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## Attendant Psycho-Social Hearing Reactions of the Elderly with Presbycusis in Rural and Urban Areas of South-West Nigeria

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### Abstract

*This study investigated the psycho-social hearing reactions of the elderly with experience of age-related hearing loss in Lagos, Oyo, and Ogun states of Nigeria. Descriptive survey research design was adopted for the study. Two hundred and forty participants were selected through Multi-stage sampling technique from both the rural and urban areas of the three states sampled. Age-related Hearing loss Reaction Scale (A-RHLS,  $r = 0.85$ ) was used as instrument for data collection. Three null hypotheses were tested at 0.05 level of significance, and data were analysed using Chi-square. The findings revealed that 178 (74.2%) of the participants exhibited negative psycho-social hearing reactions as against 62 (25.8%) who manifested positive psycho-social hearing reactions. The females from the rural areas showed positive psycho-social hearing reactions, compared to their counterparts from urban areas. The study thus confirms a trend of psycho-social hearing reactions among the elderly in Nigeria. The study recommends that elderly individuals with hearing loss be audiologically evaluated and rehabilitated holistically, as this will help them to develop an enduring socio-emotional coping strategies even as their hearing ability degenerates with increase in age.*

**Keywords:** Ageing, elderly individual, hearing reactions, psycho-social reactions, and presbycusis

### Introduction

As human beings grow older in life, several changes become evident along the human's internal and external structures due to increase in age. These changes always occur in form of decline in intellectual, physical, physiological and psychological capacities to utilise all the sensorineural and muscular facilities for human daily activities. Thus, the changes that occur, may leave the individual vulnerable to internal homeostatic imbalances or to environmental factors which may pose threat to the survival of

the humans. Though the age-related changes vary between individuals, it is rather constant for each individual (Araujo, 2002). According to Barker(1998), the observed changes in human life existed due to ageing; which is the process of growing old and a chronological event that is measured in terms of the physical and psychological deficits, deteriorations or disabilities acquired as human's life progresses.

The word 'Ageing' according to Carter (1980), is defined as changes in structures and functions occurring with the passage of time and includes at least three separate processes: intrinsic time-related degeneration; the cumulative effect of extrinsic insult (due to diseases and trauma) and intrinsic insult (due to wear and tear); and age related susceptibility to disease (Tobias, 1988). The World Health Organisation (WHO) categorises ageing population into three: elderly individuals (ages of 60-75 years); old individuals (ages 76-90 years); and the very old of 90 years and above. Each of these classifications must be defined and considered separately with inherent changes and status. Although the effects of ageing and the resultant functional changes make it difficult to categorise as most body systems demonstrate a reserved functional capacity which varies with the individual, and that the limitations in the functional systems depend on the extent of the reserves and the rate of loss on each of the population (Barker, 1998). Indeed, it is also difficult to distinguish the normal changes due to ageing from alterations caused by injury and diseases. The ageing of the human body and of specific organs proceed unevenly as it occurs sooner in some cells and later in others. As human beings grow, there is a loss of hair in the organ of the *corti* of the cochlea. With that, there are usually alterations in the perception, recognition and discrimination capabilities of the auditory organs along some speech frequencies (Coser, Costa, Coser & Fukuda, 2000). Consequently, the perception of sound pitch and amplitude will become diminished, and the affected person cannot hear soft sound. Also, hair-cells are lost from the vestibular apparatus that controls equilibrium and balance. This may result in loss of balance and tendency to hold arms away from the body. This condition is peculiar to elderly individuals and the consequences is manifested as presbycusis.

The observable changes in humans as a result of increased age vary across individuals, likewise, the effects of ageing are bountiful and intrinsic as many years have to pass before differences or changes can be detected in humans. Also, the rate and effects of these changes are individualised with a marked reduction in the sensory capabilities, as the bone deposition and reabsorption disregulate, and human joint movement becomes less fluid, and then requires more effort (Carter, 1980; Herbert, 1992). According to Frantz and Ferrell-Tory (1993), as a result of ageing, some pathological disorders may be experienced. These include coronary heart disease, ischaemic heart disease, hypertension, cerebrovascular accidents, reduced fertility in both gender and heart failure, and presbycusis. More so, there is a steady loss of cerebral cortical neurons leading to diminished sensory motor and associative control. There is also diminished ability to recognise the part of the body being touched as a result of peripheral neural atrophy in the cerebral cortex. In fact, with observation of changes in humans as a result of ageing, Hypocrites (400BC), cited in Bennett and Ebrahim (1995), stressed that old men suffer from difficulty in breathing, catarrh accompanied by coughing, strangury, difficult micturition, pains at the joints, kidney disease, dizziness, apoplexy,

cachexia, pruritus of the whole body, sleeplessness, watery discharge from the bowels; eyes and nostrils. Other pathological disorders common among the aged are dullness of sight, cataract as well as hardness of hearing. In the same vein, ageing brings about changes in the perception of some frequencies of sound.

Presbycusis, describing the effect of ageing on the threshold sensitivity of the auditory system with observable diminished hearing sensitivity for high pitched tones beginning in the fourth decade of human life (Kryter, 1983; Brown, 1990) is of four types: Sensory; Neural; Strial and Cochlear-conductive. All these disorders are caused by selective atrophy of different cochlear structures. Generally, this condition makes hearing losses in the two ears to be symmetrical but progressively slow. Also, it could affect both the peripheral and central structures within the auditory system. The principal alterations associated with ageing occur in the cochlea. Hayes (1985) revealed that primary degeneration of hair cells, nerve cells and fibres as well as changes in the mechanical properties of the supporting structures of the organ of corti, atrophy of the stria vascularis with marked reduction in afferent synapses frequently results in gradual slopping and bilaterally symmetrical pure tone audiogrammic configuration of hearing loss among the older individuals (Nadol, 1979). The behavioural audiogrammes of elderly individuals always show precipitous drop in sensitivity especially for frequencies above 2000Hz. Most often, this type of hearing loss is peculiar to age-related classification which is characterised by the nature of losses or reduction in the ability to understand speech, especially in difficult listening conditions.

Therefore, the sensorial deprivation makes the elderly gradually reduce in their social contact, promoting emotional disorders that are many times devastating (Marques, Kozlowski & Marques, 2004). Consequently this sensorial deprivation exposes the elderly individuals who present with the difficulty to series of psycho-social problems, such as psychological isolation from the sound environment, limited awareness of auditory signs and signals little or no appreciation of music, poor concepts resulting from lack of auditory perceptions, frustrations and stress (Mindel & Vernon, 1991). In fact, to adjust adequately to the dictate of ageing and its attendant effects on the auditory performance, the elderly develop some psycho-social problems due to continued reduction in their hearing ability, and this include higher-levels of distress, somatisation, depression and loneliness (Nachtegaal, Festen & Kramer, 2012). Thus, sensorial abnormalities due to ageing also impairs the continuous flow of exchange of information and perfect reception of all auditory signals among the elderly. This in turn, impact significantly their everyday life, causing frustration, dependence and reduced quality of life, even reduced life expectancy among the elderly population.

Presbycusis was found to have an insidious onset as from the fourth decades of life in the environment, and constitutes an important problem in the society as it occurs in an elderly population that relies on their special senses (especially auditory) to compensate for other age-associated disabilities (Ogunleye & Labaran, 2005). Similarly, Lim, Garringer and Pankratz (2006) reported that individuals of age 60 years and above had a higher risk of presbycusis. Yoon, Howard, Sanqwoo, Bhrama and Sung (2011) concluded that presbycusis tends to correlate with the type of occupation a person is engaged in, and that those who

worked with noisy machines, appliances and in a noisy environment had a higher level of presbycusis. Left untreated, presbycusis of a moderate or greater degree affects communication and can contribute to isolation, depression and possibly dementia, interfering with the quality of life, resisting the ability to interact with others, causing misunderstanding and fatigue, heightening stress and filtering out the myriad of sound experiences that give pleasure and meaning to life (Spoor, 1967). Based on the above, this paper investigated the psycho-social effects of hearing loss on the elderly with experience of presbycusis in rural and urban areas of some states in the southwest geopolitical zone of Nigeria. In order to realise these objectives, three null hypotheses were tested at 0.05 level of significance to guide the study, which are stated thus:

- Ho<sub>1</sub>. There is no significant relationship between the reactions of the urban and rural dwellers to psycho-social hearing related issues.
- Ho<sub>2</sub>. There is no significant relationship between the reaction of the males in urban and rural areas to the psycho-social hearing related issues.
- Ho<sub>3</sub>. There is no significant relationship between the reactions of the females in urban and rural areas to the psychosocial hearing related issues.

## **Methodology**

The study adopted a descriptive research design, while the population comprised all elderly individuals with presbycusis in the South-west, Nigeria. The samples consisted of 240 elderly individuals (60-75 years) with presbycusis, selected through multi-stage sampling technique from Ogun, Oyo, and Lagos states, without any history of hearing loss. The samples were the elderly individuals who met the inclusion criteria, after subjecting a total group of 416 willing elderly (60-83 years) to audiometric evaluation of physical observation, clinical otoscopy, Pure-tone audiometry (PTA) and speech audiometry to determine the speech recognition ability of the samples to ensure their inclusion in the study. A calibrated Audiometre-MAICO 54 was used to evaluate the hearing acuity (hearing threshold), while the speech recognition ability was determined through speech audiometry. The PTA and SRT were done sequentially on individuals to determine their inclusion in the study. Afterwards, those identified with evidence presbycusis were subjected to filling of a test scale- Hearing Handicap Inventory for the Elderly- screening version (Ventry & Weinstein, 1983), in order to ensure the appropriateness of each of the participants to participate in the study.

An adapted research scale entitled 'Age-related Hearing Loss Reaction Scale' (AHLRS) was used for data collection. The research scale was adapted from four (4) standardised instruments designed differently by Ventry and Weinstein (1982); Ewerton and Nielson (1973); Noble and Atherley (1970) to measure the impact of hearing loss on the emotional and social adjustment of elderly people with presbycusis. The scale was adapted in line with the factors considered appropriate to measure the psycho-social reactions of the elderly due to effects of age-related hearing loss. The construct and content validity were also established in this regard. The reliability of the scale was determined by analysing the data

collected from the pilot study. A co-efficient value of 0.85 was obtained using Cronbach alpha.

The researcher personally administered the instrument to the participants, consequent upon the determination of their eligibility for inclusion in the study. The study was conducted in three states of the South-west Nigeria, using this same procedure. The researcher distributed and collected the completed questionnaire from the participants. The participants were adequately informed of the adherence to confidentiality, the need to be affirmative and truthful in filling the questionnaire. Prior to this, permission was obtained from the authorities of the primary health care centres used in the three states involved. Two hundred and forty (240) questionnaires were administered across the three states and successfully collected by the researcher. The questionnaires were collated and pooled together according to the variables and reactions based on the **Yes** and **No** constructs. Data collected from the study were analysed using chi-square statistical method, and tested at 0.05 level of significance.

## Results

### Hypothesis 1

There is no significant relationship between the reactions of the urban and rural dwellers to the psycho-social hearing related issues:

**Table 1: Summary of the responses of the two groups to psychosocial hearing-related issues**

Psycho-social Hearing Variables	Options	Locations		Total	X <sup>2</sup>	Df	P
		Urban	Rural				
Recognition of people through their voice	Yes	90 (101.0)	112 (101.0)	202	15.14	1	0.05
	No	30 (19.0)	08 (19.0)	38			
	<b>Total</b>	<b>120</b>	<b>120</b>	<b>240</b>			
Regular misunderstanding of people's conversation	Yes	18 (33.0)	48 (33.0)	66	18.81	1	0.05
	No	102 (87.0)	72 (87.0)	174			
	<b>Total</b>	<b>120</b>	<b>120</b>	<b>240</b>			
Continuous conversation with soft spoken people	Yes	54 (72.0)	90 (72.0)	144	22.50	1	0.05
	No	66 (48.0)	30 (48.0)	96			
	<b>Total</b>	<b>120</b>	<b>120</b>	<b>240</b>			
Recognition of people through their voices based on gender difference	Yes	116 (107.0)	98 (107.0)	214	13.98	1	0.05
	No	04 (13.0)	22 (13.0)	26			
	<b>Total</b>	<b>120</b>	<b>120</b>	<b>240</b>			
Understanding of people with low tone from afar	Yes	78 (89.5)	100 (89.5)	178	10.52	1	0.05
	No	42 (31.0)	20 (31.0)	62			
	<b>Total</b>	<b>120</b>	<b>120</b>	<b>240</b>			
Difficulty in hearing in a room when rain is falling or an aircraft is hovering around	Yes	30 (41.0)	52 (41.0.5)	82	8.97	1	0.05
	No	90 (79.0)	68 (79.0)	158			
	<b>Total</b>	<b>120</b>	<b>120</b>	<b>240</b>			

NB\* = Significant at  $P < 0.05$

Note: Figures in parenthesis are expected frequencies



Table 1 reveals the psycho-social hearing reactions of the participants due to evidence of hearing loss. On the recognition of people through their voices, 112 participants from the rural areas responded positively as against 90 participants from the urban areas. 48 rural dwellers out of 120 responded that they always misunderstood people's conversation, while the majority (114) of the urban dwellers responded negatively to the notion. With this, it means that the elderly with presbycusis in urban area had better understanding of the people's conversation than their counterparts in rural areas. In fact, this difference was found to be statistically significant with an indication that the elderly in rural areas are more prone to difficulty in understanding and enjoying conversation around them. In the area of continuous conversation with the soft-spoken ones, it was discovered that the majority from the two groups could follow and still understand people and discussions under such condition. 214 elderly out of the group of 240 participants from both the rural and urban settings respond positively, and that they can recognise people through their voices on the basis of their gender make up without seeing them.

With the understanding of people that communicate in low-tones from a far, this study reveals that 178 elderly from both the rural and urban areas reacted negatively as against 62 participants who reacted positively, though 42 of the participants from the urban areas, claimed to have problem in understanding from afar, people with low tones. Also, from the Table, it could be observed that 158 participants from the two groups claimed no difficulty in hearing in a room whenever rain is falling or with the hovering of the aircraft, while, 52 participants from the rural setting signalled difficulty in hearing under this atmosphere. Going by the results in Table 1, hypothesis 1 was therefore rejected and the alternative hypothesis accepted on the basis that there was a statistically significant relationship between the reactions of the two groups to the psycho-social hearing related issues.

**Hypothesis 2**

There is no significant relationship between the reactions of the males in urban and rural areas to the psycho-social hearing related issues.

**Table 2: Comparison of the responses of the males based on differences in geographical setting**

Psycho-social Hearing related Variables	Options	Urban	Rural	Total	X <sup>2</sup>	Df	P
Self-appraisal and understanding of one's hearing efficiency	Yes	58 (53.0)	48 (53.0)	106	8.085	1	0.05
	No	02 (7.0)	12 (7.0)	14			
	<b>Total</b>	<b>60</b>	<b>60</b>	<b>120</b>			
Recognition of the sources of sounds from far/distance	Yes	56 (50.0)	44 (50.0)	100	8.644	1	0.05
	No	04 (10.0)	16 (10.0)	20			
	<b>Total</b>	<b>60</b>	<b>60</b>	<b>120</b>			
Recognition of people through their voices in line with differences in gender	Yes	58 (52.0)	46 (52.0)	104	10.38	1	0.05
	No	02 (8.0)	16 (8.0)	18			
	<b>Total</b>	<b>60</b>	<b>60</b>	<b>120</b>			

NB: \* = Significant at  $P < 0.05$

Note: Figures in parenthesis are expected frequencies

The results on Table 2 shows the reactions of the male participants from both the two areas to some specific variables on the research scale. 106 out of the 120 elderly individuals in the two groups self-appraised their hearing efficiency as being normal and perfectly working. With this claim, it means that the reactions of the participants showed a significant relationship. It was also observed that 100 participants from the two groups, with 56 from the urban setting claimed that they could always recognise the sources of sounds from afar without much ado, while the remaining 20 indicated difficulty in recognising the sources of sounds from afar. Though as high as 16 elderly individuals from the rural areas as against 4

from the urban areas expressed difficulty in the recognition of sounds under this atmosphere. In essence, this findings revealed that the elderly individuals in rural area had a poorer hearing efficiency towards the recognition of sound signals. Also, the Table reveals that 104 participants from the two groups positively expressed that they easily recognise the voices of the people in line with their gender make-up, while the remaining 16 expressed difficulty in this realm.

On the basis of the results in Table 2, hypothesis 2 was rejected on the ground that there is a significant relationship between the reactions of the males in the two groups on the psycho social hearing related issues.

### Hypothesis 3

There is no significant relationship between the reactions of the females in urban and rural areas to the psycho-social hearing related issues.

**Table 3: Comparison of the responses of the females in line with differences in location**

Psycho-social Hearing related Variables	Options	Urban	Rural	Total	X <sup>2</sup>	Df	P
Regular misunderstanding of peoples conversation	Yes	08 (20.0)	32 (20.0)	40	21.60	1	0.05
	No	52 (40.0)	28 (40.0)	80			
	<b>Total</b>	<b>60</b>	<b>60</b>	<b>120</b>			
Problem with understanding of people's conversation in the midst of many	Yes	10 (18.0)	26 (18.0)	36	10.16	1	0.05
	No	50 (42.0)	34 (42.0)	84			
	<b>Total</b>	<b>60</b>	<b>60</b>	<b>120</b>			
Continuous conversation with the soft spoken people	Yes	24 (36.0)	48 (36.0)	72	20.00	1	0.05
	No	36 (24.0)	12 (24.0)	48			
	<b>Total</b>	<b>60</b>	<b>60</b>	<b>120</b>			

NB: \* = Significant at  $P < 0.05$

Note: Figures in parenthesis are expected frequencies

From Table 3, 40 female participants from the two groups, with majority (32) of the participants from the rural areas responded positively to the notion of regular misunderstanding of people's conversation on the research scale. This implies that 80 participants, with 52 from the urban areas, often misunderstand other people's conversation. In the area of understanding of people's conversation in the midst of many, 84 participants out of the 120 from the two groups claimed no difficulty in this realm, while the remaining 36 of the participants expressed difficulty in understanding whenever members of the family gather together for discussions. Also, the Table reveals that 48 rural female participants indicated that they can carry-on conversation(s) with someone who does not speak as loudly as most people do. On the contrary, 36 urban female participants expressed difficulty in following conversations with the soft spoken people. In fact, going by these findings, the rural female participants demonstrated a better psycho-social hearing related reactions than those of their counterparts from the urban setting. The participants from the rural areas expressed positively ahead those from the urban setting to the issues under consideration. At the same time, it can be observed from the table that there is an established significant relationship between the responses of the females in urban and rural areas to the psycho-social dictates.

## **Discussions**

The findings of this study revealed a significant relationship between the psycho-social reactions of the participants from the rural and urban areas due to age-related hearing loss. It was observed that the elderly individuals with presbycusis in the urban area reacted positively to the psycho-social issues occasioned by the hearing loss. In fact, it was found that elderly individuals from the rural areas experienced difficulty in understanding and enjoying conversation around them due to reduced hearing ability. Also, the participants from the rural areas expressed difficulty in understanding of people with low tone from afar. This was due to manifestation of age-related decline in speech perception and discrimination.

The study found that the elderly individuals in the rural areas had difficulty in understanding and enjoying conversation around them, although they demonstrated better understanding of people with low-pitch from afar than their counterparts from urban areas. This observed reactions might be influenced as a result of relatively free environmental background noise in the rural areas. The rural areas in the south-west, Nigeria were free from competing noise of different sound signals unlike the urban centres. This finding therefore corroborates the earlier findings that environmental dictates and insults, climate, mental stress, nature of past occupations, and background noise could affect hearing sensitivity of the elderly and also bring about negative psycho-social reactions (Ciorba, Blanchini, Pelucchi & Pastore, 2012).

The findings also revealed that the female participants from the rural areas reacted positively to the psycho-social hearing related dictates than their counterparts from the urban areas compared to the male gender from the same environment. It was observed that the females in the rural areas exhibited relatively calmness and display of positive patterns of behaviour which greatly influence their development of positive social-emotional adjustment patterns,

even with their reduced hearing sensitivity. The female participants in the rural areas showed relative stability of mind, control of emotions and excitable temperament as against the demonstration of shyness, withdrawal syndrome, feelings of depression and poor intra-personal relationship due to poor listening conditions observed in their counterparts from the urban areas. The findings thus support earlier observation of Biren and Woods (1985), Scurfield (1980) and Mondelli and Souza (2012) that presbycusis has capacity to make the elderly develop poor communication and functional ability, leading to regular misunderstanding of verbal communication, cognitive decline and depression.

The study revealed poor social-emotional adjustment to reduced hearing sensitivity among the elderly individuals in both rural and urban areas. Thus, these individuals exhibited negative psycho-social reactions, reduced ability to understand and discriminate speech perfectly, social opportunity deficiencies, low self-esteem, disorientation and confusion due to their faulty attention and memory. In addition, the elderly individuals assessed demonstrated poor physical and psychological functions which includes reduced mobility activity, reduced interpersonal relationship and life enjoyment, high level of depression as well as psychological isolation.

## **Conclusion**

The impact of hearing loss on the elderly individuals could be profound, with great consequences for social, functional and psychological well-being of any individual who experience presbycusis. Age-related hearing loss have been observed as having global, deteriorating and irreversible psycho-social problems on the elderly individuals, apart from sensorial abnormalities that follow the reduction of hearing ability. This condition always lead to development of psychological isolation from the sound environment, and poor concepts resulting from lack of auditory perceptions, frustration and stress. Thus, individuals with this kind of hearing should be rehabilitated through a comprehensive therapeutic measures, in addition to psycho-therapeutic consideration.

## **Recommendations**

On the basis of the findings, the following recommendations are made:

1. Elderly individuals across the geo-political zones of the country should be encouraged to go for audiological check-up and intervention, in order to identify hidden case of age-related hearing loss and the attendant psycho-social challenges. The audiological measures should be done periodically, and issues relating to reduced hearing sensitivity as well as attendant psycho-social effects of hearing loss observed be resolved early through appropriate amplification devices and psycho-therapeutic approaches.
2. Continuous daily communication exercises must be encouraged so as to sharpen the elderly's ability to recognise differences in form of speech signals, complex forms of perception, discrimination and linguistic understanding.

3. Psycho-social issues due to reduced hearing sensitivity among the elderly must be evaluated and resolved holistically. This must be done in addition to building a strong socio-emotional spirit in them.
4. The elderly with hearing loss must be counselled and helped to develop an enduring socio-emotional strategies to cope with, even as their hearing ability degenerates.
5. Finally, the families, hospitals, private organisations and government should put in place adequate psycho-social and recreational supports, in addition to medical care available for the aged in all the nooks and crannies of the country. Also, the environment of the elderly must be free from all forms of environmental factors such as noise, stress and loneliness, because this phenomenon can impact the quality of their lives.

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