



# Knowledge and Attitude of Parents Residing in Urban and Rural Areas Towards Infant Hearing Loss

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**Abstract** To investigate the knowledge and attitude of parents residing in urban and rural areas towards infant hearing loss. This was a cross sectional study with 384 participants. Initially, a pre-test interview was carried out to collect demographic data such as age, gender, educational qualifications, and residential status. The participants' consent was taken prior to the study followed by, administration of knowledge and attitude questionnaire. Mann–Whitney *U* Test was used to analyze the data and offer inferences. Results revealed poor awareness on knowledge of risk factors towards infant hearing loss among parents. Parents showed positive attitude towards early identification and intervention of hearing loss. There were no significant differences in knowledge of risk factors and attitudes between Urban and Rural population. Statistically significant differences were found only in the second domain which dealt with knowledge of identification and intervention. Overall, the study provides baseline information regarding the parental knowledge and attitude towards infant hearing loss in urban and rural areas. The outcome of this study indicates a dire need for educating and creating awareness among parents regarding the general risk factors and need for early identification and intervention.

**Keywords** Hearing loss · Knowledge and Attitude · Risk factor

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## Introduction

The consequences of hearing loss have a negative impact on overall development of the child, which results in delay in development of speech and language skills, poor speech intelligibility and cognitive impairments. It may further lead to poor academic performances and affect the communication skills. Thus, hearing loss, if not treated, could lead to social isolation, anxiety, loneliness, depression, inattentiveness, lack of self-esteem and poor socioemotional development [1].

The impact of hearing loss can be reduced by identifying the condition early and providing early intervention. According to Birchwood et al. [2] the child's early years are critical, because during this period of life, rapid development of brain occurs. Thus, timely rehabilitation will help the child to acquire age appropriate speech and language skills, thereby minimizing the effect of hearing loss. Joint committee for Infant Hearing (JCIH) (2005) has recommended that every child needs to undergo neonatal hearing screening within first 3 months of age and if needed, to be provided with appropriate rehabilitation within 6 months of age. Infants is an age group between birth to 1 year.

The active participation of parents is important for the early detection of hearing loss. The knowledge and attitudes towards hearing impairment in children is the foothold for their further decisions. In a survey, it was found that children missing out of early identification of hearing loss in children was due to the lack of parental awareness. Mothers exhibited uncertainty on major risk factors such as measles, jaundice, and convulsion. Further, it was reported that most of the parents were unaware about the treatment availability for hearing loss [6].

There was a lack of maternal awareness regarding common etiological factors by more than half of the subjects in a study conducted in South Africa. The study also noted that parents had superstitious beliefs towards hearing loss and its management. Interestingly, parents had positive attitude toward Infants hearing screening and a wide acceptance of rehabilitative measures at early stages. The study endorsed the importance of bringing the awareness regarding the impact of hearing loss among parents [7].

Parents/caregiver education level, socioeconomic status, residential status have significant impact on the knowledge and attitude towards the illness. Parental literacy and overall wellbeing are also based on the locality where they reside. People from urban areas are more likely to be educated, high in economic resources, with better access to health care, and rich in qualitative environment. In contrast, people from rural areas are low in population density and affected with factors such as illiteracy, poor sanitation, social exclusion, isolation and lack of service provision [3].

A short survey on awareness of hearing loss in urban and rural areas on Malaysian mothers, revealed that most of the urban mothers rated high levels of awareness on risk factors for hearing loss. (Ear discharge, ear pain, consanguineous marriage). Interestingly, majority of the rural mothers exhibited poor awareness towards causes for hearing loss, early identification and intervention of hearing loss. In superstitious belief and attitude, there were no significant differences between urban and rural mothers. Overall, the study concluded that both urban and rural mothers had poor understanding regarding risk factors that accompanied hearing impairment in children [8].

Thus, recognizing hearing impairment, speech and language difficulties as early as possible would support children and their families in instituting early intervention with better outcomes and quality of life.

## Method

Clearance was obtained from the Institutional Research Committee, Institutional Ethics Committee (449/2019) and Clinical Trial Registry-India (CTRI) [CTRI/2019/08/020725] before the study commenced.

## Participants

This study had 384 mothers as participants (Table 1). Inclusion criteria was the willingness of the parents of newborns in the age group of 20–40 years (26.4 years, SD = 3.8). To confirm the residential status of the participants, the list of urban and rural areas was obtained from the District Health Officer (DHO), Udupi district, Karnataka. Based on the list obtained and the scores of

**Table 1** List of domain and frequency of study participants

Domain	Frequencr (n)
Population	
Urban	193
Rural	191
Gender	137
Male	247
Female	0
Education	0
Graduate	199
Senior secondary level	185
Occupation	5.5
Medical	87
Non Medical	29

socioeconomic status questionnaire (Modified Kuppuswamy Socioeconomic scale updated for January 2018), the participants were classified as urban and rural. Participants selected for the study were residents in their specific locality for a minimum of five years. Parents who had significant medical issues and psychologically ill were excluded from the study.

## Instrument

The 19-item knowledge and attitude questionnaire [6] in Kannada language was used. The questionnaire has four sections: knowledge of risk factors (10 items), knowledge of identification and intervention (4 items), superstitious cultural beliefs (2 items) and attitudes (3 items).

## Procedure

A pre-test interview was carried out to collect demographic data such as age, gender, educational qualifications, and residential status. The participant information sheet and consent were taken prior to the study. The knowledge and attitude questionnaire were provided to the participants. After a duration of 1 h, questionnaires were collected and subjected to analysis.

## Data Analysis

Responses of each question of 19 item knowledge and attitude questions were coded where 01 indicated No, 02 indicated Not sure and 03 indicated Yes. Descriptive statistics was used to calculate the frequency of the occurrence of each response. Median and quartiles were determined for each section of the questionnaire separately.

Further, the data was analyzed with respect to economic status (urban and rural), gender (male/female), and educational level (graduate/senior secondary level). As the data was not normally distributed, to compare the outcome variable, the Non-parametric test (Mann–Whitney *U* Test) was used. Statistical analysis was performed using SPSS 15, South Asian Ed, and Bangalore, India.

## Results

### Knowledge of Risk Factors

There were ten questions in the first domain. Parents exhibited better knowledge of risk factors of hearing loss such as congenital causes (68%), ear discharge (62.2%), high fever (62.2%), drugs/medication (56%), and measles (54.9%). However, parents were not sure of causes such as; jaundice (70.1%), native medicine (65.9%), delayed crying at birth (58.3%), convulsion (54.9%) and prolonged noise (48.2%) (Table 2). The median and quartiles of urban and rural populations were 25(24, 25) and 24(24, 25)

respectively. There was no significant difference between urban and rural parents in knowledge of risk factors ( $p = 0.078$ ).

### Knowledge of Identification and Intervention

In the second domain, most of the parents (56.8%) exhibited good knowledge towards testing the baby soon after birth. Almost 55.7% of the parents were aware about the educational opportunities available for hearing impaired children as their hearing peers. However, knowledge of treatment available for hearing loss was 53.4% among the parents; only 50% of the parents knew that hearing-impaired children can attend schools (50.8%) (Table 3).

The median and the quartiles of urban and rural populations were 10(10, 11) and 10(9, 11) respectively. There was a significant difference between urban and rural parents in knowledge of risk factors ( $p = 0.002$ ). In the present study, the urban population has shown better scores in knowledge of intervention and identification than rural population.

**Table 2** Summary of frequency of responses of Knowledge and attitude questionnaire with regard to percentages and quartiles

QUESTIONS	Percentage of responses			Quartiles Median (Q1, Q3)
	No	Not Sure	Yes	
<i>Knowledge: Risk factors</i>				
1. Babies can be born with hearing loss	0	32	68	3(2,3)
2. High fever can cause hearing loss	0	37.8	62.2	3(2,2)
3. Measles can cause hearing loss	0	45.1	54.9	3(2,3)
4. Ear discharge can cause hearing	0	37.8	62.2	3(2,3)
5. Convulsion can cause hearing loss	0	54.9	45.1	2(2,3)
6. Drugs/medication can cause hearing loss	0	44	56	3(2,3)
7. Native medicine can cause hearing loss	4.9	65.9	29.2	2(2,3)
8. Jaundice can cause hearing loss	13.8	70.1	16.1	2(2,2)
9. Prolonged noise can cause hearing loss	5.5	48.2	46.4	2(2,3)
10. Delayed crying at birth can cause hearing loss	0	58.3	41.7	2(2,3)
<i>Knowledge: Identification and intervention</i>				
11. Hearing loss can be identified soon after birth	0	43.2	56.8	3(2,3)
12. Treatment for hearing loss is available	0	46.6	53.4	3(2,3)
13. Children with hearing loss can attend school	0	49.2	50.8	3(2,3)
14. Children with hearing loss can have similar educational opportunities as hearing peers	0	55.7	44.3	2(2,3)
<i>Superstitious cultural beliefs</i>				
15. Blood impurities can cause hearing loss	0	57.3	42.7	2(2,3)
16. Bewitchment can cause hearing loss	0	43.5	36.5	2(1,2)
<i>Attitudes</i>				
17. Would like baby tested soon after birth?	21.1	16.7	62.2	3(2,3)
18. Would let baby use hearing aids?	0	40.4	59.6	3(2,3)
19. Are you concerned about your child's hearing & need more information?	0	15.6	84.4	3(3,3)

**Table 3** Summary of frequency of responses with respect to Urban and Rural population

QUESTIONS	Percentage of responses					
	No		Not Sure		Yes	
	R*	U**	R	U	R	U
<i>Knowledge: Risk factors</i>						
1. Babies can be born with hearing loss	0	0	32.1	31.9	67.9	68.1
2. High fever can cause hearing loss	0	0	36.8	38.7	63.2	61.3
3. Measles can cause hearing loss	0	0	49.2	40.8	50.8	59.2
4. Ear discharge can cause hearing	0	0	38.9	36.6	61.1	63.4
5. Convulsion can cause hearing loss	0	0	56.0	53.9	44.0	46.1
6. Drugs/medication can cause hearing loss	0	0	45.6	42.4	54.4	57.6
7. Native medicine can cause hearing loss	4.7	5.2	64.8	67.0	30.6	27.7
8. Jaundice can cause hearing loss	15.5	12	65.3	74.9	19.2	13.1
9. Prolonged noise can cause hearing loss	6.2	4.7	53.9	42.4	39.9	52.9
10. Delayed crying at birth can cause hearing loss	0	0	58.0	58.6	42.0	41.4
<i>Knowledge: Identification and intervention</i>						
11. Hearing loss can be identified soon after birth	0	0	46.1	40.3	53.9	59.7
12. Treatment for hearing loss is available	0	0	51.8	41.4	48.2	58.6
13. Children with hearing loss can attend school	0	0	54.4	44.0	45.6	56.0
14. Children with hearing loss can have similar educational opportunities as hearing peers	0	0	56	55.5	44	44.5
<i>Superstitious cultural beliefs</i>						
15. Blood impurities can cause hearing loss	0	0	57.5	57.1	42.5	42.9
16. Bewitchment can cause hearing loss	39.4	47.6	38.9	34	21.8	18.3
<i>Attitudes</i>						
17. Would like baby tested soon after birth?	21.8	20.4	17.6	15.7	60.6	63.9
18. Would let baby use hearing aids?	0	0	39.4	41.4	60.6	58.6
19. Are you concerned about your child's hearing & need more information?	0	0	20.2	11.0	79.8	89.0

### Superstitious Cultural Belief

In the third domain, it was noted that most of the parents agreed with superstitious cultural beliefs. Parents denoted that blood impurities could cause hearing loss (42.7%). Around 36.5% of parents considered bewitchment as a cause of hearing loss.

The median and the quartiles of urban and rural populations were 4(4, 5) and 4(4, 5) respectively. There was no significant difference found between urban and rural parents in knowledge of risk factors ( $p = 0.213$ ).

### Attitude

Most of the parents reported positively on being worried about their child's hearing (84.4%) and required more information regarding it. Around 62.2% of parents exhibited their interest to test the baby soon after birth. 59.6% of parents reported positively with respect to letting the child wear hearing aids.

The median and the quartiles of urban and rural population were 8(7, 9) and 8(7, 9) respectively. There was no significant difference found between urban and rural parents in knowledge of risk factors ( $p = 0.279$ ).

Factors such as gender, education, occupation were analysed with regard to knowledge and attitude. Statistically significant differences ( $P = 0.000$ ) were found between gender in superstitious cultural belief. Females were more superstitious than males. However, there were no significant differences in the domains of education and occupation.

### Discussion

#### Knowledge of Risk Factors

In the current study, ear discharge was frequently identified as a risk factor other than congenital causes. This could be

due to the high prevalence rate of otitis media in developing countries [4]. This endorses the study of Olusanya et al. [5] who reported Nigerian mothers with good awareness regarding ear discharge (73%) as risk a factor for hearing loss.

Ravi et al. in 2016 [6] stated similar findings regarding awareness about risk factors for hearing loss in mothers. They reported that mothers had better knowledge towards infant hearing loss causes such as ear discharge, congenital causes and noise. The study also highlighted the need for awareness towards risk factors of hearing loss.

In the present study, parents expressed poor knowledge towards important etiological factors of infant hearing loss like jaundice, native medicine and asphyxia. It is also noteworthy that there were uncertain responses towards causes such as convulsion, prolonged noise. A study conducted among mothers to determine the knowledge and attitude has reported that more than 80% of mothers were not aware that jaundice and native medicines cause hearing loss [6].

However, in the present study, there were no significant differences between mothers belonging to urban and rural places. This finding implies the lack of awareness in both rural and urban population on risk factors for hearing loss. In support of the present study is a report of Malaysian mothers from both the urban and rural places exhibiting poor knowledge of risk factors related to hearing impairment. According to them, ear discharge and congenital causes were common risk factors for hearing loss [8]. Thus, there is a dire need for intensive educational training in hearing and overall health conditions, especially in mothers during gestational period.

### Knowledge of Identification and Intervention

The present study participants showed comparatively better knowledge regarding early identification and intervention of hearing loss. Few parents were aware that hearing impaired children can have similar educational opportunities as normal hearing children. However, fifty percent of the parents were unsure about equal opportunity rights available for the hearing-impaired children in schools. This could be attributed to the parents' lack of awareness of schemes, policies, acts and rights for the hearing impaired.

In support to the present study, Olusanya et al. [5] stated that 68% of Nigerian mothers indicated that hearing loss can be identified at birth and almost 50% of them considered the possibility of similar opportunities at school. In the present study, there was a statistically significant difference with respect to urban and rural parents. Urban parents had better knowledge as compared to rural population on intervention and identification. This may be due to the lack of adequate health education as well as overall health

management seen in rural areas. Rural parents seemed to be unaware of consultant health profession and service centers. Moreover, lack of availability of hearing care professionals and resources in rural areas can lead to uncertainty and unawareness. It was also stated that they may depend on native medicines. Further, superstitious beliefs were rated to be high in rural parents regarding management. Thus, it is imperative that Audiologists should conduct awareness programs in rural areas & enlighten the parents and caregivers regarding early identification and intervention. Further, they must embark on regular hearing evaluations to minimize the chances of missing out babies with hearing loss and failure to follow up.

### Superstitious Cultural Beliefs

In the present study, parent's beliefs towards superstitions regarding the causes of hearing loss were rated to be high. This was evidenced by factors such as blood impurities and bewitchment. Most of the parents denoted blood impurities as causing hearing loss; few parents considered that bewitchment could cause hearing loss. In support to the present study, Wong et al. [8] stated that 58% of mothers believed that bewitchment during pregnancy could cause hearing loss in infants.

No differences were found between urban and rural parents in this aspect. This is in consonance with the study where Malaysian mothers' knowledge associated with superstitious beliefs was rated high for both urban and rural areas.

In superstitious cultural beliefs, significant differences were found in gender. Mothers were found to be highly superstitious as compared to fathers. Mothers in general were more concerned about infant's overall health. Mothers tend to experience lot of emotions inclusive of anticipation, overwhelming joy, high expectations along with mixed feelings of fear and uncertainty towards birth and health of infant. Literature has revealed that maternal anxiety as well as lack of awareness could be the reasons for believing in superstitious cultural beliefs during pregnancy.

At the younger stage of life, auditory as well as speech and language stimulation play a vital role in child's developmental stages. Negative effect on speech and language development would ensue if parents believed in superstitions and miss out child's hearing loss for intervention. Thus, appropriate information with respect to hearing loss has to be given to mothers to educate them on superstitions and to minimize its negative effect.

## Attitude

The parental attitude towards early identification and intervention of hearing loss yielded positive responses. Almost all of the parents were interested to know about the baby's hearing status. They also exhibited keen interest to check the hearing of the child soon after birth. Parents strongly agreed on the use hearing aids, if required. This outcome supports the report of Ravi et al. [6] who stated that, most of the mothers were concerned about child's hearing and allowed the baby to wear hearing aids, if required. Olusanya et al. [5] stated that most of the mothers exhibited positive attitude towards allowing the baby to wear hearing aids and would like to undergo infant's hearing check-up soon after birth. Majority of developing countries have shown positive attitude towards infant hearing screening at early stage, and mothers were willing for rehabilitation at the earliest.

## Conclusion

Overall study revealed limited knowledge towards hearing loss but positive attitude towards early identification and intervention of hearing loss among parents of both urban and rural population. Thus Audiologist should take the responsibility of increasing awareness towards hearing loss among parents.

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