



Original Article:

Knowledge, Attitude and Practices Among Nurses Towards Newborn Hearing Screening in India

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Abstract: Background and objectives: Multidisciplinary team approach can act as the major facilitator for the successful implementation of newborn hearing screening. Nurses can act as a good educator for the parents due to their close association. Therefore, the need was felt to explore the knowledge, attitudes and existing practices towards newborn hearing screening. Method: Cross-sectional study was carried out using the convenient sampling in a tertiary hospital to assess knowledge, attitude and practices. Results: The familiarity about newborn hearing screening was relatively low, also there was lack of surety regarding the ideal time for receiving additional testing for the newborns not passing the screening. More than 90% were positive about screening all newborns for hearing loss at the same time 40% felt that it leads to excessive anxiety and concerns. Conclusion: The role played by nurses include educating parents, explaining parents about impact of hearing loss, follow-up and facilitator for screening process as team member. Nurses showed positive attitude while at the same time emphasized need to have additional information.

Key Words: Infants, Hearing, Nurses, Screening

Introduction:

As per the National Sample Survey Organization survey in 2002 in India, 291 persons per 100,000 are suffering from severe to profound hearing loss of which almost 7% have a congenital hearing loss (1). As per the World Health Organization, an estimated prevalence of hearing loss is 6.3% in India (2). However, in spite of this high prevalence, universal newborn hearing screening is still in the initiation phase in India and confined to individual centers. These centers are also predominantly located in urban cities. Thus,

rural population which forms a major portion remains untested.

A successful newborn hearing screening (NHS) program requires the active participation of several health care professionals (physicians, pediatricians, neonatologists, midwives, nurses, and audiologists). This active multidisciplinary team forms the backbone for the successful implementation of NHS program. The primary medical care team including physicians, pediatricians as well as the nurses are mainly involved in referral and ensuring a proper follow-up. The audiologists are involved in screening and further detailed audiological evaluation and treatment procedures. The success of NHS lies on the capability to form a link between screening and effective diagnosis and treatment. Parents form the backbone of this program from before the birth of the child to beyond. The program can be successful only with their consent, co-operation and motivation.

As per a survey evaluating different universal newborn hearing screening (UNHS) programs in the United States, the screening is performed by nurses in most hospital-based settings (3). This highlights the important and crucial role played by nurses/midwives in the successful implementation of the NHS program. In a study carried out in Switzerland to assess the success of a NHS program, 88% of the institutions running the program reported that nurses/midwives do the main testing. The remaining 12% was carried out by audiometrists or doctors (4).

A knowledge, attitude and practices (KAP) survey helps to gauge what people know about a certain concept or problem, how they look at it and how they deal with it (5). The results help in filling the knowledge gaps which can in turn help for the successful implementation of a program. Attempts have

been made at assessing the knowledge, attitude and practices towards NHS among health care professionals such as physicians (6-9), nurses/midwives (10), physicians and/or medical interns (11), pediatricians (12).

Midwives or nurses are usually in direct contact with the parents and play a key role in encouraging follow-up services. These professionals can educate and counsel expectant mothers as well as during the postpartum period on need and importance of NHS, steps followed, early identification and intervention and timely follow-up. Also, they can provide valuable information on motor, sensory and language developmental milestones. As these professionals are more accessible and easily available as compared to doctors, they form a crucial emotional support system for parents of diverse socio-economic and cultural backgrounds during the NHS procedures (13).

In a KAP survey conducted on midwives in the United States regarding NHS, significant knowledge gaps in knowledge regarding screening steps, referral and follow up procedures were reported. They also expressed the need to have additional information on genetics and hearing loss conditions, hearing screening guidelines, existing protocols for ensuring follow-up testing, referrals to be made and treatment options. However, surprisingly only 68% of the respondents considered hearing screening for all newborns as essential (10).

A recent survey was carried out to identify if the existing midwifery education programs being implemented in the United States include sufficient information related to NHS in their curriculum and also what information is included. Twenty-seven program directors replied to the survey of which 96.3% reported that UNHS was discussed at some point of time during their midwifery education program. Most directors (96.3%) felt the importance of educating their students about the programs. Also, it was felt that if the midwives received detailed education about the NHS program, its importance and implementation then the age of newborn screening could be brought down to below one month of age (14).

The aim of the present study is to explore and compare the existing knowledge levels, attitude and practices of the NHS among nursing professionals in a tertiary hospital in South India. This study was undertaken at the time of initiation of a NHS program at the tertiary hospital.

Method

Study design

The study used a cross-sectional study design.

Setting and sample

A questionnaire based study was carried out using the convenient sampling method in a tertiary hospital in South India among nurses working in pediatric/neonatal wards.

Instrument

The questionnaire developed by Moeller et al. (6) and Goedert et al (10) was adopted with appropriate modifications. Prior permission was taken from the corresponding author for the same. The final questionnaire was subjected to content validation by providing it initially to five audiologist with more than 10 years of experience in the field of pediatric audiology. The criteria for validation was based on the domains of selection of question items, language used, feasibility and scoring. They were asked to rate on three point scale; strongly agree, agree or do not agree for each question. An additional open ended question was added in the validation form to seek input about the overall questionnaire. Further, it was administered on five nurses to seek their input regarding the suitability of the questionnaire and ease of administration. The questionnaire was explained and provided in English language. The participants could ask for clarification on any question if required.

The final questionnaire consisted of 15 questions related to NHS. The questions 1, 2, 5, 8, 10 and 11 assessed existing knowledge and options for expanding this knowledge. The questions 3, 4, 6, 7, and 12 elicited the attitudes towards NHS. While, questions 9, 13, 14 and 15 required the participants to provide an input regarding the existing practices. Four questions (8, 9, 11 and 15) were open ended in nature. This provided the participants with a scope to express their opinions freely. Later, based on the responses obtained, question numbers 8, 9 and 11 were categorized for ease of analysis. The remaining questions contained multiple choice questions to be rated on different rating scales.

Procedure

The participants were explained the purpose of the study and a written consent was taken prior to administering the questionnaire. On an average, the time taken to fill the questionnaire was 8-10 minutes. The participation was on a voluntary basis and confidentiality of the participant details was maintained.

Data analysis

Descriptive statistics was used to summarize the continuous data as well as to calculate frequency and percentages. Data analysis was carried out using SPSS 15 (SPSS Inc., South Asian Ed, Bengaluru, Karnataka, India).

Results

A total of 106 nurses participated in the study who were working in pediatric/neonatal wards. The mean age of the nurses 26 ± 8.53 years (range: 20-52 years). The results have been discussed in terms of existing knowledge, attitude and practices towards NHS among the nurses.

Existing knowledge levels about NHS

The Table 1 shows the distribution of responses for following questions eliciting the knowledge levels; 1, 2, 5, 8 and 10. The familiarity with newborn and infant hearing screening was relatively low with 41.5 % responding as not familiar. The existence of universal newborn hearing screening program was known to 57.5% nurses. For, the question on the ideal time to teach families regarding NHS and importance of follow-up, 57.5% reported it to be both pre and post birth. There was lack of surety for the earliest estimated age at which newborn not passing the hearing screening should receive additional testing among 60.4% nurses. For the question whether their training prepared them to meet the need of infants with hearing loss, 43.4% nurses reported in negation. The responses for primary sources of information about NHS have been shown in Figure 1.

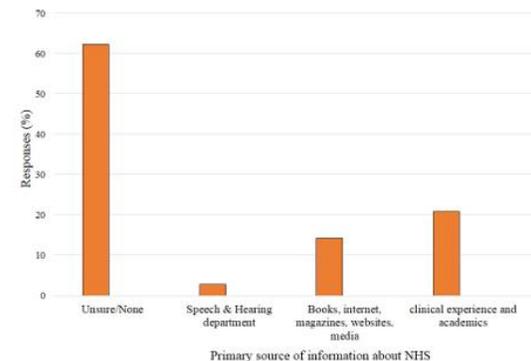


Figure 1 Primary sources of information about NHS

Table 1: Distribution of responses of questions on knowledge, attitude and practice levels		
Question	Responses	% of nurses
Responses to questions on knowledge		
1. How familiar are you with new born & Infant hearing Screening?	0= Not Familiar	41.5
	1= Somewhat not familiar	9.4
	2= Familiar	28.3
	3= Somewhat familiar	19.8
	4= Very familiar	0.9
2. Does your hospital have a universal new born hearing screening program	0= Unsure	32.1
	1= NO	10.4
	2= Yes	57.5
5. In your opinion, what would be the ideal time to teach families about the new born hearing and remind them about the importance for follow-up?	0= Prenatal, gestational period	14.2
	1= 1-8 Weeks post-birth	24.5
	2= Both pre and post birth	57.5
	3= Others	3.8
8. What is the best estimate of the earliest age at which a new born not passing the hearing screening should receive additional testing?	0 = No response/Unsure	60.4
	1= Before 3 months	9.4
	2 = 3-6 months	8.5
	3 = 6-12 months	10.4
	4 = after 1 year	11.3
10. Did your training prepare you adequately to meet the needs of infants with permanent hearing loss	0= Unsure	18.9
	1= No	43.4
	2= Yes	37.7
Responses to questions on Attitudes		
3. How important do you think it is to screen all new borns for hearing loss?	0= Unsure	0.9
	1= Very Unimportant	0
	2= Somewhat Unimportant	0.9
	3= Somewhat Important	5.7
	4= Very Important	92.5
4. Do you think hearing screening causes parents excessive anxiety and/or concerns?	0= Unsure	17.9
	1= No	39.6
	2= Yes	42.5
6. Do you believe that universal new born hearing screening is worth its cost?	0= Unsure	31.1
	1= No	19.8
	2= Yes	49.1
7. How confident are you that you could explain the new born hearing screening process to parents who have questions about their infant's results	0= Unsure	12.3
	1= Not confident	33.0
	2= Somewhat confident	40.6
	3= Very confident	14.2
Responses to questions on practices		
14. How frequently did you use the internet to access information about medical topics	0= Never	0.9
	1= Rarely	4.7
	2= Sometimes	42.5
	3= Frequently	51.9

Attitude towards NHS

The Table 1 shows the distribution of responses for following questions eliciting the attitudes; 3, 4, 6, and 7. It was really pleasing to note that 92.5% nurses were positive about screening all newborns for hearing loss. However, 42.5% respondents reported that hearing screening can cause parental anxiety and concerns. For the question, if NHS is worth its cost, 49.1% respondent were positive, however, 31.1% were

unsure about it. To the question related to how confident they are to explain the NHS process to parents about their infant results, 40.6% nurses reported affirmatively. The responses obtained on the need for having information on different aspects related to permanent hearing loss in terms of percentages have been shown in Table 2.

Table 2: Responses for the need for having information on different aspects related to permanent hearing loss in children		
Item	Response (%)	% nurses
a. Methods of screening	Great need	86.8
	Somewhat of a need	13.2
	No need	0
b. Protocol for follow-up screening	Great need	77.4
	Somewhat of a need	22.6
	No need	0
c. Methods for screening children (0-5 years) during well child visits	Great need	76.4
	Somewhat of a need	20.8
d. Guidelines for informing families about screening results	Great need	87.7
	Somewhat of a need	11.3
e. Impact of different degrees of hearing loss on Infant language	Great need	64.2
	Somewhat of a need	32.1
	No need	3.8
f. Early intervention Options	Great need	82.1
	Somewhat of a need	17
	No need	0.9
g. Useful contacts for more information	Great need	72.6
	Somewhat of a need	26.4
h. Patient education resources	Great need	86.8
	Somewhat of a need	13.2
	No need	0
i. Genetics and hearing loss	Great need	73.6
	Somewhat of a need	25.5
	No need	0.9

Practices towards NHS

Question 9 required the nurses to mention the specialists to whom they routinely refer the family of a child with confirmed hearing loss. About 42.5% of all the participants kept this question blank. As depicted in Figure 2, the other professionals referred to were ENT, pediatrician and audiologist and speech language pathologist. Figure 3 shows the responses for the preferred methods for dissemination of information. Nurses (51.9%) frequently used internet for medical topics as shown in Table 1. Question 15 required responses to the roles played by the nurses in promoting NHS and/ or follow-up services. A majority of respondents (74.76%) were unaware of the role they play in the NHS and follow-up services. The other responses were; providing health education, explaining the parents regarding impact of hearing loss, encouraging & motivating parents regarding hearing screening and its

advantages, educating parents about importance of follow-up, acting as a team member in the NHS process to felicitate screening.

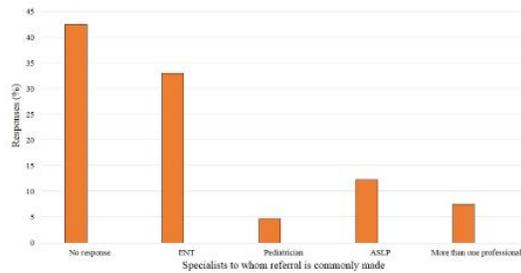


Figure 2: Specialists to whom referral is commonly made

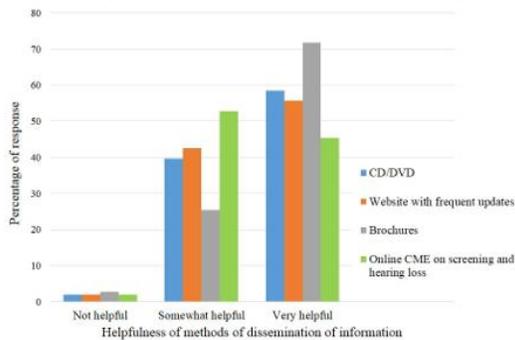


Figure 3: Helpfulness of methods of dissemination of information

Discussion

The present study was a first attempt at exploring the knowledge, attitudes and practices among nurses regarding NHS in a tertiary hospital in India. The study was carried out as a part of an ongoing study on the implementation of NHS in the tertiary hospital. Therefore, studying the KAP towards NHS among nurses was considered essential. The nurses who participated in the present study were actively involved in pediatric/neonatal wards and hence played a crucial role. The results have been discussed based on the different sub-sections of the questionnaire.

Existing knowledge levels about NHS

The familiarity with NHS was relatively low 41.5% being not familiar, this can be attributed to newly implemented program. The lack of adequate training regarding infant hearing loss was reported by 43.4% of respondents similar to 56% of midwives (10). Nurses were unsure about the earliest age for retesting and the ideal time to teach the families regarding NHS and follow-up. Further, a large number of nurses were unsure or had no response for the open-ended question on primary sources of information related to NHS. This further reiterates a shortcoming in the curriculum or awareness campaign regarding NHS. These findings are similar to study in midwives working in US (10).

Attitude towards NHS

A higher percentage of nurses (90%) felt that NHS is important as compared to 68.5% midwives in US (10). However at the same time, 42.5% respondents felt that hearing screening causes excessive anxiety and concerns despite previous research providing evidence that NHS should not be a cause of parental anxiety (15-17). These differences in responses could be the result of cultural differences in the present study as compared to previous reports. The nurses were somewhat confident in explaining NHS process to the parents which can be attributed to their hands-on experience they receive. In terms of need for having additional information on different aspects related to permanent hearing loss, the majority of responses were 'great need'. This sheds

light on the need felt by the nurses for receiving additional information as well as their receptiveness. The information can be imparted through organizing awareness drives, continuing medical education programs (CMEs) and visual display through charts.

Practices towards NHS

Nurses are a part of the multi-disciplinary team for NHS, however, they are rarely involved as decision makers or for making referrals/follow-up services (10). This lack of clarity of the role might have led to no responses by 42.5% of the participants for the question on specialists that are routinely referred. Also, a majority of respondents (74.76%) were reported to be unaware of the role they play in the NHS and follow-up services. Similarly, (10) reported in midwives that NHS is not their primary responsibility and they are not directly involved in referral process.

In recent years, internet has become a good source of vast information that is readily available to its users. Different studies carried out in nurses have emphasized on the growing use of internet for education and knowledge purposes (18-20). Likewise in the present study, nurses were receptive towards accessing internet for medical topics. The order of preference for the most preferred way of dissemination of information was brochures being most preferred followed by, CD/DVD, updated websites, and continuing medical education (CME) programs.

Palmer et al. (15) have given suggestions on the topics that may be included in the midwifery education programs. These include prevalence of congenital hearing loss, risk factors leading to hearing loss, impact of early as compared to late identified hearing loss on overall development especially speech and language, detailed information on steps and implementation levels of universal NHS programs, legal responsibilities and strategies of counselling parents.

Conclusions

The present study helps to identify certain lacunae areas among nurses that can be worked up for a successful implementation of the NHS program and follow-up. These include highlighting the role played by the nurses, preparing the being active members in the NHS program for counselling and educating the parents, encouraging and ensuring follow-up, being able to explain screening results and importance of early identification and intervention.

References

1. National Sample Survey Organization. Disabled persons in India, NSS 58th round. Report no. 485 (58/ 26/1). 2002. New Delhi.
2. World Health Organization. State of Hearing and Ear Care in the South East Asia Region, WHO Regional Office for South East Asia. 2012. Available from: http://apps.searo.who.int/pds_docs/B1466.pdf
3. Shulman S, Besculides M, Saltzman A, Ireys H, White KR, Forsman I. Evaluation of the universal newborn hearing screening and intervention program. *Pediatr.* 2010;126:S19-27.
4. Metzger D, Pezier TF, Veraguth D. Evaluation of universal newborn hearing screening in Switzerland 2012 and follow-up data for Zurich. *Swiss Med Weekly.* 2013;143:w13905. doi:10.4414/smw.2013.13905
5. Kaliyaperumal K. Guideline for conducting a Knowledge, Attitude and Practice study. 2004. Retrieved from [http://www.birds.cornell.edu/citscitoolkit/toolkit/steps/effects/resource-folder/Guideline for Conducting a KAP Study \(PDF\).pdf](http://www.birds.cornell.edu/citscitoolkit/toolkit/steps/effects/resource-folder/Guideline%20for%20Conducting%20a%20KAP%20Study%20(PDF).pdf) on 1st January 2017.
6. Moeller MP, White KR, Shisler L. Primary care physicians' knowledge, attitudes, and practices related to newborn hearing screening. *Pediatr.* 2006;118(4):1357-70. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/17015524>.

7. Johnson C, Danhauer J, Granali A, Ross M, Harrison J, Cresawn C. Systematic review of physicians' knowledge of, participation in, and attitudes toward newborn hearing screening programs. *Semin Hear.* 2009;30(3):149–64.
8. Rogha M, Mokhtari E. Study of the knowledge of pediatricians and senior residents relating to the importance of hearing impairment and deafness screening among newborns. *Iran J Otorhinolaryngol.* 2014;26(2):57–63.
9. Lopez-Vazquez M, Berruecos P, Lopez LE, Cacho J. Attitude and knowledge of hearing loss among medical doctors selected to initiate a residency in Mexico. *Int J Audiol.* 2009;48(3):1017.
10. Goedert MH, Moeller MP, White KR. Midwives' knowledge, attitudes, and practices related to newborn hearing screening. *J Midwifery Women's Heal.* 2011;56(2):147–53.
11. Yerraguntla K, Ravi R, Gore S. Knowledge and attitude of pediatric hearing impairment among medical interns and general physicians in Udupi taluk. *Indian J Otol.* 2016;22:183–7.
12. Ravi R, Gunjawate DR, Yerraguntla K, Lewis LE, Bellur R. A national survey of knowledge, attitude and practices among pediatricians towards newborn hearing screening in India. *Int J Pediatr Otorhinolaryngol.* 2017;95:9-14. doi:10.1016/j.ijporl.2017.01.032
13. Biernath K, Holstrum WJ, Eichwald J. Hearing Screening for Newborns: The Midwife's Role in Early Hearing Detection and Intervention. *J Midwifery Women's Heal.* 2009;54(1):18–26.
14. Palmer SB, Bednarz SE, Dilaj KA, McDonald AM. Universal Newborn Hearing Screening in Midwifery Education: A Survey. *J Midwifery Woman's Health.* 2016;61(4):435–41.
15. Crockett R, Wright AJ, Uus K, Bamford J, Marteau TM. Maternal anxiety following newborn hearing screening the moderating role of knowledge. *J Med Screen.* 2006;13(1):20–5.
16. Watkin PM, Baldwin M, Dixon R, Beckman A. Maternal Anxiety and Attitudes to Universal Neonatal Hearing Screening. *Br J Audiol.* 1998;32(1):27–37.
17. Suwannapak A. Parental anxiety and attitude to neonatal hearing screening. Degree of. Masters of Arts, Faculty of graduate studies, Mahidol University; 2004. ISBN 974-04-4765-1
18. Gilmour JA, Huntington A, Broadbent R, Strong A, Hawkins M. Nurses' use of online health information in medical wards. *J Adv Nurs.* 2012;68(6):1349–58.
19. Ajuwon GA. Computer and internet use by first year clinical and nursing students in a Nigerian teaching hospital. *BMC Med Informatics Decis Mak.* 2003;3:10.
20. Younger P. Internet-based information-seeking behavior amongst doctors and nurses: A short review of the literature. *Health Information and Libraries Journal.* 2010;27:2–10.