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Original Research Article

Prevalence, Severity Patterns and Modifiable Risk Factors of Hearing Loss among Adults Attending ENT Clinic at Bugando Medical Centre, Mwanza, Tanzania

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Abstract: Hearing is one of the greatest form of communication among living being. Other different form of communications are signs and writing. In the developed world hearing loss has been on the rise due to modernization of the communities all over the planet. This involves heavy industries, airplanes and occupations that produces a lot of noise. This study has shown the magnitude of hearing problems in adult and also associated factors in a particular group. The study has been conducted at referral consultant hospital serving about 8regions of the country. This is analytical cross-sectional study; conducted from Sept 2024 to December 2024. The total number of the study participants was 118 whereby the leading age group to be affected with hearing loss among adults is the age between 50yrs to 59yrs by 23.7% followed by age 30yrs to 39yrs and above 60years by 21.2%.Widowed were leading by 29.7% among the marital status that had highest problem with hearing loss followed by singles 27.1% .Also employees and fishing participants were found to have marked hearing loss compared to other cadres by 22%.The prevalence of hearing loss in adult is found to be 26.3%.Among those diagnosed, mixed hearing loss was the most common type, affecting 14.4% of participants, followed by sensorineural hearing loss at 6.8% and conductive hearing loss at 5.1%. In terms of severity, 10.2% of participants were found to have profound hearing loss, representing the most severe cases. Mild hearing loss was reported in 5.1%, while moderate and severe cases were 4.2% and 6.8%, respectively. These findings indicate delayed detection of the adult hearing loss and highlight the need for early screening, occupational noise control and ototoxic medication monitoring.

Keywords: Prevalence, Hearing Loss, Associated Factors, Adult.

INTRODUCTION

The World Health Organization (WHO) defines hearing loss as "a person who is not able to hear as well as someone with normal hearing; hearing thresholds of 20 decibels (dB) or better in both ears" is said to have hearing loss. It can affect one ear or both ears [1, 2]. Regarding the causes of hearing loss depends on the ear involved, it can be; Conductive hearing loss this is caused by a problem in the outer or middle ear, that is sound is having difficulty traveling to the inner ear. Other causes are fluid in the middle ear, wax in the ear canal, or a hole in the eardrum. Sensorineural hearing loss is caused by a problem in the inner ear.

Sensorineural hearing loss in young children can occur with certain infections before birth, from a lack of oxygen during birth, or from genetic syndromes. Mixed hearing loss occurs when both conductive and sensorineural hearing loss occur together. Based on its degree or severity, hearing loss can be categorized as mild (26– 40 dB), moderate (41–70 dB), severe (71–90 dB), or profound (above 90 dB) [1-3].

Globally hearing loss ranks the fourth leading cause of disability, with estimated costs of over 750 billion dollars, and unless action is taken, there will be about 630 million people living with disabling hearing loss by the year 2030.

Hearing impairment affects 6 per 1000 live births sub-Saharan Africa, with lower incidence of 1 per 1000 live births in developed countries [4, 5]. In Tanzania a study done Bugando Medical Centre with involvement of 6234 patients attending at the otorhinolaryngology department found 526 (8.4%) had hearing impairment. Females were more by 1.3%. Sensorineural hearing loss was the leading type (51%),

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followed by conductive hearing loss (41%). The group most affected by sensorineural hearing were 40-59 (53.7%). In conductive hearing, the leading group being affected were 3-39 years (46.6%). In the distribution of sensorineural hearing the leading one was mild hearing in the age group of 3 39 (63%), followed by moderate hearing at 25.5%. The contributory factors were inflammation, such as allergic rhinitis (38%), otitis (34%), and wax (9.5). These factors contributed to about 60% of hearing loss. A group of young adults have been found to have mild hearing (63%); this shows that in a few years, the majority of the young group will have severe hearing problems, hence decreasing the manpower of our economy [6].

A cross-sectional study conducted in South Korea among civilians on the prevalence of hearing loss and associated factors in subjects with normal otoscopy found that 21.9% of study participants had hearing loss with the worse ear and 12.5% with the better ear. Factors that had a significant association with hearing loss in the study were smoking, noise exposure at the workplace, stroke, depressive mood, and anemia [7]. Lower socioeconomic status is correlated with higher rates of hearing loss. Limited access to healthcare services and poor nutrition contribute to the prevalence, though specific percentages are less documented [8]. Age-related hearing loss known as presbycusis, is prevalent, especially in individuals over 50. The risk increases significantly with age, with studies showing a prevalence of 23.8% in those aged 50 and above [9]. The use of ototoxic drugs, such as certain antibiotics (aminoglycosides) and chemotherapy agents, contributes to hearing loss. Studies indicate that 3-5% of hearing loss cases in adults may be attributed to ototoxic medications [9]. While genetic predisposition to hearing loss is recognized, specific prevalence data for hereditary hearing loss in Tanzania are limited.

Chronic noise exposure in workplaces and prolonged exposure to noise is highly associated with risk of hearing loss. Among occupations related to high noise exposure, metal workers can be mentioned on the first line. A cross-sectional study conducted in Northwest Ethiopia, Gondor City, found that the prevalence of hearing loss among metal workers was 30.7% [10].

A study conducted in England on socioeconomic and lifestyle factors associated with hearing loss in older adults identified that 32.1% and 22.3% of men and women aged 50 to 89, respectively, had hearing loss, and the level of education, sex, occupation, income, and lifestyle of the study participants were strongly associated with hearing loss [11].

Hearing loss among adults in Tanzania is a significant public health issue with prevalence rates influenced by age, occupational noise, chronic ear infections, socioeconomic factors, genetic predisposition, and ototoxic medications. Addressing this issue requires a multifaceted approach involving improved healthcare access, preventive measures in noisy work environments, and public health education on the risks of untreated ear infections and harmful medications [12]. The older adults were leading by having severe hearing loss by 47%, which tallies with the literature. As the age increases the outer hair cells tend to decrease in number, contributing to hearing impairment. Out hair cell decrease caused mainly by sensorineural hearing which is attributed genetic causes and similar occurrence of other related disease conditions as hypertension, vascular, diabetics, tumors, trauma, infections, immunological and inflammatory conditions [13, 14].

Study done in North West Nigeria on the pattern of hearing loss found the leading cause of hearing loss to be presbyacusis 16.7% followed by ototoxicity 9.7%, Majority77.8% had sensorineural hearing loss,followed by 16.7 conductive and mixed 5.5%. Most of the patients had mild hearing loss 64.3% followed by moderately severe with the remaining 34.7% having severe to profound hearing losses respectively [15]. In Brazil, a study conducted on hearing impairment and its determinants found that 24.9% of the study participants had some level of hearing impairment, of which 18.9%, 5.1%, and 1.9% had mild, moderate, or severe hearing loss, respectively. The study also found that increased age, Genetic factor, comorbidities like diabetes and hypertension, chronic otitis media, otosclerosis, and papilloma of the outer ear canal were the determinants of hearing loss among the study participants at various degrees [16].

Study Design and Area

This was analytical cross-sectional study done at Bugando medical centre Mwanza Tanzania at the otorhinolaryngology Head and Neck department.

Study Duration: This was from September 2024 and October 2024.

Study Population: All adult patient with hearing loss that received otorhinolaryngology services at BMC

Inclusion Criteria: Any patient complaining of hearing impairment and having any ear signs was included in the study.

Exclusion Criteria

Patients with profound mental health problems, patients with severe health problems, and those who were unable to respond to the questionnaire were excluded from the study.

Data Collection

The socio-demographic data, distribution of hearing loss, associated factors were filled in the questioners. All the information were counterchecked

and corrected where necessary by using special designated coded questionnaire. Pure tone audiometry (PTA) were conducted by a trained clinical audiologist in a sound-proof room using a calibrated audiometer , following World Health Organization grading standards, after history taking and physical examination.

Air and bone conduction thresholds were tested at frequencies range from 250HZ to 8000HZ. Hearing was graded as per WHO grades of hearing impairment whereby 0-25 dB was regarded as normal hearing, 26-40dB mild hearing loss, 41-55dB moderate hearing loss, 56-70 dB moderately severe hearing loss, 71-90dB severe hearing loss and >90dB profound hearing loss [24]. The type and severity of hearing loss were assessed in each ear as stipulated on the audiogram charts. Patient were given results by the doctor. Management were done accordingly to the findings and in combination to the history taking and physical examination.

The study was approved by the Ethics Committee of Joint Bugando Medical Centre/CUHAS (Approval No. 3338/2024) before the commencement of the research. Written informed consent was obtained from all participants.

Data Analysis: Data were analyzed using SPSS software for Windows version 21.

RESULTS

The total number of the study participants was 118 whereby the leading age group to be affected with hearing loss among adults is the age between 50yrs to 59yrs by 23.7% followed by age 30yrs to 39yrs and above 60years by 21.2%.Widowed were leading by 29.7% among the marital status that had highest problem with hearing loss followed by singles 27.1% .Also employees and fishing participants were found to have marked hearing loss compared to other cadres by 22%.

Table 1: Social demographic information

Variable	Categories	Frequency	Percentages (%)
Age Group	18-29	18	15.3
	30-39	25	21.2
	40-49	22	18.6
	50-59	28	23.7
	60 And Above	25	21.2
Marital Status	Divorced	24	20.3
	Married	27	22.9
	Single	32	27.1
	Widowed	35	29.7
Education Level	No Formal Education	24	20.3
	Others	21	17.8
	Primary Education	26	22.0
	Secondary Education	19	16.1
	Tertiary Education	28	23.7
Income Source	Business	23	19.5
	Employee	26	22.0
	Farmer	23	19.5
	Fishing	26	22.0
	Others	20	16.9

Prevalence of hearing loss in adult is found to be 26.3%. Among those diagnosed, mixed hearing loss was the most common type, affecting 14.4% of participants, followed by sensorineural hearing loss at 6.8% and conductive hearing loss at 5.1%.

Table 2: The prevalence of hearing loss among adults attending ENT clinic at BMC Mwanza, Tanzania

Variable	Categories	Frequency	Percentages (%)
Diagnosed With Hearing Loss	No	87	73.7
	Yes	31	26.3
Type Of Hearing Loss	Conductive	6	5.1
	Sensorineural	8	6.8
	Mixed	17	14.4
Severity Of Hearing Loss	Mild	6	5.1
	Moderate	5	4.2
	Profound	12	10.2
	Severe	8	6.8

Profound hearing loss accounted for the largest proportion of cases, reflecting advanced disease at the time of presentation.

Table 3: Modified Risk Factors for patients with hearing loss among adults receiving ENT Services at BMC Mwanza, Tanzania

Variable	Categories	Frequency	Percentages (%)	P-value
Noise Exposure	No	56	47.5	0.0034
	Yes	62	52.5	
Frequent Ear Infections	No	60	50.8	0.065
	Yes	58	49.2	
Ear Surgery	No	95	80.5	1.23
	Yes	23	19.5	
Genetic factor	No	60	50.8	0.965
	Yes	58	49.2	
Ototoxic Medications	No	58	49.2	0.0002
	Yes	60	50.8	

It`s statistical significant that noise exposure and ototoxic medications are the main risk factors with the p value < 0.05%.

DISCUSSION

The prevalence of hearing loss among adults attending otorhinolaryngology services at BMC Mwanza, Tanzania, was found to be 26.3%, with mixed hearing loss being the most common type (14.4%), followed by sensorineural (6.8%) and conductive hearing loss (5.1%). This prevalence aligns with findings from a study conducted in Kenya, which reported a prevalence of 23.4% among adults attending similar clinics [17]. The predominance of mixed hearing loss reflects the multifactorial nature of hearing impairment in this population, likely due to coexisting middle and inner ear pathologies. Globally, the prevalence of hearing loss varies widely, with higher rates observed in low-resource settings, often attributed to limited access to early diagnosis and treatment [2]. In the study done by Olivia *et al*., showed the prevalence hearing loss to be of 8.4% which is different from this study reasons may be due to time durations as it was for 1year and involved all patients that attended hospital at that time while this is months and based only in adult. Also the Olivia *et al*., study found the leading type of hearing loss to be sensory neural hearing loss by 51% followed by conductive hearing loss by 41% then mixed hearing loss to be 8%; these findings are different from this study due to the study participants involved and also the period of the study although Olivia study is similar to Shuaibu *et al*., study [15].

In terms of severity, profound hearing loss was the most frequently observed, affecting 10.2% of participants, followed by mild (5.1%), moderate (4.2%), and severe (6.8%) cases. These findings are consistent with a study in Nigeria, where profound and severe hearing loss were predominant among adults with hearing impairments [18]. The study done at Bugando Mwanza had different findings as leading was Mild hearing loss followed by 63% followed by moderate hearing loss by 25.5%. The varies of the this may be due to the study participants involved in study [6]. The high prevalence of profound hearing loss could be attributed to delayed medical intervention and limited awareness of hearing health in the study area. Early detection and rehabilitation, such as hearing aids or cochlear implants, are crucial to mitigating the impact of severe hearing impairments.

Noise exposure was significantly associated with hearing loss in this study, with 52.5% of participants reporting frequent exposure to excessive noise. This finding aligns with studies in Uganda and South Africa, which identified noise-induced hearing loss as a major public health concern among adults exposed to occupational and environmental noise [19, 20]. The association between noise exposure and hearing loss underscores the need for stricter occupational safety regulations and public education on noise protection measures, such as earplugs and noise reduction devices.

Age group also become the most promising factor leading to the hearing loss, this align with the study conducted by Olivia *et al.,* and Shuaibu *et al*., [6-15], that one of the major leading pattern of hearing loss is age of the respondents. The use of ototoxic medications was another significant factor associated with hearing loss, with 50.8% of participants affected. This result concurs with findings from a study in India, where ototoxic drugs, particularly aminoglycosides and chemotherapeutic agents, were identified as significant contributors to hearing loss [21]. The high prevalence of ototoxic medication use highlights the need for healthcare providers to monitor patients closely and explore safer therapeutic alternatives when possible. Awareness campaigns targeting both healthcare workers and the general population could help reduce the risk of ototoxicity.

Other factors, including frequent ear infections, ear surgery, and Genetic factor, did not show statistically significant associations in this study. However, their presence in nearly half of the participants suggests potential contributing roles that warrant further investigation. Previous studies in Tanzania, Ethiopia and

Rwanda have reported significant associations between recurrent ear infections and hearing loss, highlighting the variability of findings across different populations [6-23]. This discrepancy may reflect differences in study design, sample size, or underlying health conditions. Future research should focus on longitudinal studies to better understand the cumulative impact of these factors on hearing health.

CONCLUSION

This study revealed that the prevalence of hearing loss among adults attending the ENT clinic at Bugando Medical Centre Mwanza is significantly higher, with mixed and profound hearing loss being the most common types and severities, respectively.

Noise exposure and ototoxic medication use were found to be significant risk factors for hearing impairment, highlighting the need for targeted interventions. These findings underscore the importance of a comprehensive approach to hearing health, involving prevention, early intervention, and accessible treatment to mitigate the impact of hearing loss on individuals and society.

RECOMMENDATIONS

Public health initiatives should focus on raising awareness about the risks of noise exposure and promoting the use of protective equipment, especially for individuals in high-risk occupations.

Healthcare providers should be trained to identify and minimize the use of ototoxic medications by prescribing safer alternatives whenever possible.

Community outreach programs should emphasize the importance of early diagnosis and treatment of hearing loss, including the management of underlying conditions such as ear infections.

Finally, policymakers should prioritize investment in accessible hearing care services, including affordable hearing aids and specialized ENT care, to improve outcomes for affected individuals.

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Authors' Contributions

BN: Discussed literature and data collection.
HH: Patient management.
JK: Patient n= management, manuscript preparation.
OMK: literature review, patient management and manuscript preparation and development.

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