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Functional Ability and Quality of Life of Adult Patients With Hearing Loss: A Cross-Sectional Study

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Original Research

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Abstract

Background: The loss of hearing becomes precious when it is lacking, which makes it valuable. Hearing loss commonly affects functional ability and quality of life (QoL). Assessing QoL in individuals with hearing loss helps with interventions and modifications of life habits. Objectives: The purpose of this study was to assess the functional ability and QoL of adult patients with hearing loss and to determine the correlation between functional ability and QoL. **Materials and methods:** Adult patients (132) aged between 19 and 70 years were selected, all of whom experienced sensorineural, conductive, or mixed hearing impairments ranging from moderate to profound severity. The data were gathered using a functional ability checklist and the World Health Organization Quality of Life BREF (WHOQOL-BREF) scale. **Results:** Among 132 patients, 49.2% exhibited independent functional ability, while 43.2% were partially dependent, with only 7.6% showing complete dependency in terms of functional status. Patients with hearing loss had a greater QoL in the physical domain (M ± SD=73.4037 ± 1.2135) and a lower QoL in the environmental domain (M ± SD=64.1098 ± 1.7257). Furthermore, there was a moderately positive correlation between the QoL scores in different domains and the functional ability scores. **Conclusion:** There was a significant positive relationship between the QoL and functional ability domains, suggesting that as functional ability improves, so does quality of life.

Keywords: Functional ability, hearing loss, hearing aids, quality of life.

Introduction

The intricate network of organs and systems within the human body works together to maintain homeostasis, ensuring a stable internal environment and optimal organ function. The vital nervous system includes five sensory organs: the eyes, ears, tongue, skin, and nose. Of these, hearing stands out as paramount, enabling the reception of sound waves, facilitating the sense of hearing, and contributing significantly to maintaining balance and equilibrium. (Dobie RA, 2004). The absence of hearing highlights its importance, rendering it valuable. Individuals who experienced hearing impairment or who had a hearing threshold of 25 dB or greater in both ears were classified as having hearing loss. (Robb, 2013). It can be mild, moderate, severe, or profound. Over 5% of the global population, equating to approximately 466 million individuals, experience significant hearing impairment. Within this group, 432 million are adults, while 34 million are children. (WHO, 2018). In India, approximately 63 million individuals, constituting 6.3% of the population, experience notable hearing impairment. Among children, four out of every 1,000 are affected by severe to profound hearing loss. Annually, approximately 100,000 babies are born with hearing deficiencies. The prevalence of adult-onset deafness is estimated to be 7.6%, while childhood-onset deafness is estimated to be 2%. Hearing loss can affect either one ear or both ears. (Singh, 2015).

Hearing impairment can lead to difficulties in listening, conversing, and overall communication, significantly impacting daily life. Feelings of loneliness, isolation, and frustration often accompany this condition. Unfortunately, there is no permanent solution for age-

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related hearing loss. However, hearing aids and cochlear implants offer avenues for improvement. Therefore, those affected by hearing loss benefit from education and counselling aimed at enhancing understanding, shifting attitudes, and reducing societal stigma. (WHO, 2018).

Evaluating QoL in people experiencing hearing impairment is crucial for guiding interventions and lifestyle adjustments. Addressing unsatisfactory QoL can be facilitated by the use of hearing aids. Therefore, this study aimed to examine functional capabilities and QoL in individuals with varying levels of hearing loss and to explore the relationship between functional ability and QoL.

Materials and Methods

A descriptive study involving 132 patients with hearing loss between the ages of 19 and 70 years was carried out. Patients referred to the Speech and Hearing Department of a tertiary care hospital with sensorineural or conductive or mixed hearing loss ranging from moderate (41-55 dB) or moderate to severe (56-70 dB) or severe (71-90 dB) or profound (91 dB+) degrees of hearing loss were approached. The study included participants who were willing to participate and who possessed literacy in either Kannada or English. The data collection tools included a demographic proforma, functional ability checklist, and WHO QOL-BREF scale. Participants were selected using a purposive sampling technique. Patients with cochlear implants, mental disorders, or intellectual disability were excluded from the study. The reporting of this study conforms to the STROBE statement.

Ethical consideration:

The study was approved by the Institutional Ethics Committee of Kasturba Hospital, Manipal (IEC:656/2018). Each research participant received a participant information sheet and a copy of the informed consent form that they signed. There was no hierarchical link between the participants and the researchers, and those who consented to participate in the study received no compensation. Permission from the WHO was granted to use the WHO QOL-BREF scale.

2.1. Subjects and Methods

Data were obtained from patients using tools such as demographic proforma, clinical proforma, functional ability checklist, and WHO QOL-BREF scale. The demographic information included information such as age, sex, educational background, monthly earnings, and marital status, while the clinical information included information such as the nature and severity of hearing impairment, duration of the condition, and whether a hearing aid was utilized. Demographic and clinical data were obtained via interviews and medical records by the researcher.

The functional ability checklist, created by the researcher, is a dichotomous questionnaire aimed at evaluating the functional capacity of individuals dealing with hearing loss. It consisted of 25 statements covering five domains: communication, social activities, emotional status, daily activities, and workplace performance. The scoring system categorized scores into three groups: independent (17-25), partially dependent (9-16), and completely dependent (0-8). The instrument's reliability was determined by assessing internal consistency through Cronbach's alpha, which resulted in a reliability coefficient of 0.79.

The WHO QOL-BREF scale is a standardized tool consisting of 26 items that measure QoL, a score relating to 4 large domains, namely, the physical, psychological, social relationship, and environmental domains. The scaling of domain scores was performed in a positive manner, where a higher score indicates a better QoL on a five-point scale within each domain. The reliability of the Kannada version used in this study was confirmed to be 0.83.

2.2. *Statistical analysis*

Statistical analysis of the data was performed using SPSS version 16.0 in alignment with the outlined objectives. The Pearson correlation coefficient was used to assess the correlation between QoL and functional ability.

Results

The demographic data of the study patients with hearing loss (132) are presented in Table 1a. Among the 132 patients studied, the largest proportion (31.1%)

were aged 61 to 70 years, while the majority (59.1%) were male. The majority (41.7%) had a primary level of education, while 82.6% reported a monthly income within the range of INR 5,000 to 10,000. The majority (86.4%) of patients were married. Of the clinical details of the patients, 40.9% exhibited symptoms of tinnitus, 43.9% had mixed hearing loss, and 42.4% had moderate hearing loss. Approximately 40.2% reported experiencing hearing difficulties for a duration ranging from 1 to 5 years, with the majority (87.9%) experiencing hearing loss in both ears. (Table 1b).

The present study revealed that 49.2% of the patients exhibited independent functional ability, while only 7.6% relied entirely on their functional status. (Figure 1).

The QoL of individuals with hearing impairment was evaluated utilizing the WHO Quality of Life-BREF (QOL-BREF) scale. The data yielded four domain scores, with two items focusing on the general QoL of individuals experiencing hearing loss. One item gauged their overall perception of QoL, while the other assessed their satisfaction with their overall health. These domains encompassed physical, psychological, social, and environmental aspects. Participants' perception of QoL in each domain was indicated by their obtained scores. The average score in each domain was utilized to determine its overall score. These scores were then converted into transformed scores according to the norms recommended by the WHO.

The majority, comprising 57.6% of the patients, expressed satisfaction with their QoL, rating it as good. Conversely, 13.6% of the patients regarded their QoL as poor, and 14.4% indicated dissatisfaction with their health. (Figure 2a and 2b).

The domain wise scores of the QoL of the patients with hearing loss are presented in Table 2. Hearing loss patients had a greater QoL in the physical domain (M±SD=73.4037±1.2135) and a lower QoL in the environmental domain (M±SD=64.1098±1.7257).

The Pearson correlation coefficient was used to determine the relationship between QOL and functional ability (Table 3). There was a positive moderate correlation between QOL and its physical, psychological, social, and environmental domains and between QOL and functional ability. Thus, the null hypothesis was rejected, and the research hypothesis was accepted. This finding could have important implications for understanding how different aspects of QoL relate to an individual's ability to function in various aspects of life.

Table 1a

Frequency and percentage distribution of sample characteristics

N=132

Sample characteristics	Frequency (f)	Percentage (%)
Age (in years)		
19-30	20	15.2
31-40	18	13.6
41-50	21	15.9
51-60	32	24.2
61-70	41	31.1
Gender		
Male	78	59.1
Female	54	40.9
Education		
Primary	55	41.7
High school	42	31.8
PUC	17	12.9
Diploma	6	4.5
Graduate	12	9.1
The family income per month (in INR)		
5,000-10,000	109	82.6
11,000-20,000	14	10.6
21,000-30,000	1	0.8
>31,000	8	6.1
Marital status		
Married	114	86.4
Unmarried	15	11.4
Widow	3	2.3

Table 1b

Frequency and percentage distribution of sample characteristics

N=132

Sample characteristics	Frequency (f)	Percentage (%)
Any other symptoms experienced		
Tinnitus	54	40.9
Vertigo	16	12.1
Fullness/blocking sensation	8	6.1
None	54	40.9
Type of hearing loss		
Sensorineural	51	38.6
Conductive	23	17.4
Mixed	58	43.9
Degree of hearing loss		
Moderate	56	42.4
Moderate to severe	52	39.4
Severe	24	18.2
Duration of hearing loss		
<6 months	23	17.4
6 months-1 year	17	12.9
2-5 years	53	40.2
6-10 years	25	18.9
>11 years	14	10.6
Hearing loss		
Unilateral	16	12.1
Bilateral	116	87.9
Using hearing aid		
Yes	3	2.3
No	129	97.7
Comorbidities		
Diabetes	6	4.5
Hypertension	9	6.8
Diabetes and hypertension	6	4.5
No comorbidities	111	84.1

N=132

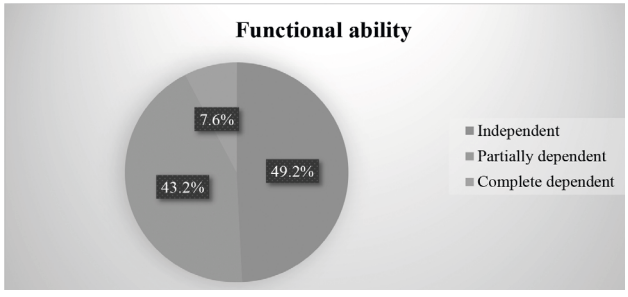

Figure 1: *Pie diagram of the functional status of patients with hearing loss.*

N=132

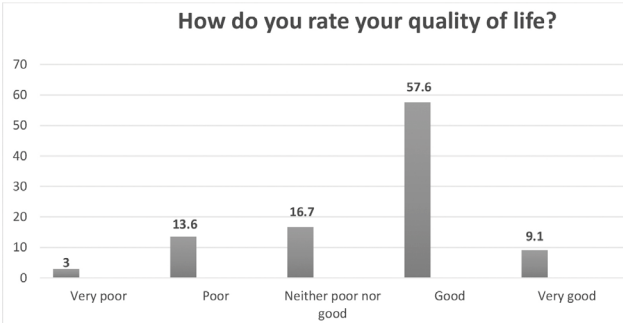

Figure 2a: *Bar diagram of the frequency and percentage of QoL*

N=132

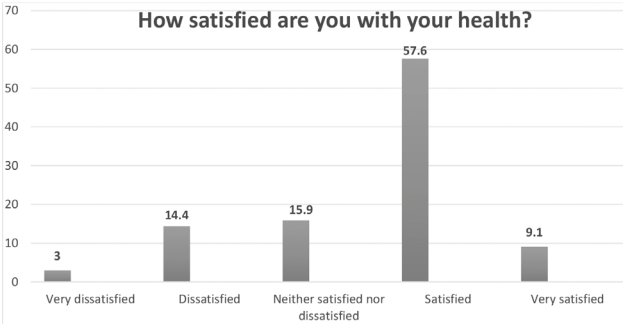

Figure 2b: *Bar diagram showing the frequency and percentage of patients with hearing loss who were satisfied with their own health.*

Table 2

Domainwise QoL scores of patients with hearing loss.

N=132

Domain	Mean	SD	Median	Minimum score	Maximum score
Physical	73.4037	1.2135	75	28.57	100
Psychological	70.9280	1.5380	75	25	95.83
Social	67.1086	1.8050	66.66	16.67	100
Environment	64.1098	1.7257	65.62	25	100

Table 3

Relationships between QOL domains and functional ability

N=132

Variables	r value	p value
Functional ability and QOL	0.494	0.00*
Functional ability and physical domain	0.401	0.00*
Functional ability and psychological domain	0.495	0.00*
Functional ability and social domain	0.362	0.00*
Functional ability and environmental domain	0.441	0.00*

*Significant at $p < 0.05$

Discussion

The findings of the present study revealed that 31.1% of the participants were aged 61-70 years, with a male predominance (59.1%). Most 40.9% of the patients had tinnitus, and 43.9% had mixed hearing loss. A comparable result emerged from a study conducted among 65 elderly individuals with age-related hearing impairment in Austria. A total of 46.2% of the participants were 75 years old or older, with males comprising 50% of the participants. (Sarah, Wolfgang, 2017).

The present study revealed moderate hearing loss among 42.4% of participants, 97% of whom did not use a hearing aid. However, a study by Sarah et al., from Austria revealed that 56.9% of patients had moderate hearing loss, and 80.8% of patients used hearing aids (Sarah, Wolfgang, 2017), which is different from the findings of the present study. In a comparative cross-sectional investigation carried out in Sweden involving 369 individuals with hearing impairment, 56% of the participants were male, while 76% experienced tinnitus. (Carlsoson, Hall, Lind, and Danermark, 2011).

Furthermore, a comparative cross-sectional study conducted in Nigeria involved 130 individuals, comprising 78 patients and 52 controls. Among the patients with hearing loss, 43.6% were between 70 and 79 years of age; 50% of the patients were males, 47.4% of the patients had an education level up to a secondary level, and 58.5% of the patients had tinnitus (Sogebi, Oluwole, and Mabifah, 2014). Similar findings were obtained in a quantitative descriptive study conducted in Puerto Rico, United States (2017), among 24 individuals with hearing loss. One study revealed that among 24 individuals, 54% had tinnitus, and 37% had a family history of hearing loss (Andrea and Hernandez, 2017).

In the present study, 49.2% of the patients were in the category of independent functional ability, while 7.6% of the patients were completely dependent on their functional ability. These findings were supported by the longitudinal study conducted by Dalton et al. (2003) in Beaver Dam, which included 2,688 individuals and showed that hearing-impaired older adults have a greater functional disability than nonimpaired adults (Dalton et al., 2003), 58.3% of the individuals severely deteriorated with their activities of daily living (Andrea & Hernandez, 2017), and 52.6% of patients had functional impairment in Nigeria (Sogebi, Oluwole, and Mabifah, 2014). The current research indicates that individuals experiencing hearing impairment report a greater level of physical well-being, with an average score of 73. Conversely, their QoL is notably lower in the environmental sphere, with an average score of 64. A similar finding was observed in a cross-sectional study conducted in Brazil, revealing that patients with hearing loss had a greater QoL in social relationships (mean 62.8) and a lower QoL in physical health (mean 55) (Carniel, et al., 2017). In contrast, a study conducted in Egypt involving 127 patients revealed that individuals with hearing impairment exhibited greater satisfaction with their environmental circumstances but reported poorer physical health QoL (Said, 2017).

In this study, there was a moderate positive correlation between domainwise QOL scores (physical, psychological, social, and environmental) and scores indicating functional abilities. This correlation suggested that as functional ability scores increase, so do the scores in the QoL domains. In support of these findings, hearing-impaired older adults have greater functional disability, which has an impact on quality of life, as seen in a longitudinal study conducted among 2,688 individuals in Beaver Dam (Dalton, et al., 2003).

Conclusions

The present study sheds light on the significant impact of hearing loss on the functional ability and QoL of adult patients. This study emphasizes the need for holistic approaches to address the various issues faced by people with hearing impairment, adding to the expanding body of knowledge on the impact of hearing loss on adult populations.

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