



## PSYCHOSOCIAL EFFECTS OF TINNITUS ON THE ELDERLY INDIVIDUALS WITH NORMAL HEARING ABILITIES IN IBADAN, OYO STATE NIGERIA

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### ABSTRACT

*The study sampled 130 elderly listeners comprising 68 males and 72 females, aged between 65 and 74 years and resident in both urban and rural areas of Ibadan metropolis as the participants for the study under a descriptive research design of the ex post facto type. A standardized Tinnitus Research Questionnaire (TRQ) consisting of twenty items with a reliability coefficient of 0.90 was the instrument used for data collection to answer the three research questions and four hypotheses. The data collected based on the research questions were analysed with the use of mean and chi-square, while Pearson's chi-squared test and Independent t-test were used to test the null hypotheses at 0.05 level of significance. It was discovered that due to tinnitus, majority of the participants experienced concentration difficulty and despair. Majority of them also felt frustrated and manifested some kinds of abnormal behaviour due to tinnitus. However, there was no significant difference between psycho-social reactions of elderly listeners sampled in rural and urban areas. Based on these findings, it was recommended that elderly individuals should avoid exposure to noise, emotional stress, worry and unprescribed drugs; and should be encouraged to go for audiological tests at regular intervals.*

**Keywords:** *Elderly listeners, hearing abilities, hearing loss, psychosocial reactions, tinnitus*

### INTRODUCTION

Several changes occur in the human internal and external structures as human beings grow and advance in age. These changes always leave human being to internal homeostatic imbalances and environmental insult which may pose as a threat to the survival of the humans (Barker, 1998). Thus, as man advances in age, the balance of the body changes, some tissues become deteriorated, the bone disposition and re-absorption dis-regulate greatly, and the human joint movement becomes less fluid as a result of ageing.

Ageing could be described as a natural phenomenon by which man advances in age from infancy or early childhood to old age. According to Marotta, Marone and Quintero (2002), ageing is the progressive changes in the personal appearance or functional capacity as one grows old. Due to these progressive changes, some pathological disorders may be experienced as a consequence of ageing. The disorders include coronary heart disease, ischaemic heart disease, hypertension, loss of hair in the cochlea leading to alterations in the perception, recognition and discrimination capabilities of the auditory organs (Frantz & Ferrell-Torry 1993; Coser, Costa, Coser & Fuduka, 2000). Consequently, the elderly individuals tend to show regular age-related decline in functions of hearing with marked evidences of poor auditory functioning and constant tinnitus- being the most condition with ageing

The condition known as Tinnitus can be described as a kind of hearing disorder in form of continuous buzzing or ringing of sounds in the human ears or brain. It is a perception of sound that is not related to an acoustic source/sound. Tinnitus is experienced as an auditory sensation without the presence of an acoustic stimulus. Tinnitus can also be defined as the perception of sound within the human ear in the absence of corresponding external sound signals. It is usually a subjective phenomenon and always very difficult to measure using objective test protocols, such as comparison of noise of known frequency and intensity as in an audiometric test. Tinnitus is often rated clinically on a simple scale from 'slight' to 'catastrophic' condition according to the practical difficulties it imposes on the afflicted persons in addition to interference with sleep, quiet activities and normal daily activities (Jastreboff, 1995). Tinnitus is not just an unwanted noise, rather it is extremely unpleasant and often interferes with enjoyment of music and concentration. It can make verbal communication impossible, and can cause depression. Axelsson and Ringdahl (1989) described tinnitus as debilitating disabilities for human beings and should be regarded as a



phantom perception of sound in the ears or head, with no external source. To this end, it is important to expatiate that "tinnitus" is usually characterized by the perception of auditory signals experienced in the absence of any external source of sound signals. Tinnitus might also be an auditory phantom phenomenon which is being experienced by 35% of the population at some points in their lives and in about 1% of the population as it seriously interferes with the person's life (Mc Fadden, 1982; Coles, 1984; Axelsson & Ringdahl 1989). Tinnitus affects the quality of life, and it is observed to be more prevalent among men than women (Meikle & Griest, 1989). Although, most of the time, tinnitus is associated with negative effects of life such as early retirement, redundancy and divorce in some cases. Tinnitus may originate from head injury, electric shock, and could also be the side effects of some drugs. In some individuals, tinnitus takes the form of a high pitched whining, electric buzzing, hissing, screaming, humming, tingling or whistling sound or as ticking, clicking, roaring, cricket or tree frog or locusts, tunes, songs or even a pure steady tones, like what is being heard during a hearing test (Berios, 1990; Jastreboff, 1995; Moller, Kleinjung, De Ridder, & Langguth, 2011; Osisanya & Ojetoyinbo, 2013). The three mechanisms proposed to underlie tinnitus, according to Muhnckle (1998), Seki and Eggermount (2003), and Eggermount, (2006) are changes in the level of spontaneous activities in the central nervous system; changes in the temporal pattern of neural activity; and reorganization of tonotopic maps. Some people may experience transient 'ear noises', which are often described as whistling sound in association with sudden temporary hearing loss (Kiang, Moxon & Levine; 1970; Sakata, 2011). The transient ear noises occur periodically and generally resolve within a few minutes, though it might exceed 5- minutes duration (Coles, 1984; Davis, 1995). Although, pathologic tinnitus which is a kind of head noise lasting more than 5- minutes and occurs more than once a week (Dauman & Tyler, 1992; Tyler, Noble, Preece, Dunn & Witt, 2004), while severe tinnitus which is frequently more disabling than hearing loss seems similar to other phantom sensations such as phantom pain and phantom limb (Jastreboff, 1995; Jastreboff & Hazell, 2004).

The observed types of tinnitus however, include continuous ringing, somatic tinnitus, objective tinnitus, and bilateral as well as unilateral tinnitus. Tinnitus can also be classified into two viz-a-viz the extra- aural causes and the intra- aural causes. The extra- aural causes depend upon a derangement of some part of the body in the immediate vicinity of the ear, or may be due to a morbid state of the system, while the intra aural causes occur across the major divisions of the human ear namely the external ear, the middle ear and the inner ear. The conditions of the external ear causing tinnitus include an inflammation of the external meatus, impacted cerumen, deficiency of cerumen, hairs in the meatus or lying on the membrane, and any other foreign body in the canal which presses on the membrane. In the middle ear, adhesive mucus on the inner surface of the membrane in the tympanic cavity, middle ear (post nasal) catarrh, foreign bodies, diseases of the Eustachian tube, acute catarrh or inflammation of the middle ear could also be the cause of tinnitus along the middle apparatus, while in the inner ear, the most common cause of tinnitus is congestion of the labyrinthine circulation.

Tinnitus can negatively affect the life of the people who are living with it. Some of the effects include anxiety, as tinnitus propels anxiety and creates stress. This kind of condition has been observed to be closely associated with some psycho social conditions such as irritation, annoyance, concentration difficulty, depression, and reduced quality of life (Mckenna, 2000; Nelson, 2007; Osisanya & Ojetoyinbo, 2013). Tinnitus can also lead to activity limitation, such as difficulties in executing activities, and can lead to Participation Restriction (PR), which is a kind of problem an individual may experience being involved with life situation (Australian Institute of Health and Welfare, 2002). The effects of tinnitus on the quality of life are highly individualized, (Erlandsson, 2000; Jakes, Hallam, Chambers, & Hinchcliffe, 1996; Meikle & Walsh, 1984). Going by the effects of tinnitus, the women have been noted to have more observed reports of emotional reactions to their tinnitus than men, while men have greater rates of personality disturbance (Erlandsson, 2000). Tinnitus in the



body could lead to emotional stress, bereavement, unemployment, mental illness, annoyance, mood changes, fear and depression.

Individuals with tinnitus may also display a lack of emotion or mood swings. Most times, they tend to show irritability, anxiety change in personality and other negative behavioural characteristics such as restlessness, aggression, anger loss of social judgement and inability to tolerate stress or negative responses. Sleep deprivation is also one of the primary effects of tinnitus, along with the effects on cognition, emotional status and hearing (Dobie, 2004; Tyler, Noble, Preece, Dunn, & Witt; 2004), and can manifest as a single independent problem. Chronic sleep deprivation caused by tinnitus may result in trouble focusing attention (effects on cognition) and give rise to associated frustration and anger (effects on emotional status). Evidence has shown that tinnitus always lead to sleep disturbances, and that patients with sleep difficulties could have the most severe type of tinnitus. With tinnitus, some patients may experience psychological distress and depression; while at times, tinnitus could be stress- induced, as tinnitus makes it very difficult for people to function properly in the society, and thus lead to inability to participate in various situations.

Some medical treatments for tinnitus have not been found beneficial, as most of these treatments may cause negative side effects for some people. The effects could range from constipation, dry lips, while some medications that are being prescribed only aggravate the condition in some people. In some instances, patients might experience discomfort, depression and irritation (Henry, Dennis & Schechter, 2005). Tinnitus may also not be habituated in some patients who typically seek treatment, but rather becomes intrusive, annoying, or disturbing for them and may persist as a recurring problem. Once tinnitus emerges and the individual begins to attend to it, the tinnitus condition becomes audible and may bring out negative beliefs on the part of the individual as the tinnitus will grow worsen and make some people develop hearing impairment and become emotionally depressed because of reduction in the ability to recognize or identify meaningful speech sounds with competing head noise and stress as well as sleep deprivation (Sweetow, 2000; Quintero, Marotta & Marone, 2002)

Over time, it has been observed that effects of tinnitus on the frailty of life are highly individualized (Mckenna, 2000; Erlandsson, 2008) but the condition is so common among the elderly individuals. For instance, in Nigeria, tinnitus has been observed as a condition affecting many people in their old age due to ever increasing rate of high blood pressure or hypertension- related diseases, diabetes, and continuous intake of medications to control or treat the aforesaid diseases as well as past exposure to loud noise. Thus, most patients with tinnitus exhibit series of emotional problems and negative behavioural characteristics in addition to observed reduced auditory perceptual abilities and regular complaints as well as discomfort (Osisanya & Ojetoyinbo, 2013).

In the light of the foregoing the aim of this study was to investigate the psycho-social effects of tinnitus on the elderly listeners in Ibadan metropolis of Oyo State. Specifically, the study intended to determine the psycho-social effects of tinnitus as well as to evaluate the effects of tinnitus on the psycho-social life and interpersonal relationship of individuals with the condition; to determine the relationship between tinnitus and other associated conditions; to examine the differences between elderly individuals with the tinnitus condition in the urban and rural areas; and to determine the gender with the higher incidence of tinnitus.

### **Purpose of the Study**

The purpose of this study is to examine the effects of tinnitus on the elderly listeners without any evidence of hearing impairment prior to the time of the condition. The specific purpose includes to:

1. investigate if tinnitus affects the social and psychological well-being of the Nigerian elderly individuals using Ibadan metropolis as case study.
2. find out whether tinnitus has negative influence on the psycho-social life and interpersonal relationship of the elderly individuals in Nigeria.



3. explain the relationship between tinnitus and associated conditions.
4. determine location difference of elderly listeners with tinnitus.
5. determine gender difference of elderly listeners with tinnitus.

### **Research Questions**

1. Can ringing in the ear lead to concentration difficulty?
2. Is ringing in the ear/head capable of preventing people from attending social functions?
3. Can ringing in the ear make elderly individuals become frustrated about life as well as to develop negative interpersonal relationship (abnormal behaviour) ?

### **Hypotheses Tested**

1. There is no significant relationship between tinnitus and other associated conditions such as hearing loss, nature of past occupation as well as psycho social effects due to tinnitus.
2. There is no significant difference between the reactions of the elderly individuals in the urban areas and their counterparts in the rural areas to the psycho-social effects of tinnitus
3. There is no significant difference between the reactions of the male elderly individuals and the reactions of the female elderly individuals to the psychosocial effects of tinnitus.
4. There is no significant relationship between ringing in the ear and abnormal behavior of the Participants.

### **Methodology**

The study employed an ex-post-facto research design. The survey was based on the observation of elderly people with tinnitus and the attendant effects on their psychological and social life.

### **Population**

The population of the study comprised all elderly individuals in Nigeria, irrespective of their gender, location, religion or culture.

### **Sample and Sampling Technique**

Purposive sampling technique was adopted in selecting the study sample. The samples were the elderly individuals who experience tinnitus without record of any hearing impairment in Ibadan metropolis. The participants were between the ages of sixty-five (65) and seventy-four (74) years. A total of one hundred and thirty (130) participants were involved in the study comprising sixty eight (68) male participants and sixty two (62) female participants.

### **Instrumentation**

The instrument used for the study was a research scale adapted from Tinnitus Research Questionnaire which was developed by Wilson in the year 1991 to gather information about the elderly individual's psycho-social well being consequent upon ringing in the ear. The scale has two (2) sections; which are Sections A & B. Section A was made up of questions in line with personal data of the participants, while Section B comprised twenty (20) research items that measure the major effects of tinnitus on personal, social and psychological life. The reliability coefficient of the adapted TRQ was found to be 0.90 when used for pilot study.



### Procedure

An adapted Tinnitus Research Questionnaire (TRQ) was used to elicit reactions from the participants. The researchers sought the consent and solicited for the participation of the participants, as the objectives of the study were thoroughly explained to them. Thereafter, the questionnaire was given to them individually to survey their reactions. Same procedure was used to elicit responses from the participants in the two locations (urban and rural areas). The researchers monitored the participants so as to rule out contamination. The study was conducted in different areas with the same procedure. Afterwards, the individual reactions were tabulated and analysed.

### Method of Data Analysis

Data generated through the research scale were subjected to descriptive and inferential analysis. Thus, the data were analysed through the use of mean, chi-square, pearson chi-squared test and independent t-test at 0.05 level of significance.

### Answering the Research Questions

#### Research Question 1: Can ringing in the ear lead to concentration difficulty?

Table 1: Concentration difficulty level of the Participants

| Items                   | Frequency  | Percentage |
|-------------------------|------------|------------|
| Not at all              | 5          | 3.8        |
| A little of the time    | 9          | 6.9        |
| Some of the time        | 20         | 15.4       |
| A good deal of the time | 43         | 33.1       |
| Almost all the time     | 53         | 40.8       |
| <b>Total</b>            | <b>130</b> | <b>100</b> |

The Table1 above shows that only 3.8% of the participants claimed not having concentration difficulty even with their tinnitus condition. 73.9% has concentration difficulty as a result of tinnitus. 6.9% and 15.4% of the participants claimed having concentration difficulty little of the time or some of time respectively. Thus, majority of the participants experience concentration difficulty as a result of tinnitus.

### Discussion of findings

Based on the above observation, it has been shown that tinnitus could lead to concentration difficulty, and that individual with ringing in the ear could experience concentration difficulty and psycho social problems such as despair and loneliness as well as other related health problems. Thus, the finding of this study agreed with the finding of The Australian Institute of Health and Welfare (2002). This Institutes' finding stressed that tinnitus makes it difficult for its patients to concentrate on a given task. With the above finding, it has been affirmed that elderly individuals with tinnitus condition irrespective of their location and gender would be experiencing concentration difficulty.

**Research Question 2: is ringing in the ear/head capable of preventing people from attending social functions?**

Table 2: Frequency distribution in line with the extent to which tinnitus prevents people from attending social functions

| Items                   | Frequency  | Percentage |
|-------------------------|------------|------------|
| Not at all              | 60         | 46.2       |
| A little of the time    | 36         | 27.7       |
| Some of the time        | 20         | 15.4       |
| A good deal of the time | 9          | 6.2        |
| Almost all the time     | 5          | 4.6        |
| <b>Total</b>            | <b>130</b> | <b>100</b> |

Table 2 above shows that 46.2% of the participants were not disturbed nor prevented by tinnitus from attending social functions, while, 27.7% were prevented little of the time, 15.4% were affected some of the time, 10.8% of the participants were affected most of the time to attend social functions. This indicates that majority of patients with tinnitus were not prevented from attending social functions in spite of their tinnitus condition.

**Discussion of findings**

With the observed outcome that tinnitus could not prevent people with the condition from attending social functions. Therefore, the people with tinnitus could go to parties and other merry making functions. The finding of this study on the extent to which tinnitus prevents people from attending social functions agreed with the study of Henry, Dennis and Schachter (2005) which showed that tinnitus does not prevent people from attending social functions. Therefore, tinnitus condition cannot limit an individual's social functions, but it can dissuade people from attending social gatherings and activities.

**Research Question 3: Can ringing in the ear make elderly individuals become frustrated about life as well as developing negative interpersonal relationship?**

Table 3: Observed frustration level and trend of negative interpersonal relationship of the participants.

| Items                 | Frequency  | Percentage |
|-----------------------|------------|------------|
| Not at all            | 8          | 6.2        |
| Little of the time    | 8          | 6.2        |
| Some of the time      | 23         | 17.7       |
| Good deal of the time | 31         | 23.8       |
| Almost all the time   | 60         | 46.1       |
| <b>Total</b>          | <b>130</b> | <b>100</b> |



Table 3 above indicates that majority of the samples with tinnitus are being frustrated due to their conditions. 12.4% of the participants experienced no frustration due to tinnitus, although 6.21 claimed being frustrated little of the time, while 69.9% of the participants experienced frustration all the time due to tinnitus. With this observation, it has been clearly shown that tinnitus can make people become frustrated in life, give way towards the development of negative interpersonal relationship.

### Discussion of findings

The above finding has revealed that due to tinnitus people can become frustrated and develop poor or negative interpersonal relationship. Thus, the finding of this study on whether tinnitus brings about frustration and negative interpersonal relationship acquiesced with the findings of Lockwood (1998) who found out that tinnitus brings about frustration to its patients. The finding of this study further corroborated the findings of Dobie (2004), and Tyler, Noble, Preece, Dunn, and Witt (2004) which observed that focusing on tinnitus can give rise to associated frustration and anger. Thus, tinnitus condition could make an individual with such condition to become frustrated and then exhibit aggressive tendencies which could affect the interpersonal relationship as the condition progresses.

### Testing the Hypotheses

#### Hypotheses 1: there is no significant relationship between tinnitus and associated conditions

Table 4: Test of psycho social reactions of the Participants based on effects of tinnitus

| Items                        | Value   | Df | Asymp. Sig (2-sided) |
|------------------------------|---------|----|----------------------|
| Pearson chi-square           | 49.749a | 16 | .05                  |
| Likelihood ratio             | 42.319  | 16 | .05                  |
| Linear-by-linear association | 14.789  | 1  | .05                  |

Table 4 above shows that there is significant relationship between ringing in the ear and other associated conditions, since the p-value =0.000 is less than the 0.05 level of significance. The null hypothesis is therefore rejected. This reveals that individuals with tinnitus experience some psycho social conditions such as feeling of irritation, despair, anxiety mood swing and reduced quality of life. The finding of this study was in line with the findings of Henry, Dennis and Schechter (2005). The researchers observed that tinnitus interferes with a person's quality of life by reducing it to some certain degree. Tinnitus makes any individual with it to develop feelings of despair and loneliness. As a result people with tinnitus develop poor interpersonal relationship and withdrawal syndrome (Henry, Dennis & Schechter, 2005).

#### Hypotheses 2: there is no significant difference between the reactions of the elderly individuals in the urban areas and their counterparts in the rural areas to the psychosocial effects of tinnitus



*Table 5: Tinnitus reactions of the elderly individuals in urban areas and the elderly individuals in the rural area*

| Variable                 | N  | Mean  | SD    | t.cal   | Df  | P  |
|--------------------------|----|-------|-------|---------|-----|----|
| Urban elderly individual | 78 | 12.5  | 5.519 | - 1.552 | 128 | ns |
| Rural elderly individual | 52 | 14.02 | 5.849 |         |     |    |

The result in the Table 5 above shows that location does not contribute or influence any psycho social effect on the elderly individuals with tinnitus. From the table, it could be observed that the mean score of the elderly individuals in the rural area was higher than that of those from the urban area, but the difference was however not significant. The calculated t-value of  $-1.552$  at  $P > 0.05$  shows a non significant difference in the tinnitus reaction among the elderly individuals with tinnitus in urban and rural area.

**Hypotheses 3: there is no significant difference between the reactions of the male elderly individuals and the reactions of the female elderly individuals to the psychosocial effects of tinnitus**

*Table 6: Gender Reactions of the Participants to Tinnitus*

| Variable                  | N  | Mean  | SD    | t.cal   | Df  | P  |
|---------------------------|----|-------|-------|---------|-----|----|
| Male Elderly Individual   | 68 | 13.4  | 6.217 | - 1.712 | 128 | ns |
| Female Elderly Individual | 72 | 15.06 | 6.903 |         |     |    |

The result in the Table 6 above shows that tinnitus is not peculiar to any gender, as it affects the male gender, so it affects the female gender almost in the same proportion or magnitude. Based on the result, the female gender had higher mean score when compared with that of the male gender, but the difference was not statistically significant. Although, this



result has revealed that the female gender is prone to have higher tinnitus reactions compared to their male counterparts.

**Hypothesis 4: there is no significant relationship between ringing in the ear and abnormal behavior of the Participants**

**Table 7: Test for Abnormal Behaviour of the Participants**

| Items                        | Value   | Df | Asymp. Sig (2-sided) |
|------------------------------|---------|----|----------------------|
| Pearson chi-square           | 26.177a | 16 | Ns                   |
| Likelihood ratio             | 27.904  | 16 | Ns                   |
| Linear-by-linear association | 1.684   | 1  | ns                   |

The Table 7 above describes the relationship between ringing in the ear and abnormal behaviour. The result indicates that there is no significant relationship between the ringing in the ear and abnormal behavior. Based on the above finding, the null hypothesis is therefore accepted. Also, the results in table 7 implies that an individual with tinnitus cannot display or show abnormal behaviour, though at times, elderly individuals with tinnitus can react abnormally to tinnitus. The finding of this study is therefore concurred with the findings of Lindberg, Scott, Melin and Lyttkens (1987); Tyler et al, (2004); and Shim (2009) that showed that changes in psychological state can trigger tinnitus, and that negative associations can increase the condition and amplify the perception of tinnitus.

### **Conclusion**

Tinnitus as a condition has been observed to have negative impact on the social and psychological well-being of any individual with such condition. This condition influences concentration difficulty, depression, anxiety, irritation, and abnormal behaviour among individuals with it. Although, tinnitus cannot prevent anyone with it from attending social function, rather it is capable of making individual with it to become frustrated in life and develop negative interpersonal relationship- even abnormal behaviour. Also, it has been observed that the female gender has more tinnitus reactions compared to their male counterparts. There was no significant difference between the psychosocial reactions of the elderly listeners from the rural and urban areas. Therefore, location has no influence on the impact of tinnitus. Further, this study has shown that individual with tinnitus can develop associated conditions such as mood swings and reduced quality of life if the condition is not perfectly managed or treated early.

### **Recommendations**

Based on the findings of this study, the following recommendations will go a long way to reduce the psycho-social effects of tinnitus among the elderly individuals in the society:

- Effective management of presbycusis (hearing loss due to old age), tinnitus and attendant effects must be rehabilitated thoroughly, as early as possible.



- Old people should be encouraged to stay away from noisy area in order to curtail the effect of tinnitus on their general well being
- Free ear screening for the elderly individuals should be done at regular intervals in order to determine their hearing levels and survey the possibility of having tinnitus.
- Awareness programme should be created for the elderly individuals, and even the younger ones to curtail possible effect of tinnitus, while identified patients with tinnitus should go to hospital for treatment immediately the sign is noticed
- Regular health seminar must be organized by the Government and NGOs in order to sensitize the people on the effects of tinnitus as well as the availability of the management or treatment options.
- Government should establish a welfare programme for the elderly as done in advanced countries
- Home to home hearing screening should be organized for the elderly individuals in our society.
- More funds should be made available for more research on tinnitus and the attendant effects on people.

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