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CLASSIFICATION OF HEARING STATUS AND HEALTH-RELATED QUALITY OF LIFE OF ELDERLY PEOPLE WITH PRESBYCUSIS IN SOUTH-WEST, NIGERIA

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Abstract

This study investigated the prevalence of the condition, and health-related quality of life of the elderly with presbycusis. Multi-stage sampling technique was employed to select 146 participants from four (4) south western states in Nigeria. The study was carried out, using Pure-tone audiometric test (PTA) to determine the prevalence and classification of the condition, while HHIE and MOS SF-36 scales were employed to investigate the perceived hearing/communication specific problems and health-related quality of life of the participants. Data were analysed, using frequency counts and percentages. The findings reveal that presbycusis is a common disabling condition among the elderly (83.4%), and not peculiar to any gender (M=85.3%; F=80.8%). Also, the findings establish high level of socio-emotional adjustment problems, poor social relationships and withdrawal syndrome, feelings of depression and loneliness, reduced daily living functions, poor general well-being and reduced quality of life among the elderly assessed. Therefore, it was recommended that detection and management of presbycusis and associated conditions be done early, while concerted efforts should be by all the stakeholders towards the prevention of presbycusis through comprehensive hearing conservation strategies and promotion of improved quality of life of the elderly in the country.

Keywords: Ageing; hearing status; quality of life; elderly; presbycusis.

Introduction

Ageing is a biological process of growing old or psychosocial phenomenon occurring in the life of human beings. It has been observed as a developing process of growing old in age as well as a process of declining and deteriorating in both the physical and sensory functions. This biological process and psycho-social phenomenon makes both the life and sensory organs of all humans to experience decline in the required capacities and functions in daily

activities. It also promotes a remarkable decline in the intellectual, physical, physiological, psychological and social functions due to deterioration, deficits or disabilities undermining the general wellness of the aged population.

Ageing is an evitable and irreversible process for any human being born as a child to experience in life. A child goes through structural and systematic stages of childhood, adolescence, adulthood and at about age 40-60years, humans being begin to

deteriorate in systematic functions due to ageing of both the anatomical structures and physiology of the in-built organs (Christiansen and Grzybowski, 1993). Therefore, whenever ageing sets in, human beings begin to notice and experience physical limitation and general reduction in the sensory functions. In essence, when human beings manifest ageing, a lot of changes and decline will become noticed and expressed differently as physiological indications of advanced age. Such expression will be the general effects of ageing on the sensorial capabilities of human organs and cells. This might induce slow and poor motor coordination (inability to walk fast and appropriately) reduced visual acuity, physical activities and social functions, appetite for food, auditory functions and sensitivity. The most disabling sensorial abnormality with advanced age is hearing loss or reduction of auditory functions. This kind of loss makes the elderly to gradually reduce their social functions while at the same time, promote the development of emotional disorders which often become devastating (Marques, Kozlowski and Marques, 2004). In fact, according to National Association for Deafened People (NADP, 2013), human being loses hair cells in the cochlea as they get older, and gradually, their hearing deteriorates and becomes less sharp as age advances. Based on this fact, hearing loss is one of the most prevalent chronic conditions affecting the elderly and its severity is associated with reduced quality of life in older adults (Dalton, Cruickshanks, Klein, Klein, Wiley and Nondahl, 2003).

According to the National Council on the Aging (1999), age-related hearing loss (presbycusis) is one of the most prevalent chronic conditions associated with ageing. Evidently, it has been observed across the

globe, that hearing loss is becoming one of the most prevalent chronic diseases in the elderly and presbycusis is increasing worldwide due to improvement in public health conditions, urbanisation and technological advancement (Lofti, Mehrkian, Moossavi, and Faghih-Zadeh, 2009; Osisanya 2013). As a result of improved medical service delivery, medical advances, health promotion and preservation, life expectancy of human being are on the increase with attendant contributions to longer life and expansion of the elderly population. Despite this current reality of the present age, age-related hearing loss remains sensorial aberration (abnormality), making a larger percentage of the elderly experience loss of sensitivity in thresholds and reduction in speech recognition, speech perception and understanding at comfortable levels.

Presbycusis, which is known as the age-related hearing loss, is a progressive kind of hearing loss, and it is usually bilateral in nature. It is sensorineural kind of hearing loss that occurs in elderly as they advance in age (Osisanya, 2013). Presbycusis is a complex and multifactorial disorder which is characterised by symmetrical progressive loss of hearing and capable of influencing multi-factorial process which is determined by a combination of genetic and environmental factors (Ruan, Ma, Zhang and Yu, 2014). The age related hearing loss is observed as the loss of hearing that gradually occurs in most individuals as they grow old in life. Thus, presbycusis is a common disorder associated with ageing and is ranked as the third most prevalent chronic condition among the elderly after hypertension and arthritis. The prevalence and severity increase with age, rising from about 30-35 percent of adults aged 65 and older to an

estimated 40-50 percent of adults aged 75 and older (WHO, 2012; Shemesh, 2010; Cruikshanks, Wiley, Tweed, Klien, Klien, Mares-Perlman and Nondahl, 1998). Presbycusis is a kind of sensorineural hearing loss which cannot be medically or surgically treated but could only be rehabilitated through appropriate assistive listening devices (ALDs) to amplify the environmental sound in accordance with the specific type and degree of loss and needs of the individuals involved. Presbycusis often occurs in both ears with equal reduction in hearing functions, especially at high pitched sounds. This condition usually affects the perception of high frequency sound due to and caused reduction in auditory sensitivity to sound, reduced central auditory processing and deterioration in understanding of speech, particularly in noisy environment. Although, apart from presbycusis, the elderly like others may suffer mixed sensorineural hearing loss (Lofti, *et al*, 2009).

It is noteworthy to say that presbycusis is a gradual loss of auditory functions and people who have the condition may not realise on time that their hearing is diminishing as a result of their advance in age. To this end, presbycusis has been observed as a result of changes in the physiological functions of the inner ear as human being advances in age. It can also occur due to changes along the nerve pathways leading to the brain (Shemesh, 2010). Other causes might include intrinsic factors (neuronal loss, loss of cochlear outer hair cells, atrophy of the highly vascular stria in the lateral cochlear wall, oxidative stress, causing DNA mutation and damage, inflammation, metabolic and systemic diseases, including hypertension and diabetes). There are also extrinsic factors (noise, ototoxic medication and diet) and risk

factors (alcohol, cigarette smoking, noise exposure, genetic issues/family history and low socio-economic level). Infection, tumours and tympanosclerosis might also cause presbycusis. Thus, the occurrence of presbycusis is considered to be determined predominantly by genetic factors. However, it can also be influenced by heritability, environmental factors, noise pollution, ototoxic drugs, alcohol, diabetes, hypertension, and damage of mitochondrial DNA (Huang and Tang 2010; Ciorba, Bianchini, Pelucchi and Pasture, 2012; Osisanya, 2013). There are four types of presbycusis occurring in the elderly. These are: Sensory presbycusis (affecting the cochlear hair cells and other supporting cells); Neural presbycusis (which is the loss of afferent neurons in the cochlear); Metabolic presbycusis (affecting the lateral wall and stria vascularis of the cochlear atrophy); and Mechanical presbycusis (appearing as the stiffening of the basilar membrane and organ of corti). Without early diagnosis and treatment of any of these types of age-related hearing loss, presbycusis is capable of deteriorating and devastating the quality of life and functional status of the elderly. The impact of presbycusis may be profound with consequences for the social, functional and psychological well-being of the people affected (Ciorba, Bianchini, Pelucchi and Pasture, 2012).

Presbycusis, like any other types of hearing loss, could be classified in line with the three (3) attributes of hearing loss commonly used to describe or explain this disabling condition. The attributes considered are:

1. Types of hearing loss (a kind of description, based on the part of the hearing mechanism that is affected);

2. Degree of hearing loss (description – based on the range and volume of sounds that are not heard)
3. Configuration (a description in line with the range of pitches or frequencies at which the loss has occurred).

These three (3) attributes can be used independently or jointly to classify the evidence of presbycusis as observed in an elderly. Similarly, age-related hearing loss can also be classified according to Shemesh (2010), as conductive hearing loss (which is characterised by an obstruction to air condition that prevents the proper transmission of sound waves through the external auditory canal and/or the middle ear, marked by an almost equal loss of all frequencies). Sensorineural hearing loss (evidence of irreversible dysfunction of the sensory receptors of the inner ear) cause loss of ability to perceive sound, even with greater loss of high frequencies and mixed hearing loss (evidence of both conductive and sensory dysfunction, due to simultaneous disorderliness of the middle and inner ear mechanism).

Presbycusis is a kind of hearing disorder which is confirmed using a battery of audiologic tests and measured via proper diagnosis. The psycho-social effects on those who experience such condition are determined through some psychological measures. The psycho-social effects of presbycusis range from psycho-social reactions to a perceived reduction in quality of life (Dalton. Cruickshanks, Klein, Klein Wiley and Nondahl, 2003; Osisanya and Akinyode, 2016). This age-related hearing loss which is one of the irreversible sensorial disabilities has been observed as the most disabling condition on the threshold sensitivity of the auditory system with observable diminished hearing sensitivity for

high pitched sounds by the elderly. In fact, this auditory difficulty varies in severity from mild to substantial loss of functions as age advances, thereby leading to reduced ability to communicate effectively, reduced quality of life, isolation, dependence and frustration, while at the same affecting the psycho-social life of people around the elderly with the condition. Due to aforementioned, several studies have shown that people in different age-groups are likely to report a hearing handicap differently, with the elderly being less likely to report hearing difficulties, compared with younger respondents (Wiley, Cruickshanks, Nondahl and Tweed, 2000). Therefore, the impact of hearing loss on the general well-being of the older people needs to be determined. Although, several studies have investigated the association of hearing loss and quality of life, there has not been any population-based data to describe the impact of hearing loss and the quality of life of the elderly in Nigeria. To this end, the study is conducted to determine the prevalence of hearing loss and the impact of presbycusis on the general well-being of the elderly in the South-west, Nigeria, using standardised hearing handicap inventory and health-related quality of life measures.

Based on the aforementioned, the study sought to find answers to the following research questions:

1. How prevalent is presbycusis among the elderly in the South-west, Nigeria?
2. What are the classifications of presbycusis observed among the participants?
3. What are the impacts of presbycusis on the socio-emotional life of the participants?

4. What is the health-related quality of life observed among the participants?

Methodology

The *ex-post facto* research design was adopted for the study. The population comprised the aged across the South western states of Nigeria, while the sample consisted of 175 (male=102, female=73) elderly (60-75 years old) selected through Multi-stage sampling technique from four (4) states (Ogun, Lagos, Osun and Oyo) in South Western Nigeria. Instruments used were Maico 41 Diagnostic Audiometer, which was calibrated in compliance with the American National Standards Institutes (ANSI/ASA S3.6-2010) specification for audiometer; Hearing Handicap Inventory for the Elderly (HHIE) questionnaire developed by Ventry and Weinstein in the year 1982; and the Medical Outcome Survey: MOS36-item Short Form Health Survey(SF-36), with the reliability coefficient of 0.94.

The study was conducted in phases across the selected states, following the same procedure in the hospital settings. The participants were subjected to otoscopy in order to accurately determine their fitness for audiometric evaluation. Consequently, Pure Tone Audiometric (PTA) test was conducted on all the participants to establish their Air and Bone Conduction (AC and BC) hearing thresholds, with aim of determining and classifying their hearing thresholds. Pure-Tone Air Condition thresholds were assessed at 125, 500, 1000, 2000, 4000 and 8000Hz in each ear while Bone Conduction thresholds

were assessed at 500, 1000, 2000 and 4000Hz. The Pure-Tone average was determined in thresholds (dBA) at 500, 1000 and 2000Hz (speech frequencies) in each ear per participants. Based on this arrangement, the hearing status of the participants in terms of prevalence and classifications of presbycusis were determined. Thereafter, the HHIE and MOS SF-36 were administered only those who were presented with presbycusis condition in order to determine their perceived hearing/communication-specific problems and health-related quality of life. The questionnaires were filled independently by the participants with the guidance of the research assistants. Afterwards, the questionnaires were collected and the responses were tabulated. Data generated were analysed using frequency counts and percentages.

Results

The results of the study are presented systematically based on the four research questions earlier stated to guide the study.

Research question 1: How prevalent is presbycusis among the elderly in the South-west, Nigeria?

Table 1: Prevalence of presbycusis among the elderly assessed.

Variables	Frequency		Total	Percentage	
	Male(M)	Female(F)			
Number of elderly with presbycusis	87(59.6%)	59(40.4%)	146	83.4%	
Number of elderly without presbycusis	15(57.7%)	14(48.3%)	29	16.6%	
Total			102	73	175 100

Table 1 shows that out of the 175 elderly people examined, 146 had presbycusis and 29 had no evidence of presbycusis. Also with the result, 87(59.6%) were male participants with presbycusis while 59(40.4%) were female participants with presbycusis. 83.4% of the participants were found with presbycusis as against 16.6%

without presbycusis. Based on the report of the investigation, presbycusis is confirmed to be common among the elderly assessed across gender, as the percentage of the male gender (87/85.3%) is almost at par with that of the female gender (59/80.8%). Thus, presbycusis has been found to be common among the elderly.

Research question 2: What are the classifications of presbycusis among the elderly assessed?

Table 2: Showing classifications of presbycusis in terms of hearing level (dBA) observed among the participants

Hearing level	Frequency	
	Right ear	Left ear
26-40 dB HL: Mild Hearing Loss	18(12.3%)	11(7.5%)
41-55dB HL: Moderate Hearing Loss	47(32.2%)	38(26.2%)
56-70dB HL: Moderately severe Hearing Loss	42(28.8%)	51(34.8%)
71-90dB HL: Severe Hearing Loss	34(23.3%)	45(30.85%)
□90dBHL: Profound Hearing Loss	05(3.4%)	01(0.7%)
Total	146	146

Table 2 reveals the distribution of the observed presbycusis in terms of decibels in relation to hearing level (dBHL). The dBHL was recorded separately for each of the hearing mechanisms in line with audiological ethical standards for audiometric result. Majority of the participants had moderate (47: 32.2%; 38: 26.2%), moderately severe (42: 28.8%; 51: 34.8%) and severe (34: 23.3%; 45: 30.8%) hearing loss at both ears, while few of the participants had cases of mild and profound hearing loss at both ears respectively. The audiometric results as expressed in table 2

show that 51(34.8%) cases of moderately severe hearing loss were found at the left ear while 42(28.8%) were found at the right ear. Only 11 of the participants had a case of mild hearing loss at the left ear as against 18 cases of the same mild hearing loss at the right ear. Cases of profound hearing loss either at right or left ear were not common among the participants. Therefore, it could be expressed clearly that profound hearing loss is not common with the elderly presented with presbycusis in the South-west, Nigeria.

Table 3: Classification of presbycusis in terms of the nature of frequency loss

Types of Frequency Loss	Frequency	
	Right Ear	Left Ear
Low Frequency Loss	07(4.8%)	05(3.4%)
Mid Frequency Loss	21(14.4%)	16(11.0%)
High Frequency Loss	118(80.8%)	125(85.6%)
Total	146	146

The Table 3 shows the types of hearing loss, with emphasis on the types of frequency loss obtained per hearing mechanism of the participants. With the results recorded, majority of the participants had high frequency loss. Thus, 118(80.8%) participants had high frequency loss at the

right while 125(85.6%) of the participants had same high frequency loss at the left ear. Few number of the participants had mid frequency loss while cases of low frequency loss seem uncommon with the elderly with presbycusis.

Table 4: Responses of the elderly to socio-emotional issues due to presbycusis

Items	Yes	Sometimes	No	Total
Does a hearing problem cause you to use the phone less often than you would like?	53(36.3%)	76(52.1%)	17(11.6%)	146
Does a hearing problem cause you to feel embarrassed when meeting new people?	71(48.6%)	69(47.3%)	06(4.15%)	146
Does a hearing problem cause you to avoid groups of people?	67(45.9%)	28(19.2%)	51(34.9%)	146
Does a hearing problem make you irritable?	73(50.0%)	57(39.0%)	16(11.0%)	146
Does a hearing problem cause you to feel frustrated when talking to members of your family?	66(45.2%)	48(32.9%)	32(21.9%)	146
Does a hearing problem cause you difficulty when attending a party?	92(63.0%)	36(24.7%)	118(12.3%)	146
Does a hearing problem cause you to feel "stupid" or "dumb"?	33(22.6%)	88(60.3%)	25(17.1%)	146
Do you have difficulty hearing when someone speaks in a whisper?	101(69.2%)	31(21.2%)	14(9.6%)	146
Do you feel handicapped by a hearing problem?	98(67.1%)	36(24.7%)	112(8.2%)	146
Does a hearing problem cause you difficulty when visiting friends, relatives or neighbours?	41(28.1%)	29(19.9%)	76(52.0%)	146
Does a hearing problem cause you to attend religious services less often than you would like?	12(8.2%)	53(36.3%)	81(55.5%)	146
Does a hearing problem cause you to have arguments with family members?	26(17.8%)	51(34.9%)	69(47.3%)	146
Does a hearing problem cause you difficulty when listening to TV or radio?	39(27.7%)	47(32.2%)	60(41.1%)	146
Does any problem or difficulty with your hearing upset you at all?	35(24.0%)	39(26.7%)	72(49.3%)	146
Does a hearing problem cause you to want to be by yourself?	25(17.1%)	40(27.4%)	81(55.5%)	146
Does a hearing problem cause you to talk to family members less often than you would like?	49(33.6%)	51(34.9%)	46(31.5%)	146
Do you feel that any difficulty with your hearing limits or hampers your personal or social life?	44(30.1%)	79(54.1%)	23(15.8%)	146
Does a hearing problem cause you difficulty when in a restaurant with relatives or friends?	43(29.5%)	72(49.3%)	31(21.2%)	146
Does a hearing problem cause you to feel depressed?	47(32.2%)	48(32.9%)	51(34.9%)	146
Does a hearing problem cause you to feel uncomfortable when talking to friends?	43(29.5%)	57(39.0%)	46(31.5%)	146
Does a hearing problem cause you to feel left out when you are with a group of people?	35(24.0%)	48(32.9%)	63(43.1%)	146

Research question 3: What is the impact of presbycusis on the socio-emotional life of the participants?

Table 4 reveals the socio-emotional feelings of the elderly due to presbycusis. 73(50%) of the participants expressed feeling of irritability while 98(67.1%) reported being handicapped due to evidence of presbycusis. This indicates that majority of the elderly assessed were experiencing negative socio-emotional adjustment due to hearing loss. In fact, this has accounted for their poor social relationships and high level of social withdrawal while 92(63.0%) of the participants claimed difficulty towards attending party or social gatherings. Similarly, almost half of the participants expressed the feelings of being embarrassed

when meeting with new people. 101(69.2%) of the participants expressed difficulty whenever people whisper information or messages to them while 76(52.1%) of the participants sometimes have difficulty using telephone. Based on these findings, it was concluded that the elderly with presbycusis had negative socio-emotional adjustment which is more handicapping than the age-related hearing loss.

Research question 4: What is the health-related quality of life observed among the participants?

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Table 5: Reactions of the participants to items on MOS SF-36 Health-Survey

Variables		Responses		
Health-related	Items	Yes	No	Total
Physical Functioning (PF)	PF1 vigorous activities, such as running, lifting heavy objects, strenuous sports	18(12.3%)	128(87.7%)	146
	PF2 Moderate activities, such as moving a table, vacuuming, bowling	131(89.7%)	15(10.3%)	146
	PF3 Lifting or carrying groceries	119(81.5%)	27(18.5%)	146
	PF4 Climbing several flights of stairs	25(17.1%)	121(82.9%)	146
	PF5 Climbing one flight of stairs	107(73.3%)	39(26.7%)	146
	PF6 Bending, kneeling, or stooping	48(32.9%)	98(67.1%)	146
	PF7 Walking more than a mile	23(15.8%)	123(84.2%)	146
	PF8 Walking several blocks	121(82.9%)	25(17.1%)	146
	PF9 Walking one block	127(87.0%)	19(13.0%)	146
	PF10 Bathing or dressing yourself	144(98.6%)	02(1.4%)	146
Role physical (RP)	RP1 Limited in the kind of work or other activities	135(92.5%)	11(7.5%)	146
	RP2 Cut down the amount of time spent on work or other activities	129(88.4%)	17(11.6%)	146
	RP3 Accomplished less than would like	118(80.8%)	28(19.2%)	146
	RP4 Difficulty performing the work or other activities	133(91.1%)	13(8.9%)	146
Bodily Pain (BP)	BP1 Intensity of bodily pain	78(53.4%)	68(46.6%)	146
	BP2 Extent pain interfered with normal work	65(44.5%)	81(55.5%)	146
General Health Perceptions (GH)	GH1 Is your health: excellent, very good, good, fair, poor	07(4.8%)	139(95.2%)	146
	GH2 My health is excellent	09(6.2%)	137(93.8%)	146
	GH3 I am as healthy as anybody I know	17(11.6%)	129(88.4%)	146
	GH4 I seem to get sick a little easier than other people	48(32.9%)	98(67.1%)	146
	GH5 I expect my health to get worse	05(3.4%)	141(96.6%)	146
Vitality (VT)	VT1 Feel full of pep	67(45.9%)	79(4.1%)	146
	VT2 Have a lot of energy	89(61.0%)	57(39.0%)	146
	VT3 Feel worn out	73(50.0%)	73(50.0%)	146
	VT4 Feel tired	75(51.4%)	71(46.6%)	146
Social functioning (SF)	SF1 Frequency health problem interfered with social activities	88(60.3%)	58(39.7%)	146
	SF2 Extent health problems interfered with normal social activities	77(52.7%)	69(47.3%)	146
Role Emotional (RE)	RE1 Cut down the amount of time spent on work or other activities	48(32.9%)	98(67.1%)	146
	RE2 Accomplished less than would like	128(87.7%)	18(12.3%)	146
	RE3 Didn't do work or other activities as carefully as usual	34(23.3%)	112(76.7%)	146
Mental Health (H)	MH1 Been a very nervous person	36(24.7%)	110(75.3%)	146
	MH2 Felt downhearted and blue	78(53.4%)	68(46.6%)	146
	MH3 Felt so down in the dumps nothing could cheer you up	71(48.6%)	75(51.4%)	146
	MH4 Been a happy person	65(44.5%)	81(55.5%)	146
	MH5 Felt calm and peaceful	53(36.3%)	93(63.7%)	146

Table 5 indicates that presbycusis reduces the quality of life of the elderly with such conditions. Majority (127:87.0%) of the elderly assessed, expressed difficulty with physical functioning activities. 133(90.1%) of the participants expressed difficulty in performing their required daily activities while 128(87.7%) accomplished less than what they would like to achieve. On the social functioning measures, 88(60.3%) of the participants, as against 58(39.7%), expressed that presbycusis has interfered with their normal social activities. Consequently, 78(53.4%) of the elderly assessed, became depressed and felt downhearted and blue due to presbycusis. Also, from the findings, it was observed that 81(55.5%) of the participants appeared unhappy and moody while 93(63.7%) of the participants felt mentally disturbed, emotionally challenged and restless. Going by the findings obtained through MOS SF-36 Health survey, it has been affirmed that age-related hearing loss has negative impact magnitude. Therefore, the findings corroborate the reported observation that presbycusis is not peculiar to any gender (Dawes, Cruikshanks, Moore, Edmonson-Jones, McCormack, Fortowm and Munro, 2014). Thus, age-related hearing loss is prominent among male elderly individuals as well as the female gender. This was observed based on the fact that both gender experience age-related decline in the sensory and neural functions and that ageing brings about progressive changes in personal

on the quality of life of the elderly with the presbycusis condition. Thus, presbycusis has capacity to bring about reduction in the quality of life of the elderly, even with attendant effects on their psychological, health and general well-being.

Discussion

The findings of this study establish that presbycusis remains a common disabling condition among the elderly, as most of the elderly experience deterioration in their sensory functions while their sense of hearing is greatly affected (Osisanya and Akinyode, 2016). The prevalence of the condition among the elderly population is increasing with evidence of reduction in auditory sensitivity to sound, central auditory processing functions and deterioration in understanding as well as discriminating of speech sounds. The study, also establishes that presbycusis is not peculiar to any gender, as the disabling condition is found in both gender on equal appearance or functional capacity (Lotfi *et al*, 2009; Ciorba *et al*, 2012). Similarly, this finding is in line with earlier submission that presbycusis affects both male and female respondents equally, with onset from the fourth decade of life in any environment and thus constitutes one of the major problems affecting the elderly population across the world (Osisanya, 2014).

The findings on the impact of presbycusis on the socio-emotional life reveal that the elderly population with age-related hearing

loss experience pronounced difficulty in understanding speech sounds, whether whispered or conversational speech. Therefore, both female and male elderly manifest difficulty in understanding high-pitched sounds. The findings show significant effects on communication and quality of life in both males and females (Lotfi *et al*, 2009; Chang and Chou, 2007). This study also confirms that the impact of the age-related hearing loss on elderly remains the same in respective of culture and race. The participants assessed through this study reacted similar with participants of other studies across the globe. This agrees with the findings of Bogardiss, Yueh, and Shekelle (2003); Betlejenski (2006); and Lofti *et al*, (2009).

Moreover, it has been established that age-related hearing loss is capable of reducing quality of life and activity of daily life of the elderly. In line with this, the study finds that the elderly assessed had difficulty in physical functioning activities and that presbycusis has negatively affected their normal social functioning. The age-related hearing loss has been confirmed to have adverse effect on the functioning abilities of the elderly in several areas of their daily life. This finding, therefore, agrees with the earlier findings that presbycusis leads to demonstration of shyness, withdrawal syndrome, feelings of depression and poor intrapersonal relationship due to poor listening conditions (Mondelli and Souza, 2012; Osisanya, 2013). Presbycusis is also found to be associated with higher levels of distress, somatisation, depression and

loneliness. It is also capable of influencing negative psycho-social reactions as well as reduced quality of life.

This study establishes that presbycusis has adverse effects on the psycho-social life of the elderly as well as interfering with their normal social activities. Also, in line with the findings of Nachtegaal, Festen and Kramer (2011), presbycusis has negative impact on the general well-being and health functions of the elderly with such condition. Therefore, there must be adequate measures to curtail this disabling condition.

Conclusion

The study establishes the prevalence of presbycusis among the elderly in South-west, Nigeria. Based on the findings, it was observed that presbycusis is a common health-related condition among the elderly, irrespective of gender. This disabling sensorial condition affects communication, physiological, psycho-social and physical functions. Owing to these reduced functions, the elderly become extremely frustrated and exhibit some psycho-social and health-related problems such as depressive symptoms, difficulty in activities of daily living (ADL), loneliness, restlessness, loss of energy for the required daily living functions, social withdrawal and reduced social functions.

Recommendations

Based on the findings of the study, it is necessary to recommend the following, as measures towards improving the health status and general well-being of the elderly in our society:

1. Diminished hearing sensitivity observed in the elderly people should be promptly examined and managed immediately. This will curtail the condition aggravating from mild to substantial loss of functions, thereby, reducing the risk of developing communication difficulties and the inability to enjoy sound health-related quality of life.
2. Elderly people should be encouraged to imbibe practices leading to prevention of age-related hearing loss through hearing conservation strategies. This will help to sustain the functional auditory sensitivity to both high and low pitched sounds while, at the same time, promoting improved quality of life of the elderly.
3. Prompt auditory and psychological rehabilitation towards reducing psychosocial effects of presbycusis must be entrenched in the health-related management of the elderly with any form of age-related auditory difficulty.
4. Elderly people should be encouraged to develop positive socio-emotional life, high level of socio-emotional adjustment to reduce auditory ability, positive social relationships and functions, as well as continued involvement in family daily functions.
5. Family members of the elderly people must be encouraged to positively adjust to the communication, health-related and psycho-social changes expressed by the elderly due to their reduced auditory sensitivity and daily functions.

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