to wait and assist the committee in dictating where boundaries between lines are.

And threat by some watch nights affected the progress of the exercise. Above all, the following are statistics and results of the concluded census.

ZONE 1

Total number of stalls in Zone 1 is 2101 ½.

Total number of human fence/sample portions/table at park 1 and upper Johnson 169.

ZONE II

Total number of stalls in zone II is 2059.

Total boots along bright street and at the security tower is 31.

Total tables at the park II 189.

Total stalls at Niger line (in dispute) 10

Total stalls in Jonz plaza (private) 168.

ZONE III

Total stalls in zone III is 1722 ½.

OVERALL RESULT IN ZONE 1, 2 AND 3

Total number of stalls in Main Market is 5,883

Total number of stalls in private building at Jonz/Jaqua plaza and at UAC 810 ½.

Total stalls in Jaqua plaza 471 (stalls)

Total number of line in the market is 118

Total number of unequal lines in each zone are as follows:

Zone I 35 lines

Zone II43 lines

Zone III 40 lines

Total number of stalls both in Main Market and Private Buildings are 6,693 ½.

CONCLUSIONS

The administration of the market shall rely on the above statistics and the result there in because it was done in good faith so that it shall be a working document for the planning and management of the market.

ZONE I

S/N	NAMES OF LINES	CHAIRMAN/SECRETARY	STALLS
1	C. P. White House	Gab. Ogbachalu	103 ½
2	Market Authority	Ifeanyi Ugochukwu	19 ½
3	Police Line	Dom Ibe 91 ½ down	107 ½
4	Chunkin Mansson	Innocent Agudiegwu	87
5	Cammeroon line		24
6	No 1 front line	Sylvester Uche 34 ½ +44	78 ½
7	Local God line		27 ½

8	Dutch line		52
9	Madress line		68
10	Lucky line	Mike Udo	32
11	George main line	Nso Okafor	90
12	Abuja line	Pius Egwuenwu	26
13	Blessed line	S. M. Okoye	73
14	Airport – Indian line	Ezechima	62
15	Ikemba line		91
16	Seaport line	Innocent Okeke	76 ½
17	Air Condition		81
18	First line	Adigwe Ugochukwu	30 ½
19	Main line	George Okafor	81
20	Hong Kong line	John Nzeakor	81
21	R1 Front line	Nwude	48
22	Capital line		31
23	Circle line	J. C. Ezeokonkwo	34
24	State line		83 ½
25	Concord line	C. Okechukwu	84
26	Co-operative		91 ½
27	Fashion line		
28	First Bank line	Cletus Okwudinka	
29	Bank line		50
30	Upper Johnson	Anthony Osude	41
31	Lagos line Textile	Innocent Amamchukwu	
32	Ado line	Igwebuike Okafor	21

33	Dustbin part 1	Onwurah 21 down 47 up	
34	New Republic	I.K Chukwu	40
35	Human Fence/Sample Portion/tables	92+46+31	169

ZONE II

S/N	NAMES OF LINES	CHAIRMAN/SECRETARY	STALLS
1	Major Lagos line Article	Barr. Molokwu	96
2	Bonus line	R. Anasonye	27
3	Thoma line		26
4	Independence line	Chukwujekwu	46
5	Freedom line	Donates U. A.	48
6	Decent line	B. Nwachukwu	53
7	Federal line	B. Nwabueze	50
8	Academic line	Leo Ukatu	26
9	Education line	A. Ndubuizu	91
10	Pionnier line		59 ½
11	Democratic	Ossy	14
12	Good name	Victor Aguzie	15
13	Zion line	Eric Nwakobi	44
14	Stationary line	Francis Ihiekwoaba	82
15	Charity line		25
16	Bicycle parts line		152
17	United front line	Leo Okeke	61

18	Upper united front line	S. Uzoukwu	28
19	Best U line	Ndukwu	85
20	Santana line	Isaac Agbodike	84
21	Current line	J. C. Chukwu	13
22	Jewelleries	Ezeoduma	174
23	Optical line		18
24	Progressive line	John	18
25	British line	Kenneth	34
26	Niger line 35M/mkt	Okey Okala	100
27	Universal Square	Patty Nwaiwu	14
28	Millennium Planzar		49 Occupied & 5 Unoccupied
29	Millennium Square	Eric Nderi	60
30	First U.A.C. line	Vitalis	23 M/mkt & 51 ½ private
31	New World line	Innocent	36 private
32	U.A.C. line	Innocent Nwanze	26 private & 35 M/mkt.
33	New Heaven line	Gregory Maduakor	19 private
34	Main Gate line	Alphonsus Ezenwa	38 private
35	Omenic line	Kevin Osualla	52 private
36	F.C.T line	Moris Ezeani	55
37	Chidera line	Beth	107
38	Favour line	Sunday Afoudo	73
39	Transformer line	Beth	60 ½

40	R^2/ Front line	G. A. Okonkwo	30
41	Senator Anah	Emma	24
42	Mandela Square	Onwa Ugiri	25
43	Eagle	Okosisi	19
	Boots at bright street/security tower		31
	Table at pork II		189
	Stalls at Niger line in dispute		10

ZONE III

S/N	**NAMES OF LINES**	**CHAIRMAN/SECRETARY**	**STALLS**
1	National line	I. G. Ekeh	45
2	Holy wood plazar	Dom Enemuo	43/3 unoccupied
3	London line	James Ezumezu	18
4	Indonesia line	Calistus Ogigwe	26
5	Sample line	Mrs. G. Okonkwo	60
6	Matchet line	Jude Muoneghe	41
7	Matchet line	47 ½ M/stall & 30 open hall	77 ½
8	Ocean line	Augustine Nwadiogu	19
9	God's own line	Emenike	47
10	Industrial line	Mr. Ifedimandu	49
11	Unique line	Rufus Arirguzo	22
12	Trinity line	Fidelis Azubuogu	44
13	River side	E. Ogbuchi	71

14	Odu Igbo	Mrs. Rose Obi 67 stall, 2 warehouse & 18 stall	87
15	Potash line		19
16	Tobacco line		128 ½
17	Peace line	Ichie Igirigi	25 ½
18	Ekoh line	Humphry Ajonuma	9
19	Fishing line	Val. Ndukauba	47
20	Parkin Stan	Emeka Ahabonu	43
21	Modern line	Isaac Mbaoma	20
22	Electric line		26
23	Lamtern line	Sunday Ejike	23
24	Kings line		22
25	Paradise line	John Omesi	22
26	Famous line	Tobias Ezeoba	21
27	Bethel line	Christian Chimenta	20
28	Service line	Uba Celestine	29
29	Plate line	Charles Nwaogu	27
30	New American line	Clement Ezechukwu	26
31	New Kingdom line	Clement Mbachu	26
32	Anointed line	Ben Asomugha	25
33	Victory line	Uche Okpechukwu	23
34	Water side line	Silas Nnadi	39 ½
35	Okirika “A”	Chukwuma Mba	36 ½
36	Okirika “B”	67 ½ down/10 up	77 ½
37	Okirika “C”	81 down/ 43 ½ up	124 ½ , 11

			empty
38	Okirika “D”	John Onuchukwu Mba (71 down/12 up)	83
39	Okirika “E”		51
410	Jesus Super Power	39 down/ 12 up	71