



# Assessment of Quality of Life in Adults with Hearing Impairment

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## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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## ABSTRACT

**Background:** Hearing loss (HL) in adults is loss of ability to perceive surrounding environmental sounds. There may be environmental or genetic cause of this disability. Presently expectancy of old adult age is going to increase as in the same way hearing problems and its negative impact on health wellbeing standard of living also increased, the beneficial of current study is to be addressed, or give awareness about health consequences to adult population with hearing impairment.

**Aim:** To determine the quality of life in adults with hearing impairment.

**Place and Duration of Study:** Riphah international University, Lahore campus between December 2018 to May 2019.

**Methodology:** A cross sectional survey was conducted on 67 adults with hearing impairment (sample size was calculated on the base of prevalence of hearing loss in the Express Tribute, (March 4, 2014) which was a Pakistani study on hearing impaired population the president of famous organization the developmental diseases and community of auditory handicap MR Afzal

estimated the occurrence of auditory deficits in Pakistan region was in between 7 to 8 percent on per 10,000 living birth, this prevalence was used to calculate sample size by using online calculator.(1), their age range were 18 to 55 (elder adults) and 56 to 97(older adults). Data collection tool which was used in this research was 15D Quality of life questionnaire to find out the influence of hearing loss (HL) on daily living activities in adult's life. Sampling technique used in this research was convenient sampling. For this purpose, descriptive analysis was done for demographics and chi square was used for inferential analysis by using SPSS20. Endnote was used for references.

**Results:** There are four domains of quality of life (speech, usual activities, mental functioning, and vitality status of participants) which have highly significant relationship value(<0.001) with hearing impairment, in other domains of quality of life p value is less than (<0.05) this means that other domains of quality of life have also significant relationship with hearing impairment except visual or sexual activity of the participants which have no significant association p-value(>0.05)with hearing impairment.

**Conclusion:** Research concluded that domains of quality of life are significantly associated with hearing loss which have negative impact on the QOL(quality of life) except visual or sexual activity, but these two domains may also indirectly have associated or may affect the quality of life individually in adults with hearing impairment.

*Keywords: Hearing impairment (HI); quality of life (QOL); (OA) older Adults; (EA) Elder Adults; hearing loss (HL)*

## 1. INTRODUCTION

Hearing is defined as the process of sound reception by outer ear, its manipulation by middle ear ossicle chain and its transmission from outer ear to brain [1-2]. Hearing disability will occur when there will be defect in aural pathway from outer ear to inner ear or one or two ear parts and in eighth cranial nerve (vestibulocochlear) which is specific for hearing and balance, or that portion of brain that is dominant for auditory comprehension like temporal lobe in left hemisphere in CNS(central nervous system), when there will be any defect in temporal lobe of brain it means that there is something wrong or not working more appropriately as it should be. Hearing disability or deficit is the most common medical condition in between young and adults with advance age range with age 60, or above this range particularly for those working within manufacturing countries [3].

Hearing has great impact on every aspect of life including communication, social emotional, cognition and greatly related to decline the quality of life (QOL) [4]. The consequence of problematic contact, encoding or problematic proper planning and programming of the person with hearing disability possibly will pick out their community skills so poorly that cause to reduce their self-esteem, and poor coping social skill which may contribute in disturbing their daily living activities [5].

Hearing disability now a day, is becoming the most ordinary deficit considered to be sensorineural deficits in adults with advance age, and is the most usual cause to deteriorate one's communication, societal, emotional, behavioral or other important aspects of life in daily living situations. Problematic hearing can damage the alternate of message in between communication partners, consequently can exchange the daily life, that may results in being alone, separation, mental distress [6], reliance, and disappointment as well as communication disorders. Hearing disability is considered to be most usual and is supposed to be complete or incomplete inability of a person to interact in their surrounding environment, this problem of aural deficits can take place at the level of one part of ear or may be from outer to inner part by effecting either one or both ear in a person suffering from this disability. Hearing destruction is the decline of the quality of existence not in child or elders but in older adults as well. Age related SN hearing or aural deficits occur mostly in adults with age more than 60 or in older age [7].

Recently researches show that this type of hearing impairment can take place due to any toxic dangerous chemicals, due to any industrial environmental with loud noise or may due to any side effects of any type of radiational treatment or therapeutic sessions, also can occur due to defective or mutational change in genetic or inheritance makeup. When there are two types that occurs at the same time it is

known as mixed type of hearing impairment in which there will be problem at the level of conduction or neural pathways ,in another context we can say that there will be problem in outer ,middle as well as inner ear that play important role for normal hearing processing this type of hearing loss may occurs due to brain insults, any traumatic brain injury ,or chronic infectious disease that may be inherited or transfer from parents to their offspring. Another type of auditory deficit is because of excessive deafening noise which is known as hearing loss that occurs due to excessive noisy environmental sounds [8].

Age related hearing can change the quality of life (QOL) in child or elderly people but also have negative impact on older adult's life. HL (Hearing Loss) can effect social [9], emotional, behavioral, cognition, even can have negative effect on daily living activities or on verbal or non-verbal message exchanging skills as problem in exchanging thoughts and ideas from one person to another which may lead to reduction of living better life with good quality of all important living domains more importantly in adults with age more than 50. There are some qualities of life domains which can be affected by hearing loss, possible problematic areas that may be affected in people with advance chronological age that may change their living standards or daily living activities or quality of living situations QOL [10].

These areas are following as Social interaction, unable to interact with people due to loss of self-esteem Emotional problems which may have loneliness, frustration, anxiety, depression guilt feeling, anger and embarrassment, cognition problems [11].

Another problem which are interlinked with hearing impairment is Communication problems 'Announcement' the way of exchange information among two or more than two individuals and it has great importance and is a vital feature of a daily basis living activities can be destroyed in individual with auditory deficits, so it is very important for an individual that he or she may have good or intact hearing for the purpose of normal development of communication skills it may be receptive or expressive or both. Furthermore, Hearing loss enlarges to a number of disabilities [12]. In a study of Sung, Y, [13] ,they concluded that there is significant positive association in between hearing impairment and domains of quality of life, in another study of Ciorba [14] they concluded that there is an

significant association between hearing impairment and social withdrawal which can lead to problem in other domains of QOL.

This study addressed, or give awareness about health consequences to adult population with hearing impairment. Results of this study will also give help in timely use of proper rehabilitation options, coping and teaching skills and use of hearing aids or other assistive devices (to prevent the adults from further hearing loss) that may lead to improve overall quality of life.

## 2. MATERIALS AND METHODS

It was a cross sectional survey conducted on 67 adults with HI (hearing impairment) which was calculated through online calculator [15] on the base of prevalence of old age hearing loss 7 to 8 per 1,000 live births by using 95% confidence level 2% confidence interval., whose age range was 18 to 55 (adults) and 55 to 97(older) from December 2018 to May 2019. Inclusion criteria of this study was following as ,Individual with hearing impairment ,both male and female were included ,Adults population with age range 18 - 55 and Older with age range 55 -97 were included in this research. Exclusion criteria was as following, Chronic and permanent disabilities with hearing loss, Individuals with Acute and chronic psychological and psychiatric disorders, Individuals using hearing aid were excluded. 15D Quality of life questionnaire which was made by sintonen, Harri used for the data collection, which is mostly useable, which has 15 dimensional, standardized, self-administered measure of health related quality of life. The 15D is sensitive highly reliable (0.793 and 0.792) [16-17] instrument. The study was conducted at Riphah international university and data was collected from the tertiary care hospital LGH (Lahore General Hospital). The study participants satisfying inclusion and exclusion criteria were recruited in this trial after informed consent. The researcher told her purpose of study and was engaged with each participant for the purpose of getting basic information and it was collected face to face by using the standardized questionnaire (15D Quality of life questionnaire) [16-17]. The researcher also assessed by herself due to secondary language, and uneducated participants. Pure tone audiometry (PTA) test scoring for the assessment of hearing impairment of each subject was done by audiologist researcher noted done the result of test from test reports to find out the type of hearing impairment at Audiology Department of

Lahore General hospital .The rationale of this study was to review the quality of daily living activities of elder and older in their surrounding environment with hearing loss and how HL (hearing loss) will effects the various domains (social, emotional, behavioral, even physical aspects of quality of life in adults). Data gather during this study was analyzed by using SPSS 20. Descriptive analysis was used for demographics and chi square was used for inferential analysis.

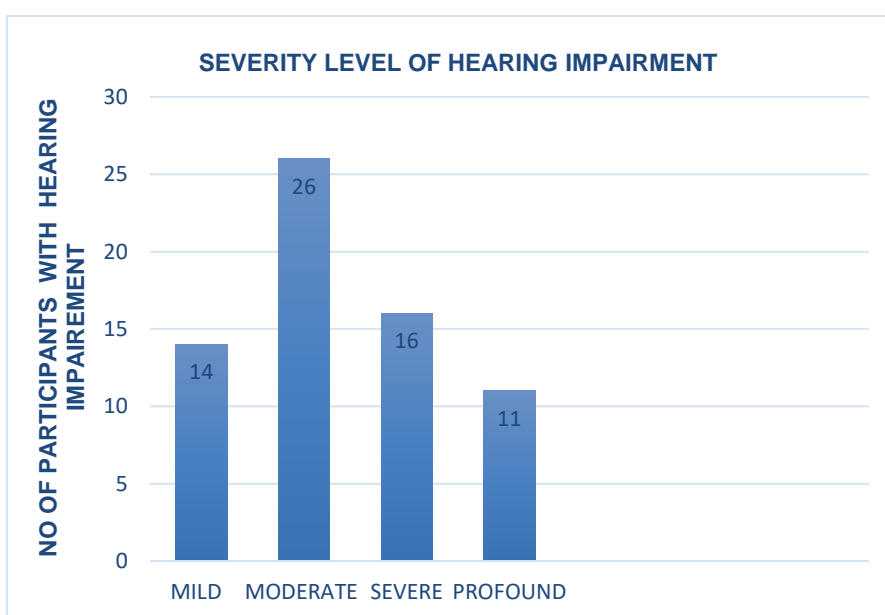
### 3. RESULTS

Results shows that most of the participants were those who had age range in between 18 -55 (76.6%) according to results most of the participants were male 37(55.5%). Most of the participants were those whose educational status was in others categories (primary, middle, high) were 50(74. 6%).Most of the participants 37 (55.2%) were those who were on job, 50 (74.6%) participants were belonged to middle-class socioeconomic status and 17 (25.4%) were with lower-class status. most of the participants were those who were lived in urban areas 48(71.6%), and 19(28.4%) were those who were lived in ruler areas. most of the participants were married who were 54(80.6%), and 12 (17.9) participants out of total 67 were single and only 1 participant was divorced.

Table 2 shows that there are four domains of quality of life (speech, usual activities, mental functioning, and vitality status of participants) which have highly significant relationship p-value(<0.001) with hearing impairment, in other domains of quality of life p value is less then (<0.05) this means that other domains of QOL have also significant relationship with hearing impairment except visual or sexual activity of the participants which have no significant association p- value(>0.05)with hearing impairment.

**Table 1. Demographics of study participants**

Variables	Subgroups	N (%)
Age	18-55	50(75%)
	56-97	17(25%)
Gender	Males	37(55%)
	females	30(45%)
Education	FA	7(9%)
	Bachelor	5(8%)
	Master	5(8%)
	Others	50(75%)
Job	On job	37(55%)
	Retired	30(45%)
Socioeconomic status	Middle	50(75%)
	Low	17(25%)
Location	Urban	48(72%)
	Rural	19(28%)
Marital status	Single	12(18%)
	Married	54(81%)
	Divorced	1(1%)



**Chart 1. Severity Level of Hearing Impairment**

**Table 2. Comparison of hearing impairment with Variables related to the quality of life**

<b>Variables related to the quality of life</b>	<b>P - value</b>
Mobility of the participants	0.012*
Visual status of participants	0.138
Breathing status of participants	0.037*
Sleeping status of participant	0.002*
Eating status of participants	0.004*
Speech status of participants	0.000*
Excretion status of participants	0.011*
Usual activities status of participants	0.000*
Mental function status of participants	0.000*
Discomfort and symptoms of participants	0.002*
Depression status of participants	0.001*
Distress status of participants	0.003*
Vitality status of participants	0.000*
Sexual activity of participants	0.068

#### 4. DISCUSSION

The main purpose of study was to assess the quality of life (QOL) in adults with hearing impairment. Results shows that there is statistically significant association in between hearing impairment and 12 domains of quality of life which effects the quality of life or have negative impact on daily living activities in adults with hearing impairment. Except two domains (visual and sexual activity which shows independent or no significant relationship with hearing impairment). But these two domains may also have negative impact on quality of life individually. Agmon et.,al (2017) conducted a systematic review to found the association in between hearing loss and mobility control or postural stability. Similar results as in current study (p-value=.001) that there is a Significant relationship (p-vale=.012) between hearing impairment and mobility in adults [18] assessed the quality of life in adults with hearing and visual impairment, and it was concluded that there is a significant association between visual impairment and hearing impairment. The results are insignificant relationship (P=.138) between hearing Impairment and visual status of participants, this difference may be due to different age Groups, setting and environment [19].

In presenting study, it concludes that there is an insignificant association(p=0.37) between hearing impairment and speech subsystem like respiration. Literature also reveals the same results that there is a positive relationship

(p=.011) between hearing impairment and speech subsystems that may impact the quality of life or cause loneliness, depression, emotional deprivation and other psychosocial disturbance [20].

In current study, hearing impairment and sleeping pattern of adults with hearing impairment are significantly associated (p=.002) with each other's literature reveals the similar result that sleeping will be disturbed in adults with hearing disability so there is positive association (p=.002) between hearing impairment and sleeping pattern [21].

Hearing impairment and eating status is positively associate (p=.004) with each other in presenting study individual with severe hearing loss will have minor eating problem. literature reveals the similar results(p=.011) as presenting in current study [22].

There is a highly significant association between hearing impairment and speech (p= .000) this Means that hearing impairment will effect on speech production in adults with hearing Impairment. Literature also reveals the same results (p=.001) as presenting in current study, P, Muriel TN et, .al ( 2018) conducted a study to find out relationship in between hearing impairment and speech production they find out that normal hearing is vital for speech comprehension or normal production of speech sounds so they concluded that hearing impairment have negative consequences in the production of normal speech sound ,these two modalities are significantly associated to each other's [23] which is also mentioned in the presenting study .p-value is less than 0.05 this means that, there is a positive association(p=.011) between hearing impairment and excretion problems in adults with hearing impairments, this table shows that adults with increasing severity level of hearing disability will have more excretion problem then individual with mild degree of hearing loss .Literature also reveals the similar result as in a study of Kim ,YS , L et., al [24] ,they concluded that severity of hearing loss in adults is positively associated(p=.002) with increase albumin in the urine so this means that these two are positively in relationship with each other's as presenting in the current study.

There is a significant relationship (p=.000) in between hearing impairment and daily usual activities in adults with hearing impairment,

literature also reveals the similar results( $p=.001$ ) that there is significant relationship in between hearing impairment and social, emotional, physical, mental normal functioning or other daily living activities, which have negative influence on adult's life with hearing disability [25].

The results of presenting study also shows that there is a positive association( $p=.000$ ) between hearing impairment and mental health in adults with hearing impairment,literature also reveals the similar results that hearing loss is positively associated( $p=.002$ )with mental health and decline of normal cognitive functioning in adults with hearing loss and the decline of mental health is linked with severity and degree of hearing loss [26]. as mentioned in above table that adults with moderate degree of hearing loss have more cognitive and mental functioning problems as compare to mild degree of hearing loss.

There is significantly positive association ( $p=.002$ ), ( $p=.003$ ), ( $p=.001$ ) between hearing impairment and pschosocial behaviors like discomfortable ,distress,and depression in adults with hearing disability respectively,literature also shows the similar results ( $p=.001$ ), ( $p=.002$ ), ( $p=.003$ ) [27] as mentioned in current study.

There is a significant relationship ( $p=.000$ ) between hearing impairment and vitality in adults with hearing loss, literature also reveals the similar results that there is Significant relationship( $p=.001$ ) in between hearing loss and physical,emotional,social,mental vitality in adults with aural difficulty.

There is insignificant relationship ( $p=.068$ ) in between hearing loss and Sexual activity, but in literature there is significant relationship( $p=.002$ ) in between hearing loss and sexual activities, adults with mild to moderate heaing loss have poor sexual health the difference in results of presenting study or other literature review may be due to different age range and different setting and environment [28].

Above results also draw attention towards the requirements to improve the methods of hearing evaluation and also provide better strategies to improve coping skills, rehabilitation methods, and to provide better quality of life to adults with aural disability to exist in their surrounding environment more confidently, and to perform their daily living activities more efficiently.

## 5. CONCLUSION AND RECOMMENDATION

The research concluded that there is significant relationship in between hearing impairment and domain of quality of one's life, research concluded that hearing loss have negative impact on the quality of life in adults with all age range, this poor quality of life level will be increased as degree and severity level of hearing loss will increase. It is mandatory to improve the services or other coping and teaching skills to provide hearing aids or other assistive devices for the purpose of better QOL (quality of life) in adults with hearing impairment.

## ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

## CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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