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Original Article

Impact of Hearing Loss on the Quality of Life in Adults with Hearing Impairment

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ABSTRACT

Introduction: Hearing loss is the most common sensory deficit, which can impair the exchange of information. The impact of hearing loss may be profound, with consequences for the person's social, functional, and psychological well-being. This study aims to assess the overall impact of hearing loss on the quality of life in the adult population.

Materials and Methods: A cross-sectional study was conducted in a tertiary care-based hospital. Patients within the age range of 18-85 years were taken. Two hundred fifty patients presenting to ENT-OPD over six months and fulfilling the inclusive criteria were recruited for the study. All patients underwent detailed audiological evaluation, including otoscopy, tympanometry, and pure tone audiometry in two room setup following ANSI standards. Communication difficulties were assessed using a modified questionnaire from the Hearing Handicap Inventory and Self-Assessment of Communication.

Results: The impact of hearing loss on quality of life was associated with age, gender, and profession. The severity and type of hearing loss were significantly associated with a hearing handicap and self-reported communication difficulties. People with severe-profound hearing loss reported more handicapping conditions and communication difficulties than mild-moderate hearing loss. The impact of hearing loss was found to be more in functional and emotional aspects than physical ones.

Conclusions: Hearing loss is associated with reduced quality of life. Identifying individuals with hearing loss and supplying appropriate rehabilitation with coping strategies may positively affect the quality of life for adults.

Keywords: Communication; Handicap; Hearing loss; Intervention; Quality of life; Rehabilitation

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INTRODUCTION

The ability to communicate is the feature that differentiates humans from other living creatures. Communication involves a speaker, a listener, and a medium, mainly language. Through hearing and decoding, the speaker speaks, and the listener understands the message. Communication is vital for the transfer of information and leads to a better quality of life, and hindrance in communication can lead to a decrease in quality of life.[1]

Hearing loss is the most prevalent sensory deficit, becoming a severe social and health problem in developing countries like

Nepal.[2] Especially in adults, hearing loss can hinder the exchange of information, leading to communication breakdown in daily life. In addition to this, hearing loss can also act as an obstacle to performing daily activities efficiently, causing emotional reactions such as loneliness, isolation, anxiety, and fear; behavioral problems such as blaming and withdrawing as well as cognitive problems such as confusion, distraction, and decreased self-esteem.[3] The impact of hearing loss in activities of daily living results in decreased quality of life for the individual. The term "Quality of Life" refers to the general well-being of the individual and society, outlining negative and positive features of life.[4] The impact of hearing loss on the quality of life may be profound with its consequences on the social, emotional, functional as well as psychological well-being of the person.

The epidemiology of Hearing loss is different worldwide. Approximately 5.3% of the total population has some hearing impairment worldwide, of which about 91.07% are adults, and 8.93% are children, respectively.[5] The prevalence of hearing disability in India is 6.3%[6] and in the USA is 14 percent.[7] In the survey done in India, the prevalence of hearing disability was 18.49 million, i.e., 1.8% of the total population.[8] Similarly, in the All India Institute of Speech and Hearing (AIISH) study, the prevalence of hearing impairment was 7.3% in the rural population.[9] Likewise, in Nepal, as reported by the Tribhuvan University Teaching Hospital (TUTH) study, about 16.6% of the population was hearing impaired.[10] As compared to other developing countries, hearing loss in Nepal is found to be more prevalent, which might be due to the result of poor socioeconomic status, lack of awareness, and lack of health-related facilities in rural areas. Hence, assessing the overall impact of hearing loss on the quality of life is very important.

Several studies have investigated the association between hearing loss and quality of life worldwide, which is lacking in the context of Nepal. A study done at Nepal Medical College measured the impact of hearing loss only in older adults. Their study reported that only 7.1% of people do not take their hearing loss as handicapping condition.[11] The United States National Council on Aging (1999) reported that among the people with hearing loss, 39% perceived that they had an excellent global Quality of Life (QoL) level, indicating they did not perceive any form of handicap.[12] In the study done at Nepal Medical College, gender was not found to be statistically significant for determining handicapping conditions among the elderly population. Similar results were observed in Italian and Danish studies.[11]

It has been shown that self-report underestimates the prevalence of perceived handicaps.[13] Additionally, people in different age groups are likely to report a hearing handicap differently. Older people are less likely to report hearing difficulties compared with younger respondents, which may be accounted for the difference in lifestyle.[14] However, most of these studies have found the hearing loss to be adversely associated with some measure of the quality of life; although, comparisons between studies are difficult because of differences in the instruments used to quantify the quality of life and differences in the methods used to determine hearing loss.

The objectives of this study are to investigate the impact of hearing loss on an individual's perceived handicap, communication difficulties, effect on daily activities, health-related quality of life, the impact of hearing loss on the professional aspect of an individual, and to assess the overall psychological and social impact due to hearing loss among Nepalese adult population with the use of standard audiometric tests along with questionnaires to measure health-related quality of life.

MATERIALS AND METHODS

A cross-sectional study was conducted in a tertiary care-based hospital over six months, from October 2018 to March 2019. The adult population ranged from 18 years to 85 years (Male=125, female=125) fulfilling the inclusion criteria, and willing participants were recruited in the study after informed consent was obtained. Each individual has explained the purpose of the study and the expected outcome. Participants were selected based on the following inclusion criteria:

- Age above 18 years to 85 years
- Visiting with the subjective complaint of hearing loss

Each participant underwent a preliminary Ear Nose Throat examination followed by detailed case history, tuning fork tests, tympanometry, and pure tone audiometry (PTA) following American National Standard Institute (ANSI) criteria.

Two questionnaires Hearing Handicap Inventory for Adults[15] and Self-Assessment of Communication for Adults[16] were modified according to the Nepali scenario and translated into Nepali, based on the translation-back-translation method as explained by World Health Organization (WHO). Health-related quality of life was assessed using a questionnaire from the instrumental Activities of daily living (ALDs) checklist and the short form 36 health survey (SF-36). Two adult native Nepali speakers were randomly chosen and not related to the field of Audiology and were asked to translate the questionnaire. One individual translated the standardized questionnaires into Nepali, which was later translated into English by the second individual. Finally, the reverse translated and the Standardized questionnaires were compared to check for content validity. Content validity was done by two educated people who did not participate in the translation. Overall, the two questionnaires' meaning was similar; hence, the translated Nepali questionnaires were used for our study. All the questions were administered to every patient, and analysis was done on a question-by-question basis**.** Subjects were asked about their profession and divided into five categories, and communication difficulties were assessed according to the profession. Questionnaires that were used for analysis are shown in Table 1.

Table1: Questionnaires used for analysis

Q.1. Do you feel handicapped by a hearing problem?
Q.2. Do you experience communication difficulties in different situations i.e. noisy areas, speaking to someone in a large group, etc.?
Q.3. Does a hearing problem cause you to feel embarrassed when meeting new people?
Q.4. Do you have difficulty in doing various daily activities i.e. eating, bathing, dressing, shopping, etc.?

Pure Tone Audiometry (PTA) was carried out to obtain Air and Bone conduction thresholds in a sound-treated two-room setup. PTA was carried out using Amplaid A137, Amplaid A177 clinical audiometers, TDH-49 supra-aural headphones, and Radioear B-71 bone vibrator. Tympanogram were obtained using Maico MA34 Touch Tymp tympanometer using 226Hz probe tone.

Likewise, tuning fork tests were administered using a tuning fork of 512Hz. Rinne and Weber's tests were the test of choice. All the audiometric equipment complied with American National Standard InstituteANSI guidelines.[17]

Pure Tone AC thresholds were measured at a frequency of 0.25kHz, 0.5kHz, 1kHz, 2kHz, 3kHz, 4kHz, and 8kHz, and Bone Conduction thresholds were measured at a frequency of 0.25kHz, 0.5kHz, 1kHz, 2kHz, 3kHz, and 4kHz. Pure tone averages were calculated using both ears' AC thresholds of 500Hz, 1kHz, 2kHz, 3kHz, and 4kHz for both ears. Hearing loss was categorized as Normal, Mild, Moderate, Severe, and Profound for either ear, following World Health Organization (WHO) guidelines. For analysis purposes, the average of both ear thresholds was taken, and the degree of hearing loss was categorized.

Obtained data was scrutinized and analyzed using Statistical Package for Social Science (SPSS)-20. In the present study, all the testing procedures were carried out using non-invasive techniques, adhering to the guidelines of the Ethics Approval Committee of the institute. All the procedures were explained to the participants, and informed consent was taken from all the study participants.

RESULTS

Of the 250 participants, 85.6% had hearing loss, 25.2% had unilateral hearing loss, and 60.4% had bilateral hearing loss. Among 250 participants, 30.8% and 34.8% had normal hearing, 21.2% and 14% had mild hearing loss, 22.8% and 28.4% had moderate hearing loss, 17.2% and 14.4 % had severe hearing loss, and 8% and 8.4% had profound hearing loss in the right and left ear respectively. Analysis of the type of hearing loss showed that 21.6 % and 28.8% had conductive hearing loss, 35.6% and 16.4% had sensorineural hearing loss, 8.4%, 34.4% had mixed hearing loss, 2.4% and 2% had high-frequency hearing loss in the right ear and left ear respectively. Furthermore, 0.4% had low-frequency hearing loss in the right ear alone.

The self-reported feeling of handicap was analyzed with hearing loss. It was found that more than half of the patients, 66.8%, did not consider hearing loss a handicapping condition. Comparison of hearing loss severity with the handicapping condition showed significant association as it was seen that feeling of handicap increased with increasing severity of hearing loss in each age group, as seen in figure 1. In the unadjusted cross-tabulation analysis, it was found that self-reported handicapping condition was found to be associated with other factors such as age, profession, and socioeconomic status. Overall, 81.2% of participants reported having communication difficulties in different situations, as seen in figure 2, which highlights the importance of audition in effective communication.

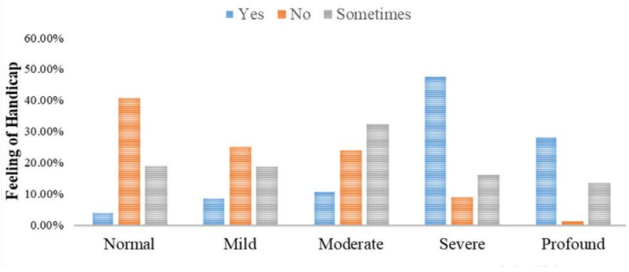

Figure 1: Feeling of handicap with the severity of hearing loss

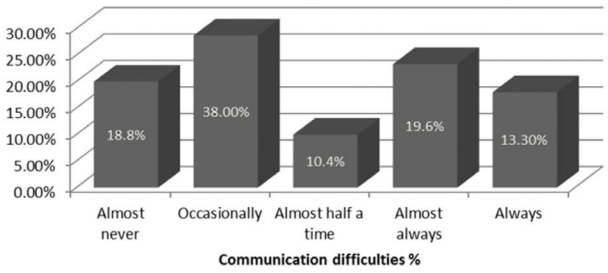

Figure 2: Communication difficulties due to hearing loss

Modified Questionnaires from the hearing handicap inventory for adults (HHI) were used to understand the emotional impact of hearing loss using comparative analysis to understand the feeling of embarrassment across different age groups. More than half of the participants, 63.2%, reported embarrassment from hearing loss while meeting new people, which was seen more in younger participants than older participants, as shown in Table 2. Further communication avoidance of the participants was analyzed according to gender, and it was found that gender is not statistically significant with the communication avoidance nature of participants due to hearing loss, indicating both genders equally avoided communication due to hearing loss.

Table 2: Feeling of embarrassment due to hearing loss according to age group

Age group (years)	Embarrassment due to hearing loss			Total
	Yes	No	Sometimes	
19-29	30/65	18/65	17/65	**65/250**
30-40	12/44	17/44	15/44	**44/250**
41-51	9/36	15/36	12/36	**36/250**
52-62	12/37	16/37	9/37	**37/250**
63-73	9/29	12/29	8/29	**29/250**
74-84	8/23	7/23	8/23	**23/250**
85-95	4/16	7/16	5/16	**16/250**
TOTAL	**84/250**	**92/250**	**74/250**	**250**

As seen in figure 3 severity of hearing loss was associated with impairment in carrying out Activities of Daily Living across all age groups. Difficulties in carrying out activities of daily living were seen more in moderate to severe hearing loss compared to individuals with normal hearing and mild hearing loss.

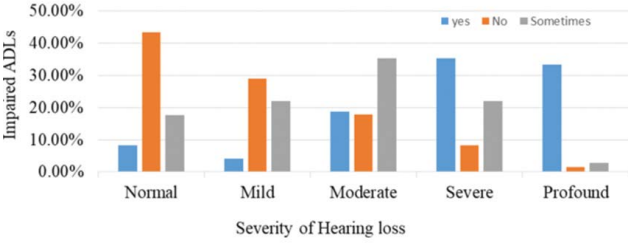

Figure 3: Impaired ADLs according to the severity of hearing loss

Communication difficulties in the different situations were analyzed according to the severity of hearing loss. The result showed that communication difficulties increased as the severity

of hearing loss increased. However, people with minimal-mild hearing loss also reported communication difficulties, as shown in table 3, which highlights the need for intervention for minimal-mild hearing loss, which has been ignored in developing countries.

It was seen that 36.95% of people with normal hearing, 70.2% with mild hearing loss, 86.25% with moderate hearing loss,94.7% with severe hearing loss, and 97.5% with profound hearing loss reported communication difficulties in different situations. Participants with severe to profound hearing loss reported a higher degree of self-reported communication difficulty compared to mild and moderate hearing loss, as seen in table 3.

Table 3: Communication difficulties according to the severity of hearing loss

Hearing Loss	Communication Difficulties (%)	
	No	Yes
Normal	63.05	36.95
Mild	29.8	70.2
Moderate	8.95	86.25
Severe	5.3	94.7
Profound	2.5	97.5
Normal	63.05	36.95
Mild	29.8	70.2
Moderate	8.95	86.25
Severe	5.3	94.7
Profound	2.5	97.5

Communication difficulties were analyzed according to the laterality of hearing loss; as seen in figure 4, individuals with bilateral hearing loss experience more difficulty in communication. It can be noted that communication difficulties are least rare with bilateral hearing loss indicating that individuals with bilateral hearing loss experience more communication difficulties than unilateral hearing loss.

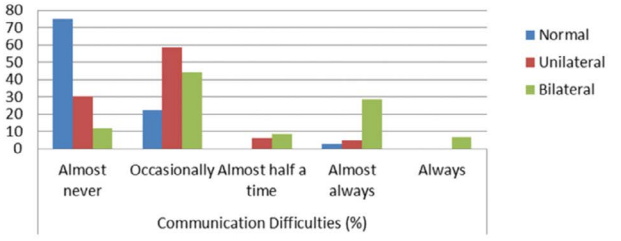

Figure 4: Communication difficulties according to laterality of hearing loss

Hearing loss has a paramount impact on the professional aspect of an individual; to understand the same; cross-tabulation was done to analyze the communication difficulty of different professionals. It was observed that individuals such as officers, businessman, and students; who needs to depend more on communication reported communication difficulties more than other professions like a housewife and retired personnel, as shown in Table 4.

Out of 250 participants, 50% were male, and 50% were female. A chi-square test was done to evaluate the association of gender with handicapping conditions. The cross-tabulation analysis found that gender is not significant ($\chi 2$=0.470) with a feeling of handicap, as shown in figure 5.

Table 4: Communication difficulties according to the profession

Profession	Communication difficulties (%)				
	Rarely	Occasionally	Half a time	Almost always	Always
Officer	33.3	41.2	5.9	15.7	3.9
Businessman	33.3	52.8	5.6	2.8	5.6
Housewife	26.6	41.5	8.5	22.3	1.1
Student	24.2	42.4	9.1	18.2	6.1
Retired	5.6	52.8	2.8	30.6	8.3

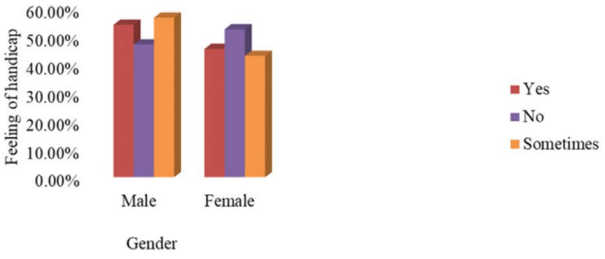

Figure 5: Feeling of handicap due to hearing loss according to gender

DISCUSSION

Hearing loss is a hidden disability that cannot be seen. Though hearing and communication are critical in everyday life, hearing loss often goes unrecognized and untreated disorder. Unlike other disabilities, many people do not consider hearing loss a handicapping condition, which might be why hearing loss is underestimated in developing countries like Nepal.

As seen in the result, more than half of the participants did not take their hearing loss as handicapping condition. The United State National Counsel (1999) reported that among people with hearing loss, 39% of people reported excellent global Quality of Life (QOL) levels indicating no handicap. Our result showed that 66.8% of people with hearing loss reported no perceived handicap. It might be because hearing loss is a hidden handicap, and people in developing countries like Nepal, where other basic needs are the primary concern and hearing loss is not prioritized.

In our study, it was found that gender was not a significant factor in determining perceived handicap level amongst the participants, similar to the Italian study and Danish study.[11] Contrary to our findings, it was reported that men were affected more than women aged over 40 years in a study conducted in the UK by Royal National Institute for Deaf People (RNID), probably because men were exposed to industrial noise.[18] However, in the same study, it was concluded that a greater number of women had hearing loss than men, which was attributed to the higher life expectancy of women.

Severity and types of hearing loss were significantly associated with a perceived self-reported handicap. People with severe-profound hearing loss reported more handicapping conditions than people with mild-moderate hearing loss. A similar association was found in a large population-based study.[19]

The multifactorial association was observed to impact hearing-related Quality of Life in the current study, similar to the study by Shrestha et al.,2014.[11] The factors impacting QoL were age, gender, profession, and socioeconomic condition.

One of the limitations of this study is that quality of life, hearing handicap, and difficulties with communication were determined by self-report from the participant. Although hearing loss certainly affects the individual, it is likely that family members and other individuals dealing with the hearing-impaired person experience as much, or possibly more, frustration as a result of communication difficulties. It also is possible that individuals living with the hearing-impaired person may be more objective about reporting the impact of hearing loss on communication. When investigating the quality of life of people with hearing loss, it may be informative to evaluate the impact of hearing loss on the family and the individual. Another aspect that needs to be evaluated is to compare the quality of life after rehabilitation.

CONCLUSIONS

Hearing loss is associated with reduced quality of life. Identifying individuals with hearing loss and supplying appropriate amplification and assistive listening devices along with coping strategies may positively impact the quality of life of the individual with hearing loss. Awareness and screening programs could be introduced that can raise awareness and increase the likelihood of them seeking help resulting in a reduced impact on the quality of life due to hearing loss.

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