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**ORIGINAL ARTICLE**

# Frequency of Hearing Impairment in Siblings of Hearing Impaired Children

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## ABSTRACT

**Background:** It has been reported that hearing impairment is significantly associated with multiple negative outcomes including depression, loneliness, altered self-esteem, and diminished functional status. The deaf and hard of hearing community is very diverse as for as cause, age of onset and degree of hearing loss.
**Aim:** To determine the frequency of hearing impairment in siblings of hearing impaired children.
**Methods:** This is descriptive observational study was conducted between September 2015 to February 201 at FMH College of Medicine and Dentistry. A total of 100 hearing impaired children aged between 4 to 20 years were included in this study. A self-designed questionnaire was used to assess the parental point of views. The questionnaire was designed as a data collection tool in order to collect the frequency from the HIC regarding their siblings hearing impairment.
**Results:** Results indicated that out of 100 subject 63(63%) were male and 37(37%) were female and the mean age of patients was 12.28±4.13 years. On asking the HIC about total number of siblings 15(15%) responded that they had only 1 sibling, 28(28 %) responded that they had only 2 siblings, 17(17%) responded that they had only 3 siblings, 17(17%) responded that they had only 4 siblings, 14(14%) responded that they had only 5 siblings, 1(1%) responded that they had only 6 siblings and 8(8%) responded that they had only 7 siblings.
**Conclusion:** It was concluded from the above study that frequency of hearing impairment in siblings of hearing impaired children is in high proportion and this high proportion of hearing impairment is because of cousin marriages, pressure due to family structure, genetic change.
**Keywords:** Hearing impairment, hearing loss, frequency, Siblings.

## INTRODUCTION

The deaf and hard of hearing community is very diverse as for as cause, age of onset and degree of hearing loss. Its member differs greatly regarding educational background, communication methods, and their feeling about hearing loss. According to medical definitions, those who are considered "deaf" have severe hearing loss, usually greater than 90 decibels (dB) loss[1]. People who have trouble hearing generally rely on hearing with the aid of amplification, and they use their sight as an additional form of communication. Those who require hearing aids are considered "hard of hearing" if their hearing loss is less than 90 dB. Even though hearing individuals may prefer the term "hearing impaired" because they believe it to be politically correct, deaf and hard of hearing people prefer to be referred to as "deaf" or "hard of hearing." It is up to persons who have hearing loss to choose whether to approach it from an audiological view or from the perspective of a particular culture. It all comes down to options, comfort level, communication style, and accepting hearing loss[2].

It can come as a huge shock to some families when they know their child is deaf. The news may upset some parents or careers. Some people will feel relieved that their suspicions were finally validated. Some parents or professions could be from a culture or community where having extra needs is seen negatively. There are no good or bad emotions. You'll respond in your own way. Your response will depend on how significant you perceive the loss to be. Parents and professionals have discussed a variety of emotions, such as astonishment, rage, perplexity, fear, and melancholy. One will progress through the process of accepting your child's deafness at his or her own rate. You must accept that your child is deaf as well as the fact that life has changed for the entire family. The deafness of your child may not feel like your first priority if they have other health issues or special requirements[3].

As their sibling's deafness will influence them too, even if they are not deaf themselves, it is crucial that brothers and sisters feel included in your deaf child's life. The way in which you notify your other children is up to you. Every family will have a unique method of communication. Deaf children's siblings and other family members may feel various emotions. They may occasionally like spending time with their deaf sibling, but they may also occasionally find it stressful and challenging[4].

The ability to perceive sound by detecting vibrations and changes in the pressure of the immediate environment over time using an organ like the ear is known as hearing, auditory perception, or audition. Humans are equipped to pick up the speech and language of their surroundings from birth and even later. Early exposure to this environment gives kids the chance to process sounds and to speed up language learning and expression. These relationships are largely made possible by audition[5].

From the time noises enter the organism in utero until 12 months of age, when the first words are often spoken, auditory perception is directly tied to human phylogeny, embryology, and interaction with their environment. The development of language, cognition, and motor skills are all closely related to one another since newborns frequently make motions to communicate their needs. It has been proposed that categorization and clarification of different information kinds also require interaction between the listening experience and the environment. However, not every infant is born with the ability to interpret and classify the noises and speech of their surroundings. The normal development of speech and language can be impaired in some newborns who experience auditory deprivation due to a lack of acoustic feedback and important auditory information. A common disease in people is the partial or total inability to sense noises[6].

An individual's ability to hear background sound without amplification is lowered by hearing impairment. In certain circumstances, even with amplification, it also makes it harder to distinguish between sounds. I can hear you but I cannot comprehend you is a typical complaint among older persons who have hearing loss. According to several studies, auditory discrimination issues exist even in some older individuals with normal hearing as determined by pure tone audiometric tests. Younger individuals with normal hearing as determined in the same way tend to experience this less frequently[7].

Hearing loss in many elderly persons is characterized by the loss of hearing high-frequency noises. The ability to hear sounds up to 30,000 Hz is present at birth, but it gradually decreases with each passing year. By their teen years, many people can only hear

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noises up to 20,000 Hz, and by the time they are old, many people are unable to hear sounds at 4,000 Hz or even 2,000 Hz, which is the frequency at which some speech sounds occur[8].

Relationships and overall quality of life depend on effective communication, which hearing loss hinders for both the individual and their family and friends. Repeated instances of unclear or misunderstood communication are upsetting for the person and everyone he converses with and could make everyone less likely to start off a conversation. Family relationships may suffer greatly if these annoying circumstances persist for an extended length of time. As a result of his own voice seeming distorted due to hearing loss, a person's ability to communicate clearly might also be affected, which adds another barrier to communication. A person with hearing loss may retreat from these sources of entertainment because they are out of his or her range of enjoyment, such as music, theatre, radio, and television. Similar to this, some persons with hearing loss stop attending church and social gatherings because they can't hear well enough to appreciate them. Access to information that is often available through personal conversation, television, radio, and telephone is similarly restricted by hearing impairment. The access to information for elderly people who suffer from both hearing and vision problems is much more severely constrained[9].

Whether an interview or an audiometric exam is used will affect frequency. Interviewing techniques frequently underestimate the prevalence of hearing impairment because many people, especially elderly persons, are unaware of their hearing loss or may downplay or deny its severity when interviewed. Although frequency data based on both approaches is frequently mentioned in the literature, some experts contend that audiometric testing offers more reliable measurement[10].

The information in the conversations that follow reflects our best knowledge of the prevalence of hearing impairment in the country. However, in other places, the generalizations might not be applicable. For instance, several ethnic groups in Sindh and Baluchistan frequently suffer from chronic ear infections, which raises the incidence of hearing loss in those regions. Hearing loss is more prevalent in people who are working age and older in lower Punjab, where there are more high noise businesses. Age, sex, colour, income, and institutional factors all affect how frequently people have hearing loss. According to interview surveys, hearing loss is more common in older men than older women. In comparison to their richer counterparts, those with low family income typically have a higher rate of hearing impairment at all ages[11].

According to the Society for Audiological and Developmental Ailments (SADA), there are 300,000 deaf people in Pakistan, and the prevalence of hearing loss is 7 to 8 per 1000 live births. This rate was rising annually[12].

## METHOD

After permission from IRB a total of 100 hearing impaired children aged between 4 to 20 years were selected to participate in this study. A self-designed questionnaire was used to assess the frequency of hearing impairment in siblings of hearing impaired children. Parents were asked to fill the designed questionnaire by simply asking some questions regarding the frequency of hearing impairment in siblings of hearing impaired children. The questionnaire was designed as a data collection tool in order to collect the frequency from the HIC regarding their siblings hearing impairment.

## RESULTS

Out of 100 subject 63(63%) were male and 37(37%) were female and the mean age of patients was12.28 ± 4.13years (Table 1).
Results indicated that on asking about the HIC about total number of siblings 15(15%) responded that they had only 1 sibling, 28(28%) responded that they had only 2 siblings, 17(17%) responded that they had only 3 siblings, 17(17%) responded that they had only 4 siblings, 14(14%) responded that they had only 5 siblings,1(1%) responded that they had only 6 siblings and 8(8%) responded that they had only 7 sibling. On asking the HIC about total number hearing impaired siblings 57(57%) responded that they had only 1 sibling, 39(28%) responded that they had only 2 siblings, 4(4%) responded that they had only 4 siblings. On asking the HIC about gender of hearing impaired siblings 63(63%) were male and 37(37%) were female. On asking the HIC about degree of hearing impairment 1(1%) responded that they had moderate degree of hearing impairment, 23(23%) severe and 76(76%) had profound degree of hearing impairment in their hearing impaired siblings. The data also showed that 3(3%) were with unilateral hearing loss, 97(97%) were with bilateral hearing loss, 93(93%) had congenital hearing loss and 7(7%) had acquired hearing loss, as shown in table 2.

Table 1: Participants Characteristics

| **Demographics** | | **Frequency** | **Frequency** |
|---|---|---|---|
| Gender | Male | 63 | 63% |
| | Female | 37 | 37 % |
| Age of Patients | Minimum | Maximum | Mean |
| | 4 | 20 | 12.28 ± 4.13 |

Table 2: Question wise analysis.

| **Questions** | **Response** | **%Frequency** |
|---|---|---|
| Total no. of siblings | 1 | 15 (15.0%) |
| | 2 | 28(28.0%) |
| | 3 | 17(17.0%) |
| | 4 | 17(17.0%) |
| | 5 | 14(14.0%) |
| | 6 | 1(1.0%) |
| | 7 | 8(8.0%) |
| No. of hearing Impaired Siblings | 1 | 57(57.0%) |
| | 2 | 39(39.0%) |
| | 4 | 4(4.0%) |
| Gender of hearing Impaired Siblings. | Male | 63 (63. 0%) |
| | Female | 37 (37. 0%) |
| Degree of hearing Impairment | Moderate | 1 (1.0%) |
| | Severe | 23(23.0%) |
| | Profound | 76(76.0%) |
| Type of hearing Impairment | Unilateral | 3 (3.0%) |
| | Bilateral | 97(97.0%) |
| | Congenital | 93(93.0%) |
| | Acquired | 7(7.0%) |
| | Conductive | 1(1.0%) |
| | Sensorineural | 91(91.0%) |
| | Mixed | 8(8.0%) |

## DISCUSSION

Research aims to explore the frequency of hearing impairment in siblings of hearing impaired children. The results indicated directly that the frequency of hearing impairment in siblings of hearing impaired siblings was 100% because data was collected from the periphery of the country where there is nutritional deficiencies in mothers and moreover they gave birth to their child in a condition where the child is deprived of oxygen resulting in congenital or acquired hearing loss.

On reviewing the literature the finding was supportive to Mohammed Ayub, Musani, Abdul Rauf, Murtaza Ahsan, and Faheem Ahmed Khan conducted a study on 600 children of different age group to determine the Frequency and causes of hearing impairment in Civil Hospital Karachi. The data shows that Frequency of conductive hearing loss was 50%, sensorineural hearing loss was 20% and mixed hearing loss was 30%. Conductive hearing loss was more prevalent than sensorineural hearing loss by a ratio of 2.5:1.

It was also found that total 100 subjects were included in study and out of 100 subjects 63(63%) were male and 37(37%) were female and the mean age of patients was 12.28±4.13 years.
On asking the HIC about degree of hearing impairment 1(1%) responded that they had moderate degree of hearing impairment,

23 (23%) severe and 76(76%) had profound degree of hearing impairment in their hearing impaired siblings. It is important to note that majority of patients were going to special education school or receiving speech therapy from a private centre which shows the concern of the parents about the communication of their children

On asking the patient about the type of hearing loss the data showed that out of 100 patients 3(3%) were with unilateral hearing loss and 97(97%) were with bilateral hearing loss and 93(93%) had congenital hearing loss and 7(7%) had acquired hearing loss. The data also showed that 91(91%) were with Sensorineural hearing loss and 1(1%) were with conductive hearing loss while 8(8%) were with mixed hearing loss. This high proportion of inheriting deafness can be cousin marriages, pressure due to family structure, genetic changes and the possible reasons for acquired deafness can be the poor diet, oxygen deprivation immediate after birth or trauma.

Fred H. Bess and Anne Marie Tharpe Conducted a study on 60 children to determine Unilateral Hearing Impairment in Children at the Bill Wilkerson Hearing and Speech Center. It is indicated in the data that almost one third of the children with unilateral hearing loss had failed at least one grade. Nearly 50% of the group had either failed a grade and/or needed resource assistance in the schools.

## CONCLUSION

On the basis of obtained findings we can conclude that that frequency of hearing impairment in siblings of hearing impaired children is in high proportion and this high proportion of hearing impairment is because of cousin marriages, pressure due to family structure, genetic change.

**Limitations:** The study was carried out on the siblings of hearing impaired children considering the nature of the topic.

**Conflict of interest:** Nil

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