

A CROSS-SECTIONAL SURVEY TO IDENTIFY THE FACTORS ASSOCIATED WITH DEAFNESS IN DEAF-MUTE CHILDREN ATTENDING CALCUTTA DEAF AND DUMB SCHOOL

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ABSTRACT

Background: Deafness is complete or profound loss of hearing. It can affect one ear or both ears. This condition can be congenital or acquired. Causes of deafness includes genetic factors, injury, age related changes, expose to loud noise, etc. Deafness significantly impairs the speech, which makes the communication difficult. Thus, hearing loss has significant effects on the development of a child's ability to learn, to communicate, and to socialize, which can be devastating. **Objects:** To perform a questionnaire-based survey of the parents of children attending special schools for deaf and dumb, to find out the major medical, socio-demographic, and health service-related risk factors along with the most prevalent cause of deafness. **Methodology:** This cross-sectional study was conducted on students of different age group of Calcutta Deaf and Dumb School, West Bengal, India. A special questionnaire was developed and related information was recorded there about the factors of their deafness. **Results:** Almost half of the participants had acquired deafness; rest were congenitally deaf and dumb. Different causes of deafness were emerged in this study. Among these causes, maternal diseases during pregnancy, neonatal fever was frequently emerged. Different risk factors during antenatal, perinatal and postnatal period were found in this study. **Conclusion:** The findings in the present study highlight the risk factors and causes of deafness among the children. There is a considerable need for the prevention and treatment of the causes among deaf, mute, children.

KEYWORDS: Deaf and dumb children, Risk factors, Prevalent causes.

INTRODUCTION

The ability to express oneself by responding to the events occurring in his surroundings is one of nature's most valuable gifts to humans. Every typical human being observes, hears, and then responds to the circumstances by expressing his opinions. However, there are some unfortunate ones who are denied this priceless gift. Over time, communication has become increasingly crucial in the ever-changing human world. In order to increase one's knowledge, intelligence, wisdom, and ultimately a positive personality, it is becoming increasingly important to listen to others talk and to be able to understand and communicate with them.^[1] The World Health Organization (WHO) definition of "deafness" refers to the complete loss of hearing ability in one or two ears. The cases included in this category will be those having hearing loss more than 90 dB in the better ear or total loss of hearing in both the ears. The WHO definition of "hearing impairment" refers to both complete and partial loss of ability to hear.^[2,3]

Worldwide hearing impairment and ear disorders are two of the main causes of years spent with disability.^[1] There are several reasons that lead to deafness in the newborn period and early childhood, which are more prevalent in developing nations such as India.^[4] These developing nations are thought to be home to two-thirds of the world's hearing-impaired population. The lack of routine ear disease screening, poverty, hunger, misinformation, and a lack of easily accessible health care facilities are some of the causes of this distribution.^[5] There are numerous factors leading to deafness in the neonatal period and early childhood, which are more common in a developing country like India. These comprise of various antenatal, perinatal, and postnatal factors. One of the most frequent causes of long-lasting mild to moderate hearing loss in children and young people in developing nations is otitis media.^[6] Mutism develops as a result of deafness not being rehabilitated.^[4]

Around 63 million people in India suffer from serious hearing impairment, with an estimated incidence of 6.3%, whereas 360 million people globally suffer from hearing impairments. According to estimates, there are one to two cases of permanent, moderate-to-severe SNHL for every 1000 live births. Two percent of people have deafness that develops in childhood. According to a recent poll, 4 out of 1000 Indian-born children suffer from severe to profound hearing loss. According to estimates, 50% of 13-year-old students with hearing impairments drop out of school.^[7] In the Indian population, hearing impairment was shown to be the most prevalent cause of sensory deficiency and the second most common cause of disability. Little money spent on early identification and prevention of deafness and its rehabilitation, can prevent this major burden of handicap in our society and improves prognosis in language development and social integration.^[4,7]

This study focuses to identify various medical, socio-demographic risk factors, causes of acute and chronic for deaf & dumb among children attending a special school of Deaf and Dumb in West Bengal, India. The information thus obtained, will open the scope for wider studies in the future and help in the planning of health strategies.

METHODOLOGY

A cross-sectional study was conducted on 75 deaf-dumb children attending special schools, between 6-25 years of age, to assess the risk factors and causes among deaf and dumb children attending a school in Kolkata. The study was conducted by Dept. of Community Medicine of The Calcutta Homoeopathic Medical College & Hospital at the Calcutta deaf and dumb school.

This cross-sectional study was carried out from December 2024 to May 2025. The study was conducted on pre-fixed days and time suitable to the school authorities and all attempts were made to avoid any disruption of studies. Apart from this, the parents of all the study subjects were also informed about the study and consent for the same was taken from them via a consent form sent through the children prior to carrying out the study. As there were students in this study were the age of 12-17 years, so assent forms were used only for these students.

A specially prepared structured questionnaire was administered to collect the information from the children and parents to know the risk factors, causes, and socio-demographic status, etc. All the questions were explained in their local language, and the answers were recorded by the authors itself.

Ethics

Prior to the commencement, the study was approved by the Institutional Ethics Committee of The Calcutta Homoeopathic Medical College & Hospital, to carry out the proposed research work at Calcutta Deaf and Dumb School, West Bengal, India. Next, the permission to conduct the study was obtained from the administrative heads of the Calcutta Deaf and Dumb School.

RESULTS

Among the 75 deaf and dumb students, 38 had deafness since birth, which is approximately 51% and rest 37 students (49%) developed the condition after different disease condition or any injury (**Fig 1**) and male-female ratio was 41 (55%) and 34 (45%) respectively (**Fig 3**). Neonatal fever was found most prevalent (29.7%) cause of deafness among these children in this study. Details of the disease conditions along with the percentage was given in **Table 3**. It was found in different studies that genetic cause was far more ahead and most prevalent cause of deafness in children. Krunal et al found 59.97% children,^[8] 69.84% children had hearing loss due to genetic causes in Feinmesser et al ^[9] and 55% in Kankkunem et al.^[10]

In this study, different type of risk factors was found after assess the antenatal, perinatal and postnatal history of the students (**Table 5**). Sociodemographic characteristics of the study participants depicts in **Table 1**. The majority of the total children, 36 (48%) were between the ages of 11 and 15, among the rest 14 students, 13 students, and 12 students were between the age group of 16-20 (19%), 21-25 (17%), and 6-10 (16%) respectively. In the current study, 41 students (55%) of the participants were male (**Fig 2**).

It was observed that socio-economic status of the 10 students was belong to the income group of <5 thousand monthly, i.e., 13.4% of total participants. 40 of the participants were from the income group of 5 thousand to 10 thousand monthly, which was the maximum (53.4%). Other than this 14 (18.6%), 6 (8%) and 5 (6.6%) students were belonging to the slightly higher income groups (**Table 4**). Although the questionnaire lacked the information needed for socioeconomic categories, the authors recognized that relevant questions should have included that help in its calculation.

DISCUSSION

This study was conducted by The Calcutta Homoeopathic Medical College & Hospital, founded in 1881 is the oldest running homoeopathic college of the world collaborated with Calcutta Deaf & Dumb School, founded in 1893, one of the prestigious schools for deaf and mute children. Hearing loss in children constitutes a considerable handicap because

it is an invisible disability and compromises the optimal and personal achievement of a child. If the diagnosis is delayed by 24 to 36 months of age, which is common in the rural and illiterate population, after this age even rehabilitation procedures (like hearing aids, cochlear implant, speech therapy, psychological intervention on the family) are unable to ensure complete development of speech, thus preventing the full participation of a deaf child in social living. Thus, deaf and dumb children struggle to express and comprehend their feelings.[4] Because of this, we can observe a comparatively high level of mistrust, stubbornness, and other behavioural issues among deaf and dumb youngsters. For children with moderate or more permanent bilateral hearing loss, intervention during the first six months of life can enhance outcomes in a variety of areas, including communication skills, education, behaviour, family interaction, psychological health, and quality of life.^[11]

In this study the majority (81%, n = 61) of the children that participated, were from Hindu families (**Fig 2**). Though religion has not much influence on deafness. There were no studies found that correlate religion with the deafness till now. Hearing loss maybe linked to certain risk factors present before birth (antenatal), during birth (perinatal), and thereafter (postnatal). Among these factors antenatal infection of the mother, almost covering (14.7%), viral infection of the neonates (18.6%) and neonatal septicemia (14.7%) in postnatal period were very frequent in the participants. Other risk factors were also given in **Table 5**. However unfortunately, due to lack of awareness and knowledge of the parents about these causes or factors and a huge hesitation in the approach of parents in regards to their child's lack of response to sound commands, these children suffered the most. There's a need to provide a nationwide education and awareness in this matter. Each and every parent's education, their knowledge about child healthcare also matters to address these risk factors and causes. In **Table 2**, the education qualification of the parents of these children were shown. Most of them (45.4%) were not passed the 10th standard.

In this study, it was found that 19% of participants had a family history of deafness (**Fig 4**). A total of 88% of students gave a history of delayed milestones, implying defects in other aspects of growth and development. Most of the students were found using the hearing aid, but 51 students out of these, i.e. 68%, were benefitted by using them. In order to overcome or minimize the risk factors, causes and social challenges as well as to enhance the opportunities of the deaf children, the intervention would require an extensive input in the home, child, school, and the local community.

Table 1: Age wise distribution of the deaf and dumb students.

Sl. No.	Age	Male	Female	Total (%)
1.	6-10	6	6	12 (16%)
2.	11-15	22	14	36 (48%)
3.	16-20	7	7	14 (19%)
4.	21-25	6	7	13 (17%)

Table 2: Education of the parents of the students.

Sl. No.	Education Status	No. of participants	Total %
1.	Illiterate	02	2.6%
2.	Below 10 th	34	45.4%
3.	10 th Pass	19	25.3%
4.	12 th Pass	09	12%
5.	Graduate	11	14.7%

Table 3: Distribution of disease conditions causing deafness.

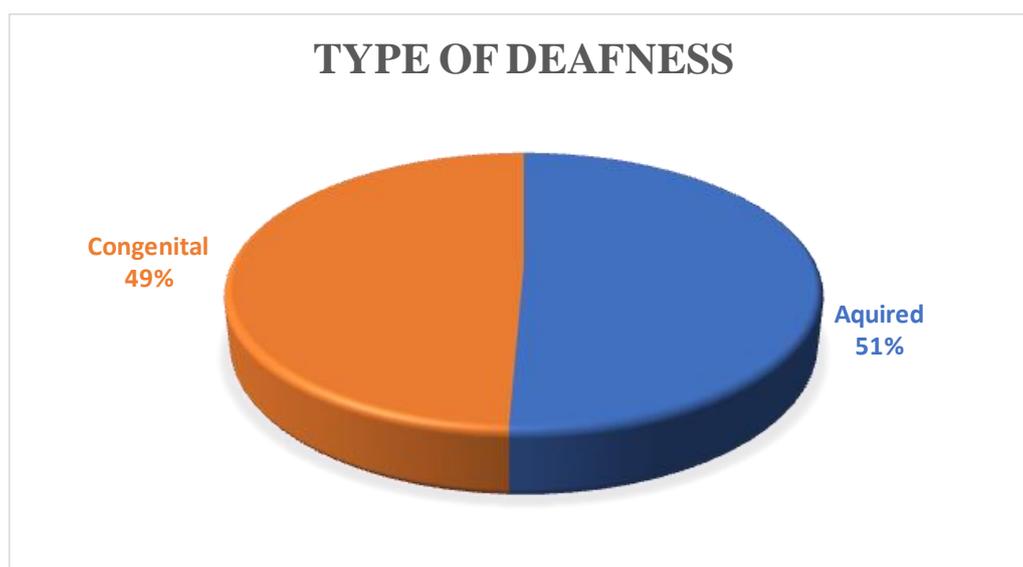
Sl. No.	Diseases	No of effected child	Total %
1.	Fever with Otitis media	11	29.7%
2.	ASOM	08	21.6%
3.	Measles	07	19%
4.	Chicken pox	03	8.1%
5.	Injury of the ear	03	8.1%
6.	Pneumonia	02	5.4%
7.	Suppressed skin disease	02	5.4%
8.	Low birth weight	01	2.7%

Table 4: Socio-economic status of the family of the students.

Sl. No.	Income group	No. of family	Total %
1.	< 5000	10	13.4%
2.	5000-10000	40	53.4%
3.	10001-15000	14	18.6%
4.	15001-20000	6	8%
5.	>20000	5	6.6%

Table 5: Distribution of risk factors causing deafness.

Sl. No.	Risk factors	No. of children	Total %	
1.	Antenatal	History of infection to mother	11	14.7%
		History of use of ototoxic drugs by the mother during pregnancy	02	2.6%
2.	Perinatal/ Intranatal	Prolonged/obstructed labor	05	6.6%
		LBW for GA	07	9.4%
		Prematurity	09	12%
3.	Postnatal	History of fever	06	8%
		Hyperbilirubinemia	03	4%
		Viral infections	14	18.6%
		Neonatal septicemia	11	14.7%
4.	No identifiable risk factor	07	9.4%	

**Fig 1: Types of Deafness.**

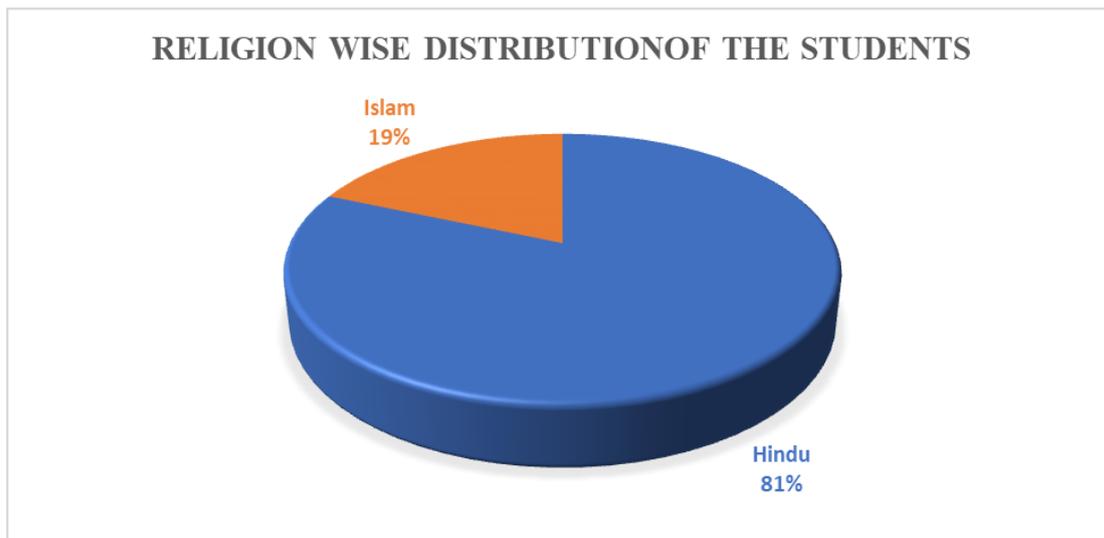


Fig 2: Religion of the participants.

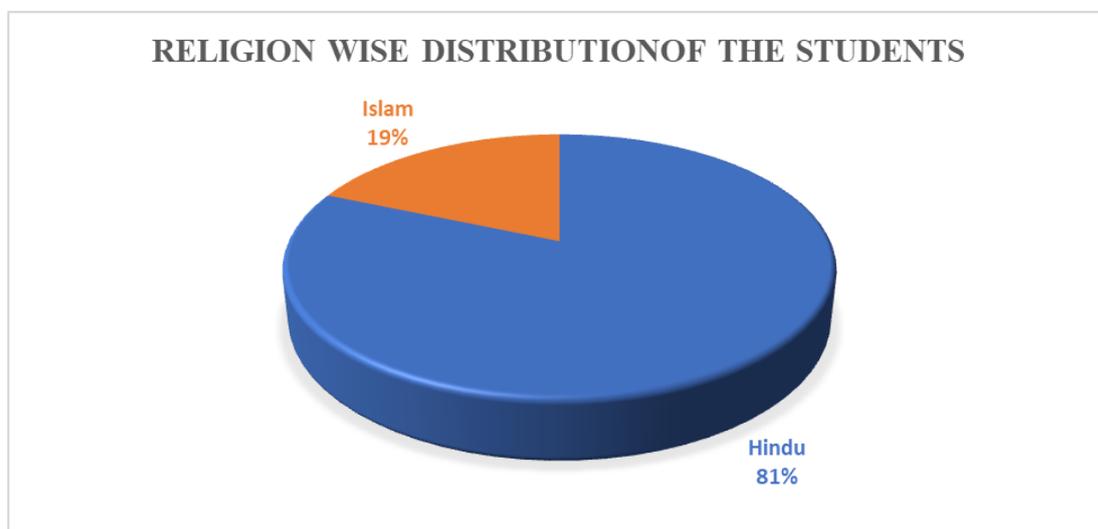


Fig 3: Male-Female distribution of the participants.

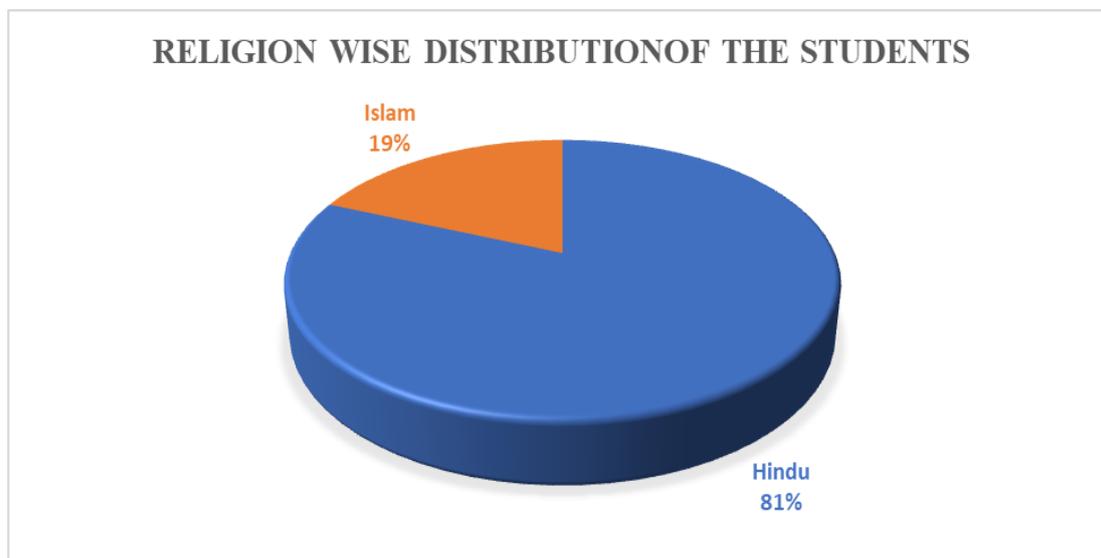


Fig 4: Family history of deafness of the participants

CONCLUSION

Hearing loss in children constitutes a considerable handicap because it is an invisible disability and compromises the optimal and personal achievement of a child. Different risk factors and causes of deafness are emerged in this study and it's the high time to address these factors properly and prevent the impairment. The questionnaire used in this study can be further improved and modified in the future as per the requirements of data collection. Authors further feel that a multi-centric study using a validated questionnaire could generate data, which is more meaningful in designing nationwide health strategies.

SCOPE & LIMITATIONS

The scope of this study lies in evaluating the preventive role of Ayush system of medicine in childhood and adolescent deafness, with particular reference to high-risk etiological factors. Among the participants, antenatal infections of the mother, neonatal viral infections in post-natal period, and neonatal septicemia were identified as frequent contributors. Homoeopathy, with its individualized approach, may provide preventive potential by reducing susceptibility to recurrent infections, modulating immune responses, and strengthening overall constitutional resistance, thereby minimizing the progression of reversible auditory pathology. If integrated with early screening and health education, homoeopathic prophylaxis could serve as a complementary tool in school health and community programs.

Nevertheless, limitations must be acknowledged. The present study was conducted with a relatively small sample size of 75 participants, which may limit the statistical power and generalizability of the findings. The restricted number of cases reduces the ability to capture the full spectrum of etiological factors contributing to childhood and adolescent deafness. Larger, multicentric studies are necessary to strengthen the validity of these observations.

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CONFLICT OF INTEREST

None.

REFERENCE

1. Shekhar H, Khokhar A, Motwani G, Daral S. Prevalence of ear morbidities among school children in delhi, india: a cross-sectional study. *International Journal of Adolescent Medicine and Health*, 2022; 34(5): 289-95.
2. Martínez-Pérez B, De La Torre-Díez I, López-Coronado M. Mobile health applications for the most prevalent conditions by the World Health Organization: review and analysis. *J Med Internet Res*, 2013; 15: e120.
3. Varshney S. Deafness in india. *Ind J Otol*, 2016; 22(2): 73.
4. Singh S, Jain S. Factors associated with deaf mutism in children attending special schools of rural central India: A survey. *J Family Med Prim Care*, 2020; 9(7): 3256-63.

5. Jacob A, Rupa V, Job A, Joseph A. Hearing impairment and otitis media in a rural primary school in South India. *Int J Pediatr Otorhinolaryngol*, 1997; 39(2): 133–8.
6. Nepali R, Sigdel B. Prevalence of ENT diseases in children: hospital based study. *Internet J Otorhinolaryngol*, 2012; 14(2): 1-5.
7. Malhotra M, Angral S, Bhardwaj A, Priya M, Varshney S, Tyagi AK, Kumar A, Malhotra R. The clinical–audiological Cross Sectional Study of Deaf-Mute patients in a Tertiary Care Centre of Uttarakhand State and Literature Review. *Indian Journal of Otolaryngology and Head & Neck Surgery*, 2022; 74(1): 106-13.
8. Varia DKG, Talsania DNJ. A cross-sectional study on behaviour and social aspects of deaf and dumb children in Ahmedabad. *American Inter J of Research in Humanities, Arts and Social Sciences*, 2015; 10(1): 50-53.
9. Feinmesser M, Tell L, Levi H. Consanguinity among parents of hearing-impaired children in relation to ethnic group in the Jewish population of Jerusalem. *Audiology*, 1989; 28(5): 268-71.
10. Kankkunen A. Preschool children with impaired hearing in Goteborg. *Acta Otolaryngol*, 1982; 1: 391.
11. Satish HS, Kumar RA, Viswanatha B. Screening of newborn hearing at a tertiary care hospital in South India. *Indian J Otolaryngol Head Neck Surg*, 2019; 71(2): 1383-90.