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ORIGINAL ARTICLE

Knowledge and Attitudes of Parents and Caregivers in New Delhi to Childhood Hearing Loss and Hearing Services

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Abstract

Parental and caregiver support is crucial for addressing childhood hearing loss in low and middle-income countries, where a significant burden of disabling hearing loss exists among children. This study aimed to assess the knowledge and attitudes of parents and caregivers regarding childhood hearing loss and available hearing services in both urban and rural settings in Delhi, India. A total of 314 participants were recruited and interviewed using a culturally adapted questionnaire consisting of 26 items, covering topics like biomedical and non-biomedical beliefs, knowledge of otitis media-related hearing loss, identification, and intervention. Statistical analysis of data was performed using Mann Whitney U tests and categorical principal component analysis (PCA). The study found that parents generally had a higher percentage of correct responses compared to caregivers in both urban and rural areas. Categorical PCA revealed variations in responses between fathers, mothers, and caregivers. In the urban group, mothers exhibited higher knowledge and more positive attitudes, while fathers showed lower involvement. In the rural group, while mothers demonstrated relatively higher awareness on all categories compared to fathers, these differences were highly relevant on questions concerning noise exposure, maternal medicine during pregnancy, and communication milestones. The findings emphasize the importance of considering regional and cultural factors when designing programs. Additionally, involving fathers in awareness campaigns and support networks is crucial to achieve comprehensive coverage in addressing childhood hearing loss. In conclusion, this study contributes valuable insights into the preparedness of parents and caregivers for audiology services and the need for contextually appropriate strategies to enhance childhood hearing health services in India.

Keywords Childhood hearing loss · Caregivers · Knowledge and attitude

Introduction

Parental and primary caregiver support is crucial for the successful implementation of ear and hearing health services for children, especially in Low and Middle-Income Countries where 34 million children are living with disabling hearing loss, with facing a disproportionate burden of cases [1]. According to a study conducted by Singh et al. [2], 5.82% people in India have congenital hearing losses for every lakh of the population at any given time. Four deaf babies are born every hour, contributing to an annual increase of 18,000 deaf children to our population each year. In the registered medical cases that are encountered in outpatient department of Ear, Nose, and Throat (ENT), the incidence of the hearing impairement is 0.9/1000 screened infants [3]. As a result, our population gains at least 10,000 children who are medically diagnosed with congenital hearing loss, every year. Addressing the burden of ear disease in India requires a public health approach, with a focus on preventive measures such as immunization and newborn hearing screening. To achieve optimal outcomes, any ear and hearing health initiatives must align with the unique cultures and healthcare beliefs. Caregiver and parental support for childhood hearing health services in low and middle income countries has generally been positive [4]. Notably, a study from the Solomon Islands found that a high percentage of parents supported infant hearing screening and school-based ear and hearing

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health examinations [5]. Similar findings were reported in studies from other low and middle income countries [4, 6–8], including Nigeria [6], South Africa [8], India [4, 9], and China [7]. Building on the insights gained from prior research conducted in low and middle income countries [10], the study in the Solomon Islands also delved into the knowledge held by parents regarding ear diseases and their associated risk factors. It was found that a substantial 94% of parents were aware of otitis media as a potential cause of childhood hearing loss [5]. Notably, there was only one study that compared urban and rural populations [11]. The authors of this study reported that urban-dwelling mothers in Malaysia had a greater awareness of the causes of childhood hearing loss compared to their rural counterparts. However, there was no statistically significant difference between these two groups when it came to their positive attitudes towards addressing childhood hearing loss [11].

It is crucial to assess caregiver and parental knowledge and attitudes toward childhood hearing loss to develop contextually appropriate and feasible programs. The Solomon Islander study also investigated parental knowledge of ear diseases and risk factors, revealing a good awareness of otitis media as a causal factor for childhood hearing loss [5]. However, non-biomedical belief systems, including attributing childhood disability to supernatural causes, continue to influence health-seeking behavior [5, 12]. Such beliefs were also reported in studies from other low and middle income countries [8, 13]. All these studies are done in urban areas, which have greater access to education and medical services than rural/remote populations. It is also known that non biomedical ideas about healthcare are more prevelant common in rural areas, where the literacy rates and awareness to medical facilities are comparitively lower.

There is scanty literature concerning the parental attitudes to childhood hearing loss in Indian population. Ravi et al. [4] examined the knowledge and attitudes of the mothers of infants in the Indian state of Karnataka concerning infantile hearing loss and reported that although majority of mothers (84.9%) expressed their desire to get children screened for hearing disabilities at birth, only half (54.3%) of them agreed that they would let their children wear hearing aid. However, this study did not involve the opinions of fathers and caregivers on childhood hearing loss. Pertaining to the current study, all the three stakeholders (mothers, fathers and caregivers) opinions are considered. the study was conducted at Delhi, an union teritory and stste in India. According to the Delhi Planning Department and the Census of India report in 2022, Delhi boasts a significant portion of the population, encompassing both rural and urban areas. With a total estimated population of 3.12 crore individuals out of India's 1.4 billion, Delhi is home to diverse population, encompassing individuals from all socio-economic, cultural and educational backgrounds with varied opinions. Approximately 97.50% of these residents reside in urban regions, while the remaining 2.50% live in rural areas. In the context of metropolitan cities like Delhi, it is crucial to evaluate awareness levels concerning hearing loss and related services. The primary objective of the current study is to evaluate the knowledge and attitudes of parents and caregivers regarding childhood hearing loss and available hearing services. This research endeavor seeks to furnish valuable insights into the preparedness of parents for audiology services and aims to support the continual enhancement of ENT and audiology services in India [14].

Methods

Participants

To determine the sample size for the study, a chi-square test of goodness of fit (contingency table) was implemented using G Power software [15]. For an moderate effect size of 0.3, a significance level (alpha error) of 0.5, a desired statistical power of 0.8, and 2 degrees of freedom, the calculated total sample size required for the study was 259 participants. To further account for variations due to other confounding factors, a higher sample size of 314 participants was used in the study. A total of 314 paticipants including fathers, mothers and caregivers were recruited by convenience sampling. The term Caregiver was operationally defined as someone accompanying an infant to the clinic for routine immunization, regardless of the family relationship (ie., mother, grandmother, aunt, sister, cousin, etc.). Participants were brought to a quiet area for the interview, provided with detailed information about the study, and, if willing to participate, were asked to sign a consent form. The age range of the study population was 19 to 63 years with an average of 29.58 years (SD = 6.61), and a median of 28 years. For the urban population (n = 138), the age ranged from 19 to 63 years with an average of 29.42 years (SD = 6.80). For the rural population (n = 176), the age ranged from 20 to 55 years with an average of 29.71 years (SD = 6.48).

Procedure

The questionnaire was constructed from the existing literature, drawing questions mainly from the Kaspar et al. [16]. After obtaining permission from the authors [16] the questionnaire was adapted and validated for the present study.

The procedure for adaptation comprised of reviewing, revising and appropriately adapting the questionnaire. The questions that were culturally or socially inappropriate were replaced by more relevant questions by 4 experienced audiologists who had a minimum of 5 years of clinical research experience. They were asked to mark the questions as highly

relevant or not relevant. The items were revised based on the suggestions provided by the experts for rephrasing and relevancy. The content validity index (CVI) was applied [17]. Questions with CVI above 0.75 were retained. All the questions received a CVI score of 0.8, indicating a good content validity. The adapted modified questionnaire was divided into three sections, as shown in Appendix A. The questionnaire consisted of 26 items: assessing knowledge of biomedical causes of childhood sensorineural hearing loss, non-biomedical beliefs regarding childhood hearing loss, knowledge of otitis media and other medical conditions or risk factors related to conductive hearing loss, hearing loss identification and intervention, and attitudes to childhood hearing services. The questionnaire was administered in the Hindi language, in a semi-structured interview style. The participants were asked to answer each question as 'yes', 'no', or unsure'. For each participant, demographic information (age) and level of education (primary, secondary, tertiary) were recorded prior to the administration of the questionnaire.

Statistical Analysis

Participant responses were tallied for each question according to age and education level and were analyzed in SPSS Version 25 statistical software package (IBM corporation, Chicago, USA). Mann Whitney U test was administered for measuring the group differences (if any) on the parental attitudes and beliefs. In addition, to elucidate the questions that best categorize the variance in satisfactory ratings between the three groups (fathers, mothers, caregivers) in each geographical location (rural, urban), Categorical Principal Component Analysis (PCA) was carried out for each geographical location separately.

Results

The detailed demographic characteristics of the parents and children who participated in the study are provided in Table 1.

Comparison Between Knowledge and Attitude of Parents and Caregiversin Urban and Rural Population

Table 2 shows the frequency count and percentage of responses between the parents and caregiver response in urban population for all questions. The corresponding data for rural group is given in Table 3. In general, the parents of children both geographical locations (urban and rural) in Delhi reported higher percentage of correct responses as compared to the caregivers.

Table 1 Detailed demographic characteristics of the parents and caregivers who participated in the study

Demographic details	Urban		Rural	
	n	%	n	%
Education of the parent				
Illiterate	13	7.4	23	16.7
Primary	40	22.7	22	15.9
Grade 10/ SSLC	35	19.9	27	19.6
Grade 12/PUC	84	47.7	63	45.7
Graduation	4	2.3	2	1.4
Gender of the child				
Male	87	49.4	80	58
Female	89	50.6	58	42

Categorization of the Variance in Responses Between the Parents and the Caregivers in Each Geographical Location

The results of categorical PCA showed that for both the Groups all the questions carried equal weightage and collectively explained an overall variance in the range of 18.33% to 33.56% for fathers, 21.73% to 29.19% for mothers and 16.57% to 30.70% for caregivers, respectively on dimension/ principal component 1(PC1) in urban population. The component loadings and the variance explained by each question in PC 1 and PC 2 is shown in Fig. 1 for urban population and in Fig. 2 for rural population. Table 4 shows all the variance for PC1 and PC2.

For Urban population, visual inspection of Fig. 1 (upper panels), shows fathers, mothers and caregivers that can be categorised based on PC1. Fathers exhibited lower weightages (canonical co-efficient/ component loading range: − 1.0 to 0.0) for questions I3 (Child can have delayed hearing loss after a normal hearing screening test) and A4 (Let child use hearing aids, if needed and higher weightages (canonical co-efficient/ component loading range: − 1.0 to 0.0) for question I12 (Preventive measures example, non-use of cotton buds) can protect your child's hearing (see Appendix A), compared to relatively higher weightage of Mothers (canonical co-efficient/ component loading—0.0 to 1.0). The caregivers exhibited lower weightage (canonical co-efficient/ component loading range: − 1.0 to 0.0) from the fathers (canonical co-efficient/ component loading—0.0 to 1.0) for questions H15 (Ear discharge and recurrent flu can cause), I3 (Child can have delayed hearing loss after a normal hearing screening test) and A4 (Speech/language problems can be a sign of hearing loss) (see Appendix A), mothers (canonical co-efficient/ component loading—0.0 to 1.0) for questions H12 (evil spirits can cause hearing loss), H16 (Alcohol consumption can cause Hearing loss) and I12 (Preventive measures (eg,

Table 2 Responses to the Questionnaire by participants in urban population. Percentage is calculated based on overall sample size (n = 314)

Question	Responses in %								
	Yes			No			Not sure		
	Father	Mother	Caregiver	Father	Mother	Caregiver	Father	Mother	Caregiver
H1	16.5	9.7	11.4	6.8	5.1	4.5	13.6	17.6	14.8
H2	13.6	14.8	12.5	8.0	6.8	6.8	15.3	1083	11.42
H3	14.2	10.2	10.2	20.5	10.2	11.4	10.2	11.9	9.1
H4	9.7	10.2	12.5	13.1	13.6	9.1	14.2	8.5	9.1
H5	19.9	12.5	11.4	4	9.1	8	13.1	10.8	11.4
H6	6.8	10.2	9.1	10.8	6.8	8	19.3	15.3	13.6
H7	12.5	8	11.4	10.8	7.4	13.1	13.6	17	6.3
H8	18.2	13.6	11.9	11.4	9.1	12.5	7.4	9.7	6.3
H9	11.9	10.2	15.9	7.4	7.4	5.7	17.6	14.8	9.1
H10	14.2	11.4	13.6	13.1	13.1	9.7	9.7	8	7.4
H11	13.1	8	7.4	14.2	17	14.8	9.7	7.4	8.5
H12	16.5	15.3	10.8	11.9	11.9	13.6	8.5	5.1	6.3
H13	14.2	14.2	17	11.4	9.7	7.4	11.4	8.5	6.3
H14	11.4	6.8	11.4	15.3	10.2	7.4	10.2	15.3	11.9
H15	19.9	12.5	17.6	7.4	10.8	6.8	9.7	9.1	6.3
H16	6.8	8.5	9.1	18.2	11.4	9.7	11.9	12.5	11.9
H17	9.7	10.8	12.5	14.8	10.2	7.4	12.5	11.4	10.8
H18	9.7	12.5	9.7	17	9.7	8.5	10.2	10.2	12.5
H19	10.8	8.5	7.4	11.4	13.1	13.1	14.8	10.8	10.2
H20	10.2	10.2	8.5	12.5	11.4	9.7	14.2	10.8	12.5
I1	13.1	12.5	13.1	8.5	10.2	8.5	15.3	9.7	9.1
I2	11.9	13.1	11.9	11.9	6.8	4.5	13.1	12.5	14.2
I3	8	10.8	8.5	12.5	10.8	9.1	16.5	10.8	13.1
I4	14.8	10.8	10.2	8	8	8.5	14.2	13.6	11.9
I5	13.6	9.1	11.4	10.2	7.4	7.4	13.1	15.9	11.9
I6	14.2	10.2	10.2	9.1	9.7	8	13.6	12.5	12.5
I7	14.2	13.6	14.2	12.5	13.6	10.2	10.2	5.1	6.3
I8	11.4	10.2	10.2	8	15.3	10.2	17.6	6.8	10.2
I9	19.3	7.4	13.1	12.5	14.8	11.4	5.1	10.2	6.3
I10	18.2	13.6	10.2	6.3	6.8	10.8	12.5	11.9	9.7
I11	10.8	10.2	12.5	17.6	9.1	9.1	8.5	13.1	9.1
I12	13.6	9.7	8.5	12.5	13.6	14.8	10.8	9.1	7.4
A1	19.9	17	15.9	6.8	8	9.1	10.2	7.4	5.7
A2	19.9	19.3	18.8	7.4	5.7	3.4	9.7	7.4	8.5
A3	18.2	18.8	18.2	6.8	6.3	4.5	11.9	7.4	8
A4	14.2	10.8	10.8	10.8	13.1	11.9	11.9	8.5	8
A5	7.4	13.6	10.2	11.4	6.8	8	18.2	11.9	12.5
A6	18.8	11.4	14.8	6.3	10.8	5.1	11.9	10.2	10.8
A7	7.4	6.8	9.7	13.1	6.8	7.4	16.5	18.8	13.6

non-use of cotton buds) can protect your child's hearing) (see Appendix A).

On other hand, in Rural population, the overall variance explained by PC1 was in the range of 16.47–31.2% for fathers, 19.15–26.78% for mothers and 17.02–26.24% for caregivers, respectively. In contrast to urban population, the weightages of questions followed a mixed results in rural population. In rural population, while mothers responses were comparable to urban population—where all the questions along PC1 carried relatively higher importance (canonical co-efficient/component loading of 0.55 to 0.74), fathers in rural population showed relatively lesser weightage (canonical co-efficient/component loading −0.29 to −0.52, Fig. 1) for questions H10 (Noise exposure : Crackers, loud music, construction noises can cause hearing loss), H11 (Medicines of mother during pregnancy can cause HL) and I10 (It is important to know the

Table 3 Responses to the Questionnaire by participants in rural population. Percentage is calculated based on overall sample size (n = 314)

Question	Responses in %								
	Yes			No			Not sure		
	Father	Mother	Caregiver	Father	Mother	Caregiver	Father	Mother	Caregiver
H1	8	10.9	14.6	6.6	6.6	8.8	9.5	16.8	18.2
H2	10.2	16.1	19.7	8.8	8	8.8	5.1	10.2	13.1
H3	13.9	8	14.6	5.1	14.6	13.1	5.1	11.7	13.9
H4	8	10.2	13.9	8	14.6	17.5	8	9.5	10.2
H5	10.2	13.1	15.3	1.5	6.6	5.1	12.4	14.6	21.2
H6	5.1	8.8	11.7	7.3	7.3	13.9	11.7	18.2	16.1
H7	7.3	13.1	17.5	8.8	8.8	10.2	8	12.4	13.9
H8	8.8	16.1	17.5	9.5	9.5	13.9	5.8	8.8	10.2
H9	10.2	14.6	15.3	5.8	7.3	8.8	8	12.4	17.5
H10	9.5	13.1	14.6	6.6	12.4	16.1	8	8.8	10.9
H11	5.8	10.9	14.6	10.2	17.5	18.2	8	5.8	8.8
H12	3.6	11.7	17.5	10.2	16.1	16.1	10.2	6.6	8
H13	13.9	16.8	21.9	2.9	10.2	8	7.3	7.3	11.7
H14	3.6	8.8	16.1	5.8	13.1	9.5	14.6	12.4	16.1
H15	11.7	13.1	20.4	6.6	12.4	9.5	5.8	8.8	11.7
H16	7.3	6.6	15.3	5.8	11.7	18.2	10.9	16.1	8
H17	6.6	11.7	13.9	7.3	10.9	13.1	10.2	11.7	14.6
H18	8	14.6	13.9	7.3	8	13.1	8.8	11.7	14.6
H19	5.8	10.2	10.9	10.9	11.7	13.9	7.3	12.4	16.8
H20	4.4	8	8.8	10.9	16.1	16.1	8.8	10.2	16.8
I1	12.4	12.4	16.8	5.1	11.7	10.2	6.6	10.2	14.6
I2	6.6	11.7	17.5	4.4	7.3	8.8	13.1	15.3	15.3
I3	4.4	13.1	11.7	8.8	8.8	12.4	10.9	12.4	17.5
I4	9.5	10.2	17.5	6.6	9.5	7.3	8	14.6	16.8
I5	9.5	15.3	11.7	2.9	6.6	14.6	11.7	12.4	15.3
I6	4.4	10.2	15.3	8	8.8	11.7	11.7	15.3	14.6
I7	8	11.7	19	10.9	17.5	11.7	5.1	5.1	10.9
I8	5.8	8	16.1	8.8	10.2	13.9	9.5	16.1	11.7
I9	8.8	11.7	13.9	10.9	17.5	15.3	4.4	5.1	12.4
I10	6.6	15.3	18.2	8	8.8	9.5	9.5	10.2	13.9
I11	10.2	10.25	10.9	5.1	16.1	14.6	8.8	8	16.1
I12	7.3	15.3	15.3	9.5	13.1	12.4	7.3	5.8	13.9
A1	11.7	17.5	19.7	5.8	8	10.2	6.6	8.8	11.7
A2	11.7	16.1	24.1	5.8	5.8	8	6.6	12.4	9.5
A3	10.2	16.8	19	5.1	8	11.7	8.8	9.5	10.9
A4	6.6	7.3	16.8	7.3	14.6	11.7	10.2	12.4	13.1
A5	8.8	15.3	15.3	5.8	8	8.8	9.5	10.9	17.5
A6	9.5	13.1	11.7	7.3	10.9	13.1	7.3	10.2	16.8
A7	2.2	8	15.3	9.5	8	9.5	12.4	18.2	16.8

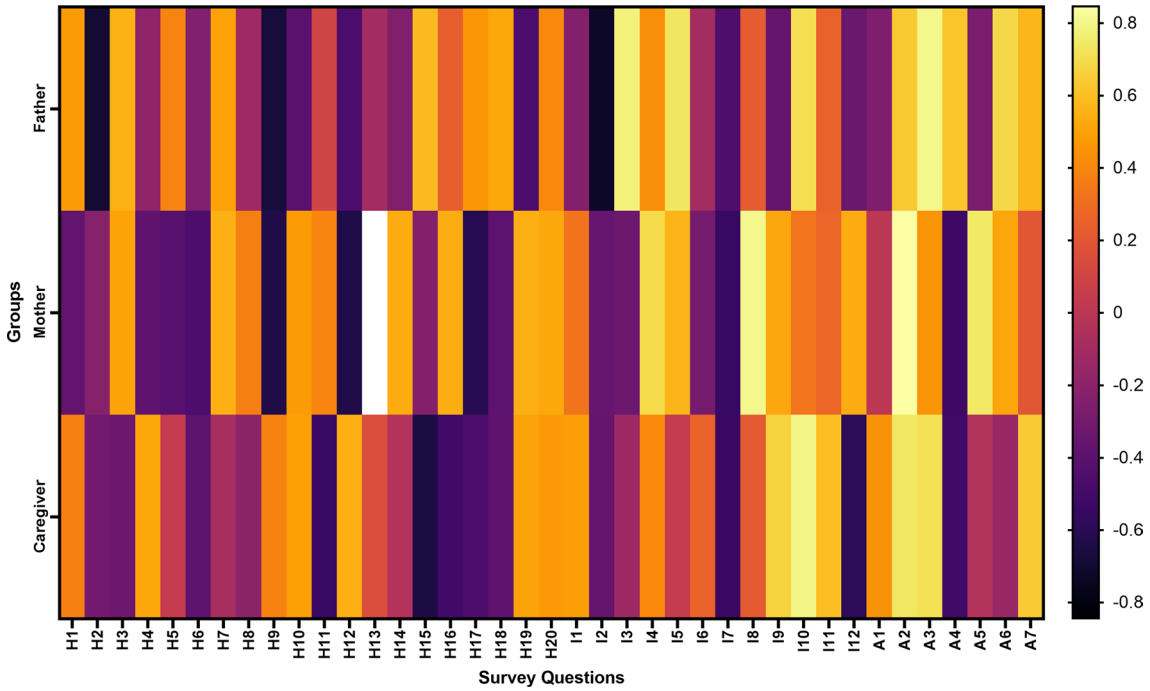

Fig. 1 Weightages of each question on PC1 in urban population across all the three groups

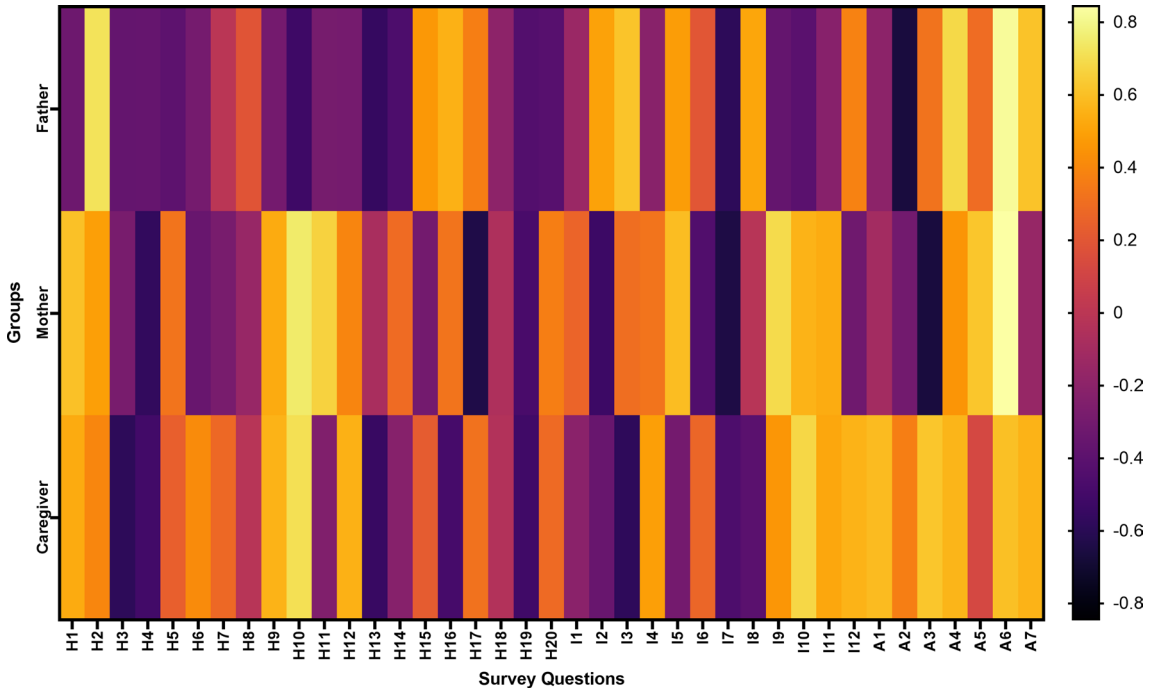

Fig. 2 Weightages of each question on PC1 in rural population across all the three groups

Table 4 Eigen value and variance of principal components across groups in urban and rural population

Questions	Urban				Rural			
	PC1		PC2		PC1		PC2	
	Eigen value	% of variance	Eigen value	% of variance	Eigen value	% of variance	Eigen value	% of variance
H section								
Mother	4.34	21.73	2086	14.33	3.83	19.15	2.84	14.22
Father	3.66	18.33	3.35	16.76	3.29	16.47	3.02	15.13
Caregiver	3.31	16.57	2.704	13.52	3.4	17.02	2.68	13.43
A section								
Mother	2.04	29.191	1.76	25.21	1.87	26.78	1.64	23.43
Father	2.35	33.56	1.55	22.14	2.18	31.22	1.56	22.32
Caregiver	2.14	30.7	1.68	24	1.87	26.24	1.7	24.35
I section								
Mother	2.89	24.11	1.9	15.89	2.68	22.34	2.15	17.96
Father	2.97	24.8	2.34	19.56	2.19	18.27	2.01	16.81
Caregiver	2.86	23.85	2.46	20.5	2.52	21.02	2.05	17.11

"communication milestones" of your child) (see Appendix A) compared to the urban population.

Discussion

The study aimed to assess the knowledge and attitudes of parents and caregivers regarding childhood hearing loss in both urban and rural geographical locations. The findings provided valuable insights into the differences in responses between these two groups and shed light on the factors influencing their perceptions. Upon reviewing the literature, it became apparent that the majority of the studies had limitations in terms of participant numbers, with a lack of diversity in educational backgrounds, as evidenced by references [4–8]. One notable aspect of the study was the diversity of participants, encompassing a wide age range (19–63 years) and various educational backgrounds. This diversity allowed for a comprehensive examination of knowledge and attitudes related to childhood hearing loss. Furthermore, the research has primarily concentrated on assessing the knowledge and attitudes of mothers and fathers, as evidenced by prior studies [4–7, 16]. Regrettably, there is a scarcity of literature that delves into the experiences of other demographics, notably caregivers [16]. The inclusion of caregivers beyond immediate family members, such as grandmothers, aunts, and cousins, broadened the perspective and ensured a more holistic understanding of the subject matter.

The results revealed that, in general, parents displayed a higher percentage of correct responses compared to caregivers in both urban and rural areas. This finding suggests that parents may have more awareness and knowledge about childhood hearing loss, possibly due to their closer involvement in the child's upbringing and healthcare decisions. Caregivers, on the other hand, may not possess the same level of information, emphasizing the importance of educational interventions targeted at this group. Categorical Principal Component Analysis (PCA) was employed to further explore the variance in responses among fathers, mothers, and caregivers within each geographical location. In the urban setting, fathers, mothers, and caregivers exhibited distinct patterns of knowledge and attitudes. Fathers displayed lower weightages for specific questions related to delay hearing loss after a normal screening test and the use of preventive measures, while mothers exhibited higher weightages for these questions. This contrast suggests that fathers may require additional education and awareness regarding these crucial aspects of childhood hearing health. In studies from literature parents showed high awareness for several causes such as otitis media, noise exposure and high fever [5–8].

In the rural context, the analysis revealed different trends. Mothers consistently showed higher importance for all questions along the first principal component (Table 4), indicating their relatively comprehensive understanding of childhood hearing loss. Fathers, on the other hand, demonstrated lower weightages for questions concerning noise exposure, maternal medicine during pregnancy, and communication milestones. These results suggest that fathers in rural/remote areas may need targeted interventions to improve their knowledge and awareness in these specific areas. The observed differences in knowledge and attitudes between urban and rural/remote populations could be attributed to various factors. Urban areas often have better access to healthcare facilities, educational resources, and awareness campaigns, which may contribute to the higher levels of

knowledge among parents and caregivers. In contrast, rural and remote regions may face limited access to healthcare information and services, resulting in lower awareness levels. The findings of this study highlight the need for tailored educational programs aimed at parents and caregivers, with a particular focus on fathers in rural areas. These programs should address specific areas of knowledge deficit identified in the PCA, such as the importance of recognizing communication milestones and the potential hearing risks associated with noise exposure and maternal medicine during pregnancy.

In conclusion, this study provides valuable insights into the knowledge and attitudes of parents and caregivers regarding childhood hearing loss and related services in Delhi. It underscores the necessity of considering cultural and regional factors when designing interventions. Future research should focus on developing contextually appropriate programs and assessing their long-term impact on childhood hearing health outcomes in diverse settings within low and middle-income countries in general, and other geographical locations in India, in particular.

Appendix A: Hearing Loss Questionnaire

Knowledge: Hearing loss (HL) and Risk-Factors ('H' Questions)

Do you think:

1. Babies can be born with Hearing loss **(YES / NO / NOT SURE)**
2. High fever can cause Hearing loss **(YES / NO / NOT SURE)**
3. Certain maternal conditions like mumps and rubella can cause Hearing loss **(YES / NO / NOT SURE)**
4. Poor food habits can cause Hearing loss **(YES / NO / NOT SURE)**
5. Drugs/medication can cause Hearing loss **(YES / NO / NOT SURE)**
6. Jaundice can cause Hearing loss **(YES / NO / NOT SURE)**
7. Delayed crying at birth can cause Hearing loss **(YES / NO / NOT SURE)**
8. Curses can cause Hearing loss **(YES / NO / NOT SURE)**
9. Family history can cause Hearing loss **(YES / NO / NOT SURE)**
10. Noise exposure (eg. Crackers, loud music, construction noises) can cause HL **(YES / NO / NOT SURE)**
11. Medicines of mother during pregnancy can cause HL **(YES / NO / NOT SURE)**
12. Evil spirits can cause Hearing loss **(YES / NO / NOT SURE)**
13. Brain fever/ infection (Meningitis/ encephalitis) can cause Hearing loss **(YES / NO / NOT SURE)**
14. Hospitalization in NICU (Neonatal Intensive Care Unit) for more than 5 days can cause Hearing loss **(YES / NO / NOT SURE)**
15. Ear discharge and recurrent flu can cause **(YES / NO / NOT SURE)**
16. Alcohol consumption can cause Hearing loss **(YES / NO / NOT SURE)**
17. Breast-feeding for first 6 months can reduce/prevent ear infections **(YES / NO / NOT SURE)**
18. Loud music in religious places (temples, churches, mosques) can cause Hearing loss **(YES / NO / NOT SURE)**
19. Smoking can lead to Hearing loss **(YES / NO / NOT SURE)**
20. Child born to parents who are blood relatives can have Hearing loss **(YES / NO / NOT SURE)**

Knowledge: Identification and Intervention ('I' questions)

Do you think:

1. Hearing loss can be identified soon after birth **(YES / NO / NOT SURE)**
2. Hearing screening is important soon after birth **(YES / NO / NOT SURE)**
3. Child can have delayed Hearing loss after a normal hearing screening test **(YES / NO / NOT SURE)**
4. Speech/language problems can be a sign of Hearing loss **(YES / NO / NOT SURE)**
5. Treatment for Hearing loss by birth is available **(YES / NO / NOT SURE)**
6. Routine childhood immunizations can reduce Hearing loss stemming from ear infections **(YES / NO / NOT SURE)**
7. Hearing loss can be managed with Hearing Aids, cochlear implants and surgery **(YES / NO / NOT SURE)**
8. Regular follow up for speech and language therapy is needed after the initial intervention (hearing aid/surgical) **(YES / NO / NOT SURE)**
9. Children with Hearing loss can attend school **(YES / NO / NOT SURE)**
10. It is important to know the "communication milestones" of your child **(YES / NO / NOT SURE)**
11. Government provides financial assistance for hearing amplification devices **(YES / NO / NOT SURE)**
12. Preventive measures (eg, non-use of cotton buds) can protect your child's hearing **(YES / NO / NOT SURE)**

Attitudes to childhood audiology services (A-questions)

Would you like to:

1. Get your baby tested soon after birth **(YES / NO / NOT SURE)**
2. Get Hearing screening test for your baby **(YES / NO / NOT SURE)**
3. Get child tested at school **(YES / NO / NOT SURE)**
4. Let child use hearing aids, if needed **(YES / NO / NOT SURE)**
5. Accept ear surgery for child, if needed **(YES / NO / NOT SURE)**
6. Have more information related to the support available to parents of children with hearing loss? **(YES / NO / NOT SURE)**
7. Are you aware of any local support groups or resources for parents of children with hearing loss in your area? **(YES / NO / NOT SURE)**

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Declarations

Conflict of interest The authors declare no conflict of interest. The authors have no relevant financial or non-financial interests to disclose.

Ethical Approval The study strictly adhered to ethical guidelines established for bio-behavioral research, as outlined by Basavaraj and Venkatesan in 2009 (Reference Number- SH/AUD-09/2022-23) [18].

Informed Consent Before participating in the survey, informed consent was diligently obtained from each participant.

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