

Knowledge And Attitude of Nurses Towards Infant Hearing Impairment in Bihar.

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I. INTRODUCTION

Hearing is one of the most important primary senses which help in the proper development of speech, language, and communication with the hearing world. Unfortunately, hearing is often neglected and people usually fail to realize its importance unless it is diminished or reduced gradually. Childhood hearing impairment can have profound effects on overall development, interpersonal communication, quality of life, and daily function (Sanju et al., 2018 & Kunnath et al., 2021). In India out of 1000 neonates approximately 5-6 infants are diagnosed with hearing impairment (HI). According to the Rehabilitation Council of India (2000) 4 out of every 1000 live births were found to have severe to profound hearing loss (HL). HI can occur as early as at birth, and is termed as congenital HI, which usually goes unnoticed by parents and by caregivers.

HI can be a substantial barrier to children's education and social integration. Early identification and intervention for HI can provide important benefits because hearing is critical for learning oral communication, as well as academic and social participation (Alsudays et al., 2020).

The Joint Committee on Infant Hearing (JCIH) in 2000 listed 10 factors that identify infants at greatest risk for HI. This list was updated in 2007 and such risk factors were added as treatment in the intensive care unit for more than 5 days and for assisted ventilation. Some studies report additional risk factors such as premature birth, low birth weight, respiratory distress syndrome and intracranial hemorrhage.

In some countries, newborn hearing screening (NHS) has become a widespread tool for the early detection of HI, while in other countries such screening is considered to be too costly and its value is questioned. Even when it is available, there is no consistent approach to NHS and there is often great variation within individual countries. The reasons for this are not always financial. Some wealthy countries have fragmented and ineffective programmes while a number of less-wealthy countries have very successful programmes.

Universal newborn hearing screening (UNHS) has been implemented and has been the standard of care in various countries, with the purpose of detecting children with HI by an early age and providing them with the necessary intervention.

Since October 2007, JCIH has launched the “Early Detection and Hearing Intervention (EDHI) 1-3-6 Plan”. This plan is outlined in three principles. First, to screen all children by a physiologic measure otoacoustic emissions (OAE) test no later than 1 month of age. Second, for children who do not pass the hearing screening, a confirmatory hearing test ABER (Auditory Brainstem-evoked Response test) should be performed before the age of 3 months. And finally, hearing intervention should be initiated as soon as hearing loss HL is confirmed but no later than the age of 6 months. This includes the best available technology and instruments, such as hearing aid (HA), bone anchored hearing aid (BAHA) bands, cochlear implants (CI) or other assistive listening devices (ALDS) when appropriate. Currently with such a screening program, over 90% of newborns are screened and diagnosed early. It has been mandatory for every newborn since 2014 to get enrolled in an NHS program.

Training nurses to perform hearing screening is critical and ongoing. It is possible that as nursing staff turnover, this staffing change can impact the quality of the NHS process, American Speech-language Hearing Association (ASHA, 2012). While maintaining professional competence belongs to each individual nurse, the accountability is also shared with the employer. It is the employer's role to provide a practice environment favourable for the nurse to maintain these competencies. “Assurance of competence is the shared responsibility of the profession, individual nurses, professional organizations, credentialing and certification entities, regulatory agencies, employers, and other key stakeholders”, American Nurse Association (ANA, 2010). In one study with a UNHS program established by nurses, competencies were developed for all staff involved in the hearing screening process (Brennan, 2004). The Nurse Educator, whether in an academic or healthcare setting, has a unique role to teach the principles of NHS to nursing students and/or nursing staff. This role involves being aware of the most current evidence-based guidelines to provide optimal care. It is essential for the nurse to be up to date on policy changes, equipment recommendations, screening protocols in order to offer excellent patient care (Selekman, 2002).

Nurses working in well-baby nursery and Newborn Intensive Care Unit (NICU) are often the point of contact for promoting and administering hearing screening, documentation, counselling parents and ensuring follow-up care. Therefore, the nurse as a care provider, advocate and educator, for patients and families is crucial (Hollenbeck, 2008). Nurses are familiar with newborn and infant developmental milestones. Information provided in a nursing curriculum includes speech and language developmental milestones. In some hospitals, an audiology department is available to do the NHS. Other hospitals have Registered Nurses (RNs) to perform the hearing screenings. In a study comparing practice and protocol data in hospital-based UNHS programs, 93% of facilities reported NHS were performed in the well-baby nursery by nursing staff; specifically, RNs and technicians. The NICU reported 87% of the screenings were performed by nurses and some patients were screened by technicians (Ferro et al., 2006).

II. REVIEW OF LITERATURE

Hearing impairment in children across the world constitutes a particularly serious obstacle to their optimal development and education, including language acquisition. According to a range of studies and surveys conducted in different countries, around 0.5 to 5 in every 1000 neonates and infants have congenital or early childhood onset sensorineural hearing loss (SNHL) or severe-to-profound HI. Deaf and hearing-impaired children often experience delayed development of speech, language and cognitive skills, which may result in slow learning and difficulty progressing in school.

In countries where NHS is conducted it is assumed that the vast percentage of babies born deaf can be helped and their futures immeasurably improved. However, issues such as quality control, screening methods, follow-up and cost effectiveness need to be thoroughly discussed and reviewed. Quality assurance issues in particular are vital to successful NHS and related interventions – in some settings it is estimated that the poor training and performance of screeners renders up to 80% of screening useless. For many countries, one major challenge is the lack of contact between the majority of mothers and their babies and the health system with about half of all global births occurring at home without skilled care. In many settings there is no continuum of care from pregnancy.

Audiologists should have a basic awareness of their condition in terms of paediatric HL knowledge and attitude and extensive audiological management to provide appropriate information to nurses. This, along with collaboration with other professionals, can lead to a better referral for a potential permanent HL that can be prevented with early identification and intervention (Ravi et al., 2017; Sanju et al., 2020).

The pervasive effect HL has on speech and language development is a well-known fact. However, HL in newborns can be an invisible or a concealed disability that usually manifests after the first year of life due to delayed speech and language development. Parents, however, typically do not become suspicious until the second year of a child's life (Gopal et al., 2001).

WESTERN STUDIES:

Chapmann and Burchfield (2008) showed that majority of the nurses have inadequate training and knowledge regarding the healthcare assistance for individuals with HI. Results also suggested that there is an extreme need to provide additional training with respect to HL and care regarding HA among nurses.

Vázquez, Berruecos and Cacho (2009) conducted a study to evaluate attitude and knowledge of HL among medical doctors selected to initiate a residency in Mexico. Results suggested that physician's knowledge level on the matter is deficient and their attitude is far from ideal but physicians selected for a residency in audiology showed slightly better results.

Khan, Joseph and Adhikari (2018) conducted a study of the hearing screening experiences and practices of primary health care nurses : indications for referral based on high-risk factors and community views about HL. Result revealed that one-third of primary health care nurses had never screened a child for HL, and most clinics did not have access to basic hearing screening equipment or materials.

Lam, et al. (2018) have reported on maternal knowledge and attitudes to UNHS. Reviewing an established program the survey results highlighted the need to provide more information to parents about infant hearing development to support home monitoring for signs of HL after UNHS, as well as more detailed explanation and information regarding hearing screening and the implications of results to parents. Regardless of location, surveys of this type may provide valuable support for UNHS program quality assurance.

Jones, Lambert and Barnett (2018) conducted a study on Nursing students: Training and maintaining UNHS knowledge. Overall, these findings support the benefit of this UNHS training program in nursing schools. Results indicated that all participants rated an increase in confidence (or comfort) levels with UNHS procedures following the training program.

Ismail, et al. (2018) examined the factors predicting health practitioners' awareness of UNHS program in Malaysian non-public hospitals. Results of the study imply that, having started the UNHS program in 2003, non-public hospitals have more experienced and well-trained employees dealing with the screening tools and instrument.

Sirirattawan and Khuancharee (2019) did a study in UNHS: Knowledge of Thai Healthcare Personals. The overall knowledge score of post training was higher than that pre-training.

Results suggested that there is also a need for continuous educational initiatives for the healthcare personals on intensively proper NHSP training workshop.

Mohamed, Hassan and Aly (2022) studied the Knowledge and Attitude of Nurses Regarding Newborn HI and Screening at Health Centres and clinics in Assiut City. Results revealed that nurses had poor knowledge and attitude regarding newborn HI.

Malas, et al. (2022) evaluated the study on Pediatrician's knowledge and attitude toward hearing loss and newborn hearing screening programs. Results revealed that there was a gap in the knowledge of our pediatricians with regard to the process of dealing with a newborn who failed screening program and the candidacy for cochlear implants. Also, some participants were unsure whether to refer a child with HI to an otolaryngologist or not.

Khirala, Safaan and Amr (2023) conducted a study to assess effect of training intervention on enhancing knowledge and practice of primary health care nurses regarding NHS. Results revealed that on post and retention tests showed a highly significant improvement in hearing screening practice than in the pre-test. There was a highly statistically significant improvement in both knowledge and practice among studied nurses.

Kanji and Jamal (2023) did a study to identify, the role and reported practices of paediatricians in the early identification and monitoring of HI in high-risk newborns and infants in University of the Witwatersrand, South Africa. Results revealed that paediatricians had sufficient knowledge regarding the assessment of HI and their role in the early hearing detection and intervention programme. There is however a need for information sharing regarding appropriate hearing screening measures.

Kaspar, et al. (2023) assessed the knowledge and attitudes of 150 female caregivers in Samoa to childhood HL and hearing services. Results showed that there is positive support for community-based hearing health services for children among female caregivers of Samoa. There was high awareness of otitis media as a major cause of childhood HL, as well as good knowledge of public health measures that reduce/minimise the risk of otitis media.

Graham, et al. (2023) conducted a study on Development of a questionnaire to assess mothers' knowledge, attitudes and practice with regard to childhood hearing loss and UNHS. Results revealed evidence of the validity and reliability of parental knowledge and attitude regarding childhood HL and newborn hearing screening was scarce.

INDIAN STUDIES:

Ravi, et al. (2016) examined the Knowledge and Attitude (KA) survey regarding infant HL in Karnataka, India. Results revealed that Mothers exhibited good knowledge and attitude towards infant HL in Karnataka and also facilitate identification of potential areas of less knowledge as a reference for endeavors of enhancement.

Ravi, et al., (2017) evaluated a national survey of knowledge, attitude and practices among pediatricians towards NHS in India. Overall the pediatricians were confident about their knowledge on this topic yet expressed a need to know more about several intricacies about hearing screening.

Sanju, et al. (2018) studied the knowledge and attitude of nurses towards infant HI in North India. Results of the study revealed poor knowledge and attitude towards HI of infants among nurses across north India. Henceforth, there is an urgent need to educate these professionals as prevention is better than cure.

Reeham and Gupta (2021) assessed the proficiency of current practice in NHS among 115 nurses (21-25 years) who were randomly selected from government, corporate and private nursing care in Kerala. The Malayalam questionnaire was translated and adapted from an English questionnaire (Sanju et al., 2018) and was based on a 3-point rating scale and consisted of 22 questions based on knowledge and attitude towards HL in newborns. The results of the study revealed that only few nurses in Kerala showed poor attitude and knowledge towards NHS and the issues related to it.

Kaviya and Gupta (2021) in a similar study assessed the proficiency of current practice in NHS among 115 nurses (21-25 years) who were randomly selected from government, corporate and private nursing care in Tamil Nadu and consisted of 22 questions based on knowledge and attitude towards HL in newborns. Results revealed that only few nurses in Tamil Nadu showed poor attitude and knowledge towards NHS and the issues related to it.

Sharma, et al. (2022) studied the knowledge and attitude of nurses about NHS in Nepal. National Institutes of Health's Consensus Development Conference on Early Identification of HL had reasoned that all infants should be screened for HI. The Results of this article suggested a lack of proper knowledge and practice of NHS in Nepal.

Hajare and Mudhol (2022) conducted a study of JCIH Risk Factors for HL in babies of NICU and Well Baby Nursery at a Tertiary Care Center. Results revealed that family history of deafness, anemia and hypertension in Antenatal care (ANC), Toxoplasmosis, rubella, cytomegalovirus, herpes simplex and HIV (TORCH) in mother, low Apgar score and hyperbilirubinemia in newborns were a major risk factors for HI.

Keerthi, et al. (2023) examined an exploratory study of nurses' knowledge, skill, and training requirements for NHS in a public-sector program in South India. Results indicated four general themes that covered the nurses' responses, their understanding of NHS and skills in its execution; gaps in their understanding of the NHS program, constraints faced in implementing the screening program, and additional needs for support.

Need of the study

Nurses are one of the core medical professionals who play a vital role in identifying hearing loss in the NICU and high-risk infants who need audiological intervention, provided they should have adequate knowledge and attitude about newborn HL. The present study aims to assess the knowledge and attitude of nurses toward infant HI in Bihar, as well as to evaluate the factors influencing their knowledge and attitude and highlight their misconception. It is important for the nurses to have adequate survey to increase their knowledge and attitude towards infant HI.

III. METHODOLOGY

Aim: The aim of the study was to assess the knowledge and attitudes of nurses towards infant HI in Patna, Bihar.

Preparations of questionnaire: Online 25 closed set of (YES/NO/NOT SURE) questions were validated by audiologists and speech language pathologists (SLP) to assess the knowledge and attitudes of nurses towards infant HI in Bihar.

Participants: 32 male and female nurses of any age group were considered in this study with the minimum education, or pursuing B.Sc nursing and up to graduation level (B.Sc nursing). The mother tongue of all the participants was Hindi.

Procedure: Online questionnaire using google form was administered to nurses related to knowledge and attitudes of infant's HL. The question was closed set task with 3 points rating scale YES, NO, NOT SURE. All participants were asked to read and understand the questions and select only one appropriate answer to the question. A total of 32 nurses including interns and students from primary nursing care centre, government and private hospitals and medical colleges were randomly selected in the present study.

Analysis: The responses for each of the 25 questions were coded for the purpose of analysis as follows: NO = 0, YES = 1, NOT SURE = 0.5. Further data was statically analyzed for frequency and percentage.

IV. Result and Discussion

The aim of the study was to assess the knowledge and attitude of nurses towards infant hearing impairment. The result obtained is discussed below:

The finding of knowledge and attitude of nurses towards infant HI in Bihar is as follows. There was a total of 25 questions. For each question the respondents have to say yes, no or not sure. According to the questions, the choice differs between yes, no or not sure.

	No		Not sure		Yes		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
1. Are you aware of infant hearing impairment?	8	25.0%	0	0.0%	24	75.0%	32	100.0%
2. Hearing impairment leads to the rise of other problems?	18	56.3%	5	15.6%	9	28.1%	32	100.0%
3.Children with hearing impairment often need extra help and instruction that are specialized?	9	28.1%	9	28.1%	14	43.8%	32	100.0%
4. Does medicine treat the hearing loss?	7	21.9%	7	21.9%	18	56.3%	32	100.0%
5. Do you think newborn hearing screening is cost effective?	15	46.9%	5	15.6%	12	37.5%	32	100.0%
6. Are you aware of government schemes/funds available for hearing screening in Bihar?	6	18.8%	9	28.1%	17	53.1%	32	100.0%
7. Is there a risk of hearing disability in prematurely born children?	16	50.0%	2	6.3%	14	43.8%	32	100.0%
8. Any kind of infection in the child's head, face, ears, neck can cause hearing impairment.	7	21.9%	5	15.6%	20	62.5%	32	100.0%
9. Can wax/cerumen in the child ear cause hearing loss?	11	34.4%	4	12.5%	17	53.1%	32	100.0%
10. Are infants with low birth weight more likely to have hearing loss?	18	56.3%	2	6.3%	12	37.5%	32	100.0%
11. Can forceps delivery affect the child's hearing ability?	15	46.9%	6	18.8%	11	34.4%	32	100.0%
12. Can chickenpox and measles in infants affect the hearing ability?	8	25.0%	4	12.5%	20	62.5%	32	100.0%
13. Do infant with hearing impairment have a delay in speech and language development?	5	15.6%	3	9.4%	24	75.0%	32	100.0%
14. Anoxia (an absence of oxygen) in newborn can cause hearing disability.	18	56.3%	2	6.3%	12	37.5%	32	100.0%
15. Use of hearing aids at an early age can help further recovery of speech and language in children.	8	25.0%	1	3.1%	23	71.9%	32	100.0%
16. Do government provide additional services for children with special needs?	9	28.1%	7	21.9%	16	50.0%	32	100.0%
17. Does high fever, ototoxic drugs affect the infant's hearing?	11	34.4%	3	9.4%	18	56.3%	32	100.0%
18. Early identification and intervention prevents hearing disability in infant.	9	28.1%	4	12.5%	19	59.4%	32	100.0%
19. Is it possible to diagnose deafness in infants at birth?	14	43.8%	2	6.3%	16	50.0%	32	100.0%
20. Are newborn hearing screening done by professional audiologists?	1	3.1%	5	15.6%	26	81.3%	32	100.0%
21. Are 2 out of every 1000 newborns are diagnosed with hearing loss?	11	34.4%	4	12.5%	17	53.1%	32	100.0%
22. Does neonatal jaundice affect the child's hearing?	10	31.3%	6	18.8%	16	50.0%	32	100.0%
23. Children with history of consanguinity are more prone to hearing loss or speech related problems.	12	37.5%	5	15.6%	15	46.9%	32	100.0%
24. Blockage in the ear canal or fluid in the middle ear can cause hearing loss in infants.	7	21.9%	2	6.3%	23	71.9%	32	100.0%
25. Do you think counselling prevents hearing impairment in infants?	10	31.3%	9	28.1%	13	40.6%	32	100.0%

Table.1 shows the percentage of knowledge and attitude of nurses towards infant hearing impairment.

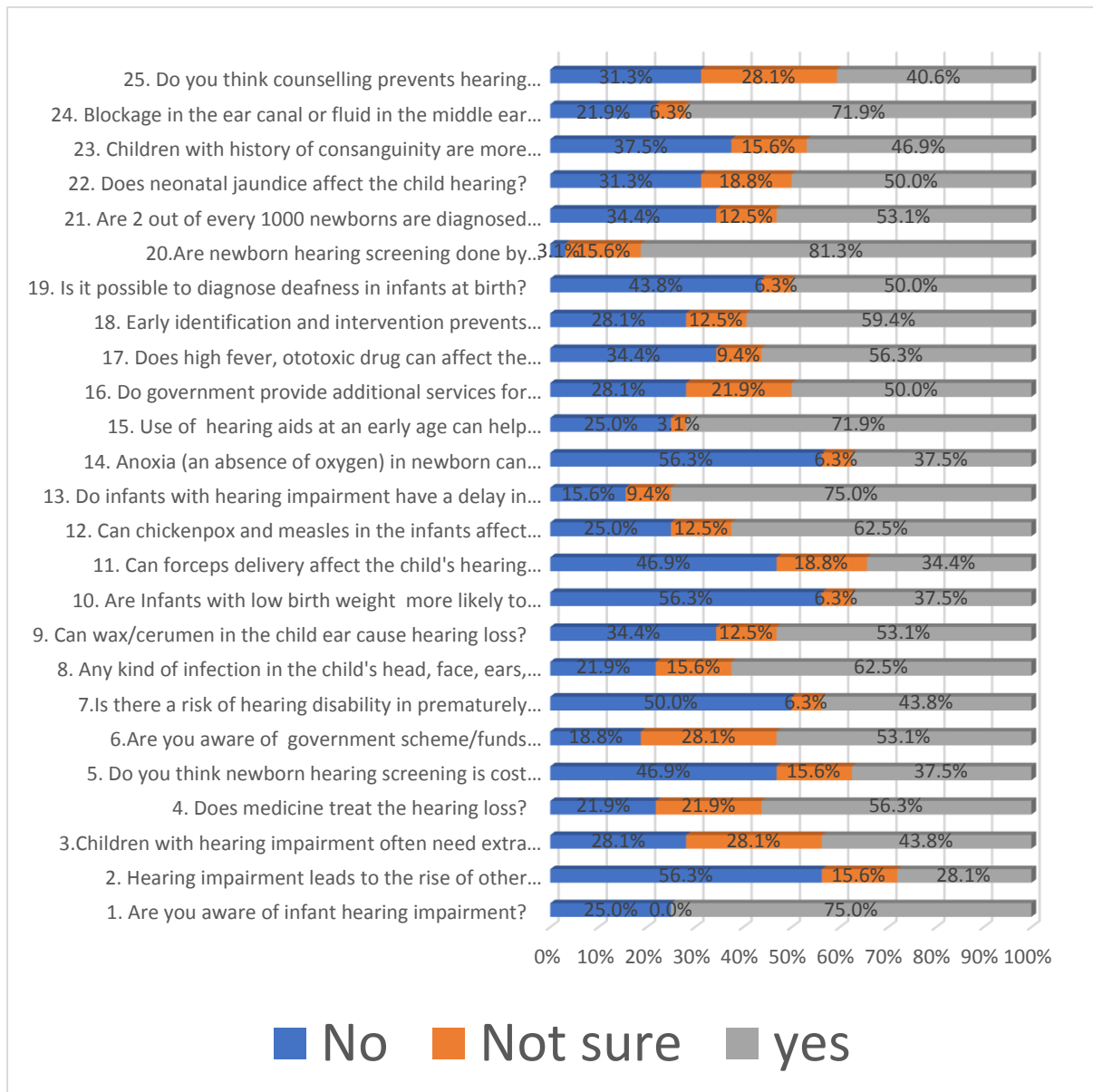


Figure.1 shows the responses of knowledge and attitude of nurses towards infants HI.

	N	Minimum	Maximum	Mean	Std. Deviation	Mean (%)
Over all awareness and attitude (25)	30	6	25	13.31	3.856	53.25

If mean (%)	
<=50%	Poor
51 – 75%	Moderate
76 – 100%	Good

Among the 30 participants, result revealed that 14(44%) of the participants had moderate knowledge and attitude, 17(52%) participants had poor knowledge and attitude and 1(4%) had good knowledge and attitude towards infant HI.

Above result indicated that there is minimal awareness of the infant HI among healthcare professionals (nurses) in Bihar. The results of the present study is similar to previous studies by Sanju et.al (2018) and Ravi et.al (2017) where, results revealed poor knowledge and attitude of nurses towards infant HI.

The results suggested that nurses should have adequate knowledge and attitude towards newborn HI, rehabilitation, evaluation and management services, as they play a vital role in identifying HL among infants in the NICU and guiding parents and their families through hearing screening and treatment procedure.

V. CONCLUSION AND SUMMARY

The purpose of the current study was to assess the knowledge and attitude of nurses towards infant HI in Bihar. A total of 30 nurses were selected randomly from primary nursing care centre, government, private hospitals and medical colleges for this study. Online 25 closed set of questions were validated by audiologists and speech language pathologists (SLP) to assess the knowledge and attitudes of nurses towards infant HI in Bihar. All participants were asked to read and understand the questions and select only one appropriate answer to the question.

As nurses are working in well-baby nursery and NICU they are often the point of contact for promoting and administering hearing screening, documentation, counselling parents and ensuring follow-up care. Therefore, the nurse as a care provider, advocate and educator for patients and families is crucial (Hollenbeck, 2008). Nurses are familiar with newborn and infant developmental milestones. Information provided in a nursing curriculum includes speech and language developmental milestones. In some hospitals, an audiology department is available to do the newborn hearing screenings.

Most HI can be identified during NHS. A successful NHS warrants the participation and support of professionals from multiple disciplines. Nurses can be a key member of this team. They can provide information and procedures to help parents perform the NHS.

HI can be a substantial barrier to children's education and social integration. Early identification and intervention for HI can provide important benefits because hearing is critical for learning oral communication, as well as academic and social participation (Alsudays et al., 2020).

Training nurses to perform hearing screening is critical and ongoing. It is possible that as nursing staff turnover, this staffing change can impact the quality of the NHS process (ASHA, 2012). While maintaining professional competence belongs to each individual nurse, the accountability is also shared with the employer. It is the employer's role to provide a practice environment favourable for the nurse to maintain these competencies. "Assurance of competence is the shared responsibility of the profession, individual nurses, professional organizations, credentialing and certification entities, regulatory agencies, employers, and other key stakeholders" (ANA, 2010).

According to the results of the current study nurses have moderate level of information about infant HI, the knowledge and attitude they have towards infant with HI scored is 53.25%.

Most nurses have been shown awareness of infant HI and its services which includes children with HI needing extra help and support, government funds/schemes in Bihar, infection in child's head neck, ear as well as chickenpox and measles causing HL, delay in speech and language development, government services, early identification and intervention, NHS done by audiologists, neonatal jaundice affecting hearing and ear canal blockage causing HL. However, few of them are not aware of the cost of NHS and also unaware that premature birth, low birth weigh, forceps delivery and anoxia can also be causes of HL.

The present study's aim was to assess the knowledge and attitude of nurses toward infant HI in Bihar, as well as to evaluate the factors influencing their knowledge and attitude and highlight their misconception. It is important for the nurses to have adequate survey to increase their knowledge and attitude towards infant HI.

Limitations:

- Sample size is very small.
- Study was conducted only in Patna, Bihar

Future implications:

- More number of participants should be included for the study
- The study can be conducted in different professionals.
- More questions can be included on knowledge and attitude towards HL
- Comparative study can be done on government, corporates and primary nursing care.

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APPENDIX

Dr.M.V. Shetty College of Speech and Hearing

QUESTIONNAIRE

Knowledge And Attitude of Nurses Towards Infant Hearing Impairment in Bihar.

1. Are you aware of infants hearing impairment?
YES / NO / NOT SURE
2. Hearing impairment leads to the rise of other problems.
YES / NO / NOT SURE
3. Children with hearing impairment often need extra help and instruction that are specialized?
YES / NO / NOT SURE
4. Does medicine treat the hearing loss?
YES / NO / NOT SURE
5. Do you think newborn hearing screening is cost effective?
YES / NO / NOT SURE
6. Are you aware of government schemes/funds available for hearing screening in Bihar?
YES / NO / NOT SURE
7. Is there a risk of hearing disability in prematurely born children?
YES / NO / NOT SURE
8. Is there any kind of infection in the child's head, face, ears, neck causing hearing impairment?
YES / NO / NOT SURE
9. Can wax/cerumen in the child's ear cause hearing loss?
YES / NO / NOT SURE
10. Are infants with low birth weight more likely to have hearing loss?
YES / NO / NOT SURE
11. Can forceps delivery affect the child's hearing ability?
YES / NO / NOT SURE
12. Can chickenpox and measles in infants affect the hearing ability?
YES / NO / NOT SURE
13. Do infants with hearing impairment have a delay in speech and language development?
YES / NO / NOT SURE
14. Anoxia (an absence of oxygen) in newborn can cause hearing disability.
YES / NO / NOT SURE
15. Use of hearing aids at an early age can help further recovery of speech and language in children.
YES / NO / NOT SURE
16. Do government provide additional services for children with special needs?
YES / NO / NOT SURE
17. Does high fever, ototoxic drugs affect the infant's hearing?
YES / NO / NOT SURE

18. Early identification and intervention prevents hearing disability in infants.
YES / NO / NOT SURE
19. Is it possible to diagnose deafness in infants at birth?
YES / NO / NOT SURE
20. Are newborn hearing screening done by professionals audiologists?
YES / NO / NOT SURE
21. Are 2 out of every 1000 newborns diagnosed with hearing loss.
YES/NO/NOT SURE
22. Does neonatal jaundice affect the child's hearing?
YES/ NO / NOT SURE
23. Children with history of consanguinity are more prone to hearing loss or speech related problems?
YES / NO/ NOT SURE
24. Blockage in the ear canal or fluid in the middle ear can cause hearing loss in infants.
YES / NO / NOT SURE
25. Do you think counselling prevents hearing impairment in infants?
YES / NO / NOT SURE