ICMR PROJECT

PROFILE OF HEARING MORBIDITY AND IDENTIFICATION OF BARRIERS AND CHALLENGES FOR ACCESS TO EAR AND HEARING CARE SERVICES IN CHILDREN OF URBAN AND RURAL AREAS OF DELHI

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FINAL REPORT

1. Title of the Project: PROFILE OF HEARING MORBIDITY AND IDENTIFICATION OF BARRIERS AND CHALLENGES FOR ACCESS TO EAR AND HEARING CARE SERVICES IN CHILDREN OF URBAN AND RURAL AREAS OF DELHI

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4. Date of commencement: 30th March 2010

5. Duration: 3 years and 3 months

6. Date of completion: 30th June 2013 (After extension of three months)

7. Objectives as approved:

i. To study the morbidity pattern in relation to ear and hearing diseases among children.

ii. To identify the barriers for seeking ear care services in the study population.

iii. To evaluate the knowledge, attitude, behaviour and practices of parents, teachers and children above 10 years, health care providers and stakeholders in relation to Ear and Hearing diseases.

iv. Assessment of services available at various levels of health care systems with respect to ear and hearing care.

v. To compare the above parameters between two districts and urban and rural populations.

8. Deviation made from original objectives if any, while implementing the project and reasons thereof: Nil

9. Experimental work giving full details of experimental set up, methods adopted, data collected supported by necessary tables, charts, diagrams and photographs:

INTRODUCTION

The most common causes of disability globally are hearing loss and refractive errors. Hearing loss is the most prevalent sensory disability globally, being disproportionately high in magnitude in South-East Asia Region, accounting for a third of the entire disease burden in the world[1]. It is a problem that is increasing rapidly in the entire world with a reported over 275 million Deaf and hearing impaired persons in the world[2].

As per the World Health Organization reports[3], 6% of the population of India suffers with significant Auditory Impairment*.

Hearing impairment assumes great significance as it can retard an individual's language acquisition and cognition, impairing the overall development. It is bound to have social as well as economic implication, both for the individual as well as for the community to which the individual belongs. Hearing loss can prevent a person from leading a professionally and socially normal life and can also hamper the development of language skills[4] and academic proficiency[5].

The effects of hearing loss may be dramatic. If the hearing loss is severe and affects the person in infancy or early childhood, it will drastically hamper the physical and psychological development of the individual[4]. There is severe compromise on the linguistic capability, educational attainment and future opportunities[6] resulting in a severe handicap.

Though all age groups are prone to ear and hearing disorders, it is essentially the younger age group which faces the maximum morbidity in this regard[7]. The common ear diseases that are prevalent in our country include Chronic Suppurative Otitis Media, Secretory otitis Media and Wax impaction.[3] A large number of these diseases are preventable. Others can be treated medically or surgically. Effective and early treatment of these ear diseases can lead to improvement in the audiological outcome of the affected persons.[4]

However, it is estimated that over 166 million people in the developing world face a severe lack of intervention services for hearing loss. According to the World Health Organization (WHO), this crisis results from a substantial increase in "disabling hearing impairment" over the last 15 years.[1] Further, there seems to be a severe shortage of skilled health care workers, especially so in the developing countries.[8] ENT problems in the community are often found to be managed without consulting a medical practitioner[9]. A variety of factors such as the sex of the child, the socio-economic status, the severity of illness[10] often determine the care seeking pattern within our country.

The aim of present study was to assess the extent of ear & hearing problems as well as accessibility of ear care services in the urban and rural population of the National Capital Region of India. It also aimed to identify those barriers, mental, physical, social or medical which prevented the diseased person from seeking suitable care.

REVIEW OF LITERATURE AND SITUATION ANALYSIS:

1. MAGNITUDE OF THE PROBLEM:

Based on 2004 estimates[2] (Global Burden of Disease, 2004), 275.7 million people have moderate or greater hearing loss (Hearing loss threshold in the better ear of 41dB or greater, measured average for 0.5,1, 2, 4 Hz). This represents approximately 4.2 percent of the world's population. Two-thirds live in developing countries. Additionally, 360.8 million people have mild hearing loss (Hearing loss threshold in the better ear of 26-40dB, measured average for 0.5,1, 2, 4 Hz).[1] The total global YLD (Years lived with disability) for hearing loss is estimated to be 24.9 million or 4.8% of the total YLD due to all causes.[11] This makes hearing loss the second leading cause of YLD after depression and gives it a larger non-fatal burden than alcohol use disorders, osteoarthritis and schizophrenia. Hearing loss ranks seventh among adults aged 15-59 years as well as among those aged over 60 years, contributing to a total of just over 26 million years of healthy life lost, which is 5.5 per cent Daly's (Disability adjusted life years) from all causes.[11]

As per WHO estimates, 6% of the Indian population[3,12] suffers with moderate or higher degrees of hearing impairment, also termed as Disabling Hearing impairment.[12] As per the NSSO[13] (National Sample survey organisation estimates, 2002), 3,061,700 (3.06 million) persons in India are afflicted with the hearing disability. This is 16.56% of the total number of 18.49 million disabled persons in the country.

Deafness in children could be both congenital and acquired. Congenital Hearing loss may be caused by hereditary factors or non-hereditary factors. The Hereditary causes of hearing loss may be syndromic or non-syndromic. A large number of syndromes associated with hearing impairment have been identified. Other non-syndromic causes are associated with various gene mutations; especially those involving the gene coding for Connexin 26.[14] Primary prevention of these is possible through genetic testing and genetic counselling.

The non hereditary causes include factors such as:[15]

- Pre-natal maternal infections: rubella and other maternal infections Toxoplasmosis, Cytomegalovirus infections.

- Peri-natal: Prematurity, Low birth weight, hypoxia, hyper-bilirubinemia that needs exchange transfusion.
- post-natal: meningitis, mumps, measles, ototoxic drugs.

All the factors listed above lead to a bilateral profound hearing loss. Every year about 38,000 children with this type of deafness are added to the population of the South East Asia region[11].

A child with this type of deafness is unable to perceive auditory stimulus and without intervention will fail to develop speech and linguistic skills. A large proportion of this deafness can be prevented by Implementing good antenatal and perinatal care, immunization against Rubella, judicious use of Ototoxic drugs and control of noise in the nursery. Secondary and tertiary prevention in the form of early identification and suitable rehabilitation play a significant role in the reduction of morbidity and improving the quality of life in these children.[1]

An early identification of this hearing loss is an essential prerequisite for effective aural rehabilitation and educational intervention. In order to ensure the best results in terms of the development of a child's speech and communication skills, the diagnosis of hearing loss must be made early and appropriate intervention done before the age of six months.[4]

Other than the bilateral profound hearing impairment, children may develop milder degrees of hearing loss later in their life. The causes that commonly lead to this are[12, 16, 11]:

- Chronic suppurative otitis media,
- non suppurative otitis media,
- Impacted Cerumen,
- post traumatic perforation
- Use of Ototoxic drugs.
- High noise levels can also have a deleterious effect on the auditory system of the premature babies who spend a long time in these incubators.

Within our country, the most commonly detected causes of significant hearing loss, in the younger age group, are Chronic Suppurative Otitis Media and Non-Suppurative Otitis Media[3]. 5.4% of the Indian population suffers with Chronic Suppurative Otitis media and 3.8% with Non-Suppurative Otitis Media.

Young children are especially prone to ill effects of ear disease. A study done in the population of Uganda revealed that 10.2% of children had disabling hearing impairment. As per this study[16], correctable causes such as dry perforations, cerumen impaction, and chronic suppurative otitis media were responsible for hearing losses in 41% of children. In India, a variety of studies have reported that a significant proportion of school children are hearing impaired.[17] A study in South India detected hearing loss in 11.9% of children at school entry age.[18] The prevalence of hearing loss was significantly lower in children from higher socio-economic strata. Another study from North India[19] also reports a significantly higher incidence of various ear diseases amongst school children from lower socio-economic strata of the society. Impacted wax is reported to be a common cause[18,19] along-with Chronic Suppurative Otitis media.[12,16,19] A study done in the SEA region, reported a 5% incidence of Chronic Suppurative Otitis Media in the population of India, of which 2% is bilateral[3].

Hearing loss in school children is reported to be linked to a variety of academic and adjustment problems.[17] Hearing loss and CSOM have a significantly adverse effect on the academic performance of the children.[16]

As per a World Bank report[6] persons living with disabilities in India, including hearing impairment, have a much higher unemployment rate. The children also have a much higher incidence of either not attending school or dropping out. This compromises their future financial and social stability.

In addition to its effect on the individual, Deafness and Hearing impairment have profound effects on social and economic aspects of communities and countries. A study carried out in the US, estimated the cost of communication disorders to be 154 to 186 Billion USD for the year 1999.[20] This includes the cost of rehabilitation, special education and loss of employment.

Most of the aetiological factors causing hearing impairment in school going children are treatable and hence deafness can be prevented to a large extent if

remedial measures are taken in time.[7,16] Hence, timely detection and intervention through suitable remedial measures is of utmost importance. As a matter of fact, it is suggested that approximately half of the burden of cases of clinically significant hearing loss could be prevented by primary, secondary and tertiary preventive measures.[21,22,23,24]

2. BARRIERS TO EFFECTIVE EAR AND HEARING CARE:

2.1 INFRASTRUCTURE AND HEARING AND EAR CARE SERVICES AVAILABLE:

A WHO SEARO study pertaining to the „Prevention and Control of Hearing Impairment"[11] identified four key issues affecting the current status of implementation of the deafness programme:

- Huge burden of diseases
- Human resources available
- Inadequate infrastructure
- Low priority for deafness prevention in the region.

This document mandates that any policy regarding Deafness prevention should have a special focus on providing services which target the primary level in underserved areas and populations. It must give attention to the secondary level for referral and appropriately strengthen tertiary care. It suggests that the programme for Prevention and Control of Deafness should be built around the existing health care infrastructure in the countries and should have a team approach. Another WHO SEARO report,[3] indicates that training of the Primary Ear Care Health worker as well as public awareness are still minimal and that ear and Hearing care is not always available at the secondary level of Health services. As per the Indian Census report 2011,[25] India with its population of over 1200 million has an average life expectancy of 67.3 years in females and 63.8 year in males. To cater to this population, there are 1376013 hospital beds available in government run centres around the country and 0.5 physicians per 1000 population. There are 23887 Primary Health Centres in the country and around 4809 Community Health Centres. These together serve as the first point of contact between the community and the trained medical physicians. India has about 148124 sub-centres which are manned by Male and Female Health care workers.

Access to organized Ear and Hearing care is available at the Secondary level, which are the District level hospitals and the Tertiary level. As per WHO 2009 data, there are approximately 8000 ENT specialists in the country,[3] a ratio of 1: 139028 population. There are approximately 1200 Audiologists practicing in India, a ratio of 1: 9216854. With 4039 teachers for the Deaf, India has the maximum number of these trained personnel in the region. However, with an estimated 3 million hearing disabled[13] in the country, the number seems inadequate.

While these personnel may benefit the Hearing disabled at the secondary and the tertiary levels, it is the grass root level workers, the ANMs, AWW and ASHA who provide guidance and services within the community. While facility based care is essential for referral and providing a range of routine and emergency services, but it is the outreach and outpatient services which act as a bridge between the households and the health facilities.[8] A 2006 report by UNICEF states that there should be an average of 2.28 health care professionals per 1000 population in the countries. It also states that many developing countries are facing an acute shortage of skilled health workers and that the greatest shortage is in Asia, especially India, Indonesia and Bangladesh.

WHO SEARO in 2007 recommended[3] that short courses for simple diagnosis and management of ear diseases and hearing disorders should be offered to the related personnel at the Primary, Secondary and tertiary levels. It also stresses on a need to provide regular training related to Ear &Hearing care in the community and Primary Health centre settings.

WHO also states that[26] the unmistakable imperative is to strengthen the workforce so that health systems can tackle crippling diseases and achieve national and global health goals. This report stresses that in order to be successful, national strategies must adopt three priorities:

- Acting now
- Anticipating the future
- Acquiring critical capabilities

It suggests that national leadership and global solidarity can result in significant structural improvement of the workforce in all counties especially those with the most severe crises.

2.2. CARE SEEKING BEHAVIOUR AND ATTITUDES

With a per capita Gross National Product of 400 USD, India is a developing country of the South East Asia region. With a birth rate of 26.1 per 1000 population, an Infant mortality rate of 68 per 1000 live births, an adverse sex-ratio of 933 females: 1000 males and an overall literacy rate of 54% among females and 74% among males[25], health care seeking attitudes form an important aspect for access to health care services by the population at large. Even with availability of health care, many social, educational and economic factors determine whether the child actually reaches the Health care provider at the right time.

A study undertaken in Nepal in 2005 [27], indicated that pharmacies were the most common facility where care was sought in cases of childhood illnesses. It concluded that a large number of mothers did not seek appropriate and prompt care for their ill child. The mothers were not aware of the danger signs of common illnesses. Family income, mother's education and knowledge about the severity of illness were identified as predictors of Care seeking behaviour. Another study from Nepal[28] aimed to capture the pathway of the household decision making process starting from the perception of illness and moving on to dthe choice of care and provider and ending with the Health care expenditure. They assessed that only 10% of the population reported illness. Of these 69% sought care and depending upon the provider they chose, spent between 2.5 to 4.3% of their per capita household total annual expenditure on health care. They took into account the changing effects of income and mother's education and indicated that there may be conceptually different household dynamics that underlie boys' and girls' illness perception and that this ultimately determines whether or not health care is sought.

Another such study[29] revealed that some form of illness strikes about 50% of households each year. When rural Nepalese are moderately or severely ill, they seek healthcare from traditional healers first, before visiting other health workers. Mild illnesses are treated at home. To improve the health of the rural population, health planners should recognize these realities and incorporate them into the development of health policies.

Similar reports from South India[10] related the decision to seek treatment to the severity of illness, the specific diagnosis, the economic status of the family and the number of antenatal visits made by the mother. The study reported that gender of the child did not influence whether or not the child was taken for treatment but did influence whether care was sought in the alternative or the allopathic system.

A report emanating from Jerusalem, Israel[30], has also listed the birth order of the ill child as a key factor in determining the number of preventive visits, while the mother's perception of her child's health status held the major influence on the number of curative visits. No association between utilization of services and social class was discovered.

An assessment of ENT related diseases done in Scotland[9] had one fifth of the respondents reporting problems relating to Ear, Nose and Throat. Of these, Hearing loss was the commonest problem. It concluded that ENT problems occur frequently in the community, and most are managed without consulting medical services. Whilst reasonable for many problems, there are likely to be important groups in the community with ENT problems that might benefit from modern interventions.

In terms of hearing disability and other persons with disability, the provider's attitude can have a significant impact on their access to health care services. As per a World Bank report[20], 2007, a research from hospitals in Orissa revealed that less than 40% of the Health care providers were aware of entitlements under the PWD (Persons with Disability) act of India and close to 40% considered PWDs as a burden. Similar findings were also reported from other states surveyed. The existence and importance of these attitudinal barriers receives support from the fact that 16% of the PWDs in Uttar Pradesh and Tamil Nadu did not seek health services due to provider attitudes. Field research from various states indicated a low level of medical awareness among health care providers on disability issues. The report also stated that the demand by district and sub-national governments for health services for PWDs is poor within the country.[20]

It may thus be summarised that the following are the major factors which affect the care seeking behaviour of a family:

- Socio-economic status of the family
- Educational status of the family
- Gender of the child
- Severity of illness
- Lack of awareness
- Over the counter medications offered at pharmacies
- Traditional or alternative systems of medicine
- Others: such as the birth order of the child, myths and beliefs of the community

A report presented to the World congress in 2002, stating the WHO perspective on deafness stated that the major challenge in the field of deafness prevention is the general lack of awareness about issues relating to deafness and hearing impairment in all parts of the society.[31] The population as a whole is not aware of the specific effects of this problem on individuals. It states that there is a need to develop a public health approach to this problem, Health professionals and health planners need to reorient their thinking and hence their activities along a public health route when addressing the situation.

Data also suggests that a lack of equipments, lack of political will and funding for the programmes related to hearing loss remains as barriers to alleviating this disability[32].

3. NATIONAL PROGRAMME FOR PREVENTION AND CONTROL OF DEAFNESS (NPPCD)

The National Programme for Prevention and Control of Deafness (NPPCD)[33] was launched on a pilot basis from August 2006. It is currently being implemented in 192 districts over 17 states and 3 Union Territories.

Main emphasis of this programme (NPPCD) is on **Prevention** of Hearing loss through awareness creation, promotion of healthy ear care practices, **Early Detection**, **Treatment**, both medical and surgical and **Rehabilitation**, where required.

For the purpose of implementing this project, the existing health infrastructure is to be utilized and upgraded.

The **District Hospital** is the nodal point for the actual implementation of the programme. The government and private doctors as well as Audiologists are to be involved. The **Primary Health Centre and Community Health Centres** are to be involved.

Multi Purpose Workers, Public Health Nurses, AWW Supervisors etc and the grass root functionaries (**ASHA, Anganwadi Workers**) will also play a role in the programme.

In the context of this newly launched initiative, it is imperative that the utilisation of ear and hearing care services in the community and the barriers that exist in this regard be evaluated. This study would help to establish the various factors pertaining to the access of ear and hearing care services by the community. Recommendations in this regard would help to address this issue a suitable manner, in order to ensure that the community at large is able to benefit from the upgraded ear and hearing care services.

METHODOLOGY

The research work was participatory, cross-sectional and included two aspects:-

- **Quantitative assessment of the profile of morbidities related to ear and hearing:** The project aimed to assess the prevalence of various ear & hearing morbidities amongst the children of Delhi. A total of 13800 children were included in the study. The children were examined for assessment of ear and hearing morbidities. This was done through a door to door survey of the households randomly identified. All children upto the age of 14 years were included in the study. All children included were being examined in the following way:

i) A Home visit proforma (Annexure 1) was filled up for the family examined. All children within the family were included in the study, after taking consent from the parents.

ii) Otoscopic examination: All children were subjected to an otoscopic examination in order to assess for the presence of any disease in the external ear, tympanic membrane or the middle ear.

iii) Tymapnometry: was undertaken for all children included with the help of a portable, hand held tympanometer. The type of the graph elicited in both the ears is recorded.

iv) Hearing Assessment: Hearing assessment was done through age specific methods:

a. 0-6 months: Oto-acoustic Emission testing: OAE testing is done with the help of a portable, hand held OAE machine. The response is noted as Pass or Refer. Those who Pass the test in both the ears are then advised regarding monitoring the hearing of the child with the help of a pamphlet (Annexure 2)
b. 6 months to 5 years: Behavioural testing is used to assess the hearing status of children in this age group. Distraction test and Voice tests are used, as applicable. In case there is any suspicion of hearing loss, the child is referred for detailed testing to Maulana Azad Medical College.
c. Above 5 years: Tuning fork tests are done in all children above 5 years, who are able to give the required response.

- **KAP (Knowledge, Attitude, Practices) survey**: An important aspect of the project was to get an insight into the knowledge, attitudes, practices and

behaviour of the community, stakeholders and service providers with regard to ear & hearing problems. It was also important to understand issues related to access of existing health care services and barriers and challenges in this regard.

1.1 Area of survey:

The project was conducted in two districts of Delhi viz. the South and the Northwest districts of Delhi. The criteria of selection included accessibility of the districts and representation of both urban and rural area proportionate to the population in the two districts.

1.2 Selection of target population:

The target population included:

(a) Quantitative assessment of ear & hearing morbidity profile: Children in the age group of 0-14 years were included in the morbidity study.

(b) KAP (Knowledge, Attitude, Practices) survey: It included the following categories:

- Children in the age group of 10-14 years
- Parents/ Caregivers
- Teachers from the identified schools
- Health care providers at all levels
    - District level
    - Primary Health Centre/ MCW Centres/ Dispensaries
    - Sub-centre level (MPW)
    - Tertiary referral centre level
- Policy makers at the State and the Central level

1.3 Development of Research Instruments:

Quantitative and Qualitative indicators were developed in consultation with:

- Public Health experts
- ENT experts
- Key programme implementers
- Stakeholders

The questionnaires were translated into Hindi for use in the community.

1.4 Pre testing of the Research instrument: The questionnaires were pretested in a small group. Following this, desired changes were made before finalizing the proformas.

1.5 Sample Size:

Taking the WHO stated prevalence of 6% hearing loss in Indian population, and with 10% allowable error, the sample size required is 6266. The sample size required was based on the following formula:

$N= 4pq/L^2$ (Where N= sample size, p = expected prevalence of hearing loss and common ear diseases, q= 100-p, L= allowable error)

(4X6X94/ 0.6X0.6 = 6266)

This was doubled in order to negate the design effect, thereby giving a sample size of 12534 children for assessment of ear morbidities

Considering the attrition (10%), 13786 children between the ages of 0-14 years were proposed to be surveyed for the purpose of determination of prevalence of ear morbidities in this age-group.

2 SAMPLING: A multistage sampling according to the population proportion of sample was done. Taking into consideration the facts that:

i) Around 10% population of Delhi is rural (Census 2001)

ii) Approximately 20% of the population of Delhi lives in urban slums

The sample was divided equally amongst two districts. The sample was considered in 3 parts

a) Urban area: 70% of the sample

b) Urban slum: 20% of the sample

c) Rural area: 10% of the sample

The division of the sample was as follows:

	North-West District	South District
Rural	689	689
Urban Slum	1379	1379
Urban area	4825	4825
TOTAL	6893	6893

URBAN AREA:

Total of 4825 children were surveyed in the urban area in each of the two districts. 2 wards were randomly selected from each district. 2 Census enumeration blocks were then identified from each of the 2 wards. Houses in each of the CEBs (Census enumeration blocks) were numbered and selection of houses was done through the random number table. Each house selected was approached and children upto the age of 14 years were examined for presence of ear diseases and hearing loss. If no child was available at the chosen house, the neighbouring house will then be visited.

URBAN SLUM:

Total of 1379 children were surveyed in the urban slum area in each of the two districts. The procedure regarding random selection of households was similar to that followed in the urban area.

RURAL:

Total of 689 children were surveyed in the villages under each of the districts covered. 2 villages were identified from each district. The clusters within each village were studied and children were selected randomly from each cluster.

2.1 Assessment of morbidities:

This was done by a detailed ear and hearing check up of the children included in the study. It included:

- Otoscopic examination of the ear
- Tuning fork tests, Voice tests and Behavioural observation (as applicable) to assess for hearing loss.

- Impedance Audiometry to assess the status of the middle ear.

Follow up of children identified to be suffering with ear and hearing problems was done at the Maulana Azad Medical College and Lok Nayak Hospital, to ensure suitable care of their ear disease or hearing loss. Linkages were also developed with the referral centre within the selected districts, in order to facilitate treatment of these patients within those districts of Delhi. Those patients who needed specialized testing such as Auditory Brainstem response testing or required specialized radiological studies or surgical intervention not available at the district hospital (eg. MRI or CT scan, Mastoidectomy for complicated CSOM etc.) will be called to Lok Nayak Hospital and attended to by the investigator on priority basis.

2.2 Children aged above 10 years were interviewed through various mechanisms in order to assess the care seeking patterns, behaviour, perceptions and knowledge through:

- Questionnaire based survey
- Focus group discussions

This was held at the local schools identified in each category of the population, ie the urban area, urban slums and the rural area. Hence the numbers of schools identified were:

Urban area: 8
Urban slums: 8
Rural area: 4
From each of the schools identified, 60 children were randomly selected. Efforts were made to ensure suitable representation of both government run and private schools as well as different socio-economic and educational strata of the society.

2.3 Parents: 500 parents i.e. 250 per districts were interviewed through:

- Questionnaire based survey
- In-depth interviews

2.4 Teachers: 10 teachers from each of the schools covered under the survey were included in the study. They were interviewed through

- Questionnaire based survey
- Focus group discussions

2.5 Health Care providers at different levels:

- Anganwadi workers
- Multi-purpose workers

50 AWW and 20 MPWs were enlisted in the study. They were interviewed through Focussed Group discussion using topic outline guide.

2.6 Doctors

- Primary Health Centre or Dispensary Doctors
- ENT specialists posted at the District hospitals
- ENT specialists posted at the Tertiary care centres
- General practitioners in the districts
- Private practitioners (ENT specialists)

The issues pertaining to accessibility to ear and hearing care and the attitudes of the care-providers as well as the perceived attitudes of the community was studied through In-depth interviews with these personnel. Their knowledge regarding the preventive aspects of ear diseases and hearing loss were also be considered.

2.7 Policy makers:

- Medical Superintendents of the hospitals in the relevant districts.
- Policy makers at the State government level
- Policy makers at the Central government level

These were subjected to In-depth interviews in order to assess their perception of the relevance of diseases related to ear as well as hearing loss and their knowledge regarding the preventive aspects of these diseases, their effect on the physical, psychological and financial health of the affected persons and their families. Their readiness and perception of the relevant government programmes and schemes was also assessed.

2.8 FACILITY SURVEY:

An in-depth assessment of the existing facilities in district with regard to management of ear diseases and hearing loss was also be undertaken in the Primary, Secondary and tertiary level facilities present in the districts included. This helped us to assess the existing services with respect to:

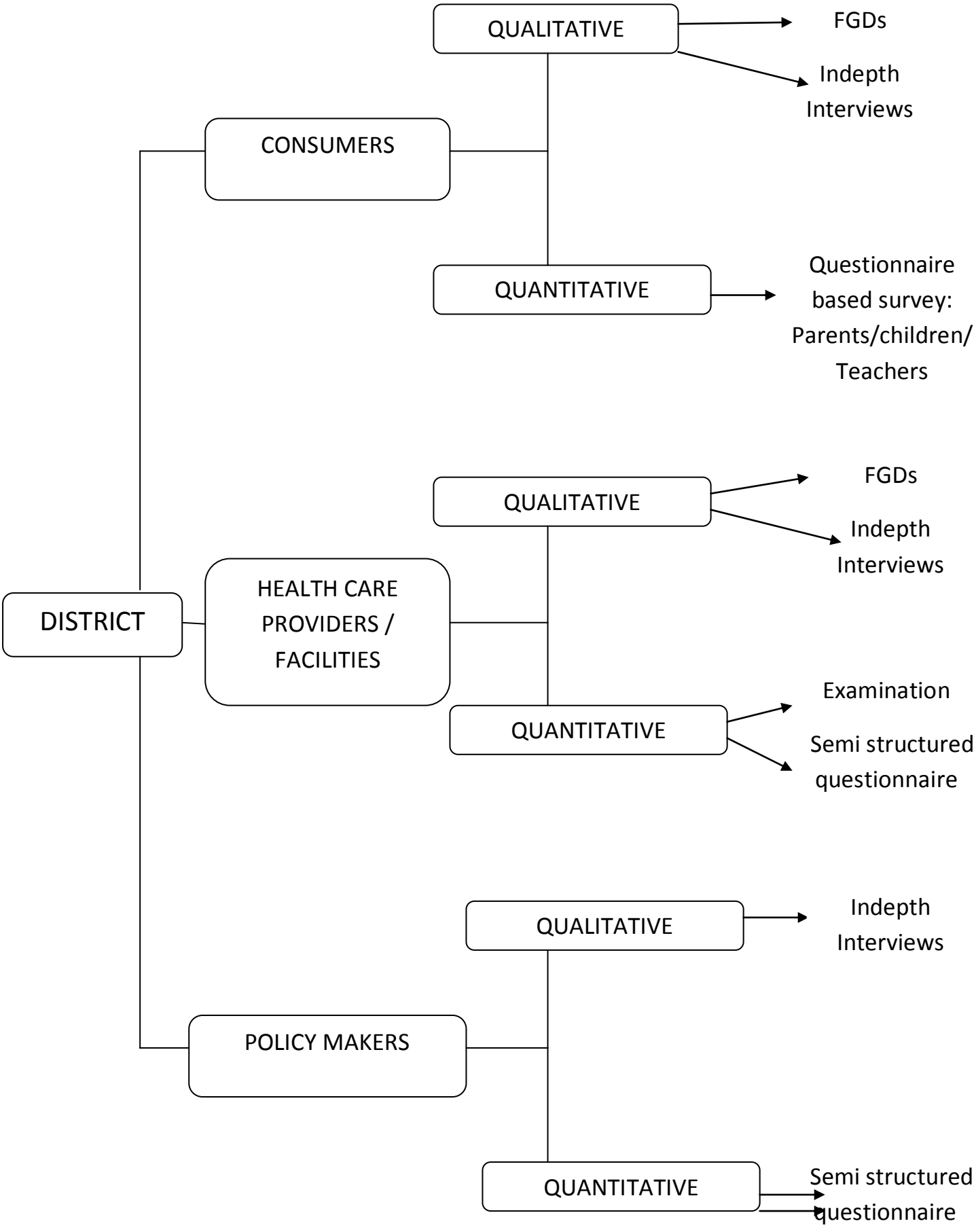
- human resources
- status of training
- equipments and infrastructure available
- diagnostic services offered
- surgical services offered at the various level
- status of availability of medicines
- gaps in services.

This will be done through:

- Physical inspection
- In depth Interviews with concerned personnel

RESEARCH DESIGN

RURAL AND URBAN:



Sample size covered:

Stakeholders	Number proposed to be covered	Process	Number covered till the end of project
Community			
Children 0-14 years	13,786	Clinical examination	13,800
School children 10-14 years	1200 120 50	Questionnaires FGD IDI	1200 136 50
Parents	500 50	Questionnaires IDI	500 50
School teachers	100 100	Questionnaires FGD	105 100
Health care providers			
Anganwadi workers	50	FGD	50
Multi-purpose workers	20	FGD	20
PHC/Dispensary doctors	10	IDI	10
District ENT doctors	100%	IDI	7
General practitioners	10 per district	IDI	20
Tertiary level ENT doctors	10	IDI	10
Policy makers			
Medical Superintendent	100%	IDI	5
State nodal officers & State Mission officer	100%	IDI	1
Central Govt. Nodal officer, CMO, Director	100%	IDI	2

METHODS OF DATA COLLECTION:

- Focussed group discussions
- Questionnaire based interview

- In-depth interviews
- Informal discussions
- Facility survey

DATA MANAGEMENT & ANALYSIS:

Quantitative data was compiled, checked for consistency and verified for correctness. It was analysed using the SPSS software.

This output was used for deriving various conclusions and recommendations. It helped to identify barriers, perception of problems and provided evidence based planning to achieve the defined targets under the National Programme for Prevention & Control of Deafness. The data helped in proposing evidence based recommendations to improve the accessibility of ear and hearing care services in the community. The report aimed to address both the urban population as well as the rural areas.

Qualitative data: The field notes were expanded and thematic analysis was by repeated text readings.

ETHICAL ISSUES:

Consent of the subjects was taken. Privacy of the records of all children identified with ear diseases and hearing loss was maintained. Suitable investigations and treatment of all the children identified to be suffering with any disease of the ear or hearing loss was ensured, free of cost. Children with hearing problems were attended/ referred to appropriate health care facility for management.

10. Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject:

Profile of morbidities related to ear and hearing:

A total of 13,800 children were examined during the study out of which 6541 (47.4%) children belonged to South Delhi while 7259 (52.6%) children belonged to North West Delhi. In South Delhi, 24.2% (1583) children belonged to rural area (Dera village and Shapur), 33.6% (2198) belonged to urban slum (Ambedkar Nagar and Lajpat nagar JJ clusters) and 42.2% (2760) belonged to urban area (Saket and Pushp Vihar). In North west Delhi, 21.7% (1575) children belonged to rural area (Pooth Khurd and Barwala), 41.2% (2991) belonged to urban slum (Pitampura and Narela slum areas) while remaining 37.1% (3063) belonged to urban area (Rohini west and Kohat Enclave).The age of the children examined ranged from a minimum of one month to 14 years.

An otoscopic examination of all the children was carried out in order to assess for the presence of any disease in the external ear, tympanic membrane or the middle ear. During examination of external ear (R), 99.8 % cases was found to be normal and only 24 (0.2%) cases had some abnormality in external ear. The children with abnormality in the external ear primarily belonged to the age group of 6-11 years. Equal numbers of children were males and females (12 respectively). Three fourth of children with abnormality in external ear belonged to South district and majority (62.5%) children were from the rural areas and urban slums.

Table1. Distribution of children by abnormality in external ear (R)

	Frequency	Percent
Normal	13776	99.8
Abnormal	24	0.2
Total	13800	100.0

During examination of external ear (L), 99.9 % external ear was found to be normal. Only 12 (0.1 %) cases had some abnormality in external ear.

Table2. Distribution of children by abnormality in external ear (L)

	Frequency	Percent
Normal	13788	99.9
Abnormal	12	0.1
Total	13800	100.0

During examination of Tympanic membrane (L), in 723 (5.2%) cases, some abnormality was found while in 0.6 % cases tympanic membrane was not visible.

During examination of Tympanic membrane (R), in 762 (5.5%) cases, some abnormality was found while in 0.6 % cases tympanic membrane was not visible.

Table3. Distribution of children by abnormality in Tympanic Membrane (R)

	Frequency	Percent
Normal	12951	93.9
Abnormal	762	5.5
Not visible	87	0.6
Total	13800	100.0

Majority of the children with abnormality of the Tympanic membrane belonged to the age group of above 10 years (39.8%) of age followed closely by those belonging to 5-10 years of age (39.4%). Presence of abnormality in Tympanic membrane was found to be more in girls (52%) as compared to boys (48%). This may be attributed to low healthcare seeking behaviour for girl child as compared to boys.

Table4. Distribution of children with abnormality of Tympanic Membrane (R) by age

	Frequency	Percent
<1 year	48	6.2
1-5 years	114	14.7
5-10 years	306	39.4
>10 years	309	39.8
Total	777	100.0

Table5. Distribution of children by abnormality in Tympanic Membrane (L)

	Frequency	Percent
Normal	12987	94.1
Abnormal	723	5.2

Not visible	90	.6
Total	13800	100.0

Those children who were found to have abnormality during examination or reported some hearing problem were subjected to hearing test (R). A total 1365 children were examined out of which 87 (6.4%) children had some abnormality in hearing and were referred to higher centres for treatment.

Table6. Distribution of children subjected to hearing test (R) by abnormality

	Frequency	Percent
Normal	1278	93.6
Abnormal	87	6.4
Total	1365	100.0

Impedance audiometry for right ear was performed in 522 children out of whom 54 children (10.3%) were found abnormal. These children were subsequently referred to higher healthcare facilities for treatment.

Table7. Distribution of children subjected to Impedance (R) by abnormality

	Frequency	Percent
Normal	435	83.3
Abnormal	54	10.3
Not clear	33	6.3
Total	522	100.0

1389 children were examined for hearing test of the left ear out of which 90 (6.5%) children had some abnormality in hearing who were referred to higher centres for treatment.

Table8. Distribution of children subjected to hearing test (L) by abnormality

	Frequency	Percent
Normal	1299	93.5
Abnormal	90	6.5
Total	1389	100.0

Impedance audiometry for left ear was performed in 534 children out of whom 48 children (9%) found abnormal and were referred to higher centres for treatment.

Table9. Distribution of children subjected to Impedance (L) by abnormality

	Frequency	Percent
Normal	444	83.1
Abnormal	48	9.0
Not clear	42	7.9
Total	534	100.0

On examination of 13800 children for right ear, 78.2 % children were found to be normal while the remaining 21.8% children had some abnormality. The most common problem that was diagnosed was impacted wax (14.4%). 3.2 % children were diagnosed with Chronic Suppurative Otitis Media (Safe- 2.7% and unsafe-0.5%), 2.8% with Otitis media with effusion, 0.5% with Acute Suppurative Otitis media and 0.3% with Otomycosis. Other diseases which were prevalent among children were foreign body in ear and sensori-neural hearing loss.

Table10. Distribution of children by diagnosis of right ear

	Frequency	Percent
Normal	10789	78.2
Impacted wax	1990	14.4
Chronic Suppurative Otitis Media- All types	442	3.2
Otitis media with effusion/Secretory/Glue ear	386	2.8
Acute Suppurative Otitis media	69	0.5
Otomycosis	41	0.3
Foreign body in ear	28	0.2
Sensori-neural hearing loss	14	0.1
Any other	41	0.3
Total	13800	100.0

On examination of 13800 children for left ear, 78.5 % children were found to be normal while the remaining 21.5% children had some kind of abnormality. The most common problem that was diagnosed was impacted wax (14.1%). 3.5% children were diagnosed with Chronic Suppurative Otitis Media(Safe- 2.8% and unsafe-0.7%), 2.8% with Otitis media with effusion and 0.4% with Acute Suppurative Otitis media. Other diseases which were prevalent were Otomycosis foreign body in ear and sensori-neural hearing loss.

Table11. Distribution of children by diagnosis of left ear

	Frequency	Percent
Normal	10833	78.5
Impacted wax	1946	14.1
Chronic Suppurative Otitis Media- All types	483	3.5
Otitis media with effusion /Secretory/Glue ear	359	2.6
Acute Suppurative Otitis media	55	0.4
Otomycosis	28	0.2
Foreign body in ear	28	0.2
Sensori-neural hearing loss	14	0.1
Any other	55	0.4
Total	13800	100.0

An analysis of distribution of children with hearing morbidity by the area of residence revealed that the abnormality is more prevalent in the urban slums and rural areas as compared to the urban areas. This was attributed to the fact that children belonging to the urban areas have better access to healthcare services due to higher socio-economic status as compared to those with rural areas. Additionally, the children from the urban areas have better awareness levels and myths and beliefs pertaining to ear care are found to be low.

Table12. Distribution of children with problem in right ear based on area of residence

	Frequency	Percent
Rural areas	1021	33.9
Urban slums	1159	38.5
Urban areas	831	27.6
Total	3011	100.0

Table13. Distribution of children with problem in left ear based on area of residence

	Frequency	Percent
Rural areas	1020	34.4
Urban slums	1110	37.4
Urban areas	837	28.2
Total	2967	100.0%

Most patients with wax in the ear (right, left and bilateral) were referred to the nearest MCD dispensary for wax impaction while those with Otitis media, otomycosis, ASOM, foreign body, CSOM, SNHL and other ailments were referred to Lok Nayak Hospital for further treatment.

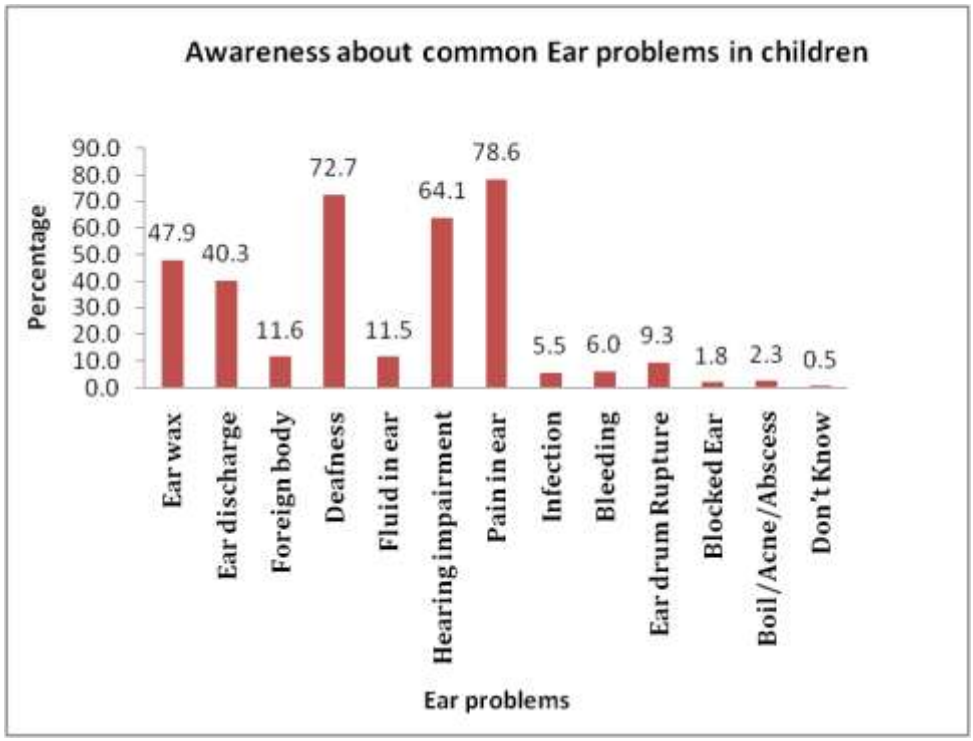
Examination of ear by an ENT specialist in the community

Assessment of KABP of students

A total of 1200 students were interviewed from various schools of South & North West Delhi. An informed consent was taken and each student was interviewed separately.

The students were first asked about the common ear problems in children. 99.5 % students were aware of common ear problems in children which was an encouraging point. The most common diseases as mentioned by the students were pain in ear (78.6%), deafness (72.7%), Hearing Impairment (64.1%), ear wax (47.9%) and ear discharge (40.3%).

Graph1. Awareness about Common Ear Problems in children



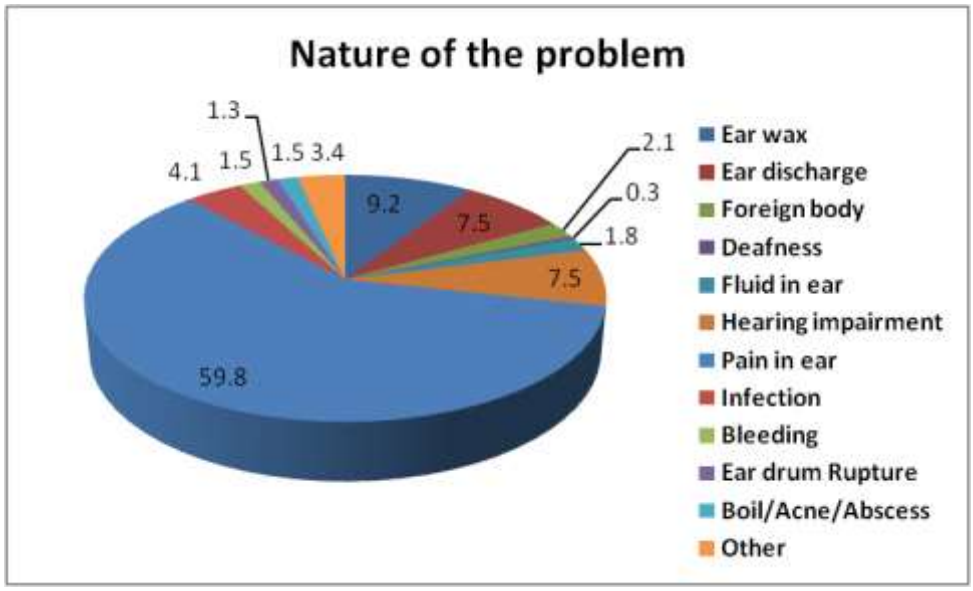
**Multiple responses possible*

Out of the total children interviewed, 40% students considered deafness as the most serious disease while 22.9 % and 15.4% children respectively perceived that pain in the ear and ear discharge were the most serious problems.

The children were asked if they had suffered from any ear problem in the past one year. About 29.5% (354) students had suffered from some ear disease

during the last one year. 58.9% children had suffered from pain in ear, 9.2% from ear wax, 7.5% with ear discharge and 7.5% with ear wax.

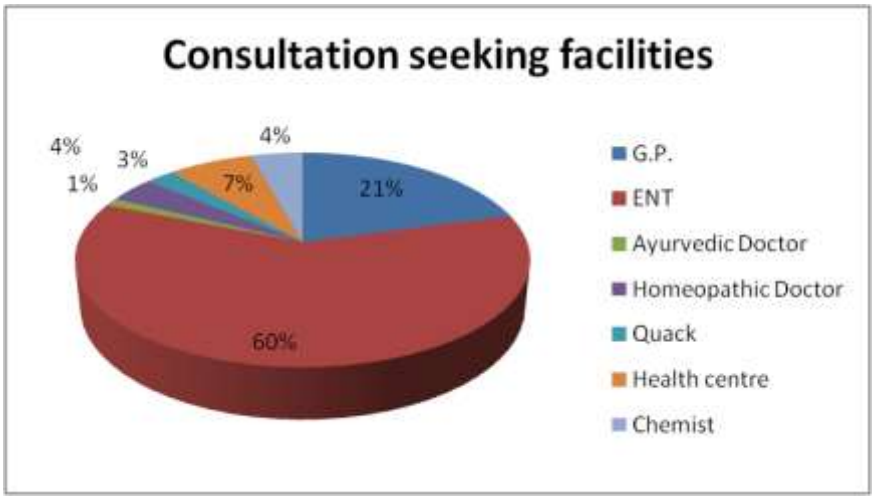
Graph2. Nature of ear problem suffered from during the last one year



Next, the treatment seeking pattern of the students for ear problems was observed in the study. 252 (71.2%) out of 354 students who were suffering from ear problem sought consultation. The remaining 102 (28.8%) students did not seek any treatment. Most of the students who did not seek any consultation for ear problems belonged to rural areas and urban slums.

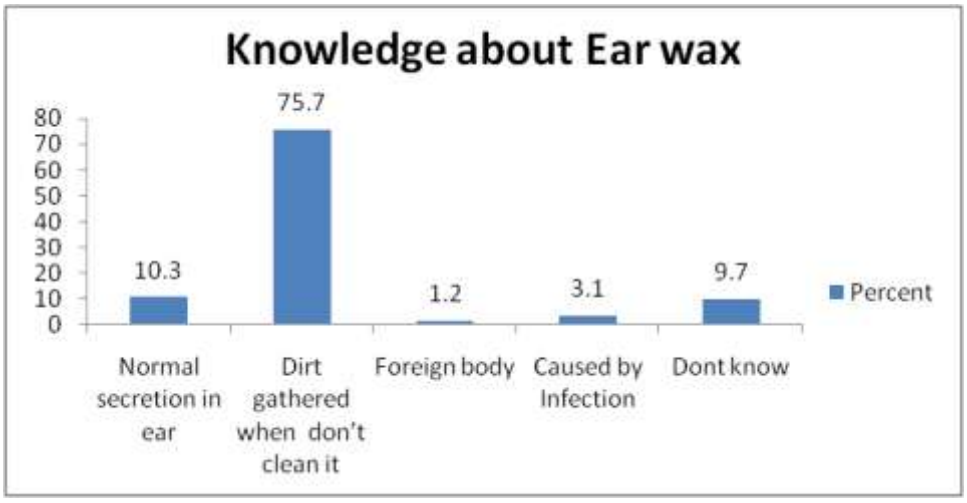
60% of students who had suffered from ear problems expressed that they had taken treatment from ENT specialist followed by 20.8% children who had visited a General Practitioner for ear problems. The children who took treatment from an ENT specialist were mostly from schools in urban areas. *An alarming point that emerged was that nearly 7% of the students took treatment from quacks or took medicines in consultation with a chemist.*

Graph3. Facilities from which consultation was sought for ear problems



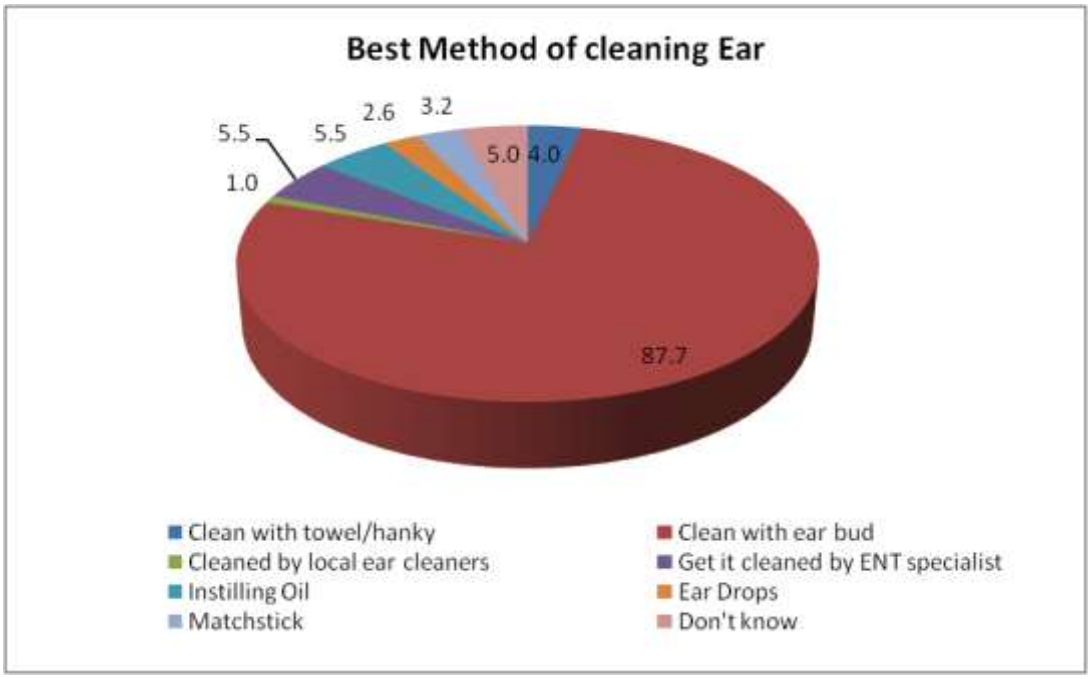
Subsequently, the students were probed about ear wax. 90.3% students know about ear wax and the remaining 9.7% were completely unaware of it. When asked what ear wax was, 75.7% students thought that it was the dirt which gathered in ear when the ear had not been cleaned properly. Only 10.3 % students knew correctly that ear wax was the normal secretion of ear reflecting low awareness levels among students about ear wax.

Graph4. Knowledge about ear wax



All the students opined that action needs to be initiated for ear wax. Only 5.5% students felt that ear wax should be cleaned by ENT specialists. Most of the students (87.7%) stated that ear buds should be used to clean ear followed 5.5% who felt that use of oil was beneficial. Predominantly in the rural areas and urban slums, students used matchsticks, ear drops or a cloth to clean their ears. 1% students were also in the favour of getting their ears cleaned from local vendors.

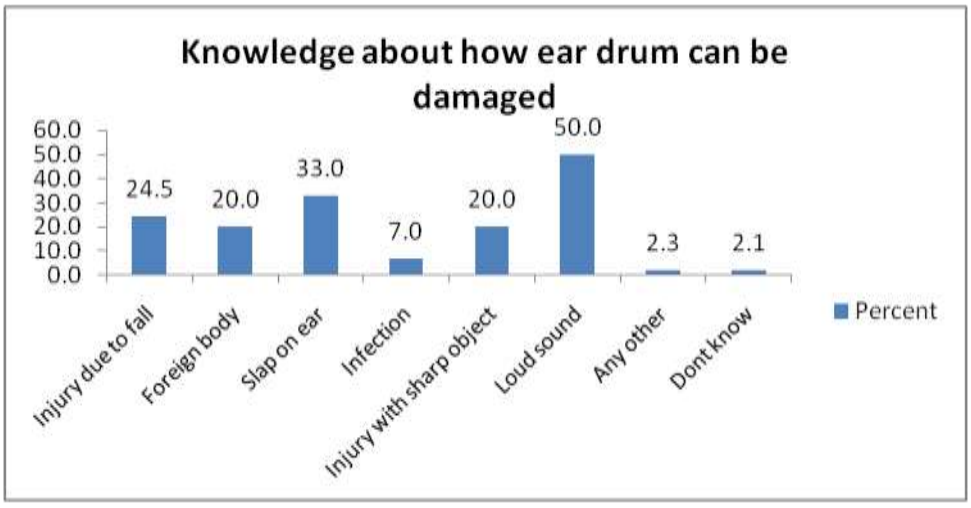
Graph5. Best method of cleaning ear



**Multiple responses possible*

Next, the students were asked how ear drums could be damaged. 98% students responded to the question while 2% did not have any knowledge about how ear drums could be damaged. Half of the students stated that ear drum is damaged due to loud noise, 33% said that it was caused due to slapping on ear and 24.5% answered that it was a result of injury due to fall.

Graph6. Knowledge about how ear drum can be damaged



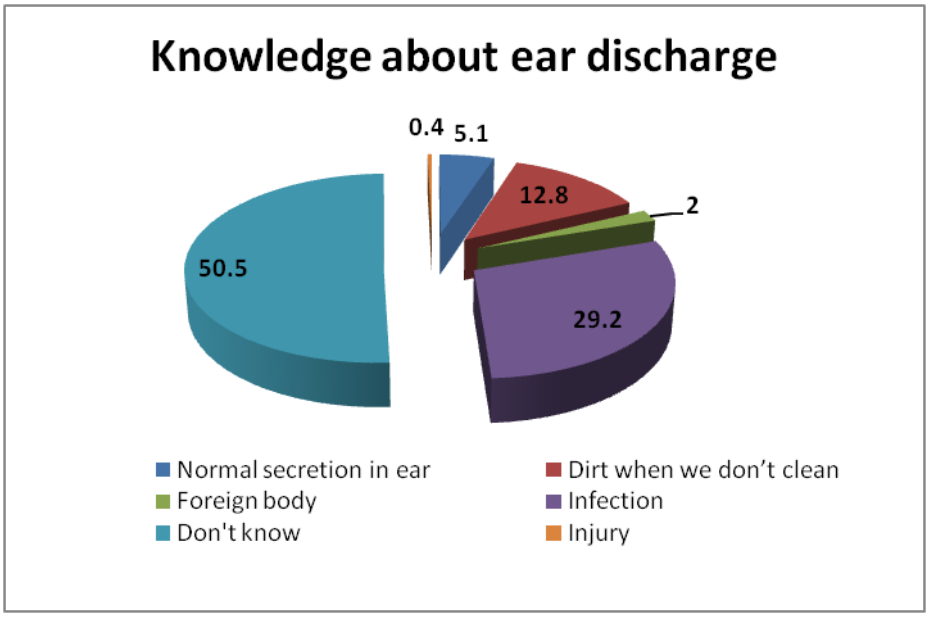
**Multiple responses possible*

About 65% students thought that damaged ear drum will lead to loss of hearing ability, 31.5% felt that it could result in decrease in hearing ability and 10%

expressed it could cause pain in the ear. Others thought it could cause pus in the ear.

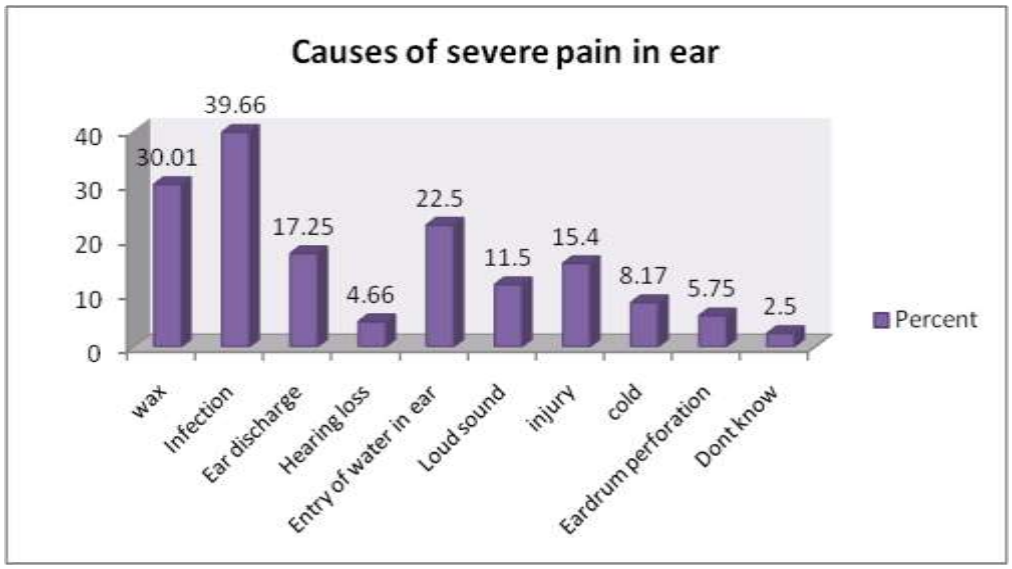
Subsequently, the knowledge of the students was gauged about ear discharge. About 50% students were aware about ear discharge while the remaining half were completely unaware of ear discharge was. Out of the students who were aware of discharging ear, 30% thought it was caused due to infection, 13% considered it to be dirt which gathered in the ear while 5% felt it was normal secretion in ear. When asked about treatment of ear discharge 34% responded that medicines could cure ear discharge, 9% expressed it could be cured with operation while14% said both medicine & operation could cure ear discharge.

Graph7. Knowledge about ear discharge



Next the students were probed about the causes of ear pain. 97.5 % students knew about causes of pain in ear. 40% student considered infection as the main cause of ear pain followed by 30% who felt that ear wax caused pain in the ear. 22.5% stated that ear pain was due to entry of water in the ear while 17% expressed that it was due to ear discharge. Other causes cited were exposure to loud sound, injury to the ear, persistent cold and ear drum perforation.

Graph8. Causes of severe pain in the ear



Nearly all the students were aware that loud sound could be harmful to ears. 84% students said loud music played through ipod/ walkman could cause damage to the ear followed by 59% who stated that exposure to loudspeakers could cause harm to the ear. Other loud noises which could cause damage to the ear as mentioned by the students were noise of electric drills, traffic, shouting, firecrackers and TV played at high volume.

Table14. Awareness about loud sounds which are harmful to the ear

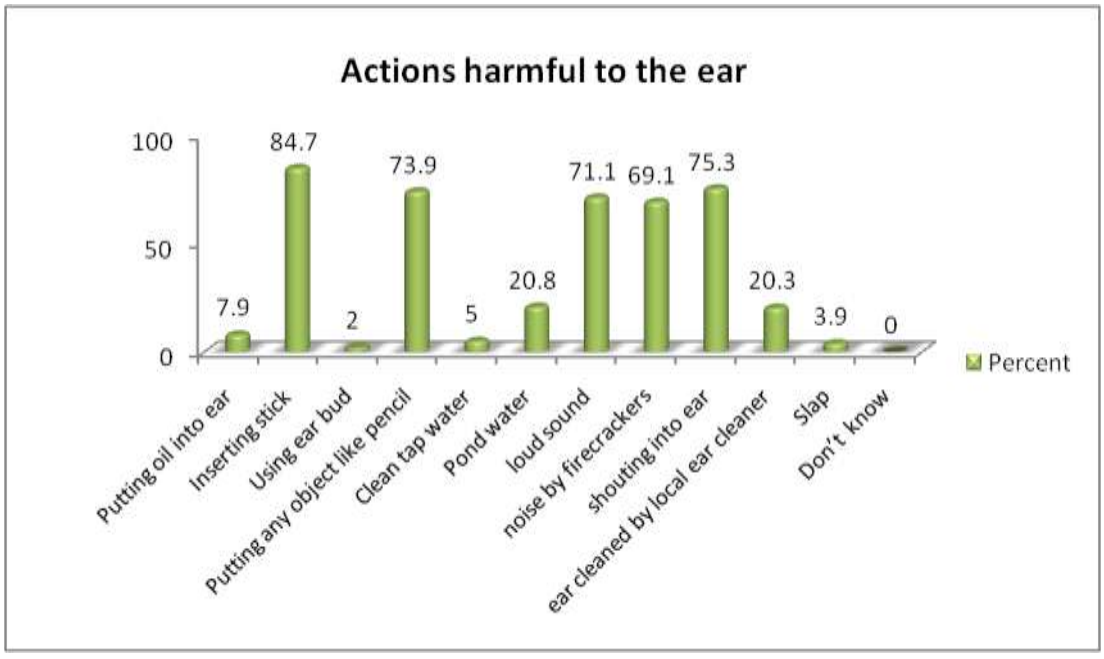
	Frequency	Percent
Loud music played through ipod/ walkman	1007	83.8
Loudspeakers	707	58.9
Electric drill	254	21.2
TV played at loud volume	35	2.8
Traffic sound	114	9.5
Shouting	70	5.8
Firecrackers	23	1.8
Total	1200	100.0

Next the students were probed how they would behave if they met a child wearing a hearing aid. 93% students said that they would behave in a positive way and would perform activities like looking to him while taking (42%) and talking to him loudly (13.1%). About 7% students stated that they would avoid talking to such a person or would make fun of him.

When asked about whether a deaf child could be treated about 66% had knowledge about this while the remaining 34% were unaware. 40% students said that a deaf child could be treated through operation while 26% said that hearing aids were the only option. 11.5% said that medicine could be useful in treatment of a deaf child.

Lastly the students were asked about the actions which are harmful to the ear. The actions harmful to the ear most commonly known to students were inserting stick in the ear (84.7%) and shouting in the ear (75.3%). Other actions harmful to ear stated by students were putting pencil in the ear, exposure to loud sound, exposure to fire crackers and swimming in pond water.

Graph9. Actions harmful to the ear



**Multiple responses possible*

Analysis of In-depth Interviews with students

In-depth interviews were conducted with the 50 students to bring out various aspects of the knowledge, attitude and practices towards ear related problems and to assess the barriers and challenges faced by them in seeking ear care. The students belonged to local schools identified in each category of population i.e. urban area (6 schools), urban slums (6 schools) and rural areas (4 schools). Suitable representation was ensured of both government and private schools and of different socio-economic and educational strata of the society.

On the basis of the data collected, it was found that 38 children out of 50 had suffered from some ear problem. The major problems suffered by students were wax accumulation in the ear (12), ear discharge (9), pain due to infection in the ear (5) and presence of foreign body in the ear (4). Other ear problems which the students had encountered in the past were pain in the ear preceded by tooth infection, pain in the ear during extreme winters, pain in the air due to change in the air pressure while travelling in an airplane etc. Six students had never experienced ear problems themselves but had seen their family members and friends suffer from similar problems. There were two students who had grandparents suffering from hearing loss and were aware that this hearing loss was due to old age. Four students had never experienced any problem in the ear nor had seen a person with any ear related problem.

Next, the students were probed about the various types of treatment that were preferred in case of various ear problems. For ear wax, the most preferred mode of treatment reported by students comprised home remedy which included cleaning the ears with ear-buds or matchstick covered with cotton, instilling lukewarm oil in the ears and subsequently cleaning with ear-buds to remove wax or medication suggested by the chemist.

Out of 12 students who had suffered from ear wax only 2 students considered consulting doctor (ENT/Local GP/school doctor). For ear discharge, majority of the students were in the favour of taking medical help therefore visited either a nearby doctor or an ENT specialist for proper diagnosis and treatment. Only one student preferred home based remedy (pouring onion juice in the ear) for the treatment of ear discharge. For foreign bodies in the ear, most (three out of four

children who had FB in ear) consulted the doctor only after trying home remedies like putting oil in the ear and cleaning the ears with ear-buds first. Only one student went to the doctor directly.

An alarming point that emerged was that most students suffering from ear problems preferred to take some treatment at home before consulting an ENT doctor. Only a few preferred to seek medical help and avoided trying any treatment at home. The major reason for opting for home based treatment was because such practices had been followed in families for generations. Also the students and their parents felt that ear problems were not so serious that medical help should be sought. The other reasons for undertaking home remedy included occurrence of pain in the ear during late hours of night or previous similar experience which compelled them to repeat the medication used previously. This acts as a major deterrent towards visiting healthcare facilities for ear problem.

In-depth interview with students

Subsequently, the students were questioned about the procedure to be adopted for taking care of their ear. The students had a varied view point on care of ear. Cleaning the ears with ear buds was found to be the most popular method (39 students) along with avoiding exposure to loud sounds (either due to headphone, speakers, traffic, firecrackers or shouting). A disturbing point that emerged during the interviews was that according to students, instilling lukewarm oil in the ear was considered an accepted and effective way of taking care of ear. Going to the doctor (wither local doctor or ENT) was only preferred in case of severe ear related problems and in those cases where the home remedies had failed and not provided any relief. Many students also pointed out the importance of avoiding insertion sharp objects and avoiding slapping on the ears as both these could cause perforation in the ear drum. Other methods of ear care mentioned by students were covering ears during cold weather, avoiding entry of dirty water in the ears and refraining from getting cleaned by local ear practitioners (quacks). Only two students pointed out the importance of avoiding

cleaning the ears with ear-buds and therefore expressed that it was best to avoid it.

The students were asked about their perception towards hearing impaired persons. Eight students had experienced that they had to talk loudly in front of hearing impaired people. 12 of them expressed that they had no problem communicating with the people with hearing aids. Six students thought they might feel strange or awkward in front of people with hearing impairment. Remaining students had neither seen nor spoken to people with hearing aid and had seen them only television.

The students were asked about the problems/ hesitation they faced towards the medical system. It was seen that private doctors were the most popular among the selected group of students as they were easily accessible and students had no problems/hesitations in consulting a private doctors. Some problems which surfaced in relation to government facilities were long queues that delayed the process of getting the required treatment and unsatisfactory quality of services. There were a few students who said that they did not like hospitals or were scared of doctors, therefore avoided going to a doctor as much as they could. One student said that he avoided going to the doctor as he preferred home remedies for most of his health related problems.

In-depth interviews with students reveal that nearly three-fourth of the total students had suffered from ailments of the ear like ear wax, ear discharge, pain due to infection in the ear and presence of foreign body in the ear. A lot of misbelieves were found to be prevalent among the students with respect to treating ear problems and proper care of the ear. Medical care was sought by most students only in case of severe ear problems and when home remedies did not deliver the results. Private Doctors were found to be more popular as compared to the government facilities for seeking treatment as private doctors were easily accessible, quality of service was good and care was delivered without any wastage of time.

Analysis of Focussed Group Discussions with students

A total of 14 Focused Group Discussions were carried out across 6 schools from urban area, 6 from urban slums and 2 from rural areas. A total of 136 students were covered in the FGD. Suitable representation of government run and private schools as well as different socio-economic and educational strata of the society was ensured. FGDs were conducted within the school premises and the average duration for each FGD was approximately 25-30 minutes.

At the beginning of the FGDs, the awareness of the students was gauged with respect to the five main sense organs. In majority of the schools the children were aware about the five main sense organs being eyes, ears, nose, tongue and the skin. The next point discussed was the significance of each of the sense organs about which the students were well aware of. Most important sense organs as pointed out by the group members were eyes and tongue. Ears were also noted as an important sense organ. The importance of ears was felt because according to students if the ears don't function properly, the communication process gets hampered. The group members were also aware that if a student cannot hear properly his speech also gets affected. The group members also expressed that students who have hearing impairment are not able to understand the teacher's instructions ("*sir kuch bataynge to samjh nahi payega"*) and perform poorly in their studies. Some students also stated that those with hearing impairment do not get good job opportunities in the long run. Such students also face problems in day to day activities for example difficulty in crossing the road, inability in replying to any question etc.

Next, the common ear problems were discussed. Pain in ears, numbness in the ear, ear discharge ("*kaan behna/ kaan se mawad nikalna*") and deafness were cited as the main problems by the students. Perforation of the ear drum ("*kaan ka parda phatna*") and foreign body in the ear were also expressed as important ear problem indicating good awareness levels of the students about ear problems.

Subsequently, the students were asked to narrate any episode of ear problems which they had heard of or witnessed in their families. Nearly half of the students reported that someone in the family or friends had suffered from ear problem in

past. Commonest ear problems reported were pain in ear and ear discharge. When the children were asked to segregate the ear problems as per age, pain (after getting slapped) was most common in the younger children. Ear discharge was widespread in adults and deafness and hearing loss ("*uucha sunnana"*) was the most common problem faced by aged family members.

When the students were asked about the way they cleaned their ears, the responses varied from school to school. In the government schools, most of the children cleaned their ears using cotton and matchsticks ("*tilli aur rui se*"). In the private schools the majority of students cleaned their ears using cotton buds. Most of them felt that ear buds were the best way to clean ears. Some students also reported using towel or handkerchief to clean their ears.

FGD with students

A lot of myths and beliefs were found to be prevalent among the students about ear care. These myths were more common among students from the rural and urban slums schools as compared to those from urban schools. Most of the students in the rural schools felt that in case of foreign body inside the ear, lukewarm mustard oil ("*sarson ka tail*") or garlic juice with oil should be put in the ears to clean it. Use of mustard oil with turmeric powder/ onion juice was also used for cleaning the ear. This was also a common practice being followed for cleaning baby's ears. Superstitions such as children being born deaf because of direct exposure to sun during a solar eclipse ("*grahan"*") etc were extremely common. The most common perception according to students was that ear wax was considered as dirt which gathered in the ears and has not been cleaned for a long time. The practice of visiting local practitioners ("*vaidji*") was found to be common in Bhogal area of South Delhi.

Factors which could lead to ear damage were discussed thoroughly across schools. Children were aware about the factors which could lead to ear damage. Majority said that injury could be caused due to insertion of sharp object in the ear, exposure to loud noise, constant use of headphones, crackers and if any insect goes in the ear.

Finally the students were asked about the initiatives that should be taken in order to deal with ear problems. The children voiced that most ear problems could be prevented in the first place if there is proper awareness about ear care. At the school level, regular talks about ear care should be organized during the assembly time. Similarly information dissemination about ear care should be done during parent teacher meeting and on other similar occasions. The students should also be educated that they should be careful about not to hit or slap another student on the ear as it could cause severe damage to the ear. Awareness should be created about ill-effects of noise pollution at the school level and students should be made aware about the harmful effects of constant exposure to loud music. The students should be educated that they should bring any problem related to the ear to the notice of their parents/ teachers immediately and timely treatment should be sought from an ENT specialist. The students expressed that if they were aware about ear problems they would spread awareness by telling their family members, relatives, friends and neighbours.

FGD with students

Assessment of KABP of parents

A sample of 500 parents i.e. 250 parents from each district was selected. Only those parents were selected who had child/children of age group 0 – 14 years. Awareness level of parents was assessed with the help of a semi-structured questionnaire.

Findings of data collected –

As per the results, 99% parents were aware of the one or more ear problem which occurs in children and only 1% was completely ignorant about the diseases of ear. Out of the parents who were aware about ear problems, 76.5% parent thought that pain in ear is most common ear problem followed by 75.5% who thought ear discharge was common and 55.2% who thought deafness was common ear problem in children. Ear wax was common problem according to 47.4% parents while hearing loss, foreign body in ear, fluid in ear and fungus in ear were common ear problem according to 26.8%, 9.4%, 11.6% and 4.6% parents respectively. The distribution is shown in the following Table1.

Table15. Ear problems commonly encountered in children

	Frequency	Percent
Ear wax	237	47.4
Fluid in ear	58	11.6
Ear discharge	377	75.4
Hearing loss	134	26.8
Foreign body in the ear	47	9.4
Fungus in ear	23	4.6
Deafness	276	55.2
Age related hearing loss	15	3.0
Pain in ear	382	76.4
Infection	4	0.8
Bleeding	7	1.4
Ear drum rupture	2	0.4
Blocked ear	1	0.2
Don't know	5	1.0
Boil	57	11.4
Itching	39	7.8
Total	500	100

Of the above mentioned common ear problems, 29% parents thought ear discharge could be most serious or dangerous for the children in future. Deafness and pain in ear could be serious according to 25.4% and 14% parents respectively. 8.6% parents considered hearing loss, 2.2% parents thought ear wax and 0.6% perceived foreign body could be most serious for children in future. A noteworthy 20% parents were unaware of the seriousness of ear related problems. This is attributed to the low awareness levels among the parents which act as a serious barrier to seeking ear care services.

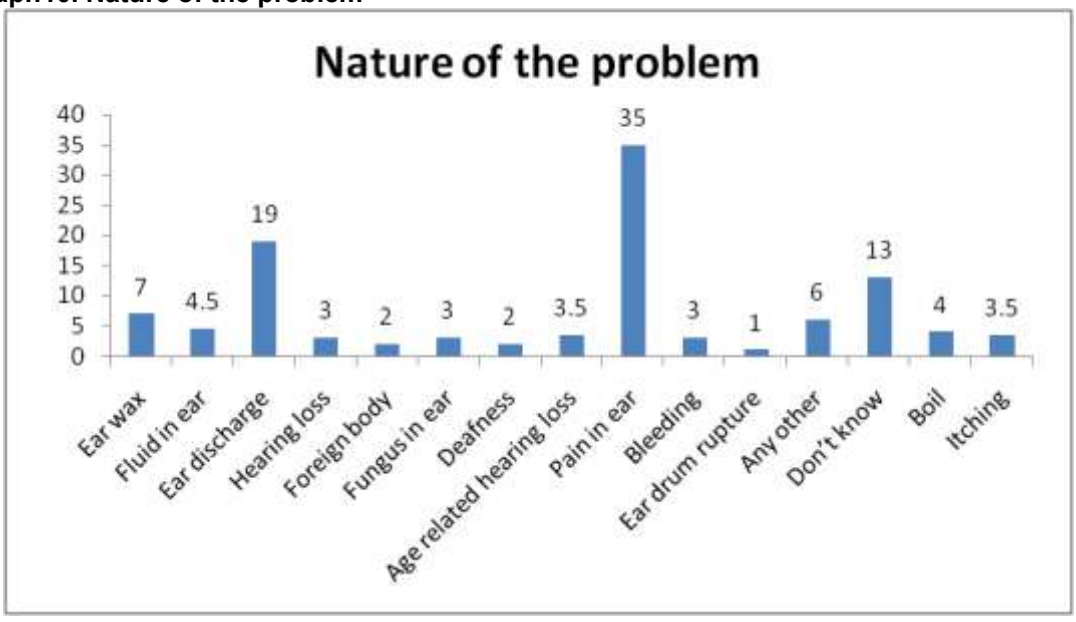
Out of 500 parents, children of 40% parents had suffered from some form of ear problem in the past one year which reflects the great extent of ear problems which are prevalent among the age group of 0-14 years.

Table16. If any child in the family had suffered any ear problem in the past one year

	Frequency	Percent
Yes	200	40
No	292	58.4
Don't know	8	1.6
Total	500	100

Out of the children of 200 parents who had suffered from ear problems in the past one year, majority (35%) reported that their children had suffered from pain in the ear in the last one year followed by 19% whose children had ear discharge. A few parents reported that their children had suffered from ear wax, fluid in the ear, boil, itching and other ailments over the past one year.

Graph10. Nature of the problem



Out of 200 parents with diseased children, 89% seek consultation and rest 11% refused to take treatment from healthcare personnel for the ear/hearing problem.

Table17. If any consultation taken for the problem

	Frequency	Percent
Yes	178	89
No	22	11
Total	200	100

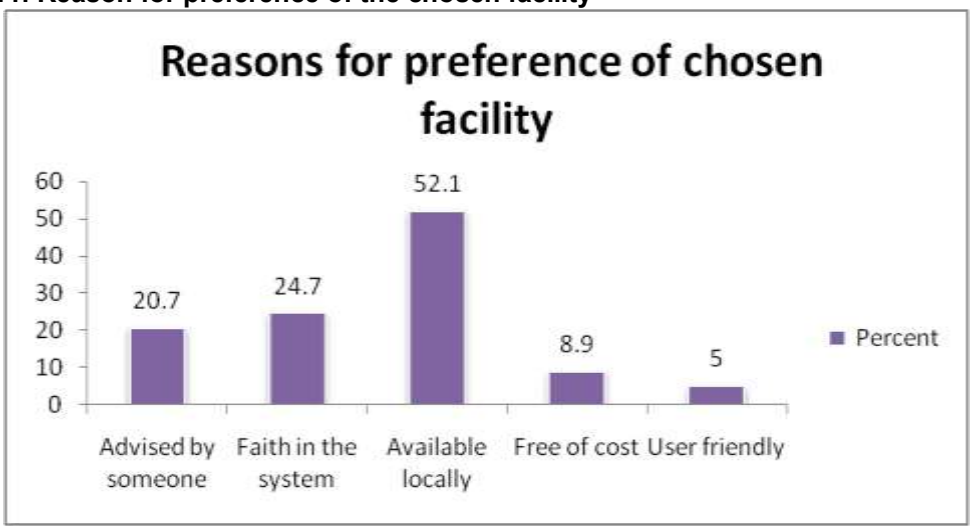
Treatment seeking pattern showed that 45.5 % parents consulted ENT doctors for the ear problems followed by 28% who consulted GP and 18% who took their children to Health centre. Only a few parents seek treatment from Ayurveda, Homeopaths, Quack, Dai etc.

Table18. Personnel/ facility from whom/ where the consultation was taken

	Frequency	Percent
G.P	50	28.1
ENT doctor	81	45.5
Ayurveda	1	0.6
Homeopathy	6	3.4
Quack	3	1.7
Health Centre	32	18.0
Dai	5	2.8
Total	178	100.0

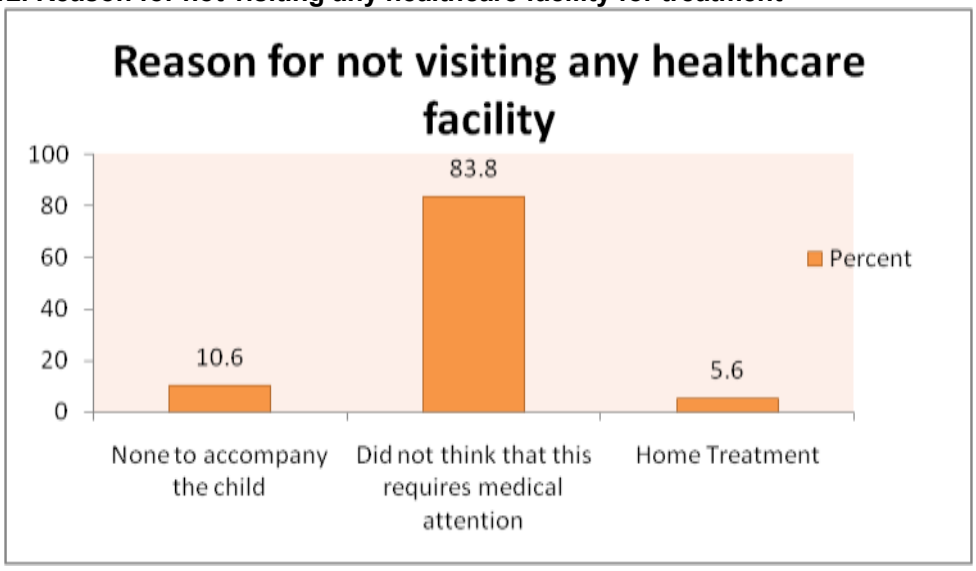
Majority (42%) of the parents selected the facility for treatment of their children because of its proximity to their area of residence. 24.7% preferred the chosen facility because of the faith in system which was based on the treatment sought from the facility on any previous occasion. 20.7% parents relied on the word of mouth and went for the mentioned facility because it was advised by someone. Less than 9% parents selected the facility because it provided free of cost treatment.

Figure11. Reason for preference of the chosen facility



The parents who did not seek and treatment for their children for ear problem ere enquired about the reason for not visiting a healthcare facility/ personnel. An alarming 84% perceived that ear problems are not serious problems and that there was no requirement of treatment. This attitude of the parents arises from their lack or awareness and prevailing myths & beliefs and acts as a strong barrier to uptake of ear care services. 7.6% parents refuse to take the consultation because they thought that there was no need of treatment for ear problem (2.8%), faith in home treatment (0.2%) and no one available to accompany the children (0.2%).

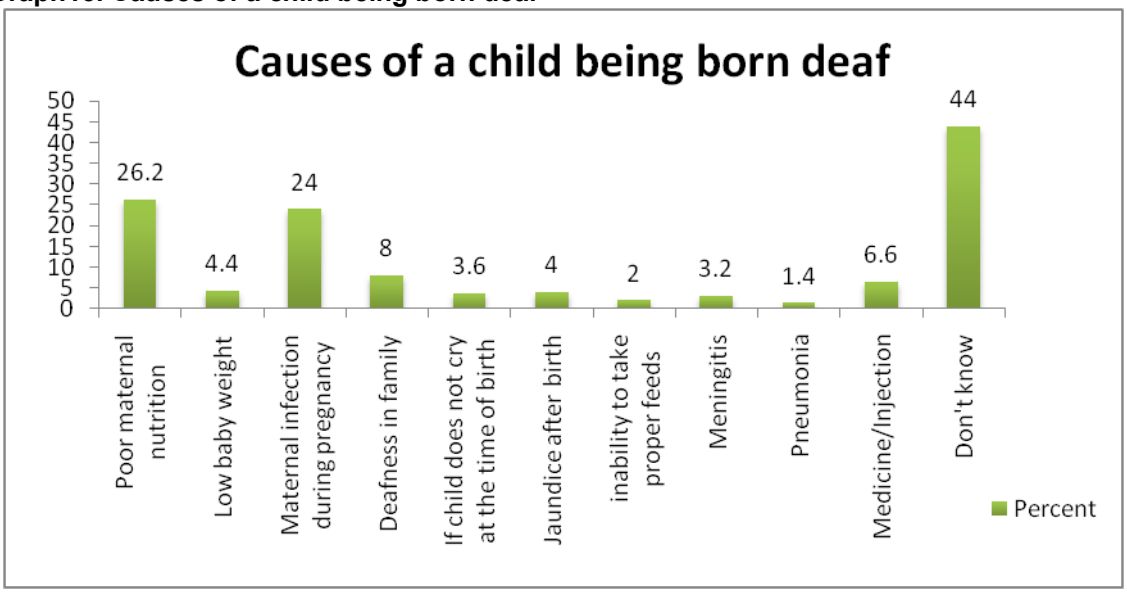
Graph12. Reason for not visiting any healthcare facility for treatment



Although a substantial 87.5% parents knew that a child could be born deaf, only 56% parents knew the causes of a child being born deaf. The most likely causes

reported were poor maternal nutrition (26.2%), maternal infection during pregnancy (24%), deafness in family (8%), medicine/ injection (6.6%) & low baby weight (4.4%).

Graph13. Causes of a child being born deaf



Parents had low knowledge about the correct age of child at which deafness could be suspected. Deafness could be suspected at the age of 3 months as per 32.6% parents and at 6 months as per 23.6% parents. 13.6% parents thought hearing ability of child could be assessed at 1 month. Only 11.2% parents knew that deafness of the child could be suspected soon after the birth.

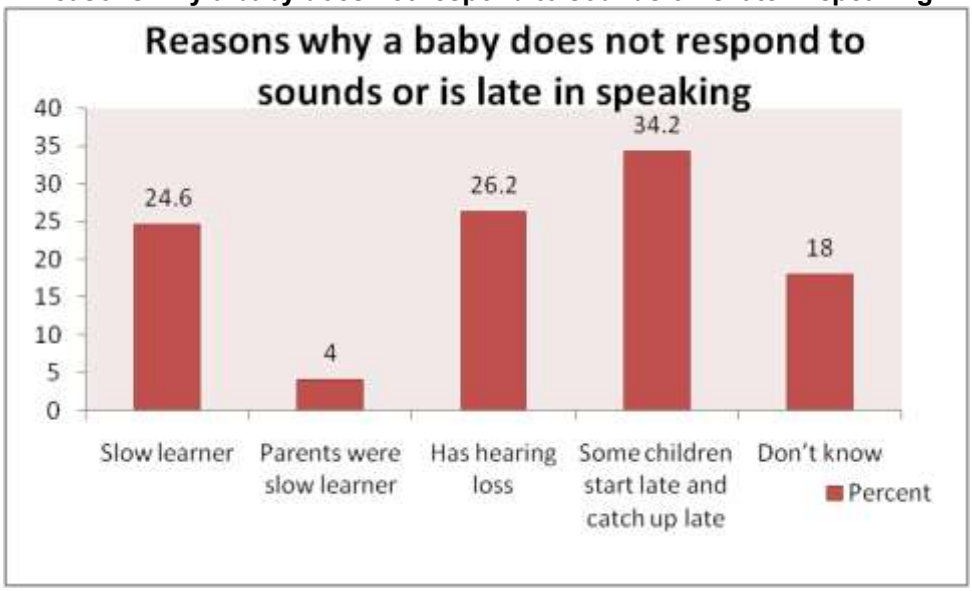
Table19. Knowledge about the age when a child can be tested for deafness

	Frequency	Percent
Soon after birth	56	11.2
1 month	68	13.6
3 months	163	32.6
6 months	118	23.6
1 year	46	9.2
2 years	19	3.8
> 2 years	21	4.2
Don't know	9	.8
Total	500	100

Parents had different thoughts about the age assessment of normal hearing ability. Only 9.4% parents thought it could be checked soon after the birth while the remaining parents had wrong perceptions on the age at which the hearing of a baby could be tested.

Parents had varied views on the reasons why a baby does not respond to sound or is late in speaking. According to 34.2% parents, some children start late and catch up late while 24.6% felt that such children are slow learners. Only 26.2% parents stated that such children could be suffering from hearing loss.

Graph14. Reasons why a baby does not respond to sounds or is late in speaking

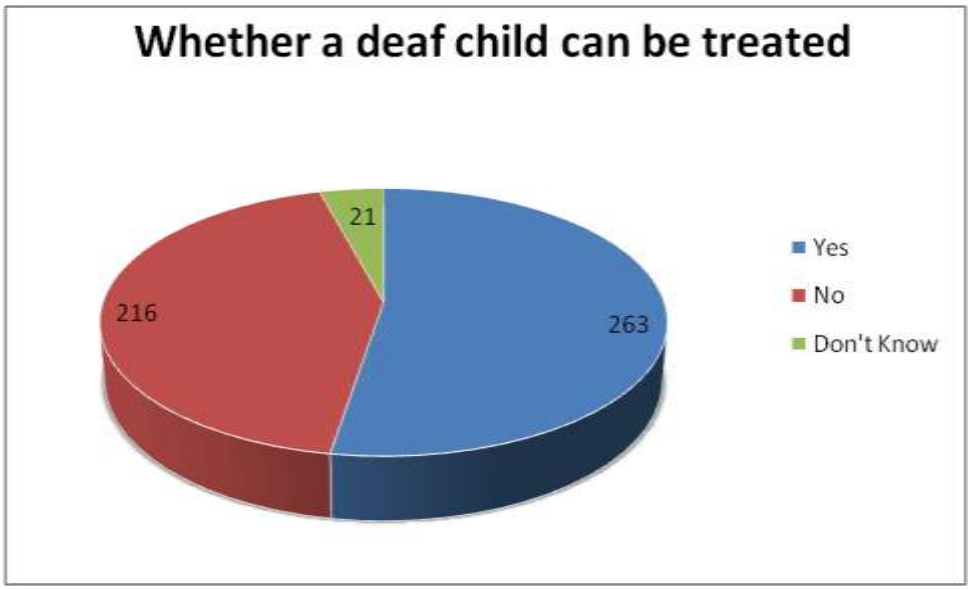


**Multiple responses possible*

Subsequently, parents were asked about the action they would take in order to cope up with such children. 53.6% parents reported that they would immediately consult a doctor for such a problem, 11% were in favour that they should wait for one year, 10% said they would wait for two year. 5.6% parents thought that there was no cure for such problems thought and so there was no need of medical check-up while 20.2% parents did not know what they should do for such problem. The lack of correct knowledge among parents about the correct age at which hearing of the baby could be tested poses as a strong barrier to the uptake of ear care services and unnecessary delay in availing treatment.

The knowledge level of the parents was assessed with respect to the treatment of a deaf child. 52.6% parents knew that a deaf child could be treated while 43.2% thought otherwise. 4.2% respondents were not aware of the above.

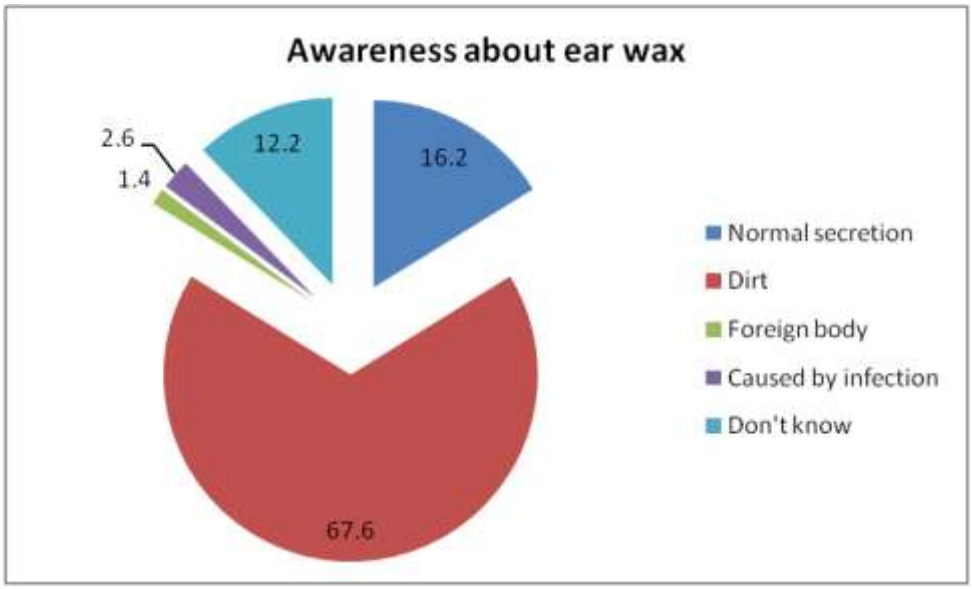
Graph15. If a deaf child can be treated



The knowledge of the parents was gauged about the modalities of treatment of a deaf child. 71% parents thought there was a possibility of treatment of deafness, 8.8% parents thought there was no treatment while 20% parents were completely unaware that there was any treatment available for deaf children. Out of those who thought there was treatment available for the deafness (263 parents), 44.6% parents were of the opinion that treatment could be operation, 40.6% were of the view that it could through medicine where 50% thought there was need of hearing aids for the treatment of deafness. Significant number of parents was of the view that there is no treatment available for deafness and therefore do not seek any healthcare service in case of ear and hearing problems.

A lot of presumptions were found to be present among the parents with respect to ear wax. Only 12.2% of the respondents knew correctly that ear wax was a normal section from the ear and was a natural protective mechanism. 67.6% parents had a misbelieve that ear wax was because of the dirt collection in the ear while 2.6% perceived that ear wax was due to ear infection and 1.4% due to foreign body in ear.

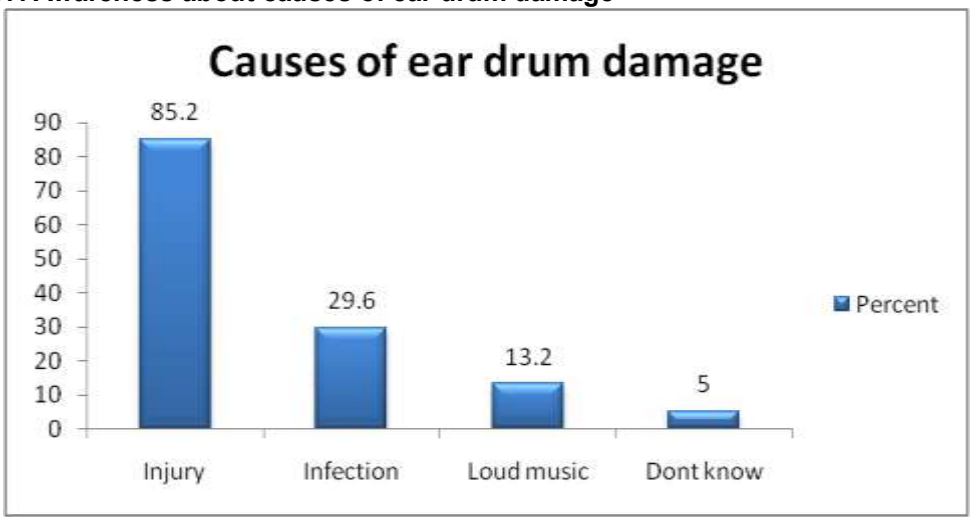
Graph16. Awareness about ear wax



**Multiple responses possible*

65.6% used ear buds to clean ear and 15 % people used hot / cold mustard oil alone or in combination with ear drops, garlic etc. 7.2% uses hydrogen peroxide hot water and cotton. 4.4% uses ear drops for ear cleaning purpose and remaining people preferred to go to doctor for ear cleaning. The use of home remedies to treat ear problems acts as a major deterrent to the uptake of ear health services.

Graph17. Awareness about causes of ear drum damage



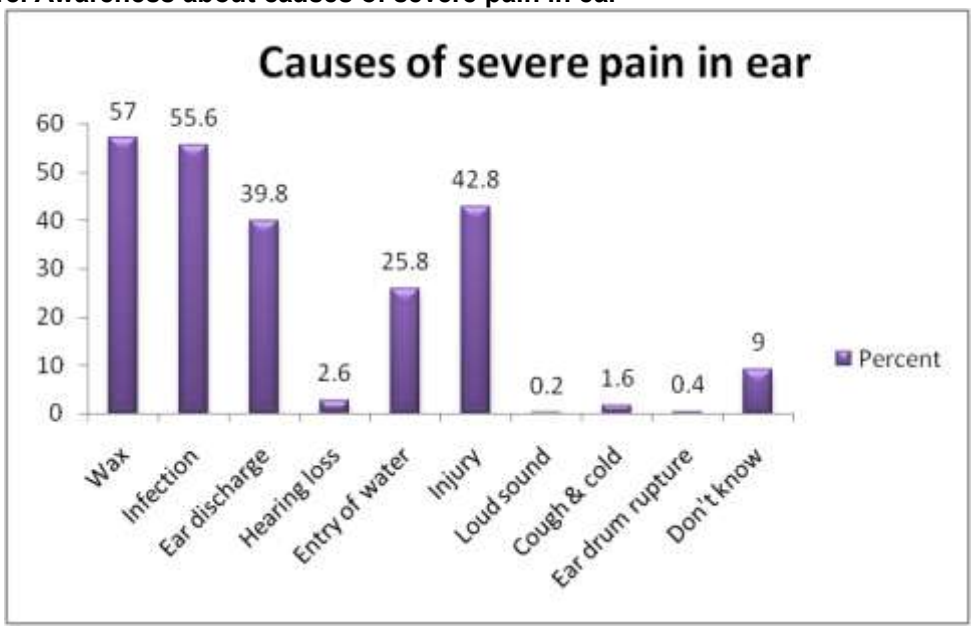
**Multiple responses possible*

According to the parents, injury to the ear is the most significant reason for the cause of ear drum damage followed by infection of the ear (29.6%) and exposure to loud music (13.2%). Damage to ear drum can lead to many complications

most important being loss in hearing (56.8%), decrease in hearing (31.4%) and pus discharge (12.6%). 10% parents were completely unaware about the adverse effects of damage to ear drum.

According to the parents, the common causes of pain in ear were wax in the ear (57%) followed by infection in the ear (55.6%) and injury (42.8%).Other reasons such as ear discharge and entry of water in the ear also emerged as noteworthy causes of pain in the ear.

Graph18. Awareness about causes of severe pain in ear



**Multiple responses possible*

The parents were asked about the actions which should taken by the parents for ear pain. 36.2% parents preferred to go to ENT specialist if their child complained of ear pain. 31.2% parents opted to go to any local doctor who was available at that time, 21.2% parents were in favour of instilling hot oil with garlic, 13.6% instilled only hot oil and 8.8% took medicine for pain.

Numerous presumptions were also found to be prevalent with respect to ear discharge which is one of the most common ear morbidity among school going children. 26% respondents were completely uninformed about what ear discharge was. 14.6% parents considered ear discharge as dirt, 12.6% as milk during lactation and 6.6% thought it was normal ear secretion. 40.2% parents opined that ear discharge was caused by infection in the ear.

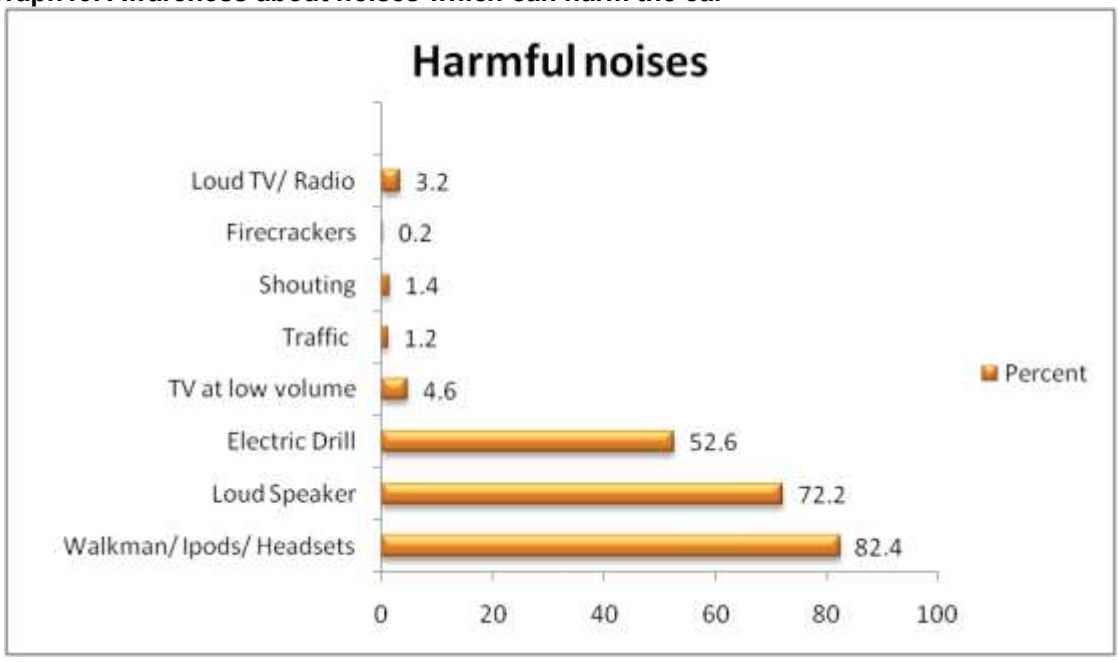
Table20. Awareness about ear discharge

	Frequency	Percent
Normal secretion	33	6.6
Dirt	73	14.6
Infection	201	40.2
Milk during lactation	63	12.6
Don't know	130	26.0
Total	500	100.0

From the point of view of treatment of ear discharge, 49.8% thought this problem is curable with the help of medicine while 26.2% thought that both medicine & operation are required to cure ear discharge. 9.2% people thought operation is necessary for the discharging ear. 1.4% thought it resolves spontaneously, 1% thought it can‟t be treated, 1.4% parents had other perception/ idea and 17% parents had no idea about the treatment of the discharging ear. The lack of correct information about what ear discharge is, its causes, prevention and prevalent misconceptions results in such problems getting neglected.

82.4% parents thought that loud music though I-pod, walkman or headsets would cause maximum harm to the ear followed by 72.2% parents thought loud sound through loud speaker was most dangerous. 52.6% parents thought sound of electric drill machine was harmful while 4.6% parents thought T.V on slow volume would also cause damage to the ear.

Graph19. Awareness about noises which can harm the ear



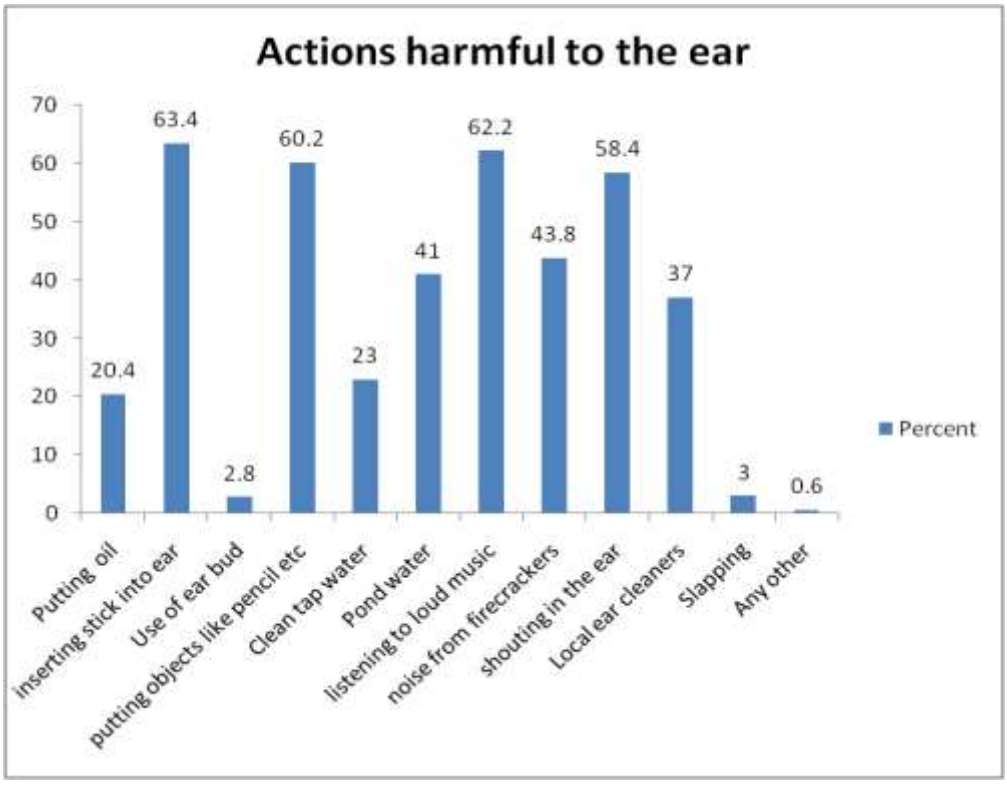
Multiple responses possible

The parents were probed on how they would react when they met someone who used hearing aids. 42.2% parents reported that they would try to talk to the person so that he could see them and 21.4% stated they would talk loudly so as to facilitate communication. 18% respondents expressed that they would talk normally to a person with hearing aid. A significant 5% said that they would not indulge in any conversation with a person using hearing aid which is an incorrect notion in the minds of the parents and would result in such a person getting isolated.

Nearly all (99.6%) parents said that if their child developed ear problems, they would take them for treatment. They also agreed that they would not discriminate against girl child when going in for treatment.

63.4% parents thought inserting stick into ear is most harmful followed by 62.2% parents who thought that loud music though I-pod, walkman is most dangerous. 60.2% parents thought putting objects like pencil causes damage to the ear. Parents were also aware of reasons like shouting in the ear, exposure to firecrackers, dirty pond water etc as causes of damage to the ear.

Graph20. Awareness about actions harmful to the ear



Multiple responses possible

Assessment of KABP of parents

Analysis of In-depth Interviews with Parents

In-depth interviews were carried out with parents of 50 children who were found to be suffering from ear problems based on otoscopic examination, tuning fork test and behavioural test. The in-depth interviews were carried out to assess the awareness of the parents about ear problems, their causes and the treatment sought for these problems. The perceptions of the parents were gauged about seeking medical help for ear problems and the challenges faced during this process.

On the basis of above collected data, it was found that majority (34%) of the parents had their children suffering from excessive ear wax accumulation. 22% parents had their children with B/L ear wax, 6% had impacted wax in left ear and 6% in the right ear. Ear wax was considered as accumulation of dust/ soap particles in the ear and therefore the parents did not take any action in this regard. Nearly all the parents preferred using ear buds, cotton covered matchsticks or home remedies such as instilling oil and garlic syrup in the ear for ear wax. Procuring medicines from local chemist was also a practice commonly followed by parents to deal with ear wax.

Nearly 16% parents had their children suffering from ear discharge. 12% were suffering from B/L discharge, 2% from the left ear and 2% from the right ear. Parents of children suffering from ear discharge were not exactly sure of the cause of the discharge. The probable causes as mentioned by the parents were injury to the ear, excessive nasal and throat infection, accumulation of dirt in the ear or entry of water in the ear. While most parents did not consult an ENT in the anticipation that the problem will be resolved on its own, others faced constraints like long queues at the hospitals, healthcare facility being far off from residence and dependence on male members (husbands) for accompanying the patient to the hospital.

Another 16% parents had their children suffering from ear pain. On otoscopic examination, the possible causes of ear pain that emerged were impacted wax in the ears, condition of retracted or dull Tympanic membrane, acute otitis media,

infection or history of ear discharge. The parents of children suffering from ear pain attributed it to be dust, injury or persistent cough and cold. They resorted to home remedies because the parents found medicines very expensive and did not feel that ear pain was important to take any formal treatment.

About 8% children were found to have foreign body in the ears (Mosquito, insect, paper ball and eraser) about which none of the parents were aware. Nearly all the parents expressed that they would first try home remedies like instilling oil in the ear and would consult a doctor only if they find it necessary.

About 4% children were diagnosed with the condition of ASOM on otoscopic examination, but their parents were unaware of the reason for ASOM. According to the parents the possible causes could be infection or injury in the ear.

Children with complaint of itching in the ear were found to have otomycosis which their parents were unaware of. None of the parents had any knowledge about the problem, and its cause and therefore no treatment was sought.

Other ear related problems included bleeding from the ear and external ear deformation for which doctor's consultation was being taken and these children were under medication.

For two cases, the result of hearing test (behavioural or tuning fork test came negative) therefore indicating low hearing. The parents of both these children thought that it was due to baby being born underweight or mother suffering from some problem during pregnancy. The parents of both these patients had not taken any action so far.

A lot of points emerged when the parents were probed about the reasons for not seeking medical help for treatment of ear problems. Distance of the healthcare facility from the place of residence, unavailability of doctors and long queues have been the major concerns of parents because of which they avoid their visit to the hospital/doctors and prefer home remedies first. The parents also felt that they had to make repeated visits to the healthcare facility for treatment which the working parents found difficult as they did not get frequent leaves from their

workplace. A lot of mothers were dependent on their husbands to accompany the child to the doctor and the husbands did not have sufficient time.

Lack of awareness about ear problems was also found among the parents. Most parents of children with the condition of wax impaction, ASOM, retracted Tympanic membrane and dull Tympanic membrane were not aware of the condition. They felt that the problem would be resolved on its own and medical assistance was not required.

Even if the parents were aware that their child is suffering from ear problems, it was observed that not much importance has been given to the ear health by the parents. Parents do not feel any need to visit a doctor for ear related problems. For any ear related problem, majority of the parents prefer resorting to home remedies which have been long followed in the family, procuring OTC drugs or going by the advice of neighbours or family members advice.

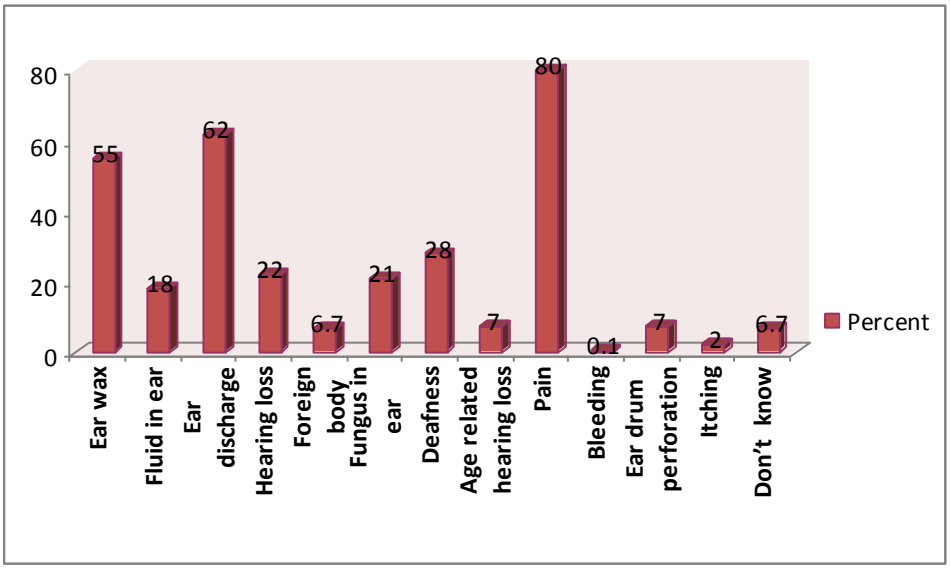
Assessment of KABP of teachers

A questionnaire based survey of 105 teachers was conducted to determine the knowledge, attitude, behaviour and practices among school teachers about various ear problems in school children of age group 12- 15 years. 10-12 teachers were covered from each school.

Awareness about common ear problems of children

When the teachers were inquired about the common ear problems encountered among school children, about 80 % said that they have heard about pain in ear. 62% had heard about ear discharge among school children followed by 55 % teachers who knew know that ear wax is a common ear problem. However awareness about significant ear problems such as bleeding in the ear, itching, foreign body in the ear, perforation of ear drum and age related hearing loss was found to be low. This indicates the need for capacity building of the teachers with respect to various ear problems.

Graph21. Awareness about common ear problems among school children

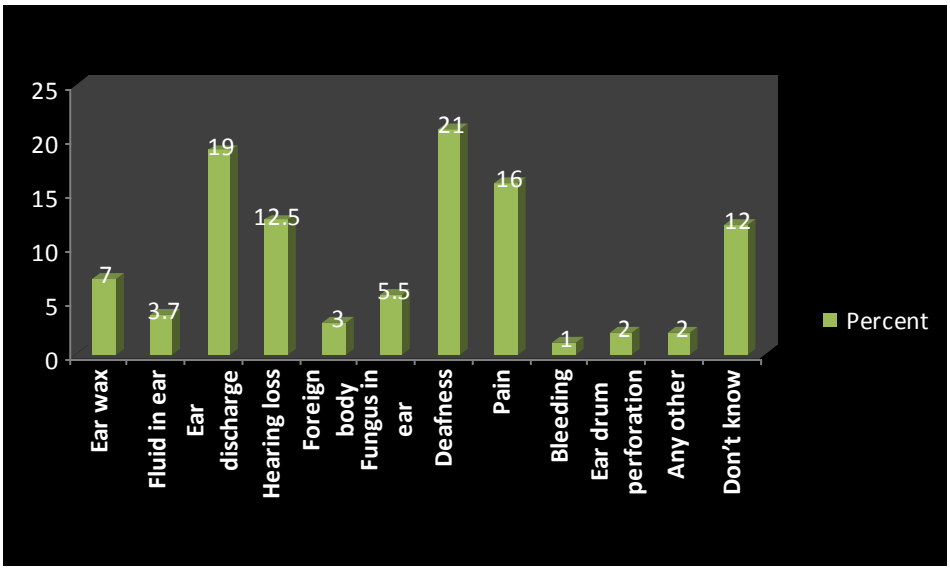


**Multiple responses possible*

When the teachers were asked about the most serious problems of the above listed common problems, deafness emerged as the most serious problem with 21% teachers stating it as the most serious problem. 19 % teachers perceive that

ear discharge is most serious problem among students while 16 % teachers think that pain is the most severe ear problem for children.

Graph22. Perception about most serious ear problem among school children



**Multiple responses possible*

When the teachers were asked whether any child in their class had suffered from any ear problem in the last one year, 43 teachers admitted that one or more student in their class had suffered from some ear problem. The nature of the problems varied but the most common problem was pain in the ear (44.7%) followed by ear discharge (19.1%) and hearing loss (17%).

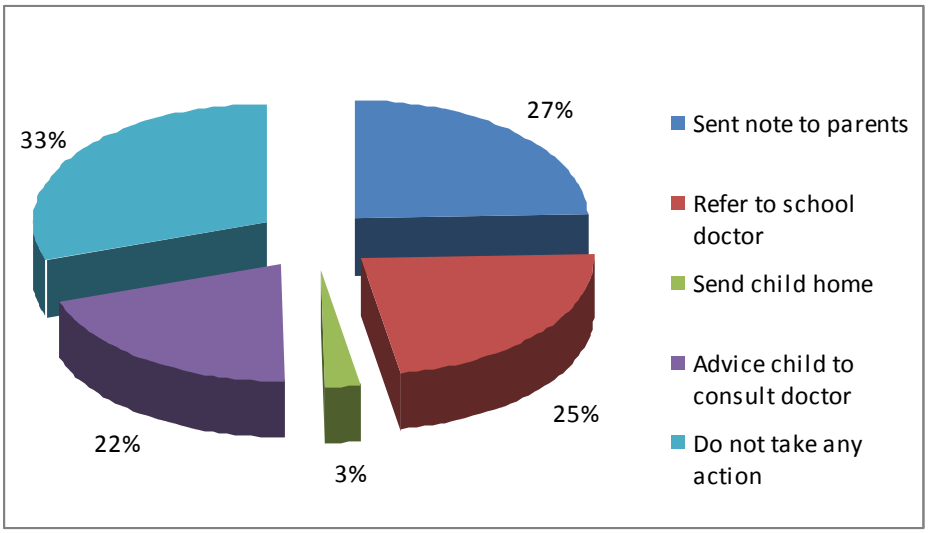
Table21. Nature of problem suffered by children in the past one year

	Frequency	Percent
Wax	1	2.1%
Fluid in ear	1	2.1%
Ear discharge	9	19.1%
Hearing loss	8	17.0%
Fungus in ear	2	4.3%
Deafness	4	8.5%
Pain	21	44.7%
Infection	1	2.1%

**Multiple responses possible*

When the teachers were asked about the action that they initiate incase of ear problems among the children, nearly one-third of the teachers do not take any action which is an issue of concern. 27% sent a note to the parents of students informing them about the problem while one-forth sent students to school doctor for treatment. 22% advise the child to consult the doctor. This highlights an immediate need to educate the teachers about the actions which should be initiated when they come across students with ear problems so that such issues could be addressed immediately.

Graph23. Action taken by teachers for ear problem among school children

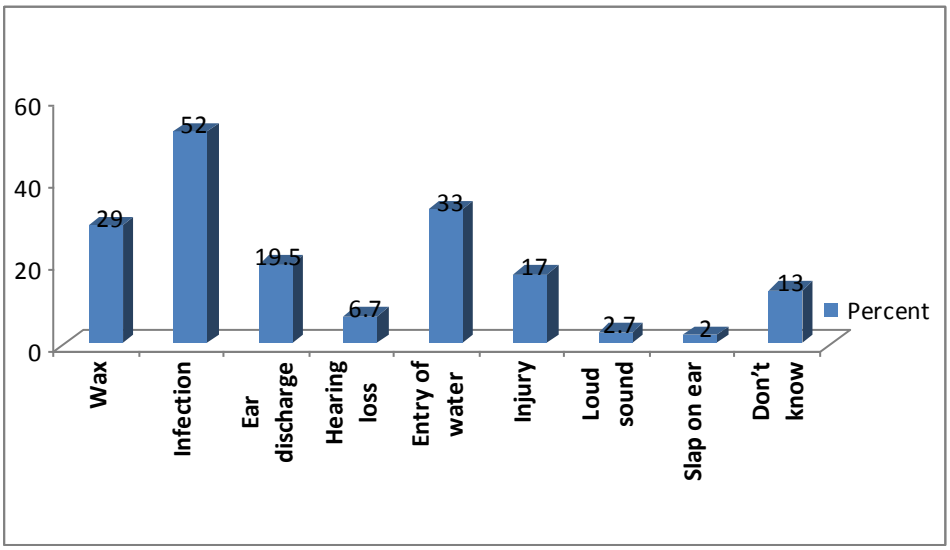


**Multiple responses possible*

Awareness about ear pain

More than half of the teachers felt that infection in ear was the main cause of pain in the ear while one-third of them felt that water which enters into ear while bathing or swimming was the major cause of ear pain. 29% of the teachers thought that wax causes pain in ear. Awareness about exposure to loud sound and slapping the ear as cause of ear pain was found to be low.

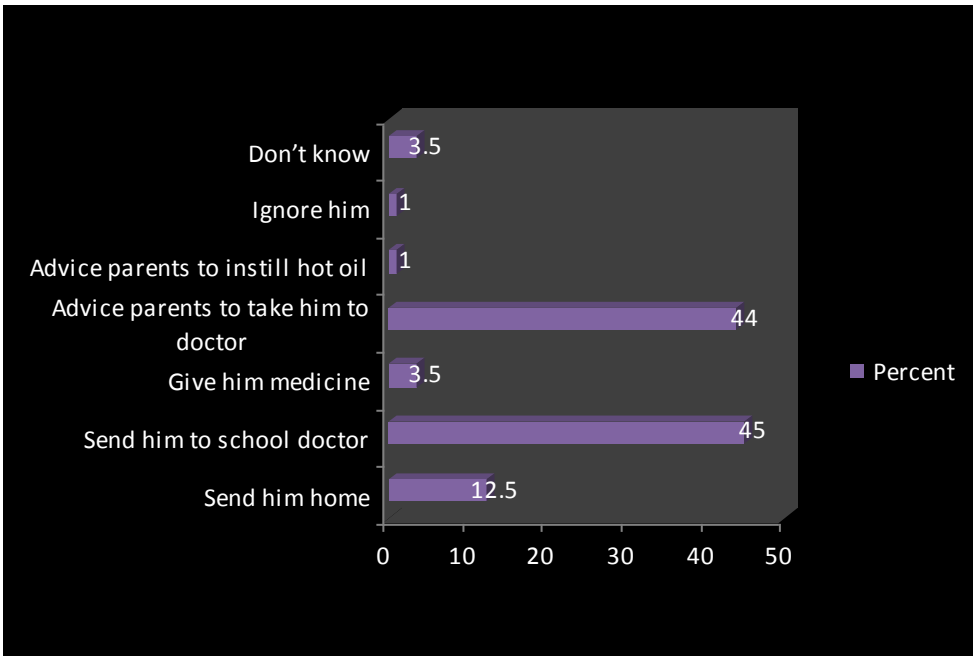
Graph24. Causes of ear pain



**Multiple responses possible*

In care of severe ear pain, 45% of teachers claimed that they would refer the students to school doctors while 44% advice the student's parents to consult doctor. 12.5 % teachers said they would send student to home. A positive point that emerged was that only 1% teachers said that they would advice parents to instill hot water reflecting extremely low prevalence of myths and beliefs among the teachers. Also only 1% of the teachers ignored children with ear pain.

Graph25. Action taken in case of severe pain among school children

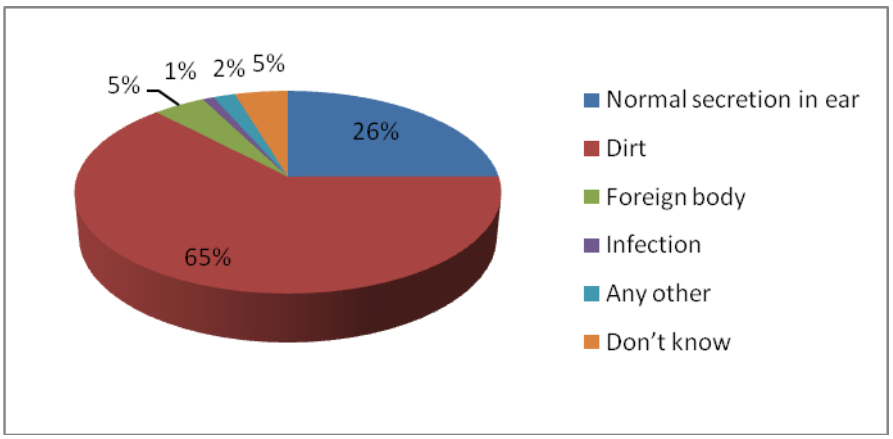


**Multiple responses possible*

Awareness about ear wax

The awareness among teachers about ear wax was found to be extremely low. Almost 65% teachers thought that ear wax is the dirt that gathers in the ear from outside while only 26 % think It is normal secretion in ear. Five percent teachers were of the opinion that ear wax is a foreign body while another 5% lacked any awareness.

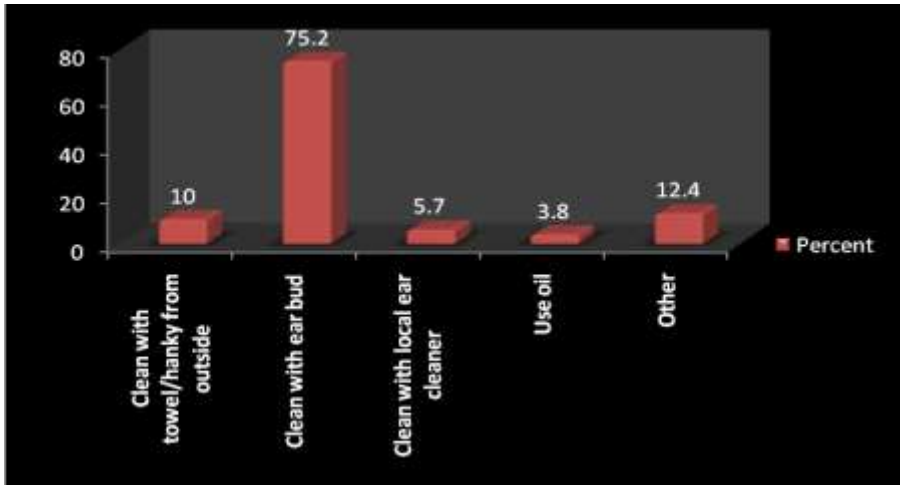
Graph26. Awareness about ear wax in school teachers



**Multiple responses possible*

Majority of teachers perceived that best method for cleaning one's ear was using ear bud followed by use of clean towel/ handkerchief and get one's ear cleaned from local vendors. Since teachers are an important influencing factor for the students, it is very important that teachers should be educated about correct method of cleaning the ear so that right guidance could be given to the children.

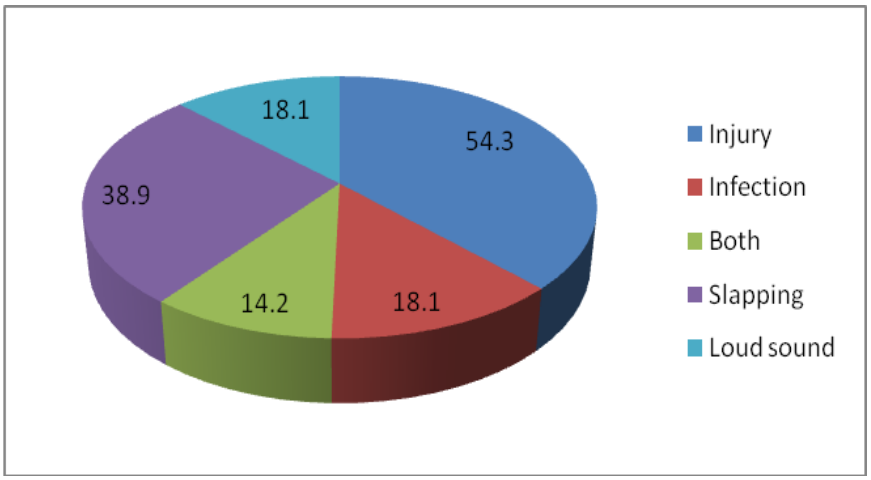
Graph27. Awareness about best method of cleaning ear



**Multiple responses possible*

Nearly 54% said ear can be damaged due to injury while 18% considered infection as the cause of ear damage. 14% considered both injury and infection as equally significant reasons for ear damage. Slapping the student (39%) also emerged as a major cause of ear followed by exposure to loud sound.

Graph28. Awareness about causes of damage to ear

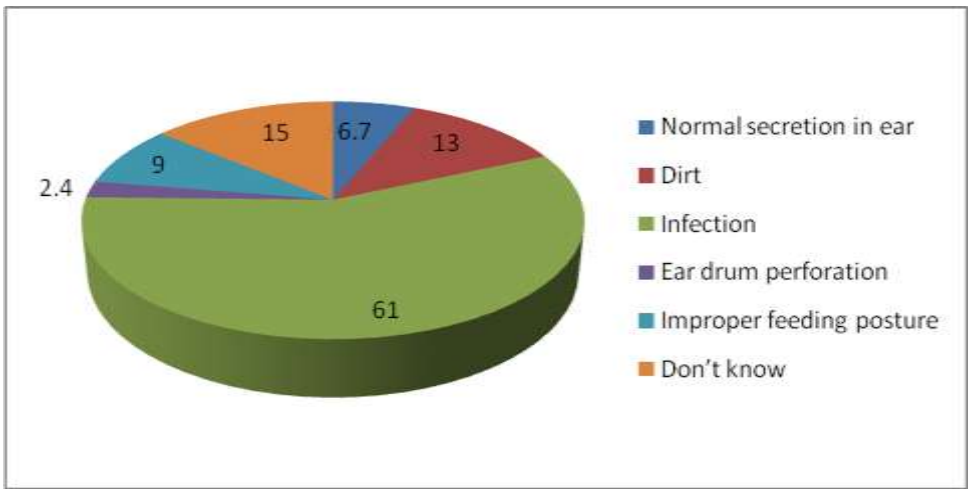


Although 91% teachers knew that slapping on ear can damage the eardrum of students, 35% of teachers still slapped students. This practice needs to be checked immediately and the school managements should take adequate steps stop this. 4% teachers said damage ear drum can lead to both decrease in hearing ability & pain while 4% said loss of hearing ability & pus discharge.

Awareness about ear discharge

61% of teachers perceived that discharging ear is caused by infection in ear and13 % claimed that it is the dirt which gathers in ear from outside. Other causes of discharge that emerged were fungus in ear, damage to eardrum, boil in ear and mothers feeding the infants in slant position. Only 6.7% of the teachers were aware that ear discharge is the normal secretion of the ear which is an extremely low percentage.

Graph29. Awareness about causes of ear discharge



65% teachers thought that ear discharge will result in ear pain, 37.5 % thought that it will lead to difficulty in hearing while 7% teachers think that ear discharge may lead to serious life threatening illness. A significant 18 % were completely unaware about the adverse effects of ear discharge. In case the teachers encountered students with discharging ear, 77.3% sent students home to seek treatment for ear discharge while 10 % teachers make such students sit in the front row so that they receive constant attention of the teachers. Considerable 18% teachers do not take any action if they come across children with discharging ear which results in delay in treatment/ no treatment and the problem getting aggravated.

Out of the 91% teachers, who thought that ear discharge was curable, 60 % thought that it could be cured by medicines only while 35 % that both medicines and operation is required for treatment. 8% thought that ear discharge could be cured only by operation. A few of them also reported that that ear discharge needs no treatment and can be resolved spontaneously or by using home treatment like luke warm mustard oil etc.

Awareness about noises that cause harm to the ear

Table22. Awareness about noises that cause harm to the ear

	Frequency	Percent
Loud music through I pod walkman	96	91.5
Loudspeaker	44	41.9
Electric drill	35	33.33
TV at low volume	3	2.8
Shouting	5	4.7

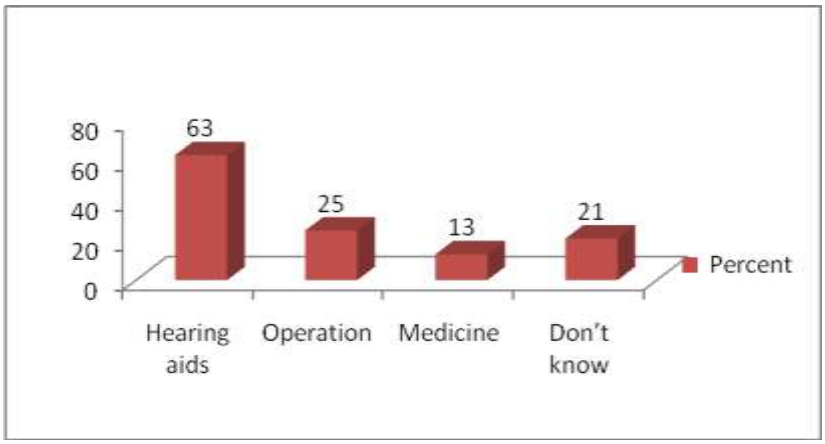
Loud TV	4	3.8
Don't know	3	2.8
Total	105	100.0

**Multiple responses possible*

Awareness about deafness and behaviour towards deaf children

Out of 78% teachers who said that deafness could be treated, 63% said that hearing aids are the only possible solution of deafness; one forth said that operation is the mode to treat deafness and 13% said that it could be treated through medication. 21% of the teachers were not aware of any treatment of deafness.

Figure10. Awareness about treatment of deafness



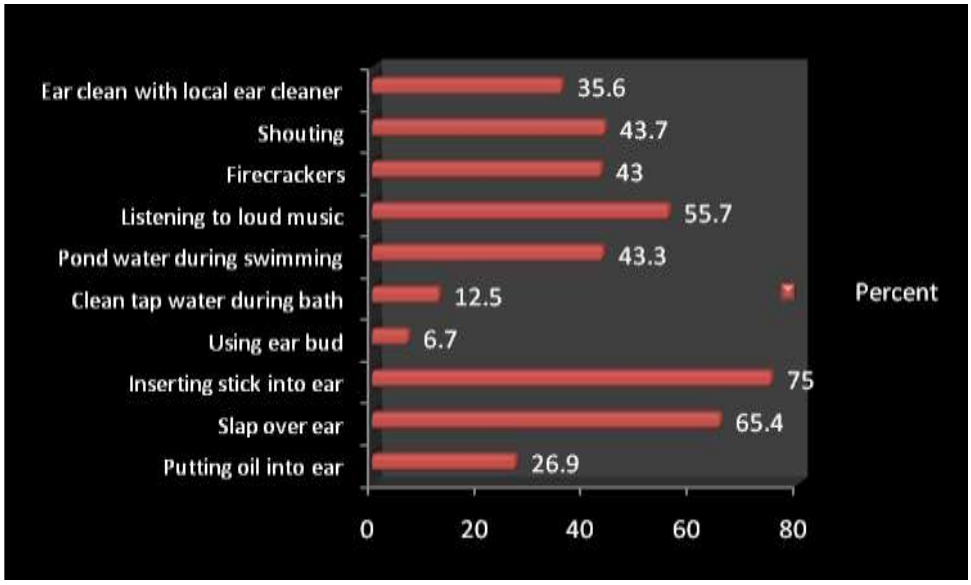
Out of 9% teachers who said that deaf child cannot be treated 84% said that were not aware of why the reason for the same. Five percent were of the opinion that no treatment exists for deafness. When asked about the special care to be given to deaf child 60% teachers were completely unaware about the care. 28% teachers expressed that there should be a special seating arrangement for these students so that they get constant attention and support from their teachers and peers. 10% teachers felt that special teachers who are trained in teaching children with hearing disability should be inducted to teach such children while 8% teachers reported that the existing teachers should be trained so as to teach such students.

As per the teachers, behaviour of normal students towards the hearing impaired students was sympathetic as per 68% teachers. However 30.5% teachers said that students make fun of such children or stay away from them.

Awareness about actions that is harmful to the ear

The teachers had moderate awareness about the actions that are harmful to the ear. The most prominent reasons that emerged were insertion of sharp objects into the ear, slap over the ear and exposure to loud music.

Graph30. Awareness about actions those are harmful to the ear



Analysis of Focussed Group Discussions with teachers

A total of nine focussed group discussions were carried out across schools of urban, rural slums and rural areas of South and North West Delhi. A total of 100 teachers were covered and the average duration of each FGD was 25-30 minutes.

Nearly all the teachers were aware of the importance of ear and hearing. As per the teachers, the ear and hearing is important because an individual reacts according to what he hears. Inability to hear properly severely hampers the communication process. More than half of the teachers were aware that hearing impairment led to speech defects. Proper hearing ability results in development of understanding of language. The teachers expressed that hearing impairment could impact studies and could result in student's faring badly in studies. Ear and hearing was important because it facilitated in day to day activities like understanding parents‟ instructions, crossing the road etc. A few teachers (approximately 5%) particularly in the urban areas were aware that ear helped in maintaining the balance of the body.

Subsequently, the teachers were probed about the common ear problems which they witnessed among students. The common ear problems mentioned by the teachers were pain in the ear, ear discharge *(“kaan mein se peep nikalna”),* pus in the ear, accumulation of ear wax, itching in the ear and age related hearing loss. Infection in the ear, entry of dirty water in the ear and recurrent cold were cited as the most common reasons for ear problems. Around 10% teachers stated that slapping on the ear was an important cause of ear pain. These teachers said that they have strict guidelines not to slap any student especially on ears. If a teacher slapped students on the ear, both students and their parents complained against the teacher.

Next, the teachers were asked to describe if they had experienced any ear problem or had seen anybody body with ear problem. Around 80% of teachers had seen people with ear problems. Teachers expressed that children with ear discharge were commonly seen among children residing in the villages. One-forth of the teachers had seen old people wearing hearing aids. One teacher had

a 19 year old niece who lacked behind in her studies because of inability to hear properly. The girl was taking treatment from an ENT specialist. One teacher gave an example of her cousin who was born deaf and eventually could not speak. Another teacher gave an example of twins in the class who had defects in speech which was attributed to hearing impairment. A teacher stated that her 3 month old daughter suffered from pain in the ear due to persistent cold.

Next, the teachers were asked to narrate their perceptions about how the care of ear should be taken. The teachers expressed that care should be taken not to allow entry of soapy/ dirty water in the ear. People particularly in the rural areas should be careful not to swim in muddy pond. Insertion of sharp object in the ear should also be avoided. Also care should be taken not to listen to music on high volume. The teachers also said that in case of any ear problems an ENT specialist should be consulted. The students should also be explained not to hit any other student on the ear during the time of play as it could lead to damage of the ear.

A lot of myths and misconceptions with respect to ear care were found to be prevailing among the teachers particularly in the urban slums and rural areas. The teachers in these schools felt that instilling oil / oil with garlic juice in ears was a good way to remove wax from the ear as the oil softened the wax. These misgivings were deeply ingrained in the minds of the teachers that they refused to believe that these practices were harmful. *("maalish wali toh baccho ke kaan mein sab jagah tail dalti hai, unke toh kuch nai hota").* Around 10% teachers were also in the favour of using hydrogen peroxide for cleaning the ear. Practice of instilling alcohol in the ear was also considered beneficial by some teachers. Wax in the ear was thought of as dirt accumulated in the ear by majority of the teachers.

Subsequently, the teachers were probed about what they did to detect hearing deficiency among their students. The teachers stated that if they asked questions in the class and the child did not respond it could be due to hearing deficiency. Defect in speech also helped the teachers recognize students with ear problems. A school in the urban area (Saket) of South Delhi had a dedicated medical team which carried out health evaluation of all the students. The students with

facilitation from teachers were made to fill questionnaires which helped the school authorities identify students with hearing deficiency.

Next, the teachers were asked about the action that should be initiated for students with hearing deficiency. Around three-forth of the members thought that once the students with any hearing abnormality were identified, it was best to inform their parents immediately. Nearly half of teachers said it should be ensured that these children sat on the front bench of the classroom for better attention of the teacher. The teachers should be very patient while dealing with such children.

Overall, there was a vast difference in perception between male and female teachers pertaining to ear care. In all the FGDs conducted, the female teachers were more participative and vocal about their thoughts and were more sensitive as far as children with hearing problems in their classes were concerned. They themselves were aware and were motivated about spreading awareness about ear problems and ear care to the children and to their parents. On the other hand, male teacher were not as participative and the majority were of the opinion that students were disinterested in studies and hence then these kids make up false stories about problems in ears for not being attentive in class.

The teachers were asked about the methods by which they could create awareness among the children. The teachers expressed they could create awareness by explaining to the students about how to take care of the ear. The students should be advised not to let dirty water into the ear, not to insert pointed objects in the ear and not to listen to music on loud volume.

The teachers across the school had little knowledge about *sarv siksha abhyaan* and there was no special care for hearing impaired which was provided in these schools. However, the teachers expressed that the school authorities should recruit teachers who have expertise in sign language and are trained to teach students with hearing disability. The school authorities could also liaison with other agencies for free distribution of hearing aids to students who required them.

Analysis of Focused Group Discussions with Anganwadi Workers (AWW)

Five focused group discussions were carried out among Anganwadi workers in the two designated districts of Delhi wherein 50 AWW were covered. The FGDs were conducted to assess the knowledge levels of Anganwadi Workers about ear problems and their preventive aspects and to understand the role that AWW play in promoting ear care in the community.

First of all, the AWW were probed about the importance of ear. It was observed that they were well aware of the importance of ear. All members stated that ears are important for hearing. Members expressed that a person responds on the basis of what he hears. If a person is not able to hear properly his communication with others would be hampered. AWW said that if a person does not hear properly he would not be able to comprehend the activities which take place in his surroundings. A person with hearing impairment may suffer from speech defect as well.

Next the workers were asked about the age at which a child starts speaking and when he/she could be tested for deafness. Most AWW opined that children start speaking at the age of 6-7 months and are able to pronounce small words like “maa” and “paa” by that time. When asked about the age at which children could be tested for deafness, the workers gave varied answers and were found to be not very well informed.

Pain in the ear, discharging ear, infection, perforation of ear drum and deafness were the most common ear problems cited by the members.

Subsequently, the members were asked to narrate the details of ear problems which they had witnessed in the community. Nearly all the AWW had seen patients with complaint of ear pain. About 30% members had seen patients with ear discharge which was caused due to perforation of ear drum. These patients had undergone surgery which rectified the problem. Around 10% AWW had seen children with foreign body in the ear such as eraser, pearl (*“moti”*) and thermocol piece. These children were subsequently taken to an ENT specialist where the foreign body was removed. 30% members had seen deaf children who used sign

language to communicate with their family and others. Some of these children were studying in special schools. About 10% members had seen children with an acne/boil inside this ear which caused pain in the ear.

Next the AWW were asked about the guidance which they gave to parents about ear care of their child. Almost all AWW said that they advised the parents to take their child to a hospital for ear problems. However, they expressed that parents do not like to hear that their children suffer from any ear problem and therefore ignore the guidance provided by AWW. Also most parents feel that if the people in the neighbouring areas come to know about their child's ear problems, they would make fun of their child. At times the parents do not take their child to a healthcare facility because of the un-cooperative behaviour of the hospital staff and long waiting hours to meet the doctor. To overcome this, about 20% AWW said that they usually offer to go along with the patients to the hospital. Some members said that they guide the mothers not to feed their child while sleeping to avoid entry of milk in the Eustachian tube. Mothers are also advised to keep their hands behind the head of child while feeding him and not to instil anything in the child‟s ear without the advice of doctor.

Next, the knowledge of AWW was gauged about the reasons for a child being born deaf. 20% members stated that children born with low birth weight are prone to hearing problems. 10% member said that stress on the mother during pregnancy can also cause hearing problems to the baby. 20% members said that the mothers who chew tobacco, smoke or consume alcohol are at risk of giving birth to children with hearing disability. 10% member said that improper nutrient intake can also cause some deficiency in the pregnant mothers leading to hearing disabilities in children. 10% members said if a mother takes wrong medication during pregnancy, it may cause the child to be born deaf. *An area of concern is that 10% member had a notion that hearing disabilities in children can also be caused due to the effect of eclipse on the pregnant mothers.*

None of the members were aware of audiometric tests to detect hearing problems. When asked about the treatment options for deafness, 40% members stated that hearing aids could help deaf people while remaining 40% said that surgery could be an option. About 20% members suggested that special schools for deaf children can help them.

Subsequently, the AWW were asked how the care of ear should be taken. Nearly all the members thought that ear buds should be used for cleaning the ear. About 10% AWW thought that the ear should be cleaned using matchstick covered with cotton. Members expressed that care should be taken not to let dirty water enter into the ear. People should not insert any sharp object inside their ear nor should any person/ child be slapped on the ear. People should not get their ear cleaned from a local vendor. *An area of concern was that still about one-forth of AWW thought that practices of instilling oil, garlic juice and opinion juice were beneficial for the ear.*

There were lots of misbelieves among the AWW about ear wax. Nearly 80% members considered that ear wax was caused due to accumulation of dust in the ear while remaining 20% thought that it was accumulation of soap in the ear. AWW were not aware of the correct method of wax removal but they had seen people getting wax removed from local cleaners or using hydrogen peroxide.

Next, the members were asked by discharging ear and its treatment. The possible treatment for ear discharge suggested by AWW was to consult a doctor who would carry out a proper examination and would give medication to the patient depending on his condition. If discharging ear is left untreated, it would keep on discharging and would result in pain and may even lead to deafness in the long run.

The AWW workers were probed about the symptoms of ear problems. All members were aware that inability to respond to loud sound is a symptom of deafness. About 10% members opined that if a child does not respond to sounds of persons calling him, it indicated ear problem. If a child remains aloof/ silent and does not respond in the classroom or in the play group, it could be attributed to ear problem.

Lastly the AWW were asked about how awareness about ear care could be created in the community. They expressed that publicity by means of television and radio could help in spreading awareness about this issue. A movie of this subject would have a better impact and would reach out to larger population.

They also said that Anganwadi workers play an important role in spreading awareness about ear care at the grass root level. However, the AWW are already

loaded with responsibilities under various National programmes and stated that if they are paid sufficient incentives, they would be motivated further to spread awareness about ear care. AWW create awareness in the community by use of flip charts and pamphlets. They also advice people in the community not to practice any home remedies and consult an ENT specialist incase of any ear problem. They also felt that awareness and screening camps should be held regularly in the community so as to identify children with ear problems. AWW advice mothers at mahila mandel not to instil anything in the child's ear without consultation with doctor

Analysis of Focussed Group Discussions with Multi Purpose Workers (MPWs)

Two focussed group discussions were carried out comprising 20 multi purpose workers across the two designated districts.

The discussion began by asking the MPWs about importance of ears and listening. According to the members hearing is important for development of speech. 10% MPWs were aware that if a child is deaf from birth he would not be able to speak. If a person suffers from hearing impairment the communication process gets hampered. A person with hearing impairment would face problems in performing his day to day work.

Next the MPWs were probed about how a normal child reacted to sound. The MPWs highlighted that a child with normal hearing would become alert as soon as he/she heard any sound. The child would respond to sounds by way of blinking his eyes or moving his head in the direction of sound. He would also react by babbling or saying small words like "*maa*", "*paa*" or trying to repeat the words which he has heard.

According to MPWs, the treatment options for deaf children include hearing aids, speech therapy, and cochlear implant. Such a child and his family members could be taught sign language to facilitate communication. According to the members, the age at which hearing aids can be used was between 2-5 years.

Subsequently, the MPWs were asked how diagnosis of hearing problems in child could be done. They expressed that mothers are the best person to suspect any ear problem in a child. If the mother finds that the child does not respond to sound, the child may be suffering from hearing problem. Hearing problems can be diagnosed by conducting behavioural or audiometric tests.

Apart from hearing loss, other ear related problems mentioned by MPWs included dryness, ear discharge, perforation of ear drum, accumulation of wax, foreign body, pain and infection. MPWs narrated experiences of patients with ear problems which they witnessed in the community. A member had seen a lady

with one year old so who had problem of ear pain due to persistent cold and cough. Itching in the ear due to accumulation of wax was cited as a widespread among children by MPWs. Foreign body like mosquito, fly or ant in the ear was a common problem particularly in the rural areas. Around 20% MPWs had seen patients with perforated ear drum and these patients had undergone surgery in the past.

Next, the problem of accumulation of wax in the ear was discussed in detail. Around 50% members were aware that wax is normal ear secretion while remaining 50% considered it to be accumulation of dust. However in either case, nearly 90% of the members agreed that ear buds should be used for cleaning the ear.

Next the problem of ear discharge was discussed in detail. The causes of ear discharge pointed by MPWs included infection in the ear and entry of mother's milk in the child's Eustachian tube due to improper feeding posture. Ear discharge could lead to decreased hearing and pain in the ear. According to MPWs, ear discharge could be cured by antibiotics. However, they stated that practice of instilling oil in the ear or burnt garlic for treating ear discharge were common in the community.

MPWs were asked how parents could prevent ear problems in their children. MPWs stated that ear problems could be prevented by avoiding entry of foreign body in the ear. Parents should be careful that their children do not insert any sharp toy, pencil, pen etc. in the ear. Parents should avoid slapping their child on the ear. Mothers should adopt correct feeding posture. The practice of instilling oil in the ear should be strictly avoided. Parents should prohibit their children from prolonged use of headphones/loud sounds.

Lastly the MPWs were asked where they referred patients for ear problems. Referrals were made to Lok Nayak Hospital, Kasturba Hospital, DDU Hospital, GTB Hospital (Shahdara, East Delhi), Ambedkar Hospital (Rohini, West Delhi), Safdarjung Hospital (South Delhi) and Malviya Hospital (Malviya Nagar, South Delhi). However, MPWs expressed that patients faced problems in form of long waiting hours to meet the doctor. MPWs stated that patients travelled from long

distances to reach the health care facility and found that the doctors did not devote sufficient time to them. About 20% of the patients which were indentified by the MPWs and referred to the various hospitals drop out from the treatment process. These patients do not consult a specialist in order to avoid the inconvenience and expenses of making multiple visits to the healthcare facilities. They are not aware of the significance of ear problem and prefer OTC drugs or local practitioners over qualified ENT specialists.

Analysis of In-depth Interviews with Primary Level Doctors

In-depth interviews were carried out with 10 primary level doctors from South and North West districts of Delhi. The issues pertaining to the attitude of care-providers and perceived attitude of the community were studied. The knowledge of the personnel regarding the preventive aspects of the ear diseases and hearing loss was assessed. The primary doctors belonged to Delhi Government Dispensaries and Maternity centres of Delhi.

The interview began by asking the Primary level doctors about the number of patients with ear and hearing problems which they encountered on a routine day. The number of patients consulting the Primary level doctors for ear problems was very low with less than 10 patients visiting them on a single day.

The most common problems as witnessed by the doctors were Otalgia (pain in the ear), ear discharge, ASOM, accumulation of ear wax and infection in the ear. The elderly people usually came up with problems of hearing loss. Foreign body in the ear and perforation of ear drum due to trauma were the other ear problems seen by primary level doctors.

Next, the primary doctors were inquired about the protocol that they followed for common ear related problems. Most of the doctors stated that they did not have an otoscope and therefore the initial examination of the patient was carried out using a torch. For patients with impacted wax, ear drops were prescribed and were advised for cleaning of the ear. The patients suffering from pain in the ear are prescribed pain killers and are referred to an ENT specialist. For patients suffering from itching in the ear, antifungal ear drops were prescribed. In case a patient had discharging ear, he was given antibiotic for 3 days and was asked to come back. If the problem was rectified, the medication was stopped else the patient was referred to the nearest healthcare facility for further treatment.

Next the doctors were questioned about the level of awareness among patients and their families regarding ear care. According to the doctors, there was low awareness regarding ear care particularly among the people belonging to the rural areas. Most people felt that ear problems were not serious and did not require medical attention. They did not realize the urgency of ear problems nor did they understand the consequences of leaving ear problems untreated.

As per the primary doctors, the common practices pertaining to ear care seen in the community included instilling oil in the ear, putting garlic juice, getting ears cleaned from quakes, using matchstick and cotton to clean the ears and taking medicines (ear drops and pain killers) prescribed by local chemists. There was also belief among the community that if a person from Jain Community touched a person who had swelling in his ear, the problem would get rectified. Adherence to medicine was also low among the patients and they stopped taking medicine as soon as they felt slight relief.

Next the doctors were asked how they provided guidance to the patients and their families. The doctors explained to the patient and his family about the course of treatment. The doctors also told the patients that they should come back for regular follow-up and explained to them the consequences of not coming back for follow-up.

Next the doctors were probed if the patients came for follow-up. Only 20% doctors expressed that patients came for follow-up while remaining 80% stated that patients did not return for follow-up. The patients particularly those from the Muslim community are advised to maintain proper hygiene. People are told not to take bath in dirty water. The patients are guided to take medication for the duration as prescribed by the doctor and not leave the treatment in between.

Lastly, the doctors were asked if their healthcare facility came under National Programme for Prevention & Control of Deafness (NPPCD). 60% doctors said that their healthcare facility did not come under NPPCD while 40% doctors were not aware whether their healthcare facility came under NPPCD or not.

Analysis of In-depth Interviews with ENT specialists at District Hospitals

In-depth interviews were carried out with 7 ENT specialists posted at the District Hospitals in Delhi. The issues pertaining to the attitude of care-providers and perceived attitude of the community were studied. The knowledge of the personnel regarding the preventive aspects of the ear diseases and hearing loss was assessed. The ENT specialists belonged to Maharishi Vamiki Hospital (Pooth Khurd), Dr. Ambedkar Hospital (Rohini), Madan Mohan Malviya Hospital (Malviya Nagar) and GTB Hospital (Shahdara). All these hospitals come under the National Programme for Prevention and Control of Deafness (NPPCD).

The number of patients consulting the ENT specialist in the Out Patient Department (OPD) on a routine day varied from one hospital to the other. On an average, 120-140 patients attended the ENT OPD for ear related problems in Maharaishi Valmiki Hospital, Madan Mohan Malviya Hospital and GTB Hospital while the patient load for ear disorders in Ambedkar Hospital was approximately 50 patients on a routine day.

The most common problem as reported by the doctors was CSOM followed by other problems like wax accumulation in the ear, ear infection, otitis externa, age related hearing loss and congenital deafness. CSOM was found to be common among children while elderly people were found to suffer from age related hearing loss. Many children were also found to be suffering from ear problems due to persistent cold and upper respiratory infections (URI).The reason for widespread prevalence of ear problems among children is attributed to poor socio-economic status of the people and low awareness levels of the people about importance of ear care. Most people preferred to first seek treatment from the local doctors or quakes and by the time the patient reached an ENT specialist the problem is further aggravated.

Next, the ENT specialists were inquired about the protocol that they followed for common ear related problems. In Maharishi Valmika hospital, there was no fixed protocol which was followed for ear related problems and treatment depended on the severity of problem. In Dr. Ambedkar Hospital and Madan Mohan Malviya Hospital, there were defined protocols for ear problems. For example, in case of

ear wax, the doctors first administered ear drop followed by wax removal. The basic protocol for the treatment of ear discharge and pain involved first giving a symptomatic treatment and asking patients take precautions like keeping the ears dry. The next step was administration of antibiotic dosage for the problem. If the discharge persisted, surgery was performed. This was followed by audiometric tests to assess the hearing loss.

Subsequently, the ENT specialists were asked about the facilities from where they got referrals and the facilities where they made referrals for serious ear related problems. Most of the hospitals got referrals from the nearby clinics and small hospitals which were both government and private. The ENT specialists in Maharishi Valmiki Hospital (Pooth Khurd) referred the patients mainly to Lok Nayak Hospital in case of severe ear problems. In Dr. Ambedkar Hospital, the facility of BERA was not available and therefore the ENT specialists referred patients requiring BERA to hospitals were this facility was available. One ENT specialist in Dr. Ambedkar Hospital reported that recently the hospital had faced a shortage of hearing aids and therefore patients were referred to Lok Nayak Hospital where affordable hearing aids were available. In Madan Mohan Malviya Hospital, no facility was available for rehabilitation of deaf people and therefore the patients were referred to AIIMS and Safdarjung Hospital.

Next the doctors were questioned about the level of awareness among patients and their families regarding ear care. According to the doctors, there was low awareness regarding ear care particularly among the people belonging to the rural areas. Most people felt that ear problems were not serious and did not require medical attention. Patients usually came to an ENT specialist only after they had tried home remedies and treatment from quakes and found that there was no relief. The ear care in case of females was most neglected and people brought their daughters to an ENT specialist only when she reached marriageable age. Acceptance of hearing aid is still very low. According to the doctors, with government agencies increasingly playing an important role in educating the community there has been an improvement in the awareness levels however a lot still needs to be done.

As per the ENT specialists, the common practices pertaining to ear care seen in the community included instilling oil in the ear, putting garlic juice, getting ears

cleaned from quakes, using matchstick and cotton to clean the ears and taking medicines (ear drops and pain killers) prescribed by local practitioners.

Lastly the ENT specialists were asked how they provided guidance to the patients and their families. The ENT doctors expressed that they explained to the patient his ear problem in detail and the consequences of not taking proper medication. The patients were counselled about treatment options. Advice on speech therapy and hearing aids was provided to the patients wherever necessary. In cases where patients required cochlear implant surgery, ENT specialists linked the patients to the healthcare facilities where they could undergo the surgery. The patients with discharging ear patients were asked to keep ears dry, put cotton in ear while taking bath and refrain from using medicine without consulting a doctor. The patients were also advised not to use any home based treatment or seek treatment from quakes.

Analysis of In-depth Interviews with General Practitioners

In-depth interviews were carried out with twenty general practitioners (ten in each district) of Delhi to assess their perception of ear problems in the community and barriers for access to ear and hearing care services.

The interview began by asking the general practitioners about number of patients with ear and hearing problems they encountered in their day to day routine practice. The average number of patients who visited the general practitioners with ear problems was negligible with an attendance of about 2-3 patients in a week. The common ear problems encountered by the GPs were CSOM followed by pain in the ear, accumulation of ear wax, swelling in the ear, itching and foreign body in the ear. Patients with age related hearing loss also visited the GPs.

Next, the GPs were asked about the common protocol they followed for treatment of ear related problems. In case of ear discharge, they first gave the patient a course of antibiotics and asked them to return back after 4-5 day to see if there was any improvement. For ear pain, the patients were advised mild pain killer and solid wax ear drops were prescribed to patients with complaint of itching in the ears. Since most of the GPs did not have an Otoscope for examination of ear, they referred the patient to an ENT specialist incase there was no improvement in the condition of the patient.

Subsequently, the GPs were probed about the referral mechanism which was adopted for serious ear problems. Majority (70%) of the GPs referred patients with ear problems to ENT specialists which were ear accessible and were located in the vicinity of the patient's residence. Nearly 35% GPs referred the patients to Government facilities like AIIMS, Safarjung Hospital and Malviya Hospital in South Delhi and Dr. Ambedkar Hospital in West Delhi. About 5% GPs referred patients to corporate hospitals like Max Hospital.

The GPs were asked about the level of awareness among patients and their families about ear care. According to 30% GPs, the awareness in the community had been improving and people had become increasingly cautious about ear related problems. However, the remaining 70% felt that a lot still needed to be done.

The General Practitioners were probed about the common ear practices which they saw among the patients. The most common practice witnessed by the doctors among patients was purchase of OTC drugs in consultation with the local chemist thereby saving them visit to the doctor. The patients also relied on medicines which had been previously given to them by a doctor for similar ailment or on medicines recommended by relatives and other family members. Another common problem which the GPs witnessed was the non-adherence of the patients to the prescribed drugs particularly to antibiotics. As soon as the patients got temporary relief they stopped consumption of medicines which resulted in interruption of treatment of the problem. The doctors also reported that now a day, use of ipods for listening to loud music on ear phones particularly among children had become a common practice. A lot of people did not realize the significance of ear problems and did not think it was important to visit an ENT specialist for such problems. They felt that these problems would get cured on their own. The GPs also stated that patients resorted to all possible home remedies first and visited a healthcare facility only when they found that there was no respite. Home remedies such as instilling oil in the ear for cleaning the ear and use of ear buds were very common.

Lastly the GPs were asked about that the guidance that they provided to the patients for ear problems. The doctors advised patients about the exact problem and course of treatment. The patients are also explained the consequences of neglected the problem and not taking treatment from a doctor. The patients are also counselled not take consume any medicine without the consent of doctor. The doctors also emphasise the importance of adherence to medication and follow-up.

Majority (95%) of General Practitioners expressed that patients mostly came back for follow-up. However, 5% stated that if the problem gets resolved, patients do not return back for follow-up.

None of the GPs interviewed had their clinic under the purview of National Programme for Prevention and Control of Deafness.

Analysis of In-depth Interviews with doctors at Tertiary care facility

In-depth interviews were carried out with ten ENT specialists at the tertiary care hospitals in the designated districts of Delhi to assess their perception of ear problems in the community and barriers for access to ear and hearing care services. The ENT Specialists from All India Institute of Medical Sciences (South Delhi), Safdarjung Hospital (South Delhi) and Sanjay Gandhi Memorial Hospital (Mangolpuri in North West Delhi) were interviewed.

The interview commenced by asking the specialists about number of patients with ear and hearing problems they encountered in their day to day routine practice. The average OPD attendance was reported to be 40-50 patients on an OPD day but for some tertiary doctors in Sanjay Gandhi Memorial Hospital, this number was approximately 70-100 patients.

The doctors in these tertiary hospitals were probed about the common ear problems which they came across in the community. Common ear problems among children of 0-5 year of age as mentioned by the doctors were congenital hearing loss and acute otitis media. Children with age of 5 years and above were found to be suffering from problem of discharging ear. Aged people visited the healthcare facility commonly for age related hearing loss. The other common ear problems seen in the community were CSOM, ear wax, itching in the ear, SNHL and deafness. The common causes of ear problems cited by the tertiary doctors were Upper Respiratory Infections (URI), lack of hygiene and untreated infection.

The ENT specialists in these hospitals provided evidence based medicines and treatment options which were acceptable to the patient in terms of time and cost. General examination of the patient was done before prescribing any medicine. History related to the incidence of the problem was taken into consideration before arriving at any prognosis.

For otomycosis antifungal drops were given to the patient and for ear discharge antibiotics and ear drops were prescribed. For problems like hearing loss, the ear of the patient was examined properly for any wax accumulation and the history of the patient was noted. Subsequently hearing loss of patients was assessed using

audiometric tests and then hearing aids were prescribed if required. In case of ear wax, ear drops were administered first followed by wax removal.

The basic protocol for the treatment of safe CSOM for children below age 14 years was administration of ear drops and oral antibiotics with instructions to the patient and family to keep the ear dry. For children with more than 14 years of age suffering from safe CSOM, surgery was done under local anaesthesia. In case of Unsafe CSOM, the surgery was performed directly. In case the child suffered from deafness the parents would be advised about the different treatment options such as cochlear implants.

Next, the doctors were asked in detail about the referral mechanism being adopted for ear problems at their respective facilities. AIIMS & Safdarjung Hospital being highly equipped hospitals did not require referring patients anywhere else for treatment of ear problems. These hospitals got referrals from CGHS dispensaries, secondary level hospitals and private practitioners across Delhi. The patients usually came for surgery and audiometry tests which were not available at the other less equipped facilities. Sanjay Gandhi Memorial Hospital also had the requisite facilities for treatment and therefore did not make any referrals for ear problems. It received patients from other private hospitals and dispensaries for surgery and audiometric tests. Both Safdarjung Hospital and Sanjay Gandhi Memorial Hospital did not have facility of cochlear implant and referred such patients to AIIMS or Lok Nayak Hospital.

Next the doctors at these healthcare facilities were asked about the level of awareness among patients and their families regarding the ear care and when to seek medical attention. All the doctors collectively stated that although the awareness with respect to ear and hearing care had improved in the community over the past it was still low.

People in the community still do not give priority to ear care and do not realize the urgency of consulting an ENT specialist in case of an ear problem. Even after recurrent episodes of ear problems, most people neglect them for years and visit a specialist only when the problem becomes chronic.

Harmful practices such as instilling oil and garlic juice in the ear, use of ear buds and other home remedies were extremely common. People were of the opinion

that ear problems would get cured on their own and therefore did not consult an ENT specialist for them. People in the community preferred local practitioners over qualified ENT doctors. Many patients had the misconception that only consuming medicines would cure their problems and only when the doctor prescribed them medicines they got psychological satisfaction and that their treatment was being done correctly. These practices were more common in the rural areas as compared to urban areas due to lack of awareness.

Also, people belonging to lower socioeconomic group were not able to seek medical attention for ear problems due to financial constrains as they were could not afford to pay the cost incurred in travelling to these facilities for treatment and follow-up.

Subsequently, the doctors were enquired about the guidance that they provided to the patients. The doctors expressed that they would first explain to the patient/ family the exact problem, the course of treatment and the consequences of not undergoing treatment. The doctors usually adopted pictorial method to make the patients understand the above mentioned points.

The patients were counselled not to use home remedies like instilling oil or garlic juice in the ear and were asked to avoid usage of ear buds and sticks as it could lead to perforation of the ear drum. The patients were also advised to avoid taking treatment from quacks and local ear cleaners. The patients were told to consult a doctor as soon as they found signs of deafness in their child. The parents were also guided not to neglect URI and get it treated at the earliest.

The patients suffering from discharging ear were asked to cover ears with cotton while taking bath and also keep their ears dry.

When the doctors were asked whether the patients came for follow-up visits, most doctors replied in affirmative as the patients were made to understand the consequences of delay at the beginning of treatment itself. However, in some cases where patients were advised surgeries they dropped out and preferred to take treatment from a local practitioner. The long waiting time at these healthcare facilities and the long waiting list for surgeries also discouraged people from visiting the facility for follow-up.

Lastly the doctors were asked about the rehabilitation facilities available for the deaf patients at their respective healthcare facilities. For cochlear implant surgery the patients at Safdarjung Hospital and Sanjay Gandhi Memorial Hospital were referred to Government Hospitals & Government approved private clinics where this facility was available. The patients requiring hearing aids were referred to Ali Yavar Jung Institute of Hearing Handicapped, (Lajpat Nagar in South Delhi).

Analysis of In-depth Interviews with Medical Superintendents

In-depth interviews were carried out with five Medical Superintendents of the hospitals in the designated districts of Delhi to assess their perception of the relevance of ear diseases and their knowledge regarding preventive aspects of these diseases. Their perception of the relevant government programmes and schemes was also assessed. The Medical Superintendents from All India Institute of Medical Sciences (AIIMS), Safdarjung Hospital, Maharishi Vamiki Hospital (Pooth Khurd), Dr. Ambedkar Hospital (Rohini) and Madan Mohan Malviya Hospital (Malviya Nagar) were interviewed.

All the hospitals had a fully functional ENT department. The number of specialists and audiologists posted in the ENT department varied from one hospital to another. Maharishi Valmiki Hospital and Madan Mohan Malviya Hospital had one specialist, one Senior Resident and one audiology assistant. The hospital also had a Junior Resident who provided support on the OT days. Safdarjung Hospital had ten ENT specialists and two audiology assistants. Dr. Ambedkar Hospital had three ENT specialists, one Senior Resident, one Junior Resident and one audiology assistant. In AIIMS, the ENT department had seven faculty members, ten Senior Residents, 12-14 Junior Residents and 2-3 audiologists.

None of the MS reported any vacant positions in the ENT department in their respective hospitals. However at Maharishi Valmiki Hospital, the MS pointed out that one sanctioned position of ENT specialist was not sufficient because if both the specialist and Senior Resident were unavailable on some day, no patients are attended to on that day. This resulted in patients losing faith in the health care facility.

All the hospitals had six days allocated to ENT OPD. The OPD timings across hospitals were 9am- 1pm. The OPD days were equally distributed among the doctors. The average number of patients attending ENT OPD on a routine day differed from one hospital to other. Maharishi Valmiki Hospital had about 140-150 patients attending OPD on a routine day while in Madan Mohan Malviya Hospital this number was 100 patients. AIIMS and Safdarjung Hospital had an OPD attendance in excess of 150 patients.

The Medical Superintendents of the hospitals were probed about the common ear problems which they come across in the community. The common ear problems reported by them included CSOM (both safe and unsafe), ASOM, ear wax, perforation of the ear drum and foreign body in the ear.

Next, the Medical Superintendents of the hospitals were asked about their perceptions of the problem of deafness in the community and importance of early diagnosis and rehabilitation. They unanimously expressed that ears are important sensory organ of the human body and if a person suffers from ear related problems, the plight of the individual cannot be imagined. The quality of life of an individual is drastically impacted if he has to suffer from ear related disorder throughout his lifespan.

All the MS collectively stated that the awareness with respect to ear and hearing care was abysmally low among the community. Harmful practices such as instilling oil in the ear and other home remedies were extremely common. People were of the opinion that ear problems would get cured on their own and therefore did not consult an ENT specialist for them.

MS across the hospitals reported that there was lack of awareness material regarding ear and hearing care. They suggested that there should be user-friendly IEC material in form of posters and handouts should be displayed across healthcare facilities. This material should be translated into local language for easy comprehension by the community.

Some of the MS also expressed that ASHA workers have been given training on making community aware about ear problems, telling them how they could suspect hearing loss and what actions should be taken in case of ear problems. However according to them, regular refresher training of ASHA workers should be conducted. They also voiced that free health camps conducted in the community should focus on giving importance to ear related problems.

Another issue pointed out was that at most dispensaries patients with ear problems were referred to secondary care or tertiary care hospitals without giving them the information about OPD days in that hospital. Specific information regarding OPD days, timings, room number and exact purpose of the visit should be told to the patients and written on the referral slip. Negligence to do so

resulted in wasting the time of the patients and caused unnecessary trouble to them.

At times, the doctors at the primary level were not sensitized about what audiological procedures were being done in which hospital. They should be made aware about the procedures secondary level hospital can handle or not handle before they make the referral. This would save the crucial time of the patient to get his/her check-up done.

MS pointed out that print and electronic media should be utilized more effectively. The awareness programs need to concentrate more on affordable and accessible health centres. Special focus should also be given to making people in the villages aware about the harmful effects of going to local practitioners for ear related issues. According to them the camp approach should be adopted so that large population could be screened to identify high risk targets. Monthly days at Anganwadi centres could also be kept as focal points where awareness regarding when and where to seek proper medical care should be given.

Lastly the Medical Superintendent's views were sought on the National Programme for Prevention and Control of Deafness (NPPCD). The programme is welcomed and the effort towards introducing hearing impaired into the main stream is considered a move in the right direction. According to them, it is very important to train manpower towards creating awareness about ear care and help change the attitude of the society towards hearing impaired. National programme is an excellent initiative and the Medical Superintendents were positive that NPPCD would yield results in line with the NPCB (National Programme for Control of Blindness). All hospitals with exception of Maharishi Valmiki Hospital were a part of the National Programme for Prevention and Control of Deafness (NPPCD).

Analysis of In-depth Interviews with State Level Health Officials

In-depth interview were carried out with State Level Health Officials of Delhi which included State Programme Officer, Adolescent Health. The interview was carried out to assess her perception about the problem of deafness in the community and its significance of early diagnosis and rehabilitation. The barriers and challenges to access of ear and hearing care services in the population and the measures taken by the Government of Delhi to overcome deafness were also gauged.

The discussion commenced by asking the Health Official about the extent of deafness in the community and the importance of its early diagnosis and rehabilitation. The official was of the view that ear problems are widespread in the community. At the same time ear problems are neglected and are never a priority among people. People with ear problems continue to suffer from them for a large part of their lives and therefore the early diagnosis and rehabilitation of ear problems was required.

The common ear problems prevalent in the community as per the state officials were ASOM, CSOM and accumulation of wax in the ear. These problems were common among adolescents and adults. The males and females with the age of 60 years and above suffered from age related hearing loss.

When asked about the barriers and challenges to access of ear care services in the community, the official expressed that there are barriers at three levels viz. at the community level, at the service providers‟ level and cultural barriers. At the community level, ear problems are not given importance which is attributed to the lack of awareness. Parents are not aware about the age at which a child should be tested for hearing loss. They do not know indicators to gauge whether the child has hearing problem or not. At times both the parents are working because of which ear health of the child gets neglected. At the school level, teachers are also not trained to identify children with ear problems.

At the service providers‟ level, adequate infrastructure, manpower and equipment for ear care are not available. People also face problems in healthcare facilities

like long waiting hours to meet the doctor and making multiple visits to the hospital during the course of treatment. Awareness among healthcare workers about ear care particularly at the grass root level is low.

The cultural beliefs of the community also act as a deterrent to access of healthcare services. The people belonging to low-socio economic status have several children and the parents do not have adequate resources to take care of their health needs. A lot of myths and misconceptions are prevailing in the community about ear care which is the accepted way of treating ear problems.

Lastly the state level official was asked about the strategies that should be developed to overcome deafness among adults, school children and infants.
They expressed that infant screening and school level screening should be carried out regularly. At the school level, the teachers should be trained to identify children with ear problems. The day reserved for parent teacher interaction should be used effectively to create awareness about ear problems among children and their parents. The adolescents should be actively involved in organizing activities related to ear care such as organizing poster competitions, awareness talks, debates, on minute shows etc. The do's and don'ts about ear care should be displayed in the schools.

She also stated that all possible media of communication viz. Mass media, local IEC and interpersonal communication should be used to create awareness about ear problems. Women are the most neglected as far as ear health is concerned and therefore a celebrity (if possible women) should be roped in for creating awareness through mass media. The defined norms for loud noise should be strictly implemented in the residential and industrial areas. The healthcare personnel should be trained regularly about ear care including hands on training of technicians. Standard treatment guidelines should be developed for ear problems and followed consistently. Linkages should be developed with other programmes to overcome manpower shortage and also to disseminate information about ear problems. Under the Mobile Health scheme, the Mobile vans should be equipped with an ENT specialist at least at a frequency of once a week to screen the patients for ear problems.

Analysis of In-depth Interviews with Central Govt. Nodal Officers

In-depth interview were carried out with National Technical Advisor, National Programme for Prevention and Control of Deafness and Deputy Additional Director General (Directorate General of Health Services, Ministry of Health and Family Welfare). The interviews were carried out to assess their perception about the problem of deafness in the community and its significance of early diagnosis and rehabilitation. The barriers and challenges to access of ear and hearing care services in the population particularly for women were assessed. Their views were also sought on the National Programme for Prevention and Control of Deafness and suggestions to improve ear care services in the state.

Firstly, the Nodal Officers were asked their perception about extent of deafness in the community. They expressed that as per WHO report, 6% of the population of India suffers from auditory impairment. The prevalence of ear problems varies from 5% to over 30% depending on whether the area is rural or urban. Literature shows that out of every 100 children born in India, 33% do not suffer from any ear problem during their life time, another 33% suffer from ear problems only once/ twice during their life time while the remaining 33% suffer from ear problems repeatedly which has to be catered to by an ENT specialist. Hearing impairment adversely affects the development of speech and academic performance of a child. Therefore problem of deafness is a significant issue in the community and its early diagnosis is important.

Next, the Nodal Officers were asked about the common ear related problems in the community. They stated that among the infants the common ear problems were acute otitis media, congenital deafness and unilateral hearing loss. Among the infants the severity of ear problem keeps on changing. The common ear problems among adolescents are ASOM and CSOM which may become complicated if remains untreated. In the age group of 20-60 years, people do not usually suffer from ear problems. However, noise induced hearing impairment, hearing impairment due to drug toxicity and uncontrolled hypertension/ diabetes may arise. Among the people of age group of 60 years and above, presbyacusis or age related hearing loss is common.

Subsequently, the stakeholders were probed about the barriers and challenges for access to ear and hearing care services in the population. They expressed that the major barrier to access of ear care services is that ear problems are not perceived as morbidity by the community. Even the healthcare workers at grass root level do not perceive ear problems of significance. This is attributed to lack of awareness in the community about ear problems. Majority of the people in the community take their children who have complaint of ear pain to local practitioners. These practitioners keep treating children for cough and cold and do not even realize that the pain may be due to an ear problem. The ear problems go unnoticed and become complicated further. The availability of trained manpower to cater to ear problems is also inadequate. The facility of cochlear implant in the country is also limited.

When asked whether women in the community are not able to access ear and hearing care services the stakeholders stated that the situation has now changed with the increased awareness. If the women are provided with hearing aids that fulfil their cosmetic requirements, women would not refrain from using them.

Next, the stakeholders were asked about the measures being undertaken by the Delhi Government to address ear problems in the state. They expressed that a number of initiatives are being taken by Delhi government. Children are being vaccinated for rubella. Under *Chacha Nehru Sehat Yojna*, screening for school children for ear problems is being undertaken regularly. Hearing aids are being provided to the hearing impaired free of cost/ at subsidized rates. Community level screening for ear problems is being done regularly.

The stakeholders had a positive view about National Programme for Prevention & Control of Deafness (NPPCD). They stated that the programme is currently being implemented in 192 districts in 20 states and Union Territories. It is further being extended to 5 states and 20 districts. In Delhi, NPPCD is being implemented in 4 districts.

Lastly, the government officials were asked about their suggestions to improve ear and hearing care among children and adults. They highlighted the importance of developing user-friendly IEC focussing towards overcoming the

myths and misconceptions being practiced in the community about ear care. ASHA and AWW should be trained regularly so that they could guide the parents on how they could identify if their child is suffering from deafness. Since universal neonatal hearing screening would be difficult and costly, they suggested that screening of high risk neonates should be carried out. The obstetricians and gynaecologists should be trained regularly. One time screening of school children should be carried out within a year of admission. Thereafter, selective screening of those children should be carried out who are suspected by the teachers to be suffering from hearing loss. Screening camps should be held regularly to identify patients with ear and hearing problems.

Conclusions summarizing the achievements and indication of scope for future work

An assessment of the profile of morbidities related to ear and hearing was carried out among children belonging to age group of 0-14 years of age. It was observed that the prevalence of abnormality of external ear was 0.2% while the prevalence of abnormality in tympanic membrane was 5.4%. The prevalence of hearing test abnormality among the children was 6.4%. On clinical examination it was found that the most common ear problem among children was impacted wax which was found in 30.5% of children who were suffering from ear problems followed by 2.6% children have OME and 1.4% children having CSOM. The prevalence of ear problems was most in the urban slums with 38% of children suffering from ear problems belonging to these areas followed by rural areas (34%). The prevalence of ear problems was least in urban areas. This was attributed to the fact that children belonging to the urban areas have better access to healthcare services due to higher socio-economic status as compared to those with rural areas. Additionally, the children from the urban areas have better awareness levels and myths and beliefs pertaining to ear care are less.

The children and their parents were not found to be receptive about seeking ear care services. The major reason which emerged was the lack of awareness about significance of ear problems. There was very low awareness about ear problems such as ear wax, discharging ear and ear pain. The lack of correct knowledge among parents about the correct age at which hearing of the baby could be tested poses as a strong barrier to the uptake of ear care services and unnecessary delay in availing treatment. Significant number of parents was of the view that there is no treatment available for deafness and therefore do not seek any healthcare service in case of ear and hearing problems.

An alarming point that emerged was that most students suffering from ear problems preferred to take some treatment at home before consulting an ENT doctor. Only a few preferred to seek medical help and avoided trying any treatment at home. Also the students and their parents felt that ear problems were not so serious that medical help should be sought.

A disturbing point that emerged was that instilling lukewarm oil, garlic juice, onion juice, alcohol etc. in the ear was considered an accepted and effective way of

taking care of ear. The major reason for opting for home based treatment was because such practices had been followed in families for generations. The other reasons for undertaking home remedy included occurrence of pain in the ear during late hours of night or previous similar experience which compels them to repeat the medication used previously. This acts as a major deterrent towards visiting healthcare facilities for ear problem. These myths were more common among students from the rural and urban slums schools as compared to those from urban schools.

Some problems also surfaced in relation to government facilities such long queues that delayed the process of getting the required treatment and unsatisfactory quality of services. There were a few students who said that they did not like hospitals or were scared of doctors, therefore avoided going to a doctor as much as they could.

The patients do not consult a specialist in order to avoid the inconvenience and expenses of making multiple visits to the healthcare facilities. Some women are dependent on their husbands for accompanying them to the healthcare facilities and therefore ear problems get neglected due non-availability of the husband.

Knowledge, behaviour, attitude and practices of children about ear care were assessed among 1200 school children less than 10 years of age. It was observed that nearly all the children were aware about the common ear problems with pain in the ear (78.6%), deafness (72.7%) and hearing impairment (64.1%) being the most widespread problems. 30% children had suffered from some ear problem during the past one year most common problem being pain in the ear (58.9%). The children who claimed to have suffered from some ear problem in the past predominantly belonged to the urban slums and rural areas. 60% children had visited ENT specialists while 20% had visited a General Practitioner. 7% children mostly belonging to urban slums & rural areas took OTC drugs from the chemist or visited a local practitioner for their problems. Ear wax was the most neglected of all ear problems with a significant 90% either being unaware of it or considering that ear wax is accumulation of dirt in the ear which has not been cleaned. Similarly awareness about ear discharge, its causes and treatment was also low. 97.5 % students knew about causes of pain in ear. 40% student considered infection as the main cause of ear pain followed by 30% who

felt that ear wax caused pain in the ear. 22.5% stated that ear pain was due to entry of water in the ear while 17% expressed that it was due to ear discharge. The actions harmful to the ear most commonly known to students were inserting stick in the ear (84.7%) and shouting in the ear (75.3%). Other actions harmful to ear stated by students were putting pencil in the ear, exposure to loud sound, exposure to fire crackers and swimming in pond water.

An assessment of the services available at various levels of health care systems with respect to ear and hearing care was carried out. The ENT specialists at the tertiary hospitals (All India Institute of Medical Sciences, Sadarjung Hospital & Sanjay Gandhi Memorial Hospital) stated that their respective hospitals were fully equipped and had all the facilities pertaining to ear and hearing problems viz. treatment, surgery and audiometric tests. These hospitals received referrals from secondary hospitals, dispensaries and private clinic. However Safdarjung Hospital and Sanjay Gandhi Memorial Hospital did not have facility of cochlear implant and referred such patients to AIIMS or Lok Nayak Hospital.

At the District Hospital level, referrals were received from the nearby clinics and small hospitals which were both government and private. The ENT specialists in Maharishi Valmiki Hospital (Pooth Khurd) referred the patients mainly to Lok Nayak Hospital in case of severe ear problems. In Dr. Ambedkar Hospital, the facility of BERA was not available and therefore the ENT specialists referred patients requiring BERA to hospitals were this facility was available. One ENT specialist in Dr. Ambedkar Hospital reported that recently the hospital had faced a shortage of hearing aids and therefore patients were referred to Lok Nayak Hospital where affordable hearing aids were available. In Madan Mohan Malviya Hospital, no facility was available for rehabilitation of deaf people and therefore the patients were referred to AIIMS and Safdarjung Hospital.

The primary level doctors at the various Delhi Government dispensaries and maternity centre and General Practitioners did not have even the basic equipment (Otoscope) for providing ear care. These doctors provided basic medication to the patients and referred them to an ENT specialist for further treatment.

11. S&T benefits accrued:

I. List of research publications with complete details: Nil
Authors, Title of paper, Name of Journal, Vol., page, year

II Manpower trained on the project:
   a. Research Scientists or Research Fellows- 02
   b. No. of Ph.Ds produced- 01
   c. Other Technical Personnel trained- Nil

III. Patents taken, if any: Nil

IV Products developed, if any: Nil

12. Abstract (300 words for possible publication in ICMR Bulletin).

The aim of this paper is to assess the knowledge, attitude, behaviour and practices about ear care among school students aged above ten years. A study was conducted across 20 schools from the urban, rural and urban slums of South and North West Delhi. Data was collected for 1200 students using a structured questionnaire regarding knowledge, attitude, behaviour and practices about ear care.

Our study found that 99.5 % students were aware of common ear problems in children which emerged as an encouraging point. The most common diseases as mentioned by the students were pain in ear (78.6%), deafness (72.7%), Hearing Impairment (64.1%), ear wax (47.9%) and ear discharge (40.3%). About 29.5% (354) students had suffered from some ear disease during the last one year. 58.9% children had suffered from pain in ear, 9.2% from ear wax, 7.5% with ear discharge and 7.5% with ear wax.

The treatment seeking pattern of the students for ear problems revealed that 252 (71.2%) out of 354 students who were suffering from ear problem sought consultation. The remaining 102 (28.8%) students did not seek any treatment. Most of the students who did not seek any consultation for ear problems belonged to rural areas and urban slums. 60% of students who had suffered from ear problems expressed that they had taken treatment from ENT specialist followed by 20.8% children who had visited a General Practitioner for ear problems. The children who took treatment from an ENT specialist were mostly from schools in urban areas. *An alarming point that emerged was that nearly 7% of the students took treatment from quacks or took medicines in consultation with a chemist.*

Subsequently, the students were probed about ear wax. 90.3% students know about ear wax and the remaining 9.7% were completely unaware of it. When asked what ear wax was, 75.7% students thought that it was the dirt which gathered in ear when the ear had not been cleaned properly. Only 10.3 % students knew correctly that ear wax was the normal secretion of ear reflecting low awareness levels among students about ear wax.

All the students opined that action needs to be initiated for ear wax. Only 5.5% students felt that ear wax should be cleaned by ENT specialists. Most of the students (87.7%) stated that ear buds should be used to clean ear followed 5.5% who felt that use of oil was beneficial. Predominantly in the rural areas and urban slums, students used matchsticks, ear drops or a cloth to clean their ears. 1% students were also in the favour of getting their ears cleaned from local vendors.

Next, the students were asked how ear drums could be damaged. 98% students responded to the question while 2% did not have any knowledge about how ear drums could be damaged. Half of the students stated that ear drum is damaged due to loud noise, 33% said that it was caused due to slapping on ear and 24.5% answered that it was a result of injury due to fall.

About 65% students thought that damaged ear drum will lead to loss of hearing ability, 31.5% felt that it could result in decrease in hearing ability and 10% expressed it could cause pain in the ear. Others thought it could cause pus in the ear.

Subsequently, the knowledge of the students was gauged about ear discharge. About 50% students were aware about ear discharge while the remaining half were completely unaware of ear discharge was. Out of the students who were aware of discharging ear, 30% thought it was caused due to infection, 13% considered it to be dirt which gathered in the ear while 5% felt it was normal secretion in ear. When asked about treatment of ear discharge 34% responded that medicines could cure ear discharge, 9% expressed it could be cured with operation while14% said both medicine & operation could cure ear discharge.

Next the students were probed about the causes of ear pain. 97.5 % students knew about causes of pain in ear. 40% student considered infection as the main cause of ear pain followed by 30% who felt that ear wax caused pain in the ear. 22.5% stated that ear pain was due to entry of water in the ear while 17%

expressed that it was due to ear discharge. Other causes cited were exposure to loud sound, injury to the ear, persistent cold and ear drum perforation.

Nearly all the students were aware that loud sound could be harmful to ears. 84% students said loud music played through ipod/ walkman could cause damage to the ear followed by 59% who stated that exposure to loudspeakers could cause harm to the ear. Other loud noises which could cause damage to the ear as mentioned by the students were noise of electric drills, traffic, shouting, firecrackers and TV played at high volume.

Next the students were probed how they would behave if they met a child wearing a hearing aid. 93% students said that they would behave in a positive way and would perform activities like looking to him while taking (42%) and talking to him loudly (13.1%). About 7% students stated that they would avoid talking to such a person or would make fun of him.

When asked about whether a deaf child could be treated about 66% had knowledge about this while the remaining 34% were unaware. 40% students said that a deaf child could be treated through operation while 26% said that hearing aids were the only option. 11.5% said that medicine could be useful in treatment of a deaf child.

Lastly the students were asked about the actions which are harmful to the ear. The actions harmful to the ear most commonly known to students were inserting stick in the ear (84.7%) and shouting in the ear (75.3%). Other actions harmful to ear stated by students were putting pencil in the ear, exposure to loud sound, exposure to fire crackers and swimming in pond water.

The study reflects a gap in the KABP of the school children about ear problems with low knowledge about ear wax and ear discharge. The practice of visiting local practitioners and resorting to OTC drugs is common among the families of school children. The knowledge about loud sound as a cause of damage to the ear was good. The children were found to have positive attitude towards people suffering from hearing impairment and deafness.

13. Procurement/usage of Equipment

a.

S.No.	Name of Equipment	Make/ Model	Cost FE/Rs	Date of Installation	Utilisation rate %	Remarks regarding maintenance/breakdown
	Nil	N.A	N.A	N.A	N.A	N.A

b. Suggestions for disposal of equipment(s)- NA

Name and signature with date

1. DR. A.K. AGARWAL
(Principal Investigator)

2. DR. SUNEELA GARG
(Co-Investigator)

REFERENCES

1) Smith A, Garms C: Alliance faces worldwide realities of Hearing loss *Hearing Health 2004*, 20:2
2) *The Global burden of disease* 2004 update, World Health Organisation
3) *Situation review and update on deafness, hearing loss and intervention programmes*, WHO, Regional Office for South east Asia, December 2007
4) Lemajić-Komazec S, Komazec Z, Vlaski L, Dankuc D: Analysis of reasons for late diagnosis of hearing impairment in children, *Med Pregl.2008*; 61 Suppl 2:21-5. .
5) Olatoke F, Ologe FE, Nwawolo CC, Saka MJ: The prevalence of hearing loss among schoolchildren with chronic suppurative otitis media in Nigeria and its effect on academic performance, *Ear Nose Throat J. 2008* Dec;87(12):E19
6) *People with disabilities in India: from commitments to outcomes*: The world Bank, May 2007
7) Kalpana R, Chamyal PC: Study of Prevalence and aetiology of hearing loss amongst school going children. *Indian journal of Otolaryngology & Head & Neck Surgery 1997*, 49(2): 142-4
8) *State of the World's children 2009*; UNICEF report
9) Hannaford PC, Simpson JA, Bisset AF, Davis A, McKerrow W, Mills R, The prevalence of ear, nose and throat problems in the community: results from a national cross sectional postal survey in Scotland, *Fam Pract. 2005* Jun;22(3):227-33
10) Pillai RK, Williams SV, Glick HA, Polsky D, Berlin JA, Lowe RA: Factors affecting decisions to seek treatment for sick children in Kerala, India, *Soc Sci Med. 2003* Sep;57(5):783-90
11) *Prevention and Control of Deafness and Hearing Impairment:* WHO, Regional Office for South east Asia, 2003
12) WHO-SEA multi-centre study on the magnitude and etiology of hearing impairment using the who ear and hearing disorders survey (WEHDS) protocol, survey results from four sea countries, submitted by Ian Mackenzie at a meeting in Delhi, SEARO HQ, in May 2001.
13) *National Sample Survey Organisation, India: Survey report 2002*
14) RamShankar M, Girirajan S, Dagan O*:* Contribution of connexin26 (GJB2) mutations and founder effect to non-syndromic hearing loss in India. *J Med Genet 2003*; 40(5):e68.
15) *Joint Committee on Infant Hearing, Position statement 1994*
16) Westerberg BD, Lee PK, Lukwago L, Zaramba S, Bubikere S, Stewart I: Cross sectional survey of hearing impairment and ear diseases in Uganda, *J Otolaryngol Head Neck Surg. 2008* Dec;37(6):753-8

17) Rout N, Parveen S, Chattopadhyay D, Kishore MT: Risk factors of hearing impairment in Indian children: a retrospective case-file study, *Int J Rehabil Res. 2008* Dec;31(4):293-6

18) Rao RS, Subramanyam MA, Nair NS, Rajashekhar B: Hearing impairment and ear diseases among children of school entry age in rural South India. *Int J Pediatr Otorhinolaryngol. 2002* Jun 17;64(2):105-10

19) Chadha SK, Agarwal AK, Gulati A, Garg A: A comparative evaluation of ear diseases in children of higher versus lower socioeconomic status. *Journal of Laryngology & Otology 2006*, 120, 16–19

20) Ruben R: Redefining the survival of the fittest: communication disorders in the 21st century. *The Laryngoscope, 2000*; 110: 241-245

21) Smith A.W.: Prevention of Deafness and Hearing Impairment in children *Scand Audiol suppl, 2001*: 53: 93-100.

22) Mencher GT: Challenge of epidemiological research in the developing world: overview. *Audiology 2000*; 39: 178-183

23) Brobby GW: Strategy for Prevention of Deafness in the Third world, *Tropical doctor, 1989*; 19(4): 152-154

24) *Report of the Informal working group on Prevention of Deafness and Hearing Impairment Program planning*, 1991, WHO/PDH/91.1. Geneva: WHO

25) Census India, report 2011

26) *Working together for Health*, The World Health Report 2006

27) Sreeramareddy CT, Shankar RP, Sreekumaran BV, Subba SH, Ramachandran H: Care seeking behaviour for childhood illness- a questionnaire based survey in Western Nepal. *BMC International Health & Human rights 2006,* 6:7

28) Pokhrel S, Sauerborn R.: Household decision making on child health care in developing countries: the case of Nepal. *Health policy plan 2004* Jul; 19(4): 218-33

29) Jimba M, Poudyal AK, Wakai S: The need for linking health care seeking behaviour and health policy in rural Nepal, *Southeast Asian J Trop Med Public Health. 2003* Jun;34(2):462-3

30) Neumark Y, Palti H, Donchin M, Ellencweig AY: Utilisation of Paediatric health services in Jerusalem, *J Community Health. 1992*;17(5):271-82

31) Smith A: *Preventing Deafness- An achievable challenge, the WHO perspective*, Presentation to IFOS World Congress Cairo, 2002

32) Cook J, Frick KD, Baltussen R, Resnikoff S, Smith A, Mecaskey J, Kilima P: loss of Vision and Hearing. *Disease control priorities in developing countries, Chapter 50*: 953-962

33) Ministry of Health and Family Welfare, Govt. of India: *mohfw.nic.in/nppcd*

34) United Nations Human Settlements Programme (UN–HABITAT): 2006 Annual report.

35) NSS 49th Round: Report on urban slums in Delhi, October 1997

ANNEXURE-1

Home Visit Proforma

Name of head of family:_____
Address: _____
_____
Number of members of family:_____
Number of children below 5 years of age: _____
5 to 15 years of age: _____
Number of persons above 60 years: _____
Is any of the persons at home suffering with:

Ear Discharge?	Yes/No
Recurrent episodes of pain in the ear?	Yes/No
Heaviness in the ear?	Yes/No
Speech problems such as non development of speech/ unclear speech?	Yes/No
Hearing loss?	Yes/No

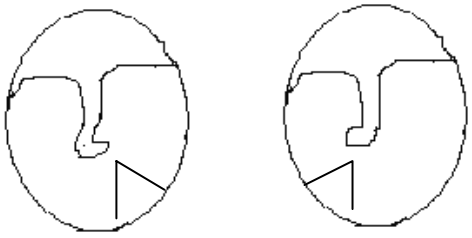
Names & Ages of the affected persons:
_____
_____

Child 1: Name/Age _____
Ear Examination

(A) External Ear:

(i) Any deformity.	Yes / No	If yes – describe
(ii) Wax	Yes / No,	If yes- slight/impacted
(iii) Any Other Pathology	Otitis externa/Otomycosis/Ear Discharge/Foreign body	

(B) Tympanic Membrane:



Right Left

(C) **Tuning Fork Test (for >5 years):**

	Right	Left
Rinne's		
Weber's		
ABC		

(D) Behavioral Observation/Voice tests: (3ths/5yrs)
Right: Normal/ambiguous/abnormal
Left: Normal/ambiguous/abnormal

(E) OAE Screening (for under 3 months):
Right: Refer / Pass
Left: Refer / Pass

(F) Impedance Audiometry: Type A/B/C/As/Ad

Diagnosis:
_____

ANNEXURE-2

नवजात शिशु की सुनने की ताकत की जाँच क्यों आवश्यक है?

हर एक व्यक्ति के लिए ठीक से सुन पाना महत्वपूर्ण है क्योंकि सुनने की ताकत ही हमारी वाणी और भाषा का आधार है।

जन्म लेने वाले 1000 बच्चों में से हो सकता है कि दो या तीन बच्चे ऐसे हों जो कि ठीक से सुन न सकते हों। कई बार माता–पिता, रिश्तेदार और यहाँ तक कि डॉक्टर भी नहीं जान पाते कि बच्चा सुन नहीं सकता।

ऐसे बच्चों की जल्द से जल्द पहचान सकना हमारे लिए बहुत महत्वपूर्ण है। यदि हम बहरेपन को जल्दी पहचान लें तो अच्छी तरह से बात कह सकने के कौशल का बच्चे में विकास और शिक्षा पाने की सामर्थ्य को सुनिश्चित करने के लिए हम यथोचित कदम उठा सकते हैं। ऐसा करने के लिए उचित है कि बच्चे के जन्म के बाद शीघ्र ही उसकी सुनने की ताकत की जाँच की जाए।

किस प्रकार सुनाई की जांच की जा सकती है।

बच्चे की सुनने की ताकत का परिक्षण 'ओ. ए. ई' नामक साधारण मशीन से हो सकता है। यह मशीन हमारे कान से ध्वनि तंरगों को लेती है और अगर उसमें कोई खास कमी हो तो उसे खोज निकालती है। जैसा कि यहां दिखाया गया है– मशीन द्वारा यह टैस्ट किया जाता है। मशीन की सिलाई को बस बच्चे के कान की कनाल के अन्दर रखा जाता है। यह सिलाई क्योंकि बहुत ही मुलायम होती है और (बेबी के अनुसार) कई मापों की होती है, इसलिए बच्चे को कुछ भी तकलीफ नहीं देती हैं। इस टैस्ट के लिए शोरगुल रहित वातावरण जरूरी है और यह भी जरूरी है कि टैस्ट के दौरान बच्चा चुप रहे और हिले–डुले नहीं। बच्चे के सोते हुए भी यह टैस्ट किया जा सकता है। इससे बच्चे को कोई तकलीफ या नुकसान नहीं होता है।

टैस्ट के क्या-क्या परिणाम हो सकते है।

टैस्ट हो जाने के बाद, टैस्ट का परिणाम हो सकता है:-

1. पास– यानि कि बच्चे की सुनने की ताकत सामान्य है इसलिए और किसी परीक्षण की जरूरत नहीं है।
2. रैफर– यानि कि दोबारा चैक करने की जरूरत है, क्योंकि पहले टैस्ट में स्पष्ट प्रतिक्रिया प्राप्त नहीं की जा सकती। ऐसी स्थिति में जोर देकर कहा जाता है कि दूसरा टैस्ट दी गई तिथि पर अवश्य किया जाये।
3. यदि किसी कारण बच्चा बैचेन है या वातावरण शोर–भरा है तो टैस्ट नहीं किया जा सकता। हम दुबारा टैस्ट करना उचित समझेंगे अगर आपको अस्पताल से छुट्टी मिल गई है अगर यह सम्भव न हो तो उचित समय बताएं जिस दिन सुनाई की जाँच की जा सके।

ऐसी स्थिति में बच्चे को घर भेजने से पहले दुबारा टैस्ट किया जाना चाहिए यदि किसी कारण से ऐसा सम्भव न हो माता–पिता को चाहिए कि अगली बार अस्पताल आने पर टैस्ट अवश्य करायें।

बचपन के बाद जीवन में कभी भी सुनने की ताकत में कमी आ सकती है सभी बच्चों में सुनने की ताकत और बोलने की कौशल के विकास की एक एक सामान्य प्रकृतियां होती है। यदि नीचे दिए गए मानदण्डों पर कोई बच्चा खरा नहीं उतरता तो कृपया उस बच्चे की श्रवण शक्ति का परीक्षण करायें।

0–3 माह:

- धमाके जैसी जोरदार आवाज के प्रति प्रतिक्रिया न कर पाना। इतनी जोरदार आवाज की प्रतिक्रिया में हो सकता है कि बच्चा आँखे झपकायें, जाग जाये या फिर रोने लगे।

3–6 माह:

- बच्चा अपनी माँ की आवाज न पहचान सके और उस दिशा में सर को न घुमा सके।
- नई आवाजों में उसे रूचि न दिखे।
- आवाज जिस ओर से आ रही है उस ओर घूम न सके।

6–9 माह:

- बच्चा शोर करने वाली आवाजे न निकाले।
- चूं–चूं, पीं पीं, करने वाले खिलौनों में रूचि न दिखाए।

9–12 माह:

- बच्चा अपने नाम के प्रति प्रतिक्रिया न करे।
- 'आओ' 'बाय' जैसे छोटे–छोटे शब्दों को न समझ ना।

ANNEXURE-3

QUESTIONNAIRE FOR STUDENTS

Name: ……. Age/sex: …… ID no……

1. What are the ear problems commonly encountered in children? (tick as many as required)
    a. Ear wax
    b. Fluid in ear
    c. Ear discharge
    d. Hearing loss
    e. Foreign body in the ear
    f. Fungus in ear
    g. Deafness
    h. Age related hearing loss
    i. Any other……..

2. Which of these, do you think, is the most serious?.....

3. Have you suffered any ear problems in the past one year? Yes/No
   If yes, what is the nature of the problem?……

4. Did you seek any consultation for the problem? Yes/No
   4.1 If yes, from whom?

    a. General practitioner
    b. ENT Specialist
    c. Ayurvedic doctor
    d. Homeopathic doctor
    e. Quack
    f. Dai
    g. Health centre
    h. Any other, please specify: ……

5. What is Ear Wax?
    a. Normal secretion in the ear
    b. Dirt which gathers in our ears when we don't clean it properly.
    c. A foreign body (from outside)
    d. Caused by infection in the ear
    e. Any other…….

6. Do you think that anything needs to be done for wax in the ear? Yes /No

7. Which of the following methods is best for cleaning the ear?
    a. Clean with towel/hanky from outside only
    b. Clean with an earbud.
    c. Get it cleaned by local ear cleaners

d. Any other: ……

8. How can the ear drum be damaged?
    a. Injury due to a fall
    b. Foreign body in the ear
    c. slap on the ear
    d. Infection
    e. Any other……..

9. Damage to ear drum will lead to:
    a. Decrease in hearing ability.
    b. Loss of hearing ability.
    c. Pus discharge from ear.

10. What is Ear Discharge?
    a. Normal secretion in the ear
    b. Dirt which gathers in our ears when we don't clean it properly.
    c. A foreign body (from outside)
    d. Caused by infection in the ear
    e. Any other…….

11. How can discharging ear be cured?
    a. Medicines
    b. Operation
    c. Medicines & Operation
    d. It CANNOT be cured
    e. Resolves spontaneously

12. Which of the following can cause severe pain in the ear? (tick as many as required)
    a. Wax
    b. Infection
    c. Ear discharge
    d. Hearing loss
    e. Entry of water in ear

13. Can loud sounds harm our ears? Yes/No

14. Which of the following noises can harm our ears (tick as many as required)
    a. Loud music through I-Pod, Walkman etc
    b. Bhajan played through loudspeakers
    c. Sound of an electric drill
    d. TV played at low volume

15. If you meet another child wearing a hearing aid, do you:
    a. Laugh at him?
    b. Find him strange and so avoid talking to him
    c. Tend to talk loudly with him

d. Try to talk to him so that he can see you

16. How do you think a deaf child can be treated?
    a. No treatment
    b. Hearing Aids
    c. Medicines
    d. Operation
    e. Any other

17. Which of the following actions can be harmful? (tick as many as required)
    a. Putting oil in ear
    b. Inserting a stick into ear
    c. Using an ear bud
    d. Putting any object into the ear, such as pencil, bead, grains etc
    e. Clean tap water entering into the ear while bathing
    f. Pond water entering into the ear while swimming
    g. Listening to loud music
    h. Use of noise producing firecrackers
    i. Shouting near someone's ear
    j. Getting ear cleaned by local ear cleaner

ANNEXURE-4

GUIDELINES FOR FOCUS GROUP DISCUSSION

STUDENTS

- The discussion with students shall be held in the school premises. One of the classrooms shall be used for this purpose
- 9-10 participants shall be chosen for each group discussion. One class shall be identified in each school for the group discussion in order to ensure participation of the all the ages from 10-14 years old. The participants shall be picked up randomly from the class and included for the group discussion.
- Boys and girls shall be in separate groups.
- The seats within the class shall be arranged in a circular manner to facilitate discussion.
- The Discussion shall be facilitated by a Facilitator and recorded by a recorder.
- The facilitator shall introduce the topic briefly in the first 10 minutes.
- The facilitator shall
    - Build a rapport with the participants and try to maintain an informal environment.
    - Encourage the participants to discuss the various aspects of the topic.
    - Ensure that all participants have an equal opportunity to express their views.
    - shall resolve any conflict of ideas/opinions amicably
- The discussion will be included in approx. 50 minutes
- The discussion points and views expressed shall be noted down by the recorder
- The main topics of discussion shall include:
    - The five senses of the body and their importance
    - Importance of ear and hearing
    - Care of the ears in a normal person
    - Common problems of the ear
    - Common myths and beliefs regarding ear care and hearing
    - Experiences regarding ear problems and actions they/their parents initiated.

- How can you prevent ear diseases/HI
- What role can they play in Primary ear and hearing care.

ANNEXURE-5

QUESTIONNAIRE FOR TEACHERS

Name: …….. Age/sex: …… ID no……

1. What are the ear problems commonly encountered in children? (tick as many as required)
    a. Ear wax
    b. Fluid in ear
    c. Ear discharge
    d. Hearing loss
    e. Foreign body in the ear
    f. Fungus in ear
    g. Deafness
    h. Age related hearing loss
    i. Any other……..

2. Which of these, do you think, is the most serious?.....

3. Has any child in your class suffered any ear problems in the past one year? Yes/No
   If yes, what is the nature of the problem? ……

4. What action did you take for this problem?
    a. Send a note for the student's parents
    b. Refer him/her to the school doctor
    c. Send the child home
    d. Advise the child to consult a doctor

5. Which of the following can cause severe pain in the ear? (tick as many as required)
    a. Wax
    b. Infection
    c. Ear discharge
    d. Hearing loss
    e. Entry of water in ear
    f. Any Other ……..

6. What action would you take in case your child complains of severe pain in the ear?
    a. Send him home
    b. Send him to the doctor in the school
    c. Give him some medicine
    d. Advise the parents to take him to a doctor
    e. Ask the parents to instil hot oil in the ear
    f. Ignore him as its not your concern
    g. Any Other ……..

7. What is Ear Wax?
    a. Normal secretion in the ear
    b. Dirt which gathers in our ears when we don't clean it properly.
    c. A foreign body (from outside)
    d. Caused by infection in the ear
    e. Any other……..…

8. Which of the following methods is best for cleaning the ear?
    a. Clean with towel/hanky from outside only
    b. Clean with an ear-bud.
    c. Get it cleaned by local ear cleaners
    d. Any other: ……

9. How can the ear drum be damaged?
    a. Injury
    b. Infection
    c. Both
    d. Any other……..

10. Damage to ear drum will lead to:
    a. Decrease in hearing ability.
    b. Loss of hearing ability.
    c. Pus discharge from ear.
    d. Any Other ……...

11. Have you ever slapped a child in your class?
    Yes/No

12. Are you aware that slapping over the ear can cause it to perforate?
    Yes/No

13. What is Ear Discharge?
    a. Normal secretion in the ear
    b. Dirt which gathers in our ears when we don't clean it properly.
    c. Caused by infection in the ear
    d. Any other…….

14. If a child has discharging ear, what sort of problems do you think he can have (tick as many as required)
    a. Difficulty in hearing
    b. Pain in ear
    c. Serious, life threatening illness

15. If there is a child with discharging ear in your class, what action would you take?
    a. Make him sit separately
    b. Make him sit in the front of the class
    c. Send him home to seek treatment as it may infect other children
    d. Send him to school doctor
    e. Ignore as it is not your concern

f. Any
Other……

16. How can discharging ear be cured?
    a. Medicines
    b. Operation
    c. Medicines & Operation
    d. It CANNOT be cured
    e. Resolves spontaneously

17. Can loud noises harm our ears? Yes/No

18. Which of the following noises can harm our ears (tick as many as required)
    a. Loud music through I-Pod, Walkman etc
    b. Bhajan played through loudspeakers
    c. Sound of an electric drill
    d. TV played at low volume

19. Can a Deaf child be treated? Yes/No

19.1If Yes, how

    a. Hearing Aids
    b. Medicines
    c. Operation
    d. Any other……

19.2 If No, why not?

    a. A deaf child cannot learn to speak as he cant hear
    b. A deaf child is also dumb
    c. That is what I have seen
    d. I don't think any treatment exists

20. Do you think that children with hearing loss, who wear hearing aids can be admitted to regular schools and study alongwith other children?
    Yes/No

21. Has your school given admission to any child who is suffering with Hearing impairment? Yes /No

22.1 If yes, Is the school giving any special care to such a child?

    a. Special seating arrangement
    b. Special training to teachers
    c. Special teachers for hearing impaired children are available in our school
    d. Any
    Other……
    …..

22. How do other children mostly treat a child with hearing loss?
    a. They often make fun of him/her
    b. They stay away from him/her as they don't know how to communicate
    c. They are helpful and sympathetic towards such a child
    d. Any
       Other……
       …

23. Which of the following actions can be harmful? (tick as many as required)
    a. Putting oil in ear
    b. Slap over the ear
    c. Inserting a stick into ear
    d. Using an ear bud
    e. Clean tap water entering into the ear while bathing
    f. Pond water entering into the ear while swimming
    g. Listening to loud music
    h. Use of noise producing firecrackers
    i. Shouting near someone's ear
    j. Getting ear cleaned by local ear cleaner

ANNEXURE-6

GUIDELINES FOR FOCUS GROUP DISCUSSION

TEACHERS

- The discussion with teachers shall be held in the school premises. One of the classrooms or a suitable staff room shall be used for this purpose.
- 10 teachers from each school shall be chosen for each group discussion.
- Males and females shall be in separate groups.
- The seats within the room shall be arranged in a circular manner to facilitate discussion.
- The Discussion shall be facilitated by a Facilitator and recorded by a recorder.
- The facilitator shall introduce the topic briefly in the first 10 minutes.
- The facilitator shall
    - Build a rapport with the participants and try to maintain an informal environment.
    - Encourage the participants to discuss the various aspects of the topic.
    - Ensure that all participants have an equal opportunity to express their views.
    - shall resolve any conflict of ideas/opinions amicably
- The discussion will be included in approx. 50 minutes
- The discussion points and views expressed shall be noted down by the recorder
- The main topics of discussion shall include:
    - Importance of ear and hearing
    - Care of the ears in a normal person
    - Common problems of the ear
    - Common myths and beliefs regarding ear care and hearing
    - Experiences regarding ear problems and actions initiated, type and place of care sought.
    - Treatment of ear diseases/deafness
    - How the teacher can suspect that a child may be suffering with ear disease/hearing loss
    - Special care required by a hearing impaired child in school
    - Prevention of ear diseases/Hearing impairment.
    - Role of teacher in ear and hearing care

- Awareness regarding ear care services in their area.

ANNEXURE-7

QUESTIONNAIRE FOR PARENTS

1. What are the ear problems commonly encountered in children? (tick as many as required)
    a. Ear wax
    b. Fluid in ear
    c. Ear discharge
    d. Hearing loss
    e. Foreign body in the ear
    f. Fungus in ear
    g. Deafness
    h. Age related hearing loss
    i. Any other……..

2. Which of these, do you think, is the most serious?.....

3. Has any child in your family suffered any ear problems in the past one year? Yes/No
   If yes, what is the nature of the problem? ……

4. Did you seek any consultation for the problem? Yes/No

4.1 If yes, from whom?

    a. General practitioner
    b. ENT Specialist
    c. Ayurvedic doctor
    d. Homeopathic doctor
    e. Quack
    f. Dai
    g. Health centre
    h. Any other, please specify: ……

4.1.1 Why did you prefer the chosen facility:
    a. Advised by someone
    b. Faith in the system
    c. Available locally
    d. Free of cost
    e. User friendly facility
    f. Easy access and follow up
    g. Any other

4.2 If No, why not?
    a. No service/doctor available in my area
    b. It is too expensive
    c. The behaviour of hospital/clinical staff is very rude

d. The timing of clinic is not suitable
e. There is no one to accompany the child
f. Did not think that this required medical attention

5. Are you aware that a child can be born deaf?
   Yes/No

6. If Yes, what are the likely causes?
   a. Poor maternal nutrition
   b. Low weight of the baby
   c. Maternal Infections during pregnancy
   d. Deafness in the family
   e. If the child does not cry at time of birth
   f. Jaundice after birth
   g. Inability to take proper feeds
   h. Meningitis (brain fever)
   i. Peumonia in the child
   j. Certain medicines/injections

7. How early in life can we suspect that a child is deaf?
   a. Soon after birth
   b. One month old
   c. 3 months old
   d. 6 months old
   e. 1 year old
   f. 2 years old
   g. > 2 years

8. What do you think is the earliest age at which the hearing of a baby can be tested?
   a. Soon after birth
   b. One month old
   c. 3 months old
   d. 6 months old
   e. 1 year old
   f. 2 years old
   g. > 2 years

9. If a baby does not respond to sounds or is late in speaking, it could be because:
   a. He/she is a slow learner
   b. His/her parents were slow learners
   c. He/she has a hearing loss
   d. Some children start late and catch up later
   e. Any other……

10. What measures are required for such a baby?
    a. Wait till the child is 1 year old and then take for a check up
    b. Wait till the child is 2 years old and then take for a check up
    c. Take for hearing and ear check up immediately
    d. No need for check up as there is no cure for deafness
    e. Any other……

11. Can a Deaf child learn to speak? Yes/No

12. How do you think a deaf child can be treated?
    a. No treatment
    b. Hearing Aids
    c. Medicines
    d. Operation
    e. Any other……

13. What is Ear Wax?
    a. Normal secretion in the ear
    b. Dirt which gathers in our ears when we don't clean it properly.
    c. A foreign body (from outside)
    d. Caused by infection in the ear
    e. Any other……

14. Which of the following methods is best for cleaning the ear?
    a. Clean with towel/hanky from outside only
    b. Clean with an ear-bud.
    c. Get it cleaned by local ear cleaners
    d. Any other: ……

15. How can the ear drum be damaged?
    a. Injury
    b. Infection
    c. Both
    d. Any other

16. Damage to ear drum will lead to:
    a. Decrease in hearing ability.
    b. Loss of hearing ability.
    c. Pus discharge from ear.
    d. Any Other ……...

17. Which of the following can cause severe pain in the ear? (tick as many as required)
    a. Wax
    b. Infection
    c. Ear discharge
    d. Hearing loss
    e. Entry of water in ear
    f. Any Other ……...

18. What action would you take in case your child complains of severe pain in the ear?
    a. Give him some medicine for the pain
    b. Instil hot oil in the ear
    c. Instil hot oil with garlic into the ear
    d. Take him to a local doctor
    e. Take him to an ear specialist

f. Any Other ……..

19. What is Ear Discharge?
    a. Normal secretion in the ear
    b. Dirt which gathers in our ears when we don't clean it properly.
    c. A foreign body (from outside)
    d. Caused by infection in the ear
    e. Any other……

20. How can discharging ear be cured?
    a. Medicines
    b. Operation
    c. Medicines & Operation
    d. It CANNOT be cured
    e. Resolves spontaneously
    f. Any Other ……..

21. Which of the following noises can harm our ears (tick as many as required)
    a. Loud music through I-Pod, Walkman etc
    b. Bhajan played through loudspeakers
    c. Sound of an electric drill
    d. TV played at low volume
    e. Any Other……..

22. If you meet a person wearing a hearing aid, do you:
    a. Laugh at him?
    b. Find him strange and so avoid talking to him
    c. Tend to talk loudly with him
    d. Try to talk to him so that he can see you
    e. Any Other ……..

23. If your child develops any problem in the ear would you like to take him/her for treatment? Yes/No

24. Do you think that you would like to take your girl child to the hospital for any treatment? Yes/No

25. If No, what is the reason?
    a. I don't like to take my girl child outside too much
    b. Girls don't need so much attention
    c. If people come to know that there is a problem in my daughter's ear/s, there will be problem in the future
    d. I have too many children to bother about the girls so much
    e. Any Other……

26. Which of the following actions can be harmful? (tick as many as required)
    a. Putting oil in ear
    b. Inserting a stick into ear
    c. Using an ear bud

d. Putting any object into the ear, such as pencil, bead, grains etc
e. Clean tap water entering into the ear while bathing
f. Pond water entering into the ear while swimming
g. Listening to loud music
h. Use of noise producing firecrackers
i. Shouting near someone's ear
j. Getting ear cleaned by local ear cleaner
k. Any Other ……

ANNEXURE-8

GUIDELINES FOR FOCUS GROUP DISCUSSION

MPW

- The discussion with MPWs shall be held in the primary/secondary health centre premises.
- 10 workers shall be included in one group
- The chairs within the room shall be arranged in a circular manner to facilitate discussion.
- The Discussion shall be facilitated by a Facilitator and recorded by a recorder.
- The facilitator shall introduce the topic briefly in the first 10 minutes.
- The facilitator shall
    - Build a rapport with the participants and try to maintain an informal environment.
    - Encourage the participants to discuss the various aspects of the topic.
    - Ensure that all participants have an equal opportunity to express their views.
    - shall resolve any conflict of ideas/opinions amicably
- The discussion will be included in approx. 50 minutes
- The discussion points and views expressed shall be noted down by the recorder
- The main topics of discussion shall include:
    - Importance of ear and hearing
    - The hearing and language development milestones in an infant.
    - Perception of deafness: its identification, diagnosis, treatment.
    - The perception of their own roles in this process
    - Care of the ears in a normal child
    - Common problems of the ear
    - Treatment of ear diseases/deafness
    - Common myths and beliefs regarding ear care and hearing
    - Experiences regarding ear problems and actions initiated, type and place of care sought.
    - How can a health care worker suspect HI in a child
    - How can you prevent ear diseases/HI
    - Role of MPW in Primary ear and hearing care.

- Awareness regarding ear care services in their area.

ANNEXURE-9

GUIDELINES FOR IDI: STUDENTS

- The Interview shall be conducted by the researcher.
- A rapporteur shall be present. Efforts shall be made to record the conversation.
- The interviewee shall be informed about the subject matter on which he/she has to be interviewed. Information sheet shall be provided.
- Informed consent for participation in the study shall be sought.
- Confidentiality will be maintained.
- Senior Students between the ages of13-15 will be chosen for the IDI.
- The interview shall start by asking the students if he/she has suffered any problem in the ear or knows of anyone who has.
- The interviewer shall try to bring out various aspects of:
    - Knowledge
    - Attitude towards ear problems, hearing disabled
    - Common practices undertaken regarding ear care
    - Type and nature f care sought for ear related problems
    - Perceived barriers for seeking ear care
- The interviewer shall ask open ended questions and encourage the subject to express his/her views without prompting
- Gentle encouragement shall be given in between by asking the students to go on or asking another open ended questionnaire.
- Care shall be taken to avoid influencing the interviewee by the thoughts and attitudes of the interviewer.
- The resulting information shall be compiled by the rapporteur and later analysed.

ANNEXURE-10

GUIDELINES FOR IDI: PARENTS

- The Interview shall be conducted by the researcher.
- A rapporteur shall be present. Efforts shall be made to record the conversation.
- The interviewee shall be informed about the subject matter on which he/she has to be interviewed. Information sheet shall be provided.
- Informed consent for participation in the study shall be sought.
- Confidentiality will be maintained.
- Parents of those children who are suffering with an ear problem, shall be chosen for the IDI.
- The interview shall start by asking the parents regarding the ear/hearing problem suffered by their child.
- The interviewer shall try to bring out various aspects of:
    - Knowledge
    - Attitude towards ear problems, hearing disabled
    - Common practices undertaken regarding ear care
    - Type and nature of care sought for ear related problems
    - Perceived barriers for seeking ear care
- The interviewer shall ask open ended questions and encourage the subject to express his/her views without prompting
- Gentle encouragement shall be given in between by asking the parents to go on or asking another open ended questionnaire.
- Care shall be taken to avoid influencing the interviewee by the thoughts and attitudes of the interviewer.
- The resulting information shall be compiled by the rapporteur and later analysed.

ANNEXURE-11

GUIDELINES FOR IDI: SERVICE PROVIDERS

PHC DOCTORS: 10
DISTRICT ENT DOCTORS: ALL
GENERAL PRACTITIONERS: 20
TERTIARY LEVEL DOCTORS: 10

- The Interview shall be conducted by the researcher.
- A rapporteur shall be present. Efforts shall be made to record the conversation.
- The interviewee shall be informed about the subject matter on which he/she has to be interviewed. Information sheet shall be provided.
- Informed consent for participation in the study shall be sought.
- Confidentiality will be maintained.
- The interview shall start by asking the doctor regarding the number of patients of ear and hearing problems that they encounter in their day to day routine practice.
- They shall be asked about what the common ear problems seen by them and their possible causes.
- Their baseline knowledge regarding ear wax, Otitis media, complicationsof Otitis media and deafness will be assessed by asking open ended questions.
- They shall be asked regarding their treatment protocols for:
    - Pain in the ear
    - Acute Otitis media
    - Discharging ear
- They shall be asked about the patients/conditions they treat on their own and the ones they refer.
- Where and whom are the referrals made to
- Information shall be sought regarding their knowledge about:
    - ENT surgeries
    - Hearing aids
    - Rehabilitation measures for a deaf child
    - Importance of early identification and rehabilitation of a deaf child.
    - Potential complications of CSOM
    - National programme for Prevention and Control of Deafness
- They shall specifically be asked about the guidance they provide to a parent of an infant/child with suspected deafness/hearing loss
- The interviewer shall try to bring out various aspects of:

    - Knowledge
    - Attitude towards ear problems, hearing disabled
    - Common practices undertaken regarding ear care
    - Types and places of referral
- The interviewer shall ask open ended questions and encourage the subject to express his/her views without prompting.
- Care shall be taken that the questions are asked in an open and friendly manner without causing any offence. The interviewer shall take care to never be judgemental towards the interviewee.
- Gentle encouragement shall be given in between by asking the doctor to go on or asking another open ended questionnaire.
- Care shall be taken to avoid influencing the interviewee by the thoughts and attitudes of the interviewer.
- The resulting information shall be compiled by the rapporteur and later analysed.

ANNEXURE-12

PERFORMA FOR STATE & CENTRAL LEVEL OFFICIALS

1. What is your perception about the extent of deafness in the community and importance of its early diagnosis and rehabilitation?

2. What common ear related problems do you think are prevalent in the community among the following subgroups?

    - Infants
    - Adolescents (10-19 years)
    - Males & Females (20-60 years)
    - Males & Females of 60 years and above

3. What do you think are the barriers and challenges for access to ear and hearing care services in the population?

4. Do you think women in the community are not able to access ear and hearing care services due to reasons such as stigma, prevalent myths and misconceptions etc.?

5. What are the measures being taken by the Government of Delhi to address hearing related problems in the state?

6. Are you aware of the measures being undertaken by the Government of Delhi to overcome the following:-
    - Infant Deafness
    - Adolescents (10-19 years)
    - Males & Females (20-60 years)
    - Males & Females of 60 years and above

7. The Government initiated the National Programme for Prevention and Control of Deafness (NPPCD) in 2006? What are your views on the programme? In how many districts of Delhi has the programme been implemented?

8. In your opinion, what strategies should be developed to overcome deafness among adults, school children and deafness?
    - All infants should be screened
    - Regular screening at school level
    - Screening at community level

9. In your opinion, what strategies should be adopted to create awareness in the society regarding ear health?

10. Are you aware of Sound Hearing 2030 initiative which has the mandate of eliminating avoidable deafness by year 2030?

11. What would be your suggestions to improve the ear care services among adults and children in the state?